Thailand Health Profile 2005-2007

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Preface

The Ministry of Public Health Thailand has published the report entitled "Thailand Health Profile" (in Thai and English) regularly every two years since 1995. This is the fifth edition of such a report, prepared in collaboration with experts, specialists and representatives of relevant agencies responsible for health information. With such efforts, the report describes the national health system that is linked to environmental factors in an integrated manner, efficiently leading to the national health system development.

This edition of "Thailand Health Profile 2005-2007" deals with the topics related to those included in the previous edition, with the addition of two priority topics: health security in Thailand, which mentions about its evolution, achievements of the health security system operations, and the outlook; and the systems for surveillance of diseases and public health emergencies that are being improved to effectively respond to public health emergencies, especially during the outbreak of sudden acute respiratory syndrome (SARS), avian influenza, and the natural disaster "tsunami".

The Ministry of Public Health really hopes that this report would serve as a technical reference at the national and international levels, leading to further health system development in accordance with changes in the globalized world.

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Acronyms

AD	Anti-dumping Duty
AEM	Asian Epidemic Model
AFTA	ASEAN Free Trade Area
AHB	Area Health Board
AIDs	Acquired Immune Deficiency Syndrome
ANC	Ante-Natal Care
APEC	Asia-Pacific Economic Cooperation
APO	Autonomous Public Organization
ASEM	Asia-Europe Metting
BCG	Vaccine against Tuberculosis
BMA	Bangkok Metropolitan Administration
BMI	Body Mass Index
CABG	Coronary Artery Bypass Graft
CEO	Chief Executive Office
CI	Concentration Index
CMCs	Community Medical Centers
CMR	Child Mortality Rate
COPD	Chronic Obstructive Pulmonary Disease
CPI	Corruption Perceptions Index
CSMBS	Civil Servants Medical Benefits Scheme
CSWs	Commercial Sex Workers
CUP	Contracted Unit of Primary Care
CVD	Countervailing Duty
DALYs	Disability Adjusted Life Years
DDC	Department of Disease Control
DG	Director Generals
DHB	District Health Board
DHF	Dengue Haemorrhagic Fever
DLA	Department of Local Administration
DMFT	Decoyed, Missing and Filled Teeth
DMH	Department of Mental Health
DMS	Department of Medical Service
DMSc	Department of Medical Sciences

DOA	Department of Agriculture
DOH	Department of Health
DPT	Vaccine against Diptheria, Pertussis and Tetanus
DRG	Diagnosis Related Group
EC	European Community
ECT	Election Commission of Thailand
EGAT	Electricity Generating Authority of Thailand
EPI	Expanded Programme on Immunization
ESWL	Extracorporal Short-Wave Lithotripters
EU	European Union
FDA	Food and Drug Administration
FETP	Field Epidemiology Training Programme
FY	Fiscal Year
GDP	Gross National Product
GIS	Geographical Information System
GMP	Good Manufacturing Practices
GPO	Government Pharmaceutical Organization
HA	The Institute of Hospital Quality Improvement and Accreditation
HB	Hepatitis B
HDI	Human Development Index
HEC	Office of the Higher Education Commission
HIV	Human Immunodeficiency Virus
HSPG	Health Service Practice Guidelines
HSRC	The National Health System Reform Commission
HSRI	Health System Research Institute
HSRO	The National Health System Reform Office
ICT	Information and Communication Technology
IDD	Iodine Deficiency Disorders
IHR	International Health Regulation
IMD	International Institute for Management Development
IMF	International Monetary Fund
IMR	Infant Mortality Rate
KPI	Key Performance Indicator
LGOs	Local Government Organizations
MCH	Maternal and Child Health
MDGs	Millennium Development Goals

MDR	Media Data Resources
MDT	Multiple Drug Therapeutic(for leprosy)
MMR	Maternal Mortality Ratio
MOC	Ministry Operations Centre
MOF	Ministry of Finance
MOPH	Ministry of Public Health
MRI	Magnetic Resonance Imaging
MSWP	Medical Service Welfare for the People
MWA	Metropolitan Waterworks Authority
n.a.	Not Available
NAFTA	North America Free Trade Area
NCCC	National Counter-Corruption Commission
NESDB	National Economic and Social Development Board
NGO	Non Government Organization
NHC	National Health Commission
NHF	National Health Foundation
NHSB	National Health Security Board
NHSO	Nation Health Security Office
NSO	National Statistical Office
NSTDA	National Science and Technology Development Agency
OECD	Organization for Economic Co-operation and Development
OPD	Out Patient Department
OPS	Office of the Permanent Secretary
OPV	Oral Polio Vaccine
ORT	Oral Rehydration Therapy
OTC	Organization for Trade Cooperation
PAO	Provincial Administrative Organizations
PCMO	Provincial Chief Medical Officer
PCR	Polymerase Chain Reaction
PCU	Primary Care Unit
PLP	Network for Promotion of People's Law Proposition Process
PPHO	Provincial Public Health Office
PWA	Provincial Waterworks Authority
SARS	Severe Acute Respiratory Syndrome
SEARO	South-East Asia Regional Office

SIP	Social Investment Project
SMR	Standardized Mortality Ratio
SPC	Survey of Population Changes
SRRT	Surveillance and Rapid Response Team
SSF	Social Security Fund
STIs	Sexually Transmitted Infections
SDU	Service Delivery Unit
TAO or SAO	Tambon or Subdistrict Administrative Organizations
TFR	Thai Research Fund
ThaiHealth	Thai Health Promotion Foundation
THB	Tambon Health Board
TT	Tetanus Toxoid
UC	Universal Coverage
UCIA	Universal Coverage Innovation Award
UNDP	United Nation Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
VAVP	Motor Vehicle Accident Victims Protection
VHIP	Voluntary Health Insurance with Government Subsides Project
VHVs	Village Health Volunteers
WEF	World Economic Forum
WHO	World Health Organization
WSH	Unsafe Water, Sanitation and Hygiene
WTO	World Trade Organization

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CHAPTER 1

CHAKRI DYNASTY AND THAI PUBLIC HEALTH

The development of public health in Thailand has been associated with the monarchy institution since the Sukhothai period and with that in the Rattanakosin (Bangkok) period in particular. Thus, this chapter focuses on the relationships between the Royal House of Chakri or Chakri Dynasty and the public health system in Thailand, which are phased into different eras as follows:

1. Health Development in the Chakri Dynasty: The Four Eras

1.1 The Era of Thai Traditional Medicine Revival (1782-1851)

The reigns of King Rama I through King Rama III (the first through third Kings) of the Rattanakosin period were a period of national **reconstruction** with efforts in **assembling various technical disciplines** for use as references for study and national development.

1.1.1 The Reign of King Rama I (1782-1809)

King Rama I (Phrabat Somdet Phra Buddha Yod Fa Chulalok the Great) graciously had Wat* Photharam (Wat Pho) renovated as a royal monastery, renamed it Wat Phra Chetuphon Wimon Mangklaram, and had traditional medicine formulas as well as body exercise or stretching methods assembled and inscribed on cloisters' walls. Regarding official drug procurement, the Department of Pharmacy (Krom Mo Rong Phra Osot) was established, similar to that in the Ayutthaya period. The medical doctors who were civil servants were called **royal doctors** (mo luang) and other doctors who provided medical services to the general public were called **private doctors (mo ratsadon or mo chaloei sak)**.

1.1.2 The Reign of King Rama II (1809-1824)

King Rama II (Phrabat Somdet Phra Buddha Loetla Naphalai) graciously had traditional medicine textbooks gathered again by inviting all experts/practitioners to assemble indications of various medicines. Anyone having a good medicine formula was requested to present it

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* Wat means Buddhist monastery.

to the King. Then the royal doctor department would select and inscribe the good ones in the **Royal Formulas for the Royal Pharmacy (Tamra Luang Samrab Rong Phra Osot)** for the public's benefits.

In 1816, the King graciously promulgated the Royal Pharmacists (Phanakngarn Phra Osot Thawai) Law, under which royal pharmacists had powers to seek medicinal plants throughout the country; and no one could raise any objection. And thus they passed on the practices to following generations.

1.1.3 The Reign of King Rama III (1824-1851)

King Rama III (Phrabat Somdet Phra Nangklao Chao Yuhua) graciously had Wat Phra Chetuphon renovated and had traditional medicine formulas inscribed on marble tablets affixed to the walls of the temple and cloisters, describing the causes and cures of illnesses. Rare medicinal herbs were planted so that the people could study and use for self-care without confining them for use only in any particular family. The Wat is thus considered the "first open university" in Thailand.

In 1828, the fifth year in the reign of King Rama III was regarded as the time that Western medicine began to play a key role in medical and health care in the country. The Western medical care including dangerous disease prevention was provided to the people. **Dr. Dan Beach Bradley,** generally known to the people as "Mo Bradley", an American Christian missionary who came to Thailand in 1835, **initiated a disease prevention** programme for the first time in the country with **smallpox inoculation.** Then, in 1838, the King advised the royal doctors to learn the inoculation techniques from Dr. Bradley in order to provide immunization services to civil servants and the public.

In 1849, Dr. Samuel Reynolds House, commonly known as **Mo House,** another doctor of the American missionary **introduced the use of ether as anaesthetic for the first time in Thailand.**

1.2 The Era of Civilization

During the reigns of King Rama IV through King Rama VI, there were diplomatic relationships with Western countries and more Christian missionaries. The Kings visited foreign countries and brought back various kinds of civilization for application in the Kingdom, which steadily became modernized; so did the medical and health system.

1.2.1 The Reign of King Rama IV (1851-1868)

During the reign of King Rama IV (Somdet Phra Chomklao Chao Yuhua or King Mongkut), the Thai medical service was divided into two systems: traditional medicine and modern medicine.

Three American doctors (Drs. Bradley, House and Lane) lived in Thailand for a long time during that period. Dr. House played an active role in the control of cholera by using water mixed with tincture iodine in effectively treating the patients orally.

Although the Western medical service was more widely provided, for example in obstetric care, it was unable to change the values of the people as Thai traditional medicine had been used culturally for several generations and was part of Thais' lifestyle.

1.2.2 The Reign of King Rama V (1868-1910)

Previously, there was no public hospital to provide curative care to sick people as only temporary hospitals were set up at various places to care for patients during epidemics. After the epidemic subsided, such hospitals were abolished. King Rama V (Phrabat Somdet Phra Chulachomklao Chao Yuhua or King Chulalongkorn) graciously initiated a medical care programme for the poor by establishing a **Hospital Management Committee** in 1886 under the Chairmanship of the King's brother, Prince (Krommamuen) Siriwachsangkat. A hospital was constructed and completed in 1888 and royally named **"Siriraj Hospital"** in commemoration of his son, **Prince Siriraj Kakuttaphan,** who had died of dysentery. Later on, the King graciously established a **Nursing Department** responsible for the management of Siriraj Hospital, replacing the Hospital Management Committee in 1889. The Department was then under the Ministry of Education (Krasuang Dharmmakan) with the King's brother, Prince (Krommamuen) Damrong Rajanuparp, as the Director-General. During that period, a number of major medical service events occurred:

In 1889, a medical school (Phaetthayakorn School) was established in Siriraj Hospital, whose curriculum included both Western and traditional medicine. And in 1895, the first **Medical Welfare Textbook (Tamra Phaetthayasat Songkhro)** covering both types of medical practices was published.

In 1896, a midwifery school was established with the personal funds of Queen Sri Patcharindra Boromarachininart in the Siriraj Hospital compound.

In 1897, a new edition of the **Medical Welfare Textbook** was published whose contents mostly dealt with Western medicine.

In 1905, a subdistrict administrative system (sanitary district) was implemented as a pilot project for the first time in Tambon Tha Chalom (Tha Chalom subdistrict) of Samut Songkhram Province.

In 1907, two medical textbooks (medical literature or wetchasat wanna and medical welfare or phaetthayasat songkhro) were published; both were considered the "first national medical and pharmaceutical textbooks" of Thailand.

A Medical Division was set up to take responsibility for epidemic control and smallpox inoculation for the people in the provinces.

1.2.3 The Reign of King Rama VI (1910-1925)

During the reign of King Rama IV (Phrabat Somdet Phra Mongkutklao Chao Yuhua or King Vajiravudh), a number of medical and health activities were initiated as follows:

In 1911, King Chulalongkorn Memorial Hospital was built with funding from the King's personal accounts and the Thai Red Cross Society (then known as Sapha Unalom Daeng).

In 1912, the Pasteur Institute was established to be responsible for rabies prevention and control; and Vajira Hospital was established.

In 1914, under the Ministry of Interior, pharmacies (Osot Sapha) were set up to provide curative care and dispense drugs; and later each pharmacy was renamed "Health Centre" (Suk Sala).

In 1916, the Nursing Department was renamed "Public Protection Department" (Krom Prachaphiban) under the Ministry of Interior.

In 1916, His Royal Highness Prince Jainad Narendhorn (or Chainat Narenthorn) revised the medical education system by adding more clinical practices **while withdrawing traditional medicine** as the two systems were not compatible and it was difficult to identify knowledgeable Thai traditional medicine teachers who were willing to teach.

In 1917, the Army Medical School was established.

In 1918, the medical and sanitation programmes, previously under the Ministry of Interior and the Ministry of City Affairs (Nakhon Ban), were merged and named the Public Health Department on 27 November, with Prince Jainad Narendhorn as the first Director-General.

In 1920, the Queen Saovabha Memorial Institute was established; and the Thai Red Cross Society was registered as a member of the International Federation of Red Cross and Red Crescent Societies on 8 April.

In 1922, the Junior Red Cross Division and the Nursing School were established under the Thai Red Cross Society.

In 1923, **the Medical Practice Act** was promulgated to control medical services and practices so that there would be no harm done by unknowledgeable or untrained practitioners.

1.3 The Pioneering Era of Modern Medical and Health Services (1917-1929)

The King's father, Somdet Phra Mahitalathibet Adulyadej Vikrom Phra Boromarajchanok (commonly known as His Royal Highness Prince Mahidol of Songkla), was the first Thai prince to become seriously interested in medicine and public health. That was because he had deemed that the medical and health services were not modernized; and the people were highly vulnerable to illnesses, particularly communicable diseases. With his firm resolution to provide modern medical care to the people, he dedicated himself to the foundation and development of medicine by resigning from the Royal Thai Navy and then studying medicine and public health at Harvard University in the United States of America. Through his steady perseverance, he graduated with a Certificate of Public Health and a Doctor of Medicine degree (cum laude). He then returned to Thailand to perform numerous medical and health activities that were extremely beneficial to the country and Thai people. He donated

funds for such medical programmes as construction of a medical school, a hospital and a dormitory for nurses. His personal financial support was provided as fellowships for doctors and nurses to study abroad. He served as a Thai delegate in the negotiation with the **Rockefeller Foundation** on assistance for Thai medical service development. His support for medical research involved the initiation of the medical research and development programme at Siriraj Hospital. Besides, he participated in teaching medical and nursing students, and served as a medical resident at Siriraj Hospital and Chiang Mai's McCormick Hospital. He supported maternal and child health (MCH) services by drawing up a project to modify Vajira Hospital to become a large maternity hospital to serve as a training centre for nurses, midwives, public health nurses, social welfare workers and traditional birth attendants, so that there would be more MCH personnel.

Throughout his life, HRH Prince Mahidol undertook activities to promote the nation's medical and health services that are greatly beneficial to all Thai citizens. It was the foundation of the Thai public health system that has resulted in steady and sustainable development, similar to that in other civilized nations. Due to his prestige and ingenuity, he was named **"the Father of Thai Modern Medicine";** and a university that mainly produced medical and health personnel was named **"Mahidol University"** in commemoration of his good deeds.

1.4 The Era of the Inception of the Ministry of Public Health (MoPH)

1.4.1 The Reign of King Rama VII (1925-1934)

During the reign of King Rama VII (Phrabat Somdet Phra Pokklao Chao Yuhua, commonly known as King Prajadhipok), a **ministerial rule** on modern and traditional medical practices was enacted, specifying that:

A. **Modern medical practitioners** were those who used healing arts based on knowledge from international textbooks that had progressed through studies, research, and experiments of scientific experts worldwide.

B. **Traditional medical practitioners** were those who used healing arts based on the observations and skills that had been verbally passed on from previous generations or the ancient notebooks with no scientific experiment.

In 1926, the Public Health Department was reorganized and divided into 13 divisions, namely, Administration, Finance, Advisors, Editing, City Protection, Engineering, Health, Pharmacy, Narcotics, Mental Illness Hospital, Sanitation Promotion, City Sanitary Doctors (Medical Services), and Vajira Hospital.

1.4.2 The Reign of King Rama VIII (1934-1946)

During the reign of King Rama VIII (Phrabat Somdet Phra Chao Yuhua Ananda Mahidol), the Ministry of Public Health was established as a result of the enactment of the Ministries

and Departments Reorganization Act (Amendment No. 3) of B.E. 2485 (1942). Research studies on traditional remedies were conducted in 1942 and 1943 while World War II was expanding to Southeast Asia, resulting in drug shortages. Professor Dr. Ouy Ketsingh conducted a study on the use of antimalarial herbal medicine at Sattahip Hospital. After the war had ended, the problem of drug shortages remained; thus the government decided to set a policy for the MoPH Government Pharmaceutical Organization (GPO) to also produce herbal medicines.

1.4.3 The Reign of King Rama IX (1946-present)

(1) His Majesty King Bhumibol Adulyadej (Rama IX), the present King, has been interested in and concerned about of the well-being, particularly health conditions, of all citizens. His Majesty has initiated numerous projects including those on disease prevention, health promotion, curative care and rehabilitative services. All Thai citizens highly appreciate his graciousness. Even foreigners also realize and appreciate his health initiatives as evidenced by WHO's **presentation of the Health For All Gold Medal** in 1992 and the presentation of Gold Medal of Appreciation by the International Commission on Iodine Deficiency Disorder Control, for his advice on the concept and direction for disseminating iodized salt to prevent iodine deficiency among the people. Besides, in 2001 the Franklin and Eleanor Roosevelt Institute and the World Committee on Disability presented His Majesty with a Franklin Delano Roosevelt International Disability Award in recognition of Thailand's achievements of major targets of the UN's global plan of action on persons with disabilities. And on 26 May 2006, UN Secretary-General Kofi Annan visited Thailand and presented His Majesty with the UNDP Human Development Lifetime Achievement Award in commemoration of His Majesty's great intelligence and ability in initiating royal development projects aimed at improving the quality of life of Thai people in a sustainable manner throughout His reign. This was the most prestigious award newly set up and presented by the United Nations to honour His Majesty the King on the occasion of the 60th anniversary of accession to the throne of His Majesty, being the first individual to receive such an award.

Public health activities that have been graciously supported/initiated by His Majesty are numerous, the major ones being the following:

(1) Establishment of the Ananda Mahidol Foundation

His Majesty the King graciously had the Ananda Mahidol Foundation established to promote and support Thai nationals who have outstanding academic records to study for an advanced degree aboard in certain subjects. It is hopeful that, upon graduation, such individuals will return to serve the country as experts in their respective fields of study. On a pilot scale, the initiative was financed with the Ananda Mahidol Fund in 1955. Later, on 3 April 1959, His Majesty decided to change the Fund's name and status to "The Ananda Mahidol Foundation" and donated 20,000 baht of his personal funds as an endowment, in commemoration of his elder brother, the late King Ananda

Mahidol (King Rama VIII), **and awarded a first scholarship for studying medicine abroad.** At present, Her Royal Highness Princess Maha Chakri Sirindhorn is the President of the Foundation.

Between 1959 and 2006, with the Foundation's fellowships, 254 individuals completed their studies aboard, while 49 were still studying. Among the returnees, 74 are medical doctors and 7 dentists; and among those studying, 5 are medical doctors and 7 dentists.

(2) Establishment of the Rajapracha Samasai Foundation

In 1954, His Majesty the King graciously granted his private funds with some public donations for the construction of the **Ananda Mahidol Building** at Siriraj Hospital in commemoration of the late King Ananda Mahidol. Upon completion of the building, there was a funding leftover of 175,065 baht. At the request for funding of the Public Health Minister for **building an institute for personnel training** and research on leprosy at Phra Pradaeng Hospital in the amount of one million baht, His Majesty gave the remaining funds to initiate such activities for leprosy patients. His Majesty graciously named the place **"Rajapracha Samasai Institute"**. Besides, the King had also been concerned about the education of lepers' children who were not infected, but isolated in a nursery of the Department of Health. Then **Rajapracha Samasai School** was established for this purpose with the initial funding of one million baht from Their Majesties the King and the Queen. The King presided over the school opening ceremony and later on visited it again several times.

(3) Establishment of the Prince Mahidol Award Foundation under the Royal Patronage

To cerebrate the 100th birthday anniversary of His Royal Highness Prince Mahidol, the King's father on 1 January 1992, the Mahidol Award Foundation was established under the Royal Patronage to publicize the prestige of the Prince who undertook activities greatly beneficial for the Thai medical and public health systems and made them as modernized as those in civilized nations. Later on 28 July 1997 the foundation was renamed "Prince Mahidol Award Foundation under the Royal Patronage of His Majesty the King".

The Foundation's objective is to confer an Award upon individuals or institutions which have demonstrated outstanding and exemplary contributions to the advancement of medical and public health services for humanity; two awards are given each year. The Foundation Committee is at present chaired by HRH Princess Maha Chakri Sirindhorn.

Between 1992 and 2005, Prince Mahidol Awards were conferred upon 41 individuals or institutions, 20 of whom had had outstanding contributions in the field of medicine and 21 in public health. One of the Awardees, Professor Barry Marshall from Australia, was later on a Nobel Prize laureate in medicine.

(4) Iodine Deficiency Control Project

In 1991, His Majesty the King initiated a pilot project in Samoeng District of Chiang

Mai Province to distribute iodized salt for preventing iodine deficiency disorders such as goitre and mental retardation. Furthermore, he has been interested in developing an appropriate technology for small-scale iodized salt producers and supported Chiang Mai Technical College to develop a medium-size salt iodization machine; the model is currently being used nationwide. Later, His Majesty supported a study on **"salt route"** to find out about the salt production and distribution system across the country. The results have been used by the MoPH in assisting iodized salt producers appropriately.

Major development activities of other Royal Family Members are as follows:

1) **Her Majesty Queen Sirikit** has always supported the King's health development projects. **Her Majesty the Queen serves as the President of the Thai Red Cross Society** and as a patron of associations and foundations involved in medical and health activities such as the **Foundation for the Blind, the Foundation for the Mentally Retarded, and the Foundation for the Deaf.** Importantly, Her Majesty is the patron of **the Polio Immunization Campaign Project,** which has steadily reduced the polio incidence; the disease is expected to be eradicated in Thailand in the near future. Besides, Her Majesty was presented with the **Lindbergh Award** on 16 May 1995 from the Charles A and Anne Morrow Lindbergh Foundation for her internationally recognized work on **"creating a balance between technology and nature", being** the first lady to receive such an award.

In addition, Her Majesty the Queen has been patronizing and involved in other health activities such as **the Royal Medical Services Project, the Village Doctors Project,** and support for patients with medical care under the Royal Patronage.

2) **Her Royal Highness the Princess Mother** (Somdet Phra Srinagarindra Boromarajajonani), the late mother of His Majesty the King, was one of the important members of the Royal Family who had undertaken or supported numerous activities related to the public health as follows:

(1) In 1956, the Princess Mother began to patronize the Foundation for Assistance of the Disabled by donating her personal funds for the operations of the Foundation and seeking support from local and international individuals as well as agencies concerned for persons with disabilities.

(2) In 1963, the Princess Mother began to patronize the Foundation for Lepers in Lampang Province by donating her personal funds for the construction of Jit Aree School building and a dormitory and providing financial support for the children of lepers as well as for the operations of the school. Consequently, the quality of life of lepers' children and people with poverty has been much improved.

(3) In 1967, the Princess Mother accepted the New Life Foundation under her patronage in order to help rehabilitate disabled lepers.

(4) In 1969, **Mobile Medical Corps (Por Or Sor Wor mobile medical units)** were set up, comprising volunteer doctors, dentists, nurses, health workers and volunteers from both central and provincial levels. The units have been providing curative, preventive, promotive and rehabilitative care to the people in remote areas.

(5) In 1973, a **Volunteer Flying Doctors** Unit was launched and later on became a **Radio Medical Services Unit** that provided medical consultation to remote health centres via radio communications in 25 provinces. Since 1976, the MoPH had undertaken similar services for other provinces. And in 1996, they were all transferred to be under the MoPH.

(6) In 1974, the Princess Mother established the **Princess Mother's Medical Volunteers Foundation** with the first royal endowment of one million baht. Later, the Royal Thai Government as well as public and private agencies from within and outside the country has provided financial support as well as medical supplies and equipment to the Foundation.

In 1986, a specialized medical services project was initiated to provide medical/surgical care for patients with cataract, hare lip and cleft palate, congenital heart disease, impacted tooth, and those in need of prosthetic/orthotic services.

(7) Dental health services of the Mobile Medical Corps include the annual dental care campaigns and exhibitions on the National Dental Health Day, 21 October each year.

(8) In 1992, the Princess Mother donated her personal funds of 500,000 baht to establish the Artificial Legs Foundation and HRH Princess Galyani Vadhana also donated another 750,000 baht to produce/provide artificial legs for poor people free of charge regardless of race and religious belief.

In recognition of her prestige and devotion for health promotion of Thai people, in 1990 the World Health Organization presented the Princess Mother with **"The Health For All Gold Medal Award"**. Furthermore, on 21 October 2000, UNESCO honoured the Princess Mother as a person worthy of respect of the world. In addition, on the 100th birthday anniversary, the Princess Mother was named **"the Mother of Thai Public Health"**.

3) His Royal Highness Crown Prince Maha Vajiralongkorn is the Honourary President of the Crown Prince Hospitals Foundation. The Crown Prince presided over the foundation stone laying and opening ceremonies of all 21 Crown Prince Hospitals (district-level hospitals in remote areas). With great interest in health activities, the Crown Prince regularly visits the hospitals and gives advice to the MoPH on how to improve hospitals' efficiency and quality for the people's benefit.

4) Her Royal Highness Princess Maha Chakri Sirindhorn (Somdet Phra Debaratrajasuda Sayamborommarajakumari) is particularly interested in improving the nutritional status of children and youths. Thus, several royally initiated projects have been launched such as the Agriculture for School Lunch Project, aiming to help improve health and nutritional status of children in remote areas particularly in border patrol police-operated schools. Later on, the Ministry of Education has adopted this approach and got it replicated in all other schools nationwide. Besides, the Princess has supported the establishment of the Toddlers Development Project and the Pre-school Child Development Centres with her personal funds, to help resolve malnutrition problem among pre-school

children, and the Nutritional and Health Promotion for Mothers and Children in Remote Areas Project.

Moreover, the Princess is the chairperson of the National Commission on Iodine Deficiency Disorder (IDD) Control, which is an important project. With the Princess' interest in seriously resolving the problem, the IDD prevalence has significantly dropped to the level that is no longer a public health problem.

5) **Her Royal Highness Princess Chulabhorn** has been playing an outstanding role as a scientist. Her reputation is internationally recognized and she was awarded the Einstein Gold Medal from UNESCO. The Princess has contributed to several medical and health development activities and established the Chulabhorn Foundation to assist in medical and health education. The Chulabhorn Research Institute was also established by the Princess as a centre for scientists to conduct research studies aimed at developing scientific products or findings that will be beneficial to the nation and resolve urgent health, environmental and agricultural problems. Besides, the Institute has also implemented the Chulabhorn Village Development Project in the southern provinces of Nakhon Si Thammarat and Surat Thani, whose aim is to improve environmental conditions and well-being of the people, based on the primary health care concept and self-reliance approach.

6) **Her Royal Highness Princess Galyani Vadhana Krom Luang Naradhiwas Rajanagarindra,** the King's elder sister, is the President of the **Kidney Disease Foundation** of Thailand that promotes and supports preventive/curative care for patients with kidney and urinary tract diseases, and research as well as dissemination of knowledge on such diseases.

Besides, the Princess has continued supporting projects initiated by the late Princess Mother. She has also served as the Honourary President of the Princess Mother's Medical Volunteers Foundation since 18 August 1995. She has also had outstanding contributions to the international mental health promotion and drug dependence prevention programmes, giving importance to young childhood development (being a patron of the Young Children in Slums Foundation and several other foundations), making donations for setting up supplementary food funds, and providing books and toys for enhancing child development according to their age. In recognition of her reputation and contributions, the South-East Asia Regional office of the World Health Organization presented her the WHO/SEARO Award on 19 August 2003.

7) **Her Royal Highness Princess Soamsavali** has continuously performed royal functions initiated by Their Majesties the King and the Queen, particularly those related to social development.

Regarding medical and health activities, Princess Soamsawali is particularly interested in HIV/AIDS as evidenced by the fact that she always presides over the Thian Song Chai (Candlelight in the Mind) Festival almost every year if she is not engaged in any other more important function. The festival has been held by the Thai Red Cross Society and the Wednesday Friends Club (a club of people living with HIV/AIDS) on 1 December, the World AIDS Day, every year since 1991. Her kindness has also been extended to all other Red Cross projects such as the Prevention of Mother-to-Child HIV

Transmission Project and the Friends Help Friends While in Difficulties Project.

2. Royal Activities Related to Health

Beside the aforementioned activities, there are a number of other major health activities initiated/supported by Their Majesties the King and the Queen as well as other Royal Family Members and underway during 2005-2010 as follows:

No.	Project title	Royal initiator
1	Helminthic Disease Prevention and Control in the Khwae Noi Area (10 villages in 2 districts), 2005-2008	HM the King
2	Follow-up Support for the Noise Control in Entertainment Places	HM the King
3	Campaign on the Rajapracha Samasai Week, 2006	HM the King
4	Public Participation Campaign on Leprosy Elimination for Merit-making in Honour of HM the King's 60th Anniversary of Accession to the Throne	HM the King
5	Phikun Thong Development Studies Centre (Health and Communicable Disease Control, Narathiwat Province)	HM the King
6	Community Health Situation after the Construction of Khwae Noi Dam, Phitsanulok Province	HM the King
7	Food Safety in Chitlada Palace, Kai Kangwon Palace, Sukhothai Palace, and the Royal Folk Arts and Crafts Centre 904	HRH the Crown Prince
8	Helminthic Disease Prevention and Control in Children under the Child and Youth Development Plan in Remote Areas (48 provinces); Phu Fa Helminthic Disease Prevention and Control in Nan Province (62 villages)	HRH Princess Sirindhorn
9	Mosquito Vector Control: Impact of the Construction of Khwae Noi Dam, Wat Bot District, Phitsanulok Province	HRH Princess Sirindhorn
10	Evaluation of the Helminthic Disease, Dengue Hemorrhagic Fever, Hearing-loss Prevention and Control Project in Schoolchildren of Rajaprachanukhro School 33, Lop Buri Province	HRH Princess Sirindhorn
11	Malaria Surveillance, Prevention and Control under the Child and Youth Development Project in Remote Areas	HRH Princess Sirindhorn
12	Ban Khun Poom Building, Phuket Province	

No.	Project title	Royal initiator
13	Promotion of Nutrition and Maternal and Child Health in Remote Areas	HRH Princess Sirindhorn
14	Healthy Child Care Centre under the Ban Thung Rak Development Project of the Chaipattana Foundation, Phang-nga Province	HRH Princess Sirindhorn
15	Agriculture for School Lunch	HRH Princess Sirindhorn
16	Iodine Deficiency Disorder Control	HRH Princess Sirindhorn
17	Toddlers Development and Promotion	HRH Princess Sirindhorn
18	Plant Genetic Conservation (Medicinal Herbs and Fragrant Plants)	
19	Caravan on Mother-to-Child Love Breastfeeding Promotion in Commemoration of the 1st Birthday Anniversary of HRH Princess Dipangkorn Rasmijoti, the King's Nephew	HRH Princess Srirasm

2.2 Health activities implemented in honour of HM the King and Royal Family Members

No.	Project	Implemented in honour of
1	Cervical Cancer Screening among Thai Women in Commemoration of HM the King's 60th Anniversary of Accession to the Throne	HM the King
2	Royal Denture for the Elderly in Commemoration of HM the King's 80th Birthday Anniversary	HM the King
3	Development of Emergency Medical Services of Thailand in Commemoration of HM the King's 60th Anniversary of Accession to the Throne	HM the King
4	Development of Excellence in Hearing and Communication in Commemoration of HM the King's 60th Anniversary of Accession to the Throne	HM the King
5	Holistic and Sustainable Development for Buddhist Monks and Novices in Commemoration of HM the King's 60th Anniversary of Accession to the Throne	HM the King
6.	Development of 80 Health Cantres in Communication of HM the Queen's 60 th Birthday Anniversary	HM the Queen
7	Development of 40 Crown Prince Hospitals	HRH the Crown Prince

No.	Project	Implemented in honour of
8	Happy Smiles and Voice in 75 Provinces in Commemoration of the 50th Birthday Anniversary of HRH Princess Maha Chakri Sirindhorn	HRH Princess Sirindhorn
9	Milk Fluoridation for Child Dental Caries Prevention in Bangkok in Commemoration of the 50th Birthday Anniversary of HRH Princess Maha Chakri Sirindhorn	HRH Princess Sirindhorn
10	Development of Model for Oral Health Promotion and Prevention in Toddlers Development Centres in Sakon Nakhon Province	HRH Princess Sirindhorn
11	Mobile Artificial Legs in 4 Provinces	HRH Princess Galyani Vadhana
12	Mother-to-Child Love Breastfeeding Promotion under the Patronage of HRH Princess Srirasm, Royal Consort to HRH Crown Prince Maha Vajiralongkorn	HRH Princess Srirasm
13	Campaign on Dental Health on the National Dental Health Day, 21 October, as Merit-Making in Commemoration of HRH the Princess Mother's Birthday Anniversary	HRH Princess Soamsavali

CHAPTER 2

THAILAND COUNTRY PROFILE

1. Location, Territory and Boundary

The Kingdom of Thailand is situated in the continental Southeast Asia, just north of the equator, and is part of the Indochina Peninsula (Figure 2.1).

Figure 2.1 Map of Thailand

Thailand covers an area of about 514,000 square kilometres. It is the third largest country among the Southeast Asian nations, after Indonesia and Myanmar. The borders around Thailand are totally about 8,031 kilometres long, of which 5,326 kilometres are inland and the other 2,705 kilometres are coastlines (including 1,840 kilometres of coastlines of the Gulf of Thailand and 865 kilometres on the Andaman seaside).

In the North, the northernmost part of Thailand is in Mae Sai District of Chiang Rai Province, bordered by Myanmar and the Lao People's Democratic Republic.

In the South, the southernmost part is in Betong District of Yala Province, bordered by Malaysia and the Gulf of Thailand.

In the East, the easternmost part is in Phibun Mangsahan District of Ubon Ratchathani Province, bordered by the Lao People's Democratic Republic and Cambodia.

In the West, the westernmost part is in Mae Sariang District of Mae Hong Son Province, bordered by Myanmar, the Andaman Sea, and the Strait of Malacca.

The whole Kingdom is in the same time zone, seven hours ahead of the Greenwich Mean Time.

2. Topography and Climate

2.1 Topography. Thailand can be topographically divided into three different areas:

2.1.1 The plains. Mostly the plain areas are in the Central Region of the country, i.e., basins of the Chao Phraya River and its tributaries (Ping, Wang, Yom and Nan), and the Mae Klong, Phetchaburi, Bang Pakong, Thachin, and Pa Sak rivers.

2.1.2 The highlands. Highland areas are mostly in the Northeast, i.e., the Korat Plateau, and the plains along the Mun and Chi rivers.

2.1.3 The mountains. Mostly it is mountainous in the North and the Southeast which cover the Ranges of Daen Lao, Luang Phra Bang, Thanon Thongchai, Phetchabun, and Tanao Si.

2.2 Climate. Thailand has three types of climate as follows:

2.2.1 Tropical rain climate in the coastal areas in the East and the South, with heavy rainfalls all year round and tropical rain forests.

2.2.2 Tropical monsoon climate in the southwestern and southeastern coasts with monsoons and a very high average annual rainfall.

2.2.3 Seasonal tropical grassland or savannah climate with a lot of heavy rains in the southwest monsoon season and dryness in the cold season covering most regions of the country, particularly the Central Region, the North and the Northeast.

Prevailing winds include the southwesterly monsoon from about mid-May through October and the northeasterly monsoon from November through February.

In summary, Thailand has pleasant geographic and climatic conditions, without severe natural disasters like volcanic eruptions, earthquakes, or cold weather.

3. Population, Language and Religions

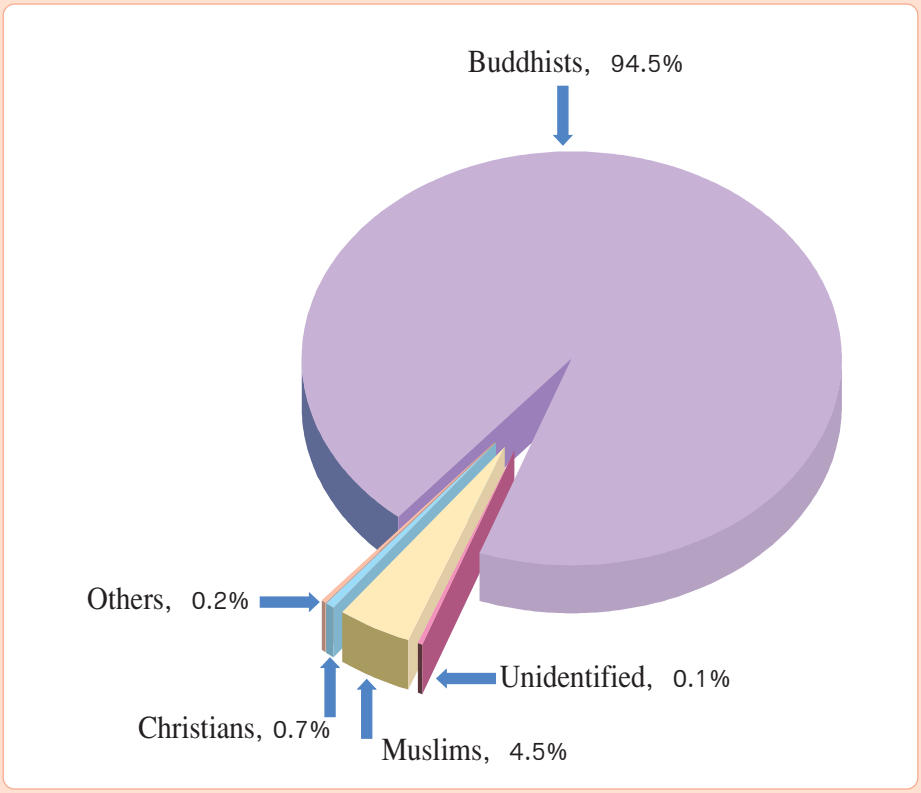
The population of Thailand is 62.83 million (2007); almost all residents (98.1%) are of Thai nationality and the rest are of other nationalities such as Chinese, Myanmar and Lao.

For communication purposes, the Thai language is officially and commonly used for speaking and writing, while English tends to play a greater role particularly in the business sector.

Most of Thai people are Buddhists (94.5%), followed by Muslims (4.5%) Christians (0.7%) and others (Figure 2.2).

4. Economy

Figure 2.2 Religions of Thai People



Source: Survey on Participation in Cultural Activities, 2005, National Statistical Office, 2006.

Note: Survey on population aged 15 years and over by religion.

In the past, the Thai economy was agrarian with mostly subsistence farming for household consumption and no commercial or export purposes. Regarding industry, the production was previously of local or village handicraft type. Later on in 1856, Thailand entered into the Bowring Treaty with England and other treaties with other Western countries, economic businesses began. Since then, people's lifestyles in both urban and rural areas have changed to those of industrial manufacturing for import substitution and eventually for exports. The Thai economic system began to shift to the economic development era with National Economic and Social Development Plans, i.e., from the 1st Plan (1961-1966) through the current 10th Plan (2007-2011). Overall, Thailand is a free-market economy and has been a member of the World Trade Organization (WTO) since 1 January 1995.

As a result of economic development, the Thai economy grew at an average rate of 7.8% annually during the past three decades, particularly during the period 1986-1990 with an average annual growth of 10.5% and during the period 1991-1995 of 8.3%. The growth had made Thailand become a middle-income country. Later on during the period 1996-1997, an economic crisis erupted, and Thailand had to seek assistance from the International Monetary Fund (IMF) in the form of US$17.2 billion loans with a number of economic structural reform terms and conditions.

During the economic crisis, the Thai economic growth contracted considerably, i.e. -1.7% in 1997 and -10.8% in 1998, but recovered to over 4% during 1999-2000 and slightly dropped to 2.1% in 2001, and most recently has been rising to over 5% since 2002. As a result, the government could repay all the IMF loans on 31 July 2003, **two years before the repayment due dates.** And the Thai economy slows down again during the period 2005-2007 to 4.5% to 5.0% (Figure 4.2) due to high oil prices, avian influenza epidemic, rising interest rates, and the unrest in the three southern most provinces.

Economic outlook for 2007

According to the forecast of the National Economic and Social Development Board (NESDB), the Thai economy will slow down in 2007 as a result of the slowdown of the world economy, particularly in Thailand's trade partners such as the USA, a decline in oil prices, baht appreciation, rising interest rates and more strict measures of trade partners. Overall for 2005, the economic growth is expected at 4.5%, the inflation at 3.5%, and a current account surplus of US$ 3.1 billion or 1.3% of GDP.

5. Thai Administrative System

Thailand is a democratic country, having the King as Head of the State, a constitutional monarchy under the Constitution of the Kingdom of Thailand of B.E. 2540 (1997), promulgated on 11 October 1997. The Constitution is regarded as the first people's constitution of the nation.

The Constitution establishes three independent powers, namely, the Legislative, the Executive,

and the Judiciary powers. Under the Constitution, a number of independent public agencies have been established for scrutinizing and counterbalancing such powers. Such agencies include, for example, the Office of the National Counter-Corruption Commission (NCCC), the Office of the Election Commission of Thailand (ECT), the Office of the National Human Rights Commission and the Constitutional Court.

On the Legislative side, before the 2006 coup d'etat or democratic reform, Thailand had 200 elected senators and 500 elected members of parliament (400 from constituencies and 100 from the party-list system). Two general elections were held under the 1997 Constitution.

Thailand's administrative system, according to the State Administration Act, B.E. 2534 (1991), as amended No. 5 of B.E. 2545 (2002), comprises three major administrative categories (Figure 2.3). The political conflict/crisis that began in early 2006 led to an administrative reform and the promulgation of the **2006 interim constitution** for use in lieu of the 1997 Constitution. Under the interim constitution, the National Assembly is composed of 242 appointed members, and the 100-member Constitution Drafting Assembly was established by the Council for National Security; the members being appointed from 200 individuals selected from 2,000 appointed members of the National Assembly.

The Constitution Drafting Assembly is required to finish the draft within six months of its establishment and the general election is expected to be held around the end of 2007.

5.1 Central Administration

5.1.1 The King is Head of the State, exercising the legislative power through the National Assembly or parliament, the administrative or executive power through the Cabinet, and the judicial power through the Courts of Justice.

5.1.2 The Cabinet or Council of Ministers is the governmental body responsible for state administrative or governmental functions.

5.1.3 The central administrative system, according to the Reorganization of Ministries and Departments Act of B.E. 2545 (2002), consists of 20 ministries as follows:

(1) Office of the Prime Minister
(2) Ministry of Defence
(3) Ministry of Finance
(4) Ministry of Foreign Affairs
(5) Ministry of Tourism and Sports
(6) Ministry of Social Development and Human Security
(7) Ministry of Agriculture and Cooperatives
(8) Ministry of Transport
(9) Ministry of Natural Resources and Environment

(10) Ministry of Information and Communication Technology

(11) Ministry of Energy

(12) Ministry of Commerce

(13) Ministry of Interior

(14) Ministry of Justice

(15) Ministry of Labour

(16) Ministry of Culture

(17) Ministry of Science and Technology

(18) Ministry of Education

(19) Ministry of Public Health

(20) Ministry of Industry

In each ministry, there are some departments and non-departmental agencies, totaling 156 in all ministries. In addition, there are another ten departmental level state agencies, not being under the Prime Minister's Office or any ministry, namely, the Office of His Majesty's Principal Private Secretary, the Bureau of the Royal Household, the Office of National Buddhism, the Office of the Royal Development Projects Board, the Office of the National Research Council, the Royal Institute, the Royal Thai Police, the Anti-Money Laundering Office, the Office of the Attorney-General, and the Office of the National Economic and Social Advisory Council.

5.2 Provincial Administration

The provincial governmental functions mean functions of various ministries and departments as delegated to the regional or provincial level, under the supervision of the provincial governor with assigned officials from various central administrative agencies. Certain provincial administrative functions only are carried out by provincial level officials with delegations from the central administration. Such functions, however, are subject to scrutiny and revision by relevant central level agencies that have the final decision-making authority.

According to the provincial administration law, the provincial administration consists of 75 provinces (Changwat), 796 districts (Amphoe) and 81 minordistricts (King Amphoe).

5.3 Local Administration

Local administration means autonomous administrative authority of the people in each administrative jurisdiction, under the law, with at least four characteristics as follows:

5.3.1 Being a juristic person.

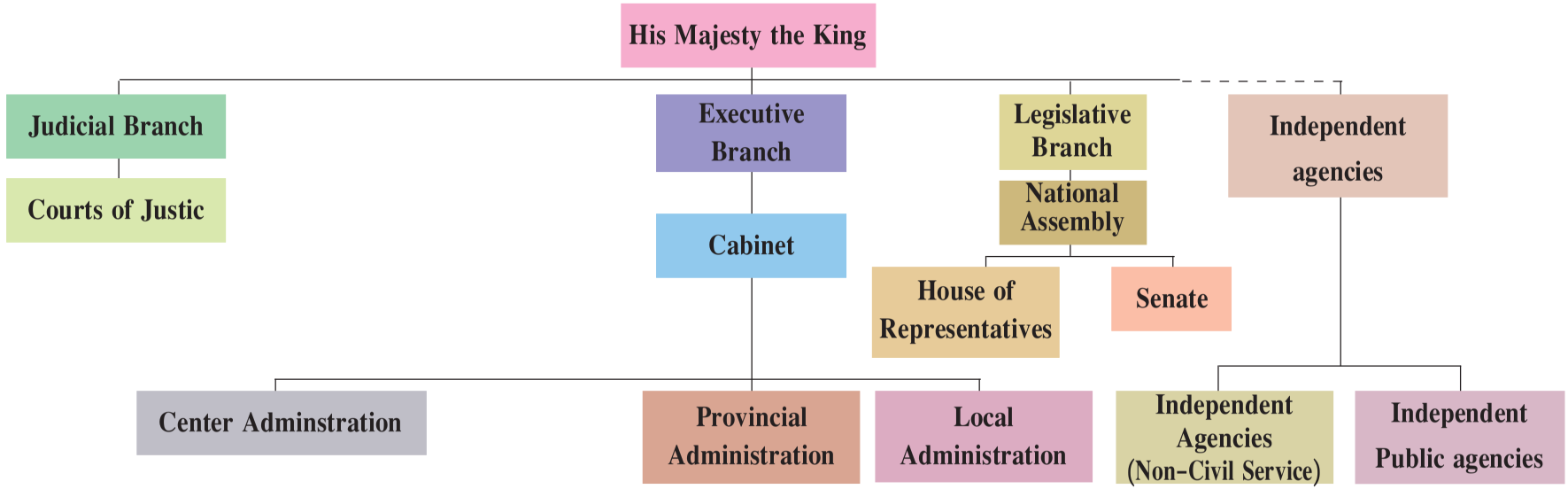
5.3.2 Having all or some local administrators or local council members elected by the people.

5.3.3 Having their own revenue and budget.

5.3.4 Having administrative autonomy under the laws.

In Thailand, there are four types of local administrative bodies, namely, Provincial Administration Organizations (75), Municipalities (1,158), and special types of local administration, i.e. Bangkok Metropolitan Administration (1), Pattaya City (1), and Tambon Administration Organizations (6,620; Tambon is a commune or a group of about ten villages).

Figure 2.3 National Administrative System of Thailand (before the 19 September 2007 Democratic Reform)



Ministries

1. Office of the Prime Minster
2. Ministry of Defense
3. Ministry of Finance
4. Ministry of Foreign Affairs
5. Ministry of Tourism and Sports
6. Ministry of Social Development and Human Security
7. Ministry of Agriculture and Cooperatives
8. Ministry of Transport
9. Ministry of Natural Resources and Environment
10. Ministry of Information and Communication Technology
11. Ministry of Energy
12. Ministry of Commerce
13. Ministry of Interior
14. Ministry of Justice
15. Ministry of Labour
16. Ministry of Culture
17. Ministry of Science and Technology
18. Ministry of Education
19. Ministry of Public Health
20. Ministry of Industry

State agencies, not being under the Prime Minister's Office or any ministry

1. Office of His Majesty's Principal Private Secretary
2. Bureau of the Royal Household
3. Office of National Buddhism
4. Office of the Royal Development Projects Board
5. Office of the National Research
6. The Royal Council Institute
7. The Royal Thai Police
8. Anti-Money Laundering Office
9. Office of the Attorney-General
10. Office of the National Economic and Social Advisory Council

1. Provinces (75)
2. Districts (796)
3. Minordistricts(81)

1. Provincial Administration Organization(75)
2. Municipalitties(1,158)
   - 2.1 City(22)
   - 2.2 Town(117)
   - 2.3 Tambon*(1,019)
3. Other local authorities
   - 3.1 Bangkok Metropolitan Administration (1)
   - 3.2 Pattya City(1)
   - 3.3 Tambon Administration Organizations(6,620)

1. Crown Property Bureau
2. The Bank of Thailand
3. Office of the the Securities and Exchange Commission

(Other Independent agencies established under the Public Organization Act and other specific laws)

1. The Administrative Courts
2. The Constitutional Courts
3. Office the Election Commission of Thailand
4. Office of the Judiciary of Thailand
5. Office of the National Human Rights Commission of Thailand
6. Office of the National Counter Corruption Commission
7. Office of the Ombudsman of Thailand
8. Office of the Auditor-General of Thailand

Notes: *Upgraded form all Sanitary Districts in May 1999

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The Kingdom of Thailand is situated in the continental Southeast Asia, just north of the equator, and is part of the Indochina Peninsula (Figure 2.1).

Figure 2.1 Map of Thailand

Thailand covers an area of about 514,000 square kilometres. It is the third largest country among the Southeast Asian nations, after Indonesia and Myanmar. The borders around Thailand are totally about 8,031 kilometres long, of which 5,326 kilometres are inland and the other 2,705 kilometres are coastlines (including 1,840 kilometres of coastlines of the Gulf of Thailand and 865 kilometres on the Andaman seaside).

In the North, the northernmost part of Thailand is in Mae Sai District of Chiang Rai Province, bordered by Myanmar and the Lao People's Democratic Republic.

In the South, the southernmost part is in Betong District of Yala Province, bordered by Malaysia and the Gulf of Thailand.

In the East, the easternmost part is in Phibun Mangsahan District of Ubon Ratchathani Province, bordered by the Lao People's Democratic Republic and Cambodia.

In the West, the westernmost part is in Mae Sariang District of Mae Hong Son Province, bordered by Myanmar, the Andaman Sea, and the Strait of Malacca.

The whole Kingdom is in the same time zone, seven hours ahead of the Greenwich Mean Time.

2. Topography and Climate

2.1 Topography. Thailand can be topographically divided into three different areas:

2.1.1 The plains. Mostly the plain areas are in the Central Region of the country, i.e., basins of the Chao Phraya River and its tributaries (Ping, Wang, Yom and Nan), and the Mae Klong, Phetchaburi, Bang Pakong, Thachin, and Pa Sak rivers.

2.1.2 The highlands. Highland areas are mostly in the Northeast, i.e., the Korat Plateau, and the plains along the Mun and Chi rivers.

2.1.3 The mountains. Mostly it is mountainous in the North and the Southeast which cover the Ranges of Daen Lao, Luang Phra Bang, Thanon Thongchai, Phetchabun, and Tanao Si.

2.2 Climate. Thailand has three types of climate as follows:

2.2.1 Tropical rain climate in the coastal areas in the East and the South, with heavy rainfalls all year round and tropical rain forests.

2.2.2 Tropical monsoon climate in the southwestern and southeastern coasts with monsoons and a very high average annual rainfall.

2.2.3 Seasonal tropical grassland or savannah climate with a lot of heavy rains in the southwest monsoon season and dryness in the cold season covering most regions of the country, particularly the Central Region, the North and the Northeast.

Prevailing winds include the southwesterly monsoon from about mid-May through October and the northeasterly monsoon from November through February.

In summary, Thailand has pleasant geographic and climatic conditions, without severe natural disasters like volcanic eruptions, earthquakes, or cold weather.

3. Population, Language and Religions

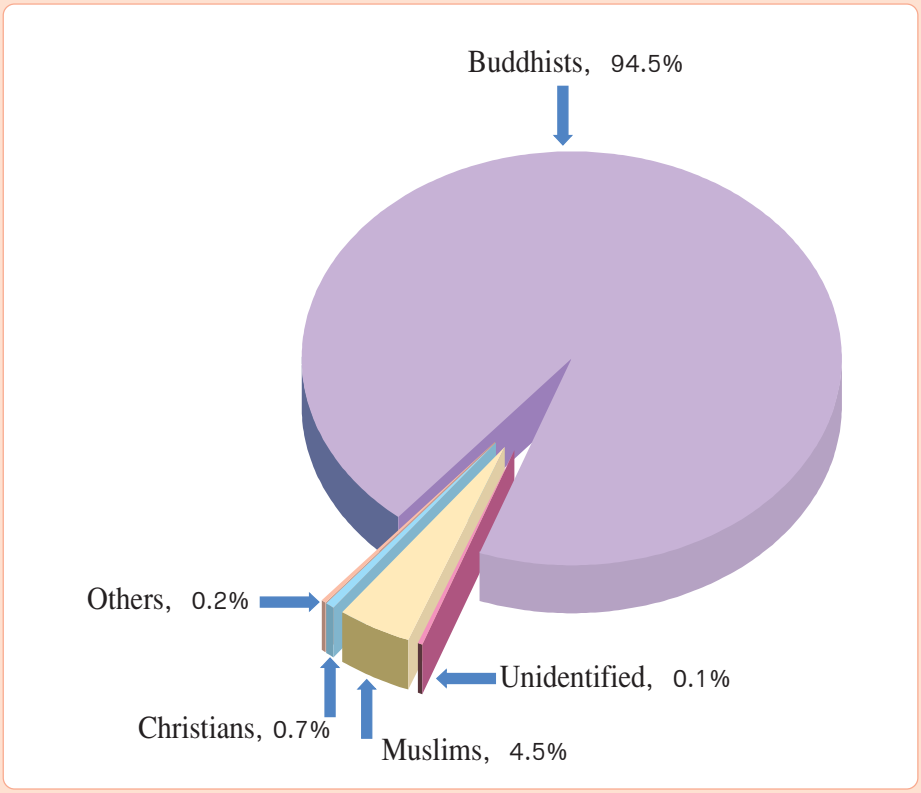
The population of Thailand is 62.83 million (2007); almost all residents (98.1%) are of Thai nationality and the rest are of other nationalities such as Chinese, Myanmar and Lao.

For communication purposes, the Thai language is officially and commonly used for speaking and writing, while English tends to play a greater role particularly in the business sector.

Most of Thai people are Buddhists (94.5%), followed by Muslims (4.5%) Christians (0.7%) and others (Figure 2.2).

4. Economy

Figure 2.2 Religions of Thai People



Source: Survey on Participation in Cultural Activities, 2005, National Statistical Office, 2006.

Note: Survey on population aged 15 years and over by religion.

In the past, the Thai economy was agrarian with mostly subsistence farming for household consumption and no commercial or export purposes. Regarding industry, the production was previously of local or village handicraft type. Later on in 1856, Thailand entered into the Bowring Treaty with England and other treaties with other Western countries, economic businesses began. Since then, people's lifestyles in both urban and rural areas have changed to those of industrial manufacturing for import substitution and eventually for exports. The Thai economic system began to shift to the economic development era with National Economic and Social Development Plans, i.e., from the 1st Plan (1961-1966) through the current 10th Plan (2007-2011). Overall, Thailand is a free-market economy and has been a member of the World Trade Organization (WTO) since 1 January 1995.

As a result of economic development, the Thai economy grew at an average rate of 7.8% annually during the past three decades, particularly during the period 1986-1990 with an average annual growth of 10.5% and during the period 1991-1995 of 8.3%. The growth had made Thailand become a middle-income country. Later on during the period 1996-1997, an economic crisis erupted, and Thailand had to seek assistance from the International Monetary Fund (IMF) in the form of US$17.2 billion loans with a number of economic structural reform terms and conditions.

During the economic crisis, the Thai economic growth contracted considerably, i.e. -1.7% in 1997 and -10.8% in 1998, but recovered to over 4% during 1999-2000 and slightly dropped to 2.1% in 2001, and most recently has been rising to over 5% since 2002. As a result, the government could repay all the IMF loans on 31 July 2003, **two years before the repayment due dates.** And the Thai economy slows down again during the period 2005-2007 to 4.5% to 5.0% (Figure 4.2) due to high oil prices, avian influenza epidemic, rising interest rates, and the unrest in the three southern most provinces.

Economic outlook for 2007

According to the forecast of the National Economic and Social Development Board (NESDB), the Thai economy will slow down in 2007 as a result of the slowdown of the world economy, particularly in Thailand's trade partners such as the USA, a decline in oil prices, baht appreciation, rising interest rates and more strict measures of trade partners. Overall for 2005, the economic growth is expected at 4.5%, the inflation at 3.5%, and a current account surplus of US$ 3.1 billion or 1.3% of GDP.

5. Thai Administrative System

Thailand is a democratic country, having the King as Head of the State, a constitutional monarchy under the Constitution of the Kingdom of Thailand of B.E. 2540 (1997), promulgated on 11 October 1997. The Constitution is regarded as the first people's constitution of the nation.

The Constitution establishes three independent powers, namely, the Legislative, the Executive,

and the Judiciary powers. Under the Constitution, a number of independent public agencies have been established for scrutinizing and counterbalancing such powers. Such agencies include, for example, the Office of the National Counter-Corruption Commission (NCCC), the Office of the Election Commission of Thailand (ECT), the Office of the National Human Rights Commission and the Constitutional Court.

On the Legislative side, before the 2006 coup d'etat or democratic reform, Thailand had 200 elected senators and 500 elected members of parliament (400 from constituencies and 100 from the party-list system). Two general elections were held under the 1997 Constitution.

Thailand's administrative system, according to the State Administration Act, B.E. 2534 (1991), as amended No. 5 of B.E. 2545 (2002), comprises three major administrative categories (Figure 2.3). The political conflict/crisis that began in early 2006 led to an administrative reform and the promulgation of the **2006 interim constitution** for use in lieu of the 1997 Constitution. Under the interim constitution, the National Assembly is composed of 242 appointed members, and the 100-member Constitution Drafting Assembly was established by the Council for National Security; the members being appointed from 200 individuals selected from 2,000 appointed members of the National Assembly.

The Constitution Drafting Assembly is required to finish the draft within six months of its establishment and the general election is expected to be held around the end of 2007.

5.1 Central Administration

5.1.1 The King is Head of the State, exercising the legislative power through the National Assembly or parliament, the administrative or executive power through the Cabinet, and the judicial power through the Courts of Justice.

5.1.2 The Cabinet or Council of Ministers is the governmental body responsible for state administrative or governmental functions.

5.1.3 The central administrative system, according to the Reorganization of Ministries and Departments Act of B.E. 2545 (2002), consists of 20 ministries as follows:

(1) Office of the Prime Minister
(2) Ministry of Defence
(3) Ministry of Finance
(4) Ministry of Foreign Affairs
(5) Ministry of Tourism and Sports
(6) Ministry of Social Development and Human Security
(7) Ministry of Agriculture and Cooperatives
(8) Ministry of Transport
(9) Ministry of Natural Resources and Environment

(10) Ministry of Information and Communication Technology

(11) Ministry of Energy

(12) Ministry of Commerce

(13) Ministry of Interior

(14) Ministry of Justice

(15) Ministry of Labour

(16) Ministry of Culture

(17) Ministry of Science and Technology

(18) Ministry of Education

(19) Ministry of Public Health

(20) Ministry of Industry

In each ministry, there are some departments and non-departmental agencies, totaling 156 in all ministries. In addition, there are another ten departmental level state agencies, not being under the Prime Minister's Office or any ministry, namely, the Office of His Majesty's Principal Private Secretary, the Bureau of the Royal Household, the Office of National Buddhism, the Office of the Royal Development Projects Board, the Office of the National Research Council, the Royal Institute, the Royal Thai Police, the Anti-Money Laundering Office, the Office of the Attorney-General, and the Office of the National Economic and Social Advisory Council.

5.2 Provincial Administration

The provincial governmental functions mean functions of various ministries and departments as delegated to the regional or provincial level, under the supervision of the provincial governor with assigned officials from various central administrative agencies. Certain provincial administrative functions only are carried out by provincial level officials with delegations from the central administration. Such functions, however, are subject to scrutiny and revision by relevant central level agencies that have the final decision-making authority.

According to the provincial administration law, the provincial administration consists of 75 provinces (Changwat), 796 districts (Amphoe) and 81 minordistricts (King Amphoe).

5.3 Local Administration

Local administration means autonomous administrative authority of the people in each administrative jurisdiction, under the law, with at least four characteristics as follows:

5.3.1 Being a juristic person.

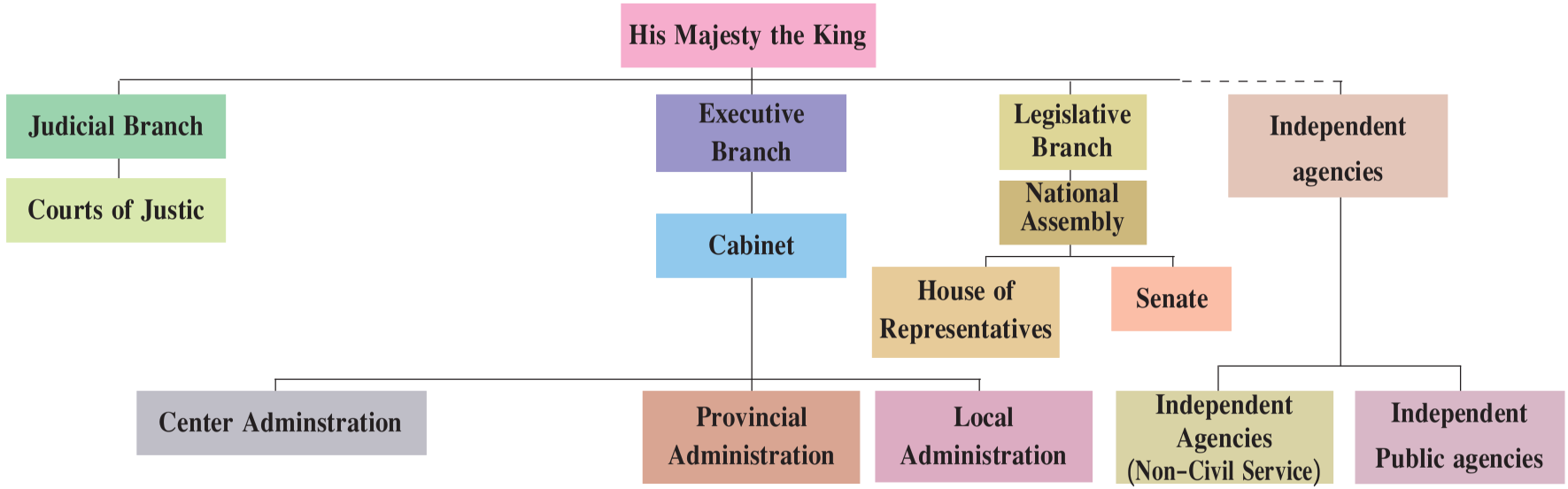
5.3.2 Having all or some local administrators or local council members elected by the people.

5.3.3 Having their own revenue and budget.

5.3.4 Having administrative autonomy under the laws.

In Thailand, there are four types of local administrative bodies, namely, Provincial Administration Organizations (75), Municipalities (1,158), and special types of local administration, i.e. Bangkok Metropolitan Administration (1), Pattaya City (1), and Tambon Administration Organizations (6,620; Tambon is a commune or a group of about ten villages).

Figure 2.3 National Administrative System of Thailand (before the 19 September 2007 Democratic Reform)



Ministries

1. Office of the Prime Minster
2. Ministry of Defense
3. Ministry of Finance
4. Ministry of Foreign Affairs
5. Ministry of Tourism and Sports
6. Ministry of Social Development and Human Security
7. Ministry of Agriculture and Cooperatives
8. Ministry of Transport
9. Ministry of Natural Resources and Environment
10. Ministry of Information and Communication Technology
11. Ministry of Energy
12. Ministry of Commerce
13. Ministry of Interior
14. Ministry of Justice
15. Ministry of Labour
16. Ministry of Culture
17. Ministry of Science and Technology
18. Ministry of Education
19. Ministry of Public Health
20. Ministry of Industry

State agencies, not being under the Prime Minister's Office or any ministry

1. Office of His Majesty's Principal Private Secretary
2. Bureau of the Royal Household
3. Office of National Buddhism
4. Office of the Royal Development Projects Board
5. Office of the National Research
6. The Royal Council Institute
7. The Royal Thai Police
8. Anti-Money Laundering Office
9. Office of the Attorney-General
10. Office of the National Economic and Social Advisory Council

1. Provinces (75)
2. Districts (796)
3. Minordistricts(81)

1. Provincial Administration Organization(75)
2. Municipalitties(1,158)
   - 2.1 City(22)
   - 2.2 Town(117)
   - 2.3 Tambon*(1,019)
3. Other local authorities
   - 3.1 Bangkok Metropolitan Administration (1)
   - 3.2 Pattya City(1)
   - 3.3 Tambon Administration Organizations(6,620)

1. Crown Property Bureau
2. The Bank of Thailand
3. Office of the the Securities and Exchange Commission

(Other Independent agencies established under the Public Organization Act and other specific laws)

1. The Administrative Courts
2. The Constitutional Courts
3. Office the Election Commission of Thailand
4. Office of the Judiciary of Thailand
5. Office of the National Human Rights Commission of Thailand
6. Office of the National Counter Corruption Commission
7. Office of the Ombudsman of Thailand
8. Office of the Auditor-General of Thailand

Notes: *Upgraded form all Sanitary Districts in May 1999

Chapter 3

Health Policy and Strategy in Thailand

Health policy and strategy are key elements of the government for implementing activities aimed at making the people healthy involving all concerned, using the "all for health" approach. So a good understanding of health policy and strategy is essential as they will positively and negatively affect the health and well-being of all Thai people.

1. Rights to Health of the People

The 1997Consititution of Thailand[1], the highest ranked public law of the country, had provisions guaranteeing rights and freedom of the people in physical mental, and social aspects which could not be violet. The state has the duty to project such rights and freedom. The constitution specified the people's rights related to health in six aspects as follows:

1. Right to know about the impact on human health, environment and quality of life (Section 59).
2. Right to express opinions about the impact on health, environment and quality of life (Section 59).
3. Right to take part in decision-making, to benefit from, to protect/promote natural resources and the environment that will have an impact on human health and quality of life (Section 56).
4. Right for at least 50,000 eligible voters to collectively sign a proposition to legislate a law on health, according to the fundamental state policy, to the parliament for consideration (Section 170).
5. Right to receive health care in an equal, universal, and equitable manner (Sections 52 and 86).
6. Right to join in examining for health consumer protection purposes through an independent agency called "Consumer Protection Organization" (Section 57).

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[1] The 1997 Constitution was revoked by the Announcement of the Democratic Reform Council, dated 19 September 2006; and the 2006 Interim Constitution is currently in force. A new constitution is being drafted and expected to be finished in mid-2007.

2. Fundamental State Policies on Health According to the Constitution

According to the 1997 Constitution, the fundamental state policies were provided with the intention for the state to provide basic services to the people and all governments are required to implement for national development. They are regarded as fundamental policies of the Country, not of any particular government. The government has to report to the Parliament on what it will do in administering the country accordingly. Basically, the fundamental state policies are divided into 4 elements: (1) public administration, justice, security and foreign affairs, (2) politics, administration, natural resources and environment, (3) social administration, and (4) economic development. The government is required to report on the implementation of the fundamental state policies to the Parliament once a year.

Health policies are mainly under the fundamental social state policies and some are also under another two elements of the state policies. Such health policies are considered to be the foundation for the state to improve Thai people's health status, covering five sections and classified as two groups as follows:

2.1 Policy on establishing a health service system that is accessible, efficient and of good standard (one section; i.e. Section 82)

Section 82 of the Constitution provides that "The State shall thoroughly provide and promote standard and efficient public health service". So 35 indicators have been developed: 16 for measuring the coverage of standard health services, 6 for measuring health security coverage, and 13 for measuring services related to the prevention and eradication of significant communicable and non-communicable diseases.

2.2 Policies on creating the environments that are conducive to healthy living and health promotion (4 sections, i.e. Sections 71, 79, 80 and 81)

1) Section 71 of the Constitution provides that "The State shall protect and uphold the institution of kingship and the independence and integrity of its territories". One significant indicator has been developed, i.e. the achievement of projects or activities for honouring the monarchy.

2) Section 79 of the Constitution provides that "The State shall promote and encourage public participation in preservation, maintenance and balanced exploitation of natural resources and biological diversity and in the promotion, maintenance and protection of the quality of the environment in accordance with the persistent development principle as well as the control and elimination of pollution affecting public health, sanitary conditions, welfare and quality of life". Five key indicators have been developed: two related to illnesses due to pollution, two related to health behaviours, and one related to the control of pollution affecting health.

3) Section 80 of the Constitution provides that "The State shall protect and develop

children and the youth, promote the equality between women and men, and create, reinforce and develop family integrity and the strength of communities. The State shall provide aids to the elderly, the indigent, the disabled or handicapped and the underprivileged for their good quality of life and ability to depend on themselves". Altogether ten indicators have been developed for this section: seven related to the control, prevention and treatment of drug dependence, two related to the development of children and youth's capacity, and one related the care for the elderly.

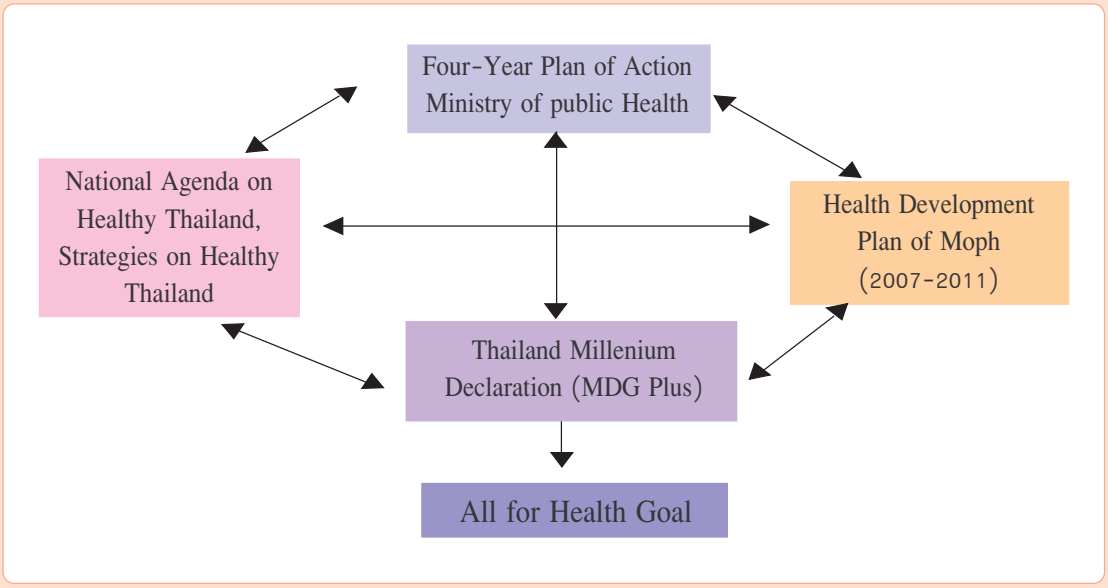
4) Section 81 of the Constitution provides that "The State shall provide and promote the private sector to provide education to achieve knowledge alongside morality, provide law relating to national education, improve education is harmony with economic and social change, create and strengthen knowledge and instill right awareness with regard to politics and a democratic regime of government with the King as Head of the State, support research in various fields of sciences, accelerate the development of science and technology for national development, develop the teaching profession, and promote local knowledge and national arts and culture". One indicator has been developed, i.e. a larger number of registered Thai traditional practitioners.

3. Health Strategic Plan of Thailand

The 1997 Constitution of Thailand contains the framework for formulating health development policies and strategies of the country, with a linkage to the national development strategies. As a results, the National Health Development Plan has been formulated, while Thailand has cooperated with other countries worldwide in adopting the United Nations Millennium Declaration which has set up the Millennium Development Goals (MDGs); and Thailand has further developed the MDG Plus concept, all aiming to achieve "all for health" conditions.

The linkage of the Thai health policies and strategies is illustrated in Figure 3.1.

Figure 3.1 The linkage of the Thai health policies and strategies



The five Thai Health Strategic Plans include the following:

3.1 Tenth Health Development Plan (1997-2001)

1) The concept and content of the plan

This is a strategic plan that signifies the importance of building up the concept and new approach of health imagination aimed at creating a unified health system in a more desirable and distinct manner. Overall it intends to develop health in a holistic way, incoorporating physical, mental, social and spiritual aspects as well as social mobilization for health promotion, based on the "sufficiency economy" philosophy which helps the system to move towards the good livelihood and health development in all dimensions, in all sectors at all levels, in accordance with the national development direction.

The Tenth National Health Development Plan will establish a sufficiency health system for social wellness by creating health culture, a medical and health service system satisfactory to clients, happy healthcare providers, and an immunity system for minimizing the impact of illness and health threats.

2) The image and desirable characteristics of the Thai health system

The sufficiency health system, according to the sufficiency economy philosophy, is a holistic development system linking economic, social, cultural and moral dimensions with the following characteristics:

(1) Having a strong foundation as a result of having acquired health sufficiency at the family and community levels.

(2) Having rational carefulness and estimation in health financing at all levels.

(3) Using appropriate technologies with a thorough knowledge, emphasizing Thai wisdom and self-reliance principles.

(4) Using an integrative approach for health promotion, disease prevention, medical treatment, rehabilitation, and consumer protection.

(5) Having a protection system that provides health security and protection.

(6) Having morality and ethics, i.e. straightforwardness, non-greediness, and sufficiency.

3) Vision of the Thai health System

Vision: **"Aiming for sufficiency health system in creating good health, good services, good society, happy/sufficient livelihood in a sustainable manner"**.

4) Mission

The Tenth National Health Development Plan has laid down six development missions:

creating thinking integrity, creating health culture, creating balanced and integrated development, creating health consciousness, creating creative leadership, and creating good governance in the health system.

5) Objectives of the Tenth National Health Development Plan

(1) To promote **good health** as a lifestyle for all age groups, from "womb to pyre", emphasizing health sufficiency at the family and community levels.

(2) To create a **good healthcare** system, based on the human-being principle, with quality and friendly care, paying attention to the suffering of patients and the delicacy of human-being.

(3) To build a **good society** with wellness and health security for the people to feel warm and secure in normal, illness and critical situations.

(4) To create a **sufficient and sustainable livelihood** that is peaceful with a culture that facilitates healthy lifestyle and leads to the attainment of the highest level of human potential.

6) Goals of the sufficiency health system development under the Tenth National Health Development Plan

The ten major goals of the Thai health system development leading to sufficiency health system are as follows:

(1) Unity and good governance in the management of a balanced and sustainable health system.

(2) A proactive health promotion programme that is able to establish fundamental actors required for healthy livelihood.

(3) Holistic health culture as well as happy and sufficiency lifestyle.

(4) Strong community health system and primary care network.

(5) Efficient medical and healthcare system, using technically justifiable appropriate/rational technology for the comfort of patients and the happiness of care providers.

(6) Health security with equity, universal coverage, and high quality.

(7) Protection and preparedness system for minimizing the impact of illness and health threats in a timely manner.

(8) Diverse healthcare alternatives integrating Thai and international wisdom, based on all the facts and self-reliance principles.

(9) Knowledge-based health system with knowledge management programmes in all aspects.

(10) Society that does not neglect but cares for the indigent and underprivileged, paying respect to the value and dignity of human being.

7) Strategies for the development of Thai health system

To establish the sufficiency health system in a healthy and happy society, six development strategies are laid down as follows (Figure 3.2):

Strategy 1: Establishment of unity and good governance in the management of health system.

Strategy 2: Creation of health culture and happy lifestyle in a society of well-being.

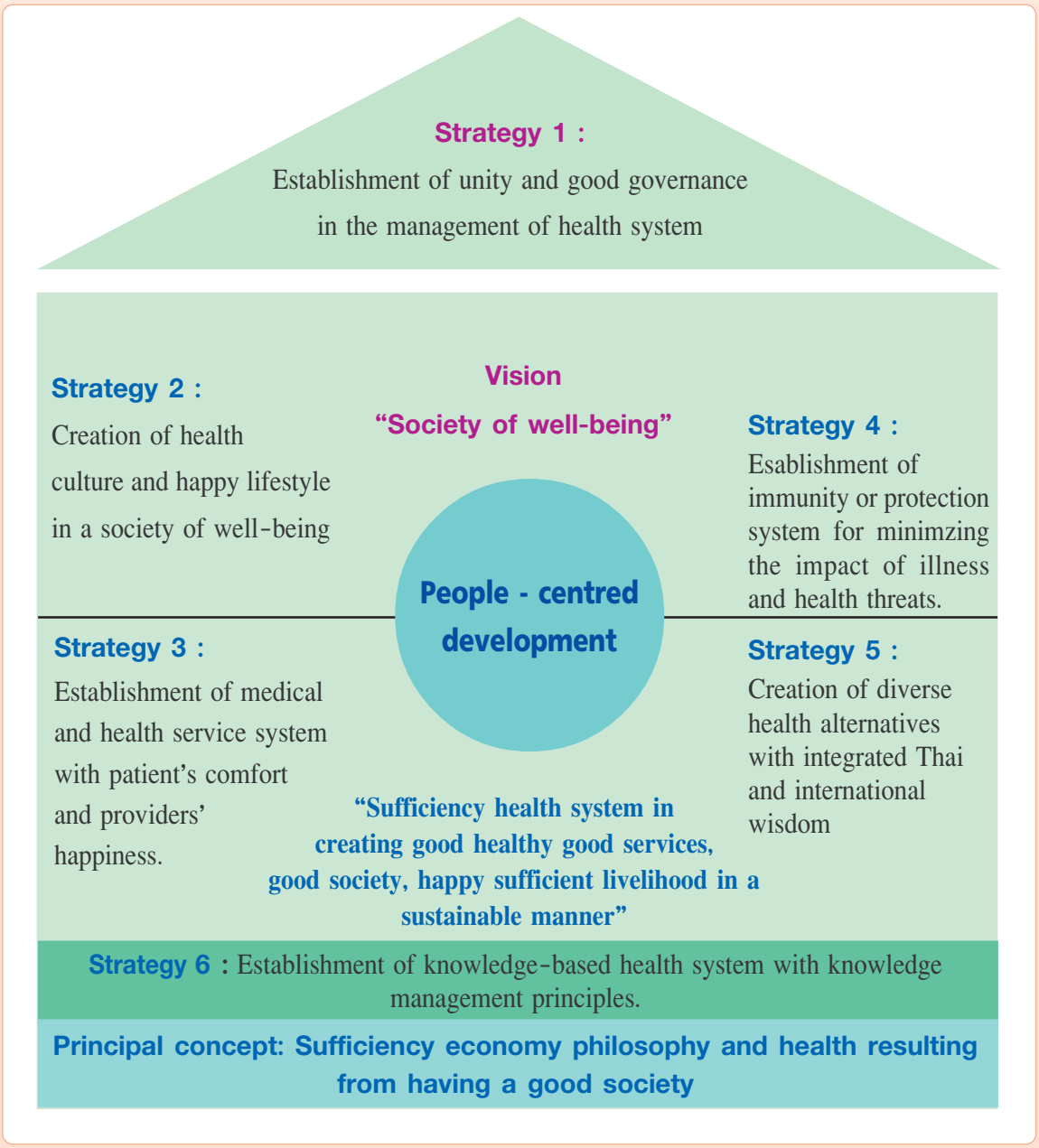
Strategy 3: Establishment of a medical and health service system with patients' comfort and providers' happiness.

Strategy 4: Establishment of immunity or protection system for minimizing the impact of illness and health threats.

Strategy 5: Creation of diverse health alternatives with integrated Thai and international wisdom.

Strategy 6: Establishment of knowledge-based health system with knowledge management principles.

Figure 3.2 Relationship of concept, vision and strategies for health and national development



Source: Steering Committee on Tenth National Health Development Plan Formulation (2007-2011), 25 January 2007.

8) Development Tactics

For each strategy the following tactics will be implemented:

Strategy 1: Establishment of unity and good governance in the management of health system.

(1) Build up the unity of health system based on the diversity of health agencies for working together in an integrated manner.

(2) Promote and support the decentralization of health actions to local administration organizations so that they can develop their own health programmes according to local needs.

(3) Establish a good governance system and organizational culture that facilitates the work for public benefit.

(4) Promote health leadership at all levels for efficient cooperation among all relevant sectors.

Strategy 2: Creation of health culture and happy lifestyle in a society of well-being.

(1) Accelerate the proactive health promotion focusing on fundamental factors for good health such as the safety of food and drug systems, the safety in environment and occupation, and the safety of health products.

(2) Expand voluntary work for health by developing different areas with different types of volunteers in the health system such as patient-care volunteers in hospitals, and volunteers caring for children, the elderly, the disabled, and patients with chronic illnesses.

(3) Promote community health clubs or groups and civil society through health activities for creating a culture of joint action with public conscience.

(4) Conduct continuous campaigns to raise health awareness and culture of public communication and learning in the formal and non-formal education systems.

(5) Promote spiritual and intellectual well-being for the development of good quality of life with a full potential for human being.

Strategy 3: Establishment of medical and health service system with patients comfort and providers happiness.

(1) Accelerate community health development and a primary care system in a proactive manner that is of high quality and community confidence for reducing overcrowding in public hospitals.

(2) Strengthen efforts for development of service quality.

(3) Reduce conflicts that lead to litigation by improving proper communication channels, establishing a mechanism for mediation and peace-process learning.

(4) Adjust the administrative and working system for boosting morale and incentives of medical and health personnel to work happily, recognizing the value of work.

(5) Promote innovations in health financing for procurement and allocation of resources in accordance with the workload and needs for public services.

(6) Raise the service quality in all health security systems to the same level in response to the diverse demands of service recipients.

(7) Establish a tertiary emergency medical service system of high quality with an efficient referral system.

(8) Promote the ideology of health professions in the educational system and in workplaces by promoting social ideology, good-deed making, and pride in working value.

Strategy 4: Establishment of immunity or protection system for minimizing the impact of illness and health threats.

(1) Establish an efficient emergency medical service system with readiness to cope with any emergency situations that may arise.

(2) Develop a preparedness plan on medical and health care at all levels for coping with natural disasters and man-made calamities.

(3) Create a mechanism and process of healthy public policies in parallel with those for health impact assessment of various policies and programmes/projects in a sufficient and systematic manner.

(4) Build up the capacity for the surveillance, prevention, control and treatment of emerging and re-emerging diseases, control of health risk factors, and protection of consumers in health.

Strategy 5: Creation of diverse health alternatives with integrated Thai and international wisdom.

(1) Accelerate the development of herbal medicines, herbal plant strains and technology for manufacturing drugs, food and devices, supplementary food, cosmetics, and spa products, so that they are efficacious and sufficient for use at the family, community and national levels for self-reliance purposes.

(2) Promote the integration of Thai traditional medicine, indigenous or folk medicine as well as complementary and alternative medicine into the national health security system.

(3) Promote local wisdom and community health system for self-healthcare by establishing learning centres of indigenous and alternative medicine, medicinal herbs and fragrant plants gardens and community centres for chronic patient care, and campaigning on consumption of healthy foods.

(4) Develop medical sciences and medical technologies so that they are efficient, safe and worthwhile in a self-sustaining and sufficient manner, focusing on the research and development on medical equipment, product processing, traditional medicines, and knowledge of alternative medicine, promoting the utilization of results in a cost-effective manner, promoting the exchange of knowledge with other countries with expertise such as China and India, protecting intellectual property, and establishing networks.

(5) Establish a system for medical technology assessment in parallel with the planning on moderate and rational use of technology according to the philosophy of sufficiency economy; healthcare business to use the technologies that are technically correct, low-cost and appropriate for the locality and environment; use local medicinal herbs as production materials in a highly economical and efficient manner with a suitable scale of production and investment and a system for raw material management as well as risk management relating to raw material importation; and use indigenous and local wisdom.

(6) Create several alternatives for the treatment of illnesses so as to reduce the use of medications and excessive/high-cost medical technologies by promoting basic health care using medicinal herbs, eating healthy/nutritious diets, and promoting exercise, healthcare business and spa.

(7) Develop an educational system and curriculum on indigenous and alternative medicine of acceptable standard, and establish an information system for all aspects of Thai traditional medicine, indigenous medicine and alternative medicine, and partnerships, all in a systematic manner.

Strategy 6: Establishment of knowledge-based health system with knowledge management principles.

(1) Establish a system for examination, monitoring and evaluation of policies and administrative decision-making process to ensure that their implementation is based on the knowledge, prudence and carefulness, using technical principles for all steps of planning and implementation.

(2) Create and support learning organizations and the application of the knowledge management concept in all health agencies in creating a learning culture at all levels.

(3) Support research and development in the fields of medical sciences and technology, for the development of health management system, social and health behaviour, and information technology, for use in the development of a sufficiency health system in an appropriate and full-cycle manner.

(4) Develop a health information system so that it is modernized, reliable and accessible for actual application.

3.2 Four-Year Health Plan of Action[2] (2005-2008)

1) Concept and Content of the plan

It is a strategic plan formulated in accordance with the Royal Decree on Good Governance Principles and Procedures of 2003 (B.E. 2546) with the aim of making the government administration systems consistent, integrative and liking to each other. With regard to health, the Ministry of Public Health cooperated with ten other relevant government agencies in formulating such a plan, clearly specifying responsible agencies and budget for implementation.

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[2] As this plan was developed in accordance with the Royal Decree on Good Governance Principles and Procedures of 2003, the formulation of such plan has been canceled for fiscal year 2007 until a new constitution is promulgated, setting a new framework for further operation.

The plan aims to promote good health among all Thai people by avoiding health-risk behaviours, improving the quality of the universal coverage of health care scheme, and reforming the medical and health service system in an efficient and full-cycle manner.

2) Goal of the plan

The people are healthy in all aspects and receive quality medical and health services.

3) Targets of the plan

The targets cover 53 indicators: 11 related to reduction of morbidity and mortality rates due to major illnesses, 6 related to quality and standard of health services, 13 related to disease prevention and health promotion, 8 related to labour protection and job security, 12 related to use of research findings for medical and health purposes, and 3 related to people's empowerment for health.

4) Strategy of the plan

The strategy is the creation of well-being for the people in a high-standard/quality and full-cycle manner, covering four stratagems as follows:

Stratagem 1: Increase the quality of the universal coverage of health care scheme and reform the medical and health management systems so that they are efficient and cover a full cycle of research and development, health promotion, disease prevention, emerging diseases, curative care, physical and mental rehabilitation, and consumer protection, for all age groups.

Stratagem 2: Empower all Thai people so that can avoid or give up unhealthy behaviours, by promoting exercise and self-care, using tax measures on products dangerous to health and measures for encouraging behaviour changes.

Stratagem 3: Develop, transfer and protect the wisdom of Thai traditional medicine, indigenous medicine, alternative medicine and medicinal herbs.

Stratagem 4: Promote sports to create an opportunity for youths to develop their sports skills for excellence, create sport-playing habits and proper spending of spare time.

3.3 Four-Year Plan of Action, Ministry of Public Health, 2005-2008[3]

1) Concept and Content

This is also a strategic plan formulated, in accordance with the Royal Decree on Good Governance Principles and Procedures of 2003, only by the MoPH. The plan specifies responsible agencies and budget for use in prepareing an annual workplan and an annual performance agreement/certification.

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[3] This plan is under the 4-year Health Plan of Action whose planning process was canceled in 2007; the process may resume after the new constitution is promulgated with a new framework.

The plan focuses on promoting good health of the people through programmes on health promotion, development of health service system of high quality/standard, research/development and transfer of modern medical knowledge, indigenous medicine, alternative medicine, Thai herbal medicine and wisdom, building up economic and social security, promoting/developing health-care business and prevention and treatment of drug dependence.

2) Vision of the MoPH

MoPH is the core agency responsible for health system development so that all Thai people will be healthy, leading to achieving the goal of healthy Thailand and becoming a leader in international health competition.

3) Goals of the MoPH Plan of Action, 2005-2008

Goal 1: Major health problems of the people are reduced and the people have access to health services and the universal coverage of healthcare.

Goal 2: The people have correct health behaviour with public participation and appropriate social measures.

Goal 3: The people are encouraged to appropriately participate in the transfer and protection of the wisdom of Thai traditional medicine, indigenous medicine, alternative medicine and herbal medicine.

Goal 4: The people including drug users and addicts receive drug dependence treatment, rehabilitation and development so that they are able to efficiently and sustainably prevent and resolve drug abuse problems.

Goal 5: Importance is given to enhancing national revenue generation through the support, promotion and development of healthcare business and health products of high quality and standard.

Goal 6: Public health laws are developed to keep abreast of changing situations; management systems and mechanism developed to facilitate efficient operation; and personnel and organizational capacity are developed up to an acceptable standard.

Goal 7: The people in southern border provinces, especially the three southern most provinces, are healthy.

4) Targets of Four-Year MoPH Plan of Action, 2005 - 2008

The targets cover 28 indicators: 12 related to the reduction of morbidity and mortality rates due to major illnesses; 3 related to the quality and standard of health services; 2 related to health behaviour promotion and people's participation in health care; one related to the promotion, development transfer and protection of the wisdom of Thai traditional medicine, folk medicine, alternative medicine and herbal remedies; two related to the prevention and treatment of drug dependence; two related to the promotion and development of healthcare business; five related to the

development of health management system, and one related to the resolution of health problems in specific areas.

5) Strategies of the Four-Year MoPH Plan of Action, 2005 - 2008

Strategy 1: Healthy Thailand

Strategy 2: Promotion of people's good health behaviours

Strategy 3: Development of Thai traditional medicine, indigenous medicine, alternative medicine, herbal medicine and Thai wisdom

Strategy 4: Building-up of life and social security

Strategy 5: Strong Thai economy

Strategy 6: Development of excellent management system

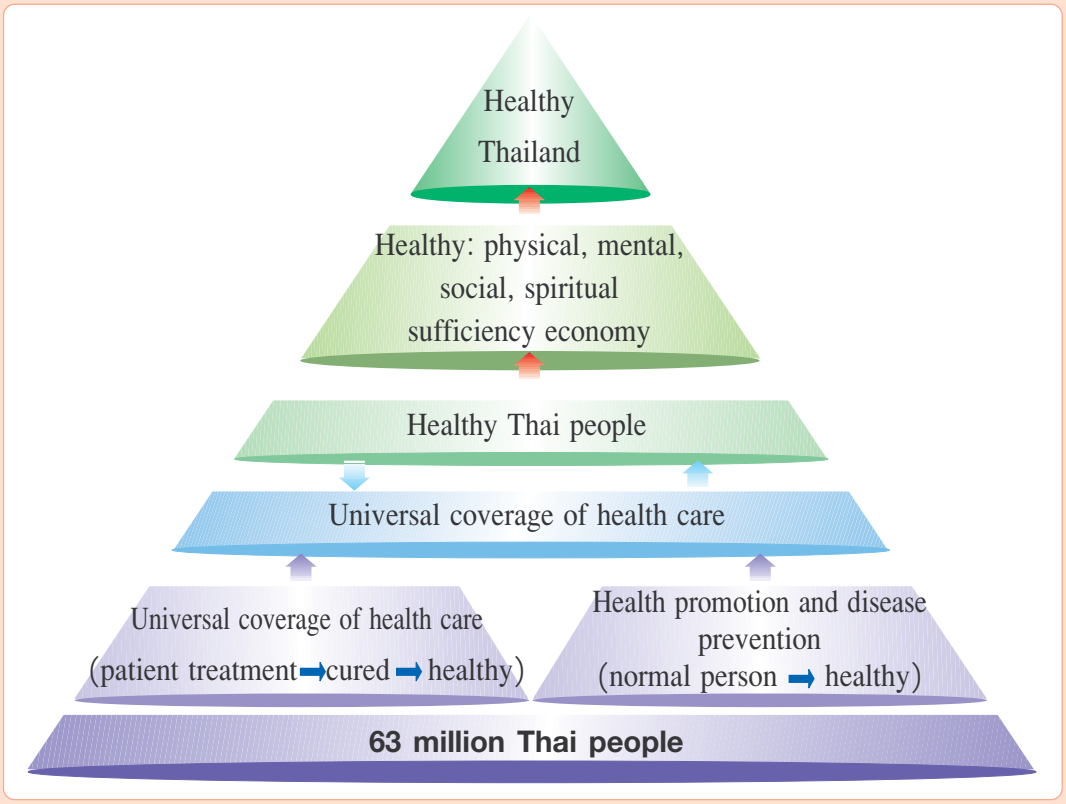
Strategy 7: Safeguard of national security

3.4 Healthy Thailand Strategy (2004 - 2015)

1) Concept and content of healthy Thailand

For Thailand to become healthy or strong, Thai people have to be healthy basically in four dimensions: physical health, mental health, social health and spiritual health. The concept emphasizes six elements: exercise, nutrition, emotion, environmental health, non-illness and non-vices.

Figure 3.3 The concept of Healthy Thailand



Source: Healthy Thailand Operational Guidelines, Ministry of Public Health, 2005.

2) Vision of Healthy Thailand

Thai people are physically, mentally, socially and spiritually healthy; have income; work with happiness; lead a life on the basis of moderation and reasonableness according to His Majesty the King's philosophy of sufficiency economy; have a warm and secure family in the environment that is good for health, life and property, in a society of learning and compassion; and live a long and healthy life.

3) Goal and targets of Healthy Thailand

There are 17 targets directly and indirectly related to health as follows:

(3.1) Physical Health

(3.1.1) Thai people aged six years and over exercise regularly to be healthy in all villages, communities, agencies and workplaces.

(3.1.2) Thai people eat safe and nutritious diets adequate for bodily needs, from chemical-free sources, health-standard-certified markets, restaurants and foodstuffs; all food processing plants are certified according to the good manufacturing practices (GMP) criteria.

(3.1.3) Thai people have a long and healthy life expectancy with a significant reduction in morbidity and mortality rates due to top-leading causes of death, particularly HIV/AIDS, cancer, heart disease, hypertension, dengue haemorrhagic fever and diabetes.

(3.1.4) Thai people reduce alcohol and tobacco use.

(3.1.5) Thai people have lower rates of injuries and deaths due to accidents.

3.5 The Millennium Declaration

1) Concept and content of the Millennium Declaration

In September 2000, leaders from 189 countries all over the world including Thailand adopted the United Nations Millennium Declaration which is the mission of the world community in pursuing sustainable development emphasizing the fight against poverty, hunger, illiteracy, illness, gender inequality, and degradation of national resources and environment, leading to the Millennium Development Goals.

For Thailand, in addition to using the adopted declaration, the philosophy of sufficiency economy has been used as a guide for integrated national development.

2) Millennium Development Goals (MDGs)

The MDGs are used for dividing the development responsibilities among the United Nations, international development agencies, governments and development partners in each country for ensuring that the goals are achieved. The goals include 48 indicators to be achieved by the year 2015:

Goal 1: Eradicate extreme poverty and hunger

Goal 2: Achieve universal primary education

Goal 3: Promote gender equality and empower women

Goal 4: Reduce child mortality

Goal 5: Improve maternal health

Goal 6: Combat HIV/AIDS, malaria and other diseases

Goal 7: Ensure environmental sustainability

Goal 8: Develop a global partnership for development

In 2004, Thailand reported on the achievements of MDGs which revealed that Thailand has progressed and achieved almost all the goals, particularly those related poverty and hunger, gender inequality, HIV/AIDS and malaria, almost ten years ahead of schedule. So additional targets and indicators so-called "MDG-Plus targets" were developed for use in the Thai context, including those directly and indirectly related to health development as follows:

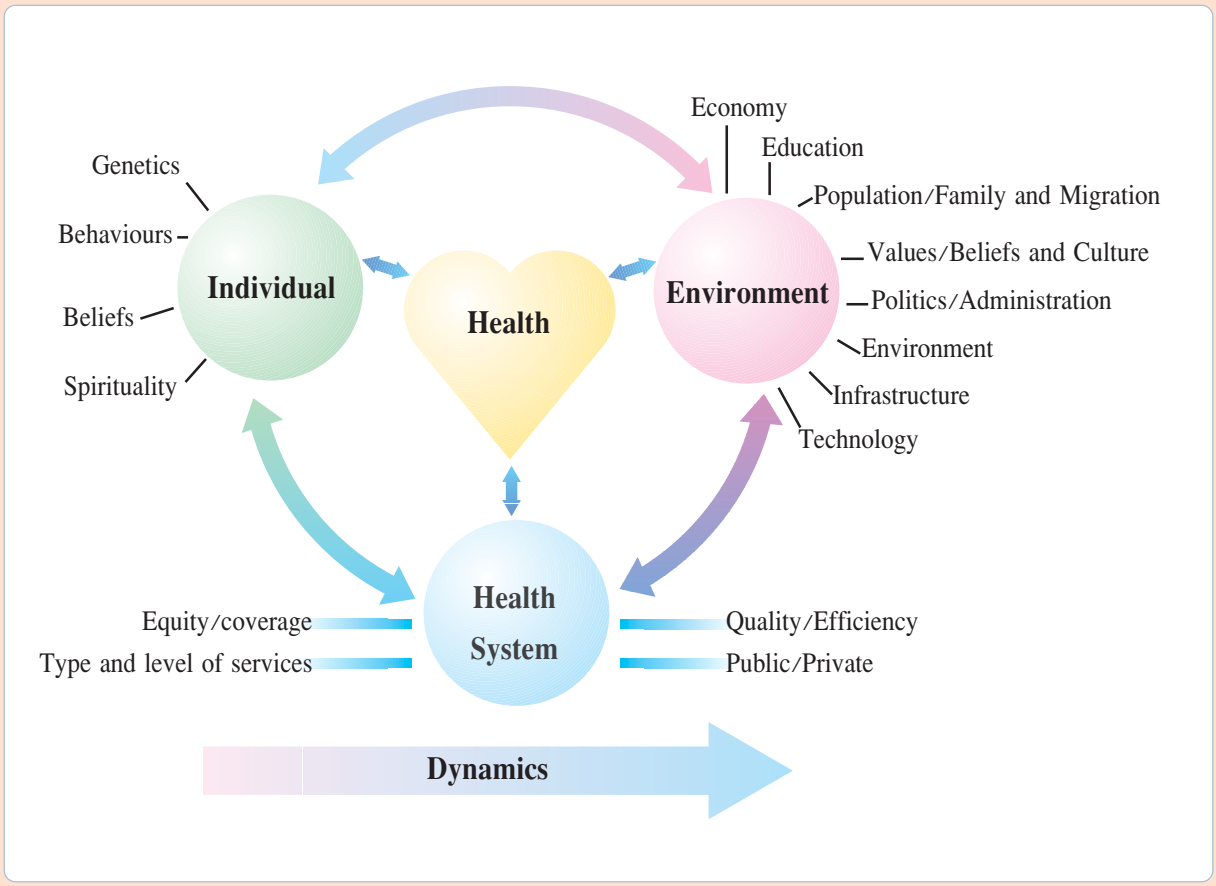
- Reduce poverty to below 4% by 2009.
- Achieve universal lower secondary education by 2006 and universal higher education by 2015.
- Double the proportion of women in the national parliament, local governments, and executive positions in civil service by 2006.
- Reduce infant mortality rate to 15 per 1,000 live births by 2006.
- Reduce by half, between 2005 and 2015, mortality rates of children under five in selected northern provinces and three southern most provinces.
- Reduce maternal mortality ratio to 18 per 100,000 live births by 2006.
- Reduce by half, between 2005 and 2015, maternal mortality ratios in selected northern provinces and three northernmost provinces.
- Reduce HIV prevalence among the population of reproductive age to 1% by 2006.
- Reduce malaria incidence in the 30 border provinces to 1.4 per 1,000 population by 2006.
- Increase the share of renewable energy in the commercial sector to 8% by 2011.
- Increase the proportion of solid waste reuse to 30% by 2006.

CHAPTER 4

Situations and Trends of Health Determinants

As health becomes more complex due to its association with numerous factors, Thailand's health situations and trends require a wider range of analyses and syntheses of changes in individual and environmental factors of all dimensions that determine health problems as well as the health services system (Figure 4.1).

Figure 4.1 Linkage and dynamics of factors related to health

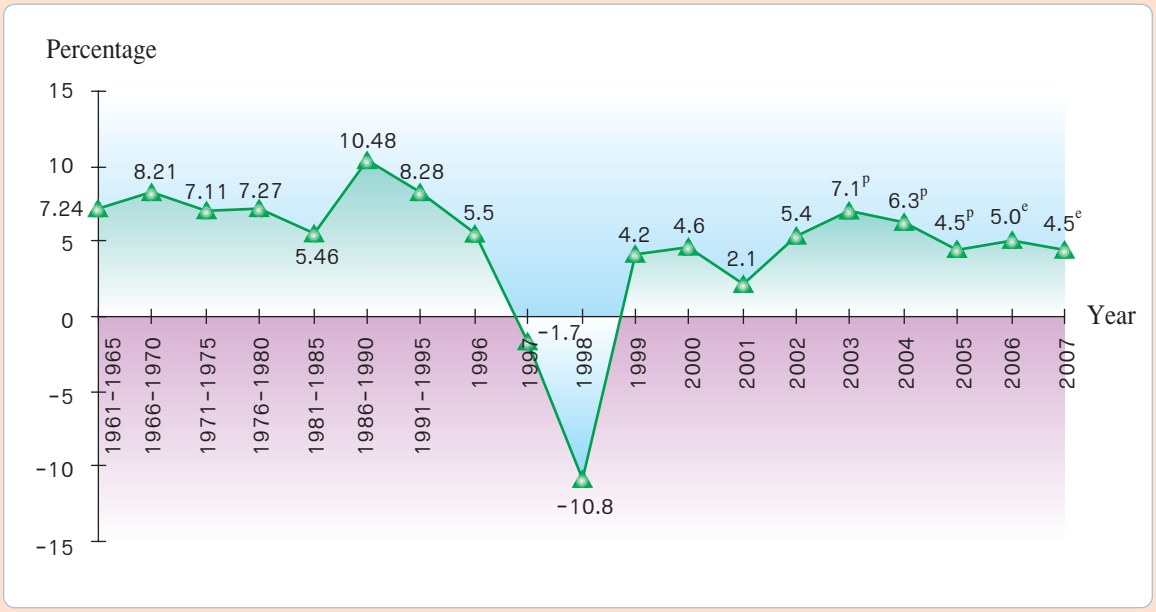


1. Economic Situations and Trends

1.1 Economic Growth

Over the three decades before 1997 the average annual economic growth was higher than 7% and the gross domestic product (GDP) per capita increased 28-fold, in particular after 1986. After the 1997 economic crisis, the annual economic growth declined to -1.7% in 1997 and -10.8% in 1998 (Figure 4.2), and the crisis drastically affected the GDP per capita (Figure 4.3). So Thailand has adopted a number of monetary and financial measures to resolve the problems, resulting in a positive growth of 4.2% in 1999 and 7.1% in 2003, but a drop is expected to 4.5% in 2007.

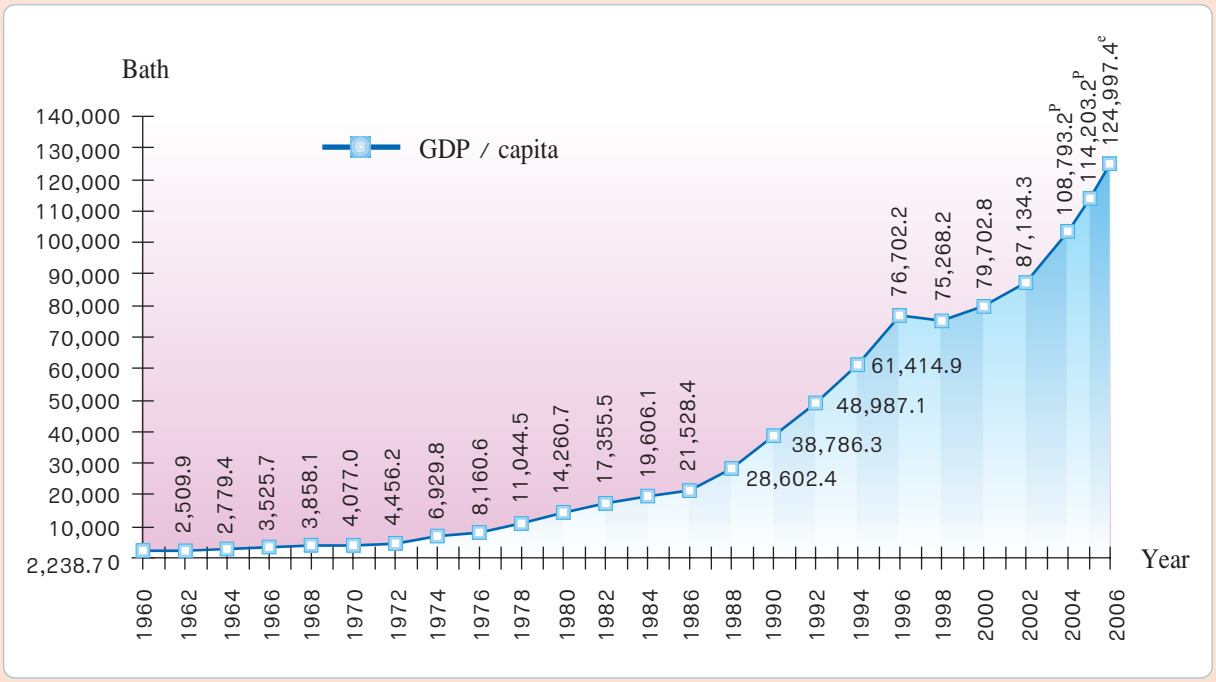
Figure 4.2 Economic growth rate in Thailand, 1961-2007



Source : Office of the National Economic and Social Development Board (NESDB).

Notes : [P] Preliminary figure; [e] estimated figure.

Figure 4.3 Gross domestic product per capita, 1960-2006 (market prices)



Source : Office of the National Economic and Social Development Board (NESDB).

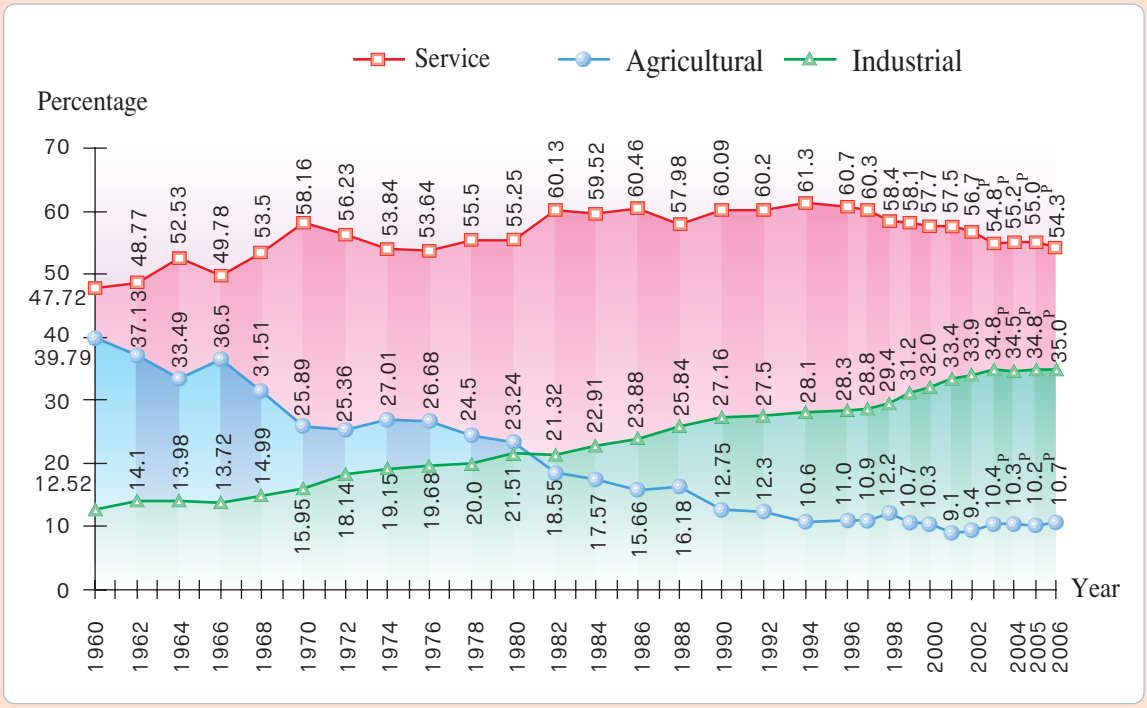
Notes : 1. ^{P} Preliminary figure; ^{e} estimated figure.

2. Since 1994, the data on GDP have been adjusted.

1.2 Economic Structure

The Thai economic structure has been transformed in such a away that the proportion of the industrial and service sectors grows faster than the agricultural sector (Figure 4.4). It is noted that since 1990, the production structure of the agricultural, industrial and service sectors has almost never changed.

Figure 4.4 Proportion of economy in the agricultural, industrial and service sectors, as a percentage of GDP, 1960-2006



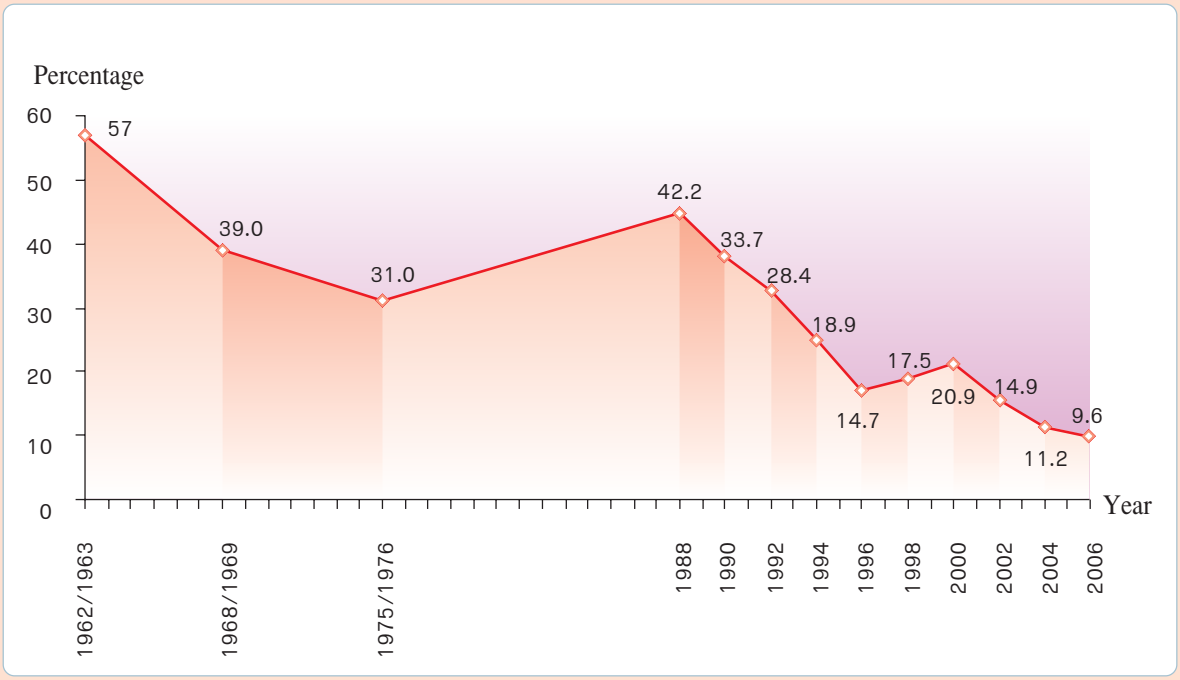
Source: National Income of Thailand, 4th Quarter (4/2006). Office of the National Economic and Social Development Board.

Notes: p Preliminary figure

1.3 Income Distribution and Poverty

The poverty situation in Thailand has been a positive trend; the proportion of people living with poverty dropped from 57.0% in 1962 to 14.7% in 1996 as a result of the rapid economic growth during that period. But after the 1997 economic crisis, the poverty prevalence rose to 20.9% in 2000, but dropped to 9.6% in 2006 (Figure 4.5) due to the economic recovery. However, even although the poverty prevalence has been steadily declining, the proportion of poverty in the rural areas is three times greater than that in the urban areas (Table 4.1).

Figure 4.5 Proportion of poverty, based on expenditure, 1962-2006



Sources: Data for 1962/63-1975/76 were derived from Ouay Meesook. Income, Consumption and Poverty in Thailand, 1962/63 to 1975/76.

Data for 1988-2006 were derived from the Household Socio-Economic Survey, analyzed by the Bureau of Economic Development and Income Distribution, Office of the National Economic and Social Development Board.

Notes: Studies on poverty in Thailand in different periods had different assumptions.

Table 4.1 Proportion of poverty based on expenditure, by locality, 1962-2006

Year	Urban area,%	Rural area, %	Whole country, %
1962/1963	38	61	57
1968/1969	16	43	39
1975/1976	14	35	31
1988	23.7	49.7	42.2
1990	20.5	39.2	33.7
1992	12.1	35.3	28.4
1994	9.9	22.9	18.9
1996	6.8	18.2	14.7
1998	7.1	21.9	17.5
2000	8.6	26.5	20.9
2002	6.4	18.9	14.9
2004	4.6	14.2	11.2
2006	3.6	12.0	9.6

Sources: Data for 1962/63-1975/76 were derived from Ouay Meesook. Income, Consumption and Poverty in Thailand, 1962/63 to 1975/76.

Data for 1988-2006 were derived from the Household Socio-Economic Survey, analyzed by the Bureau of Economic Development and Income Distribution, Office of the National Economic and Social Development Board.

Regarding income distribution, it is found that the gap between the rich and the poor has been widening. In 1962, the highest income group (one-fifth of the entire population) had a 49.8% share of the national income. Such a share rose to 56.7% in 1996, while the lowest income group (one-fifth of the entire population) had a national income share of only 7.9% in 1962, falling to 4.2% in 1996 (Figure 4.6), and being slightly better during the period 1994-1996.

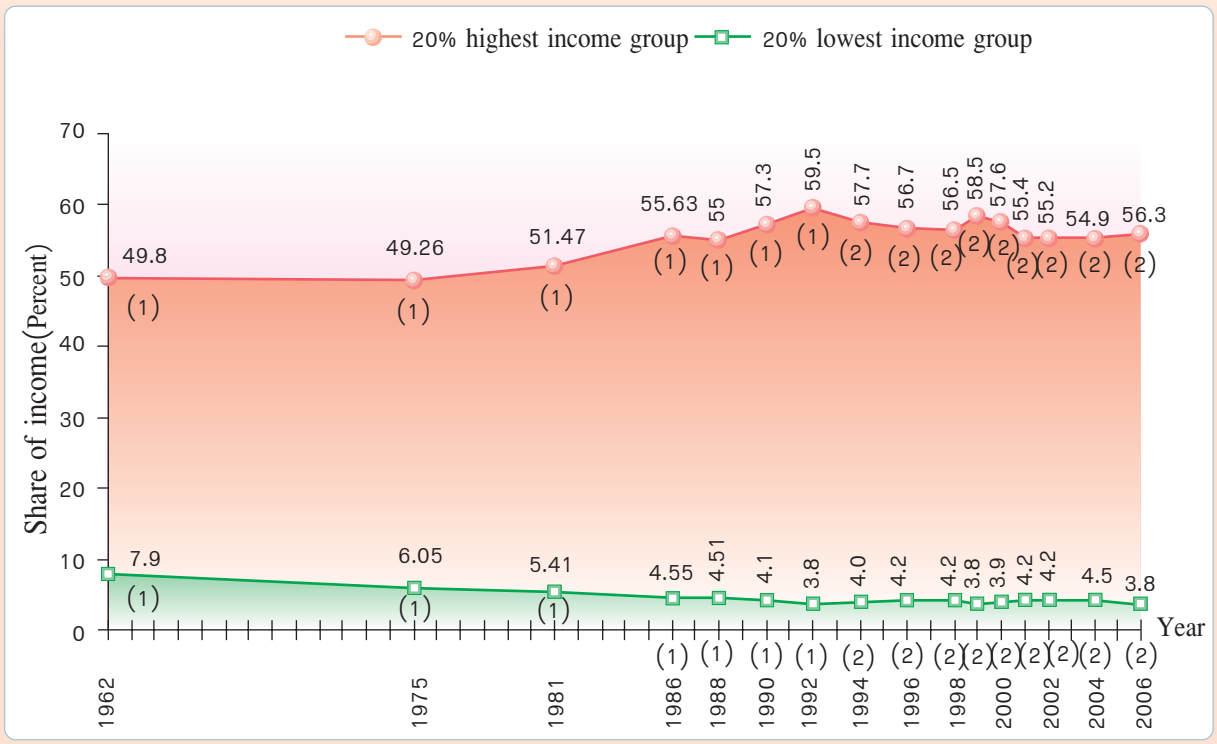
During the economic crisis, the income distribution became more inequitable. The 20% lowest income group had their income proportion declining from 4.2% in 1996 to 3.9% in 2000, while the 20% highest income group had their income proportion rising from 56.7% to 57.6% during the same period. But in 2001-2004, the trend in income distribution improved slightly. The income disparity between the richest and the poorest groups increased from 12.2-fold in 2004 to 14.8-fold in 2006. Nonetheless, in terms of income distribution inequalities, Thailand is higher than in many other countries in Southeast Asia (Table 4.2).

Table 4.2 Income share of the population in Southeast Asian countries

Country	20% highest income group	20% lowest income group	Discrepancy (times)
Thailand (2002)	55.2	4.2	13.2
Singapore (1998)	49.0	5.0	9.8
Malaysia (1997)	54.3	4.4	12.3
Indonesia (2002)	43.3	8.4	5.1
Philippines (2000)	52.3	5.4	9.7
Vietnam (2002)	45.4	7.5	6.0
Cambodia (1997)	47.6	6.9	6.9
Laos (2000)	43.3	8.1	5.3

Source: Human Development Report, 2006.

Figure 4.6 Income share of Thai people: five income groups



	Year															
	1962	1975	1981	1986	1988	1990	1992	1994	1996	1998	1999	2000	2001	2002	2004	2006
20% highest income group	7.9	6.05	5.41	4.55	4.51	4.1	3.8	4.0	4.2	4.2	3.8	3.9	4.2	4.2	4.5	3.8
20% lowest income group	49.8	49.26	51.47	55.63	55.0	57.3	59.5	57.7	56.7	56.5	58.5	57.6	55.4	55.2	54.9	56.3
Income disparities	6.3	8.1	9.5	12.2	12.2	14.0	15.6	14.4	13.5	13.5	15.4	14.8	13.2	13.2	12.2	14.8

Sources: (1) For 1962-1992, from the Office of the National Economic and Social Development Board and the Thailand Development Research Institute.

(2) For 1994-2006, from the Economic and Social Household Survey of the National Statistical Office, analyzed by the Development Evaluation and Dissemination and Bureau of the Economic Development and Income Distribution, Office of the National Economic and Social Development Board.

Note: For 2002, the data for computation of income disparities according to the Economic and Social Household Survey were adjusted from the first six months of survey to 12-month cycle of survey.

1.4 Global and Regional Economic Cooperation

In the globalization era, the world has entered into the free trade system and consolidated regional trade organizations so as to establish negotiating power for competition. This has resulted in movements in establishing economic cooperation mechanisms, in which Thailand is involved, such as the ASEAN Free Trade Area (AFTA), the Asia-Pacific Economic Cooperation (APEC), the Asia-Europe Meeting (ASEM), the Southern Triangle for Economic Cooperation, the Mekong Committee (for development cooperation among six countries), and the Ayeyawady - Chao Phraya - Mekong Economic Cooperation Strategy (ACMECS). In other regions, such organizations include the North America Free Trade Area (NAFTA) and the European Community (EC). At the global level, there are international trade agreements coordinated by the World Trade Organization (WTO). This has tremendously led to greater liberalization and competition. In particular, developed countries have generated new non-tariff barriers, such as environmental measures, child labour employment, human rights, anti-dumping duty (AD) or countervailing duty (CVD).

At present, Thailand has focused on the expansion of free trade policies in the form of bilateral agreement to minimize trade barriers with several other countries such as Australia, China, New Zealand, India, Japan, the USA, Peru and Bahrain. Other mechanisms have also been adapted to enhance its status and protect national interest in multi-lateral frameworks such as WTO and ASEAN.

Such economic changes affect the Thai health system as follows:

1. **Rising health expenditure.** The national health accounts have been rising from 3.8% of GDP in 1980 to 6.14% in 2005. In terms of equality of health spending burden, it was found that in 2004 the poor had a higher health spending burden relative to their income, i.e. 2.1 times higher than that of the rich. This inequality has however fallen from 6.4 times in 1992 as a result of the implementation of universal healthcare scheme (see Chapter 6, Health Financing).

2. **Roles of the public and private sectors in health care delivery.** During the bubble economy, the demand for doctors in the private sector rose rapidly; the proportion of doctors in the private sector climbed from 6.7% in 1971 to 20.5% in 1996, resulting in a serious public-to-private sector brain drain. During the economic crisis, with the people's declining purchasing power, a portion of the people who could not afford private health care turned to state-run health facilities instead. As a result, the utilization of private health facilities dropped slightly in the initial stage. But since 2001, with the government's implementation of the universal healthcare policy, more outpatients have attended **public health facilities.** In 2005, the number of outpatients rose by 131.7%, compared with that for 2000, whereas the increase of inpatients in the public sector was only 4.0% for the same period.

3. **Income disparities between the rich and the poor resulting in inequalities in health resource distribution.** Despite the increase in resources and infrastructure for health care, the inequalities in resource distribution are still high as a result of the rapid expansion in the private health

sector, draining human resources from the rural to urban areas and from the poor to the rich (see Chapter 6, Health Resources). Such inequalities have resulted in inaccessibility to state health services of the rural poor and urban slum dwellers.

4. Mental health problems are on the rise. Even though the crisis has been over, mental health problems are on a rising trend, the prevalence of mental disorder rising from 440.1 per 100,000 population in 1997 to 640.6 per 100,000 population in 2006 (see the section on mental health indicators in Chapter 5).

5. Government budget for health is rising. The state health budget varies with the economic situation. During the period of economic boom, the health budget was rising, the Ministry of Public Health's budget being 7.7% of the national budget. But during the economic crisis, the government budget for health had a declining trend. Since 2001 the government has implemented to universal healthcare policy and the government health budget, particularly the operating budget, has risen steadily. As a result, the proportion of overall MoPH budget has risen from 6.7% in 2001 to 8.3% in 2007 (see Chapter 7, MoPH Budget).

6. Free trade and international economic agreements. Trade competition and discrimination are more widespread with a negative impart on the part of health products and healthcare industries.

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[1] UNDP. Human Development Report,2005.

2. Educational Situations and Trends

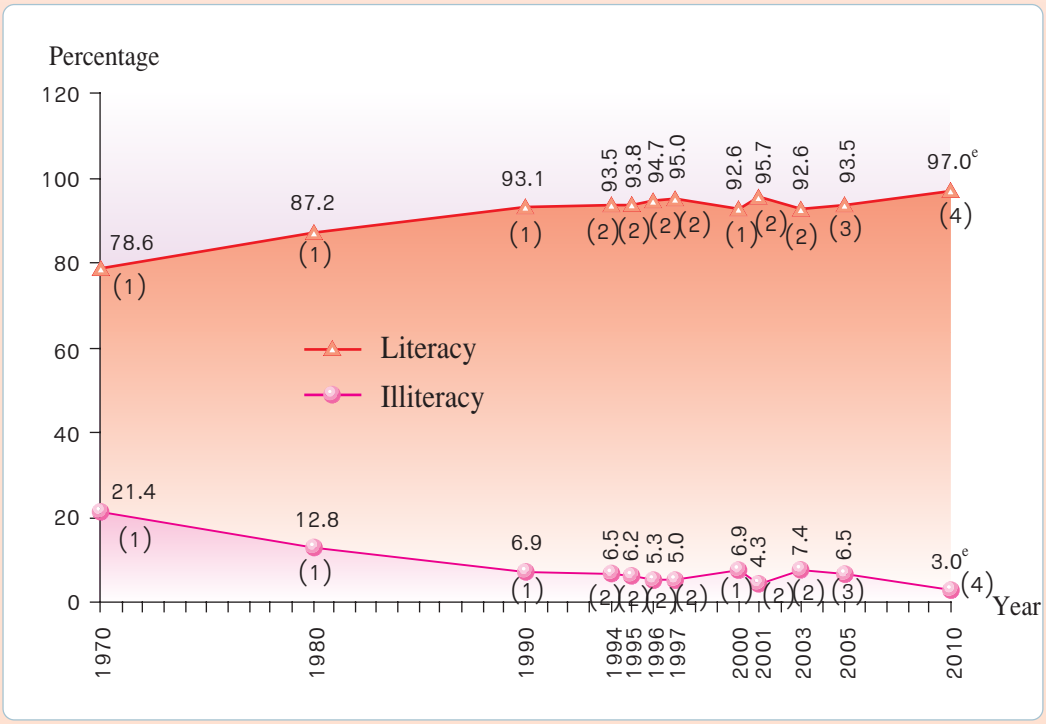
2.1 Knowledge, Capability and Skills of Thai People

2.1.1 Literacy Rate

The literacy rate among Thai population aged 15 and over rose from 78.6% in 1970 to 93.5 in 2005 (Figure 4.7), much higher than the average for developing countries (67.0%). Although Thailand's literacy rate ranks second among the ASEAN member countries,[1] second to Brunei, its illiteracy rate was recorded at 6.5% in 2005; and it is estimated that the literacy rate will be as high as 97% in 2010.

[1] UNDP. Human Development Report,2005.

Figure 4.7 Literacy and illiteracy rates of Thai population aged 15 and over, 1970-2010



Sources: (1) Data for 1970, 1980, 1990 and 2000 were derived from the Population and Housing Censuses. National Statistical Office.

(2) Data for 1994-1997, 2001, and 2003 were derived from UNDP, Human Development Reports, 1997-2003.

(3) Data for 2005 were derived from the report on population characteristics from the population change survey, 2005-2006, National Statistical Office.

(4) UNESCO, Principal Regional Office for Asia and Pacific, Literacy in Asia and the Pacific.

2.1.2 Learning Rate

The learning rate of Thai people is rather low at only 60.0% (2005) and there are wide disparities between those for the regions and between urban and rural residents (Table 4.3).

Table 4.3 Learning rate of Thai people, 1992-2005

Unit: Percent

Region and area	1992	1996	1997	1999	2001	2002	2003	2004	2005
Urban	57.1	60.0	61.7	65.4	67.5	68.6	70.0	70.8	71.2
Rural	36.5	41.0	42.2	46.9	49.4	50.8	52.9	54.6	54.3
Region									
Central	41.0	48.2	49.4	52.1	52.4	53.2	58.6	59.7	62.3
North	36.2	38.6	40.7	43.5	46.6	48.2	49.9	51.8	50.0
Northeast	39.6	44.1	45.0	51.0	54.8	55.7	56.5	58.3	56.0
South	43.6	47.5	48.5	53.8	56.3	58.7	58.7	60.7	62.5
Bangkok	61.6	64.8	66.8	72.1	73.1	73.7	75.7	75.9	76.4
Whole country	**42.3**	**47.1**	**48.5**	**53.0**	**55.3**	**56.6**	**58.7**	**60.1**	**60.0**

Source: Data from the Workforce Survey (3rd Round) of the National Statistical Office, analyzed by the Bureau of Development Evaluation and Dissemination, NESDB.

Note: Learning rate is the level of literacy and basic computation required for daily livelihood; to attain such a level, a person should have had 5-6 years of formal schooling or equivalent.

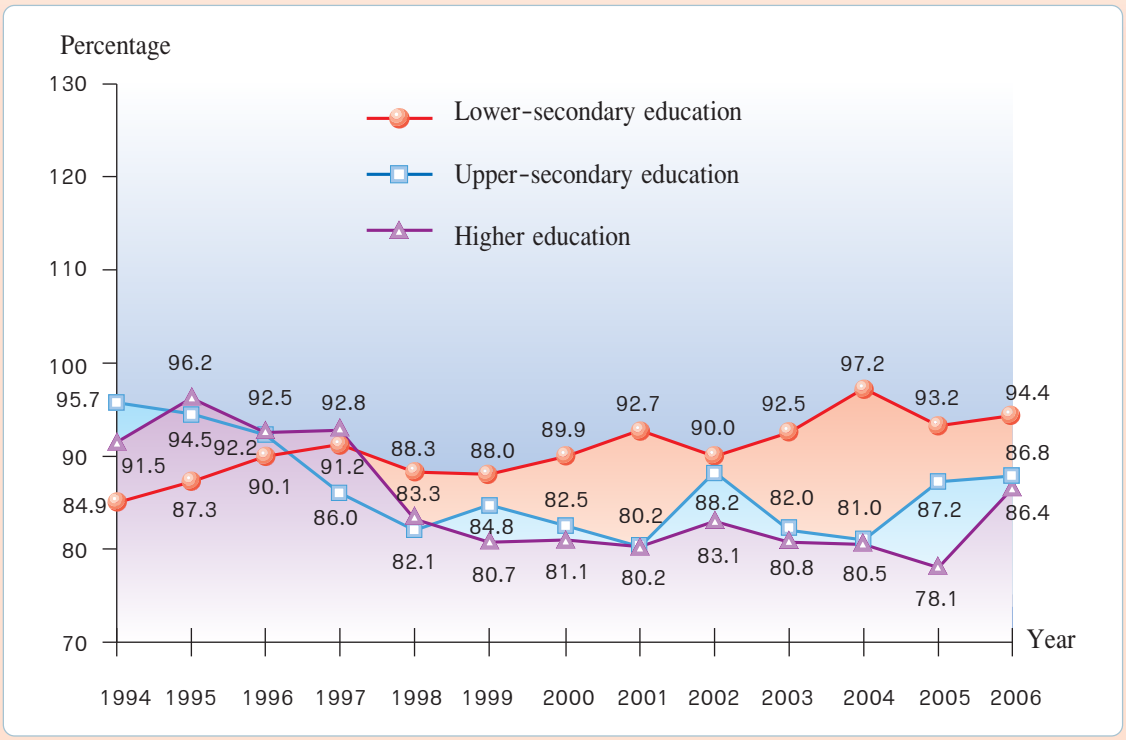
Nevertheless, when considering the reading rate among the Thai people, it was found that only 35.4 million people (61.2%) read regularly in 2003 and the trend rose slightly to 40.9 million (69.1%) in 2005 (Report on Reading of Population Survey, 2005, National Statistical Office).

2.2 Education Opportunities

2.2.1 Educational Continuation

The rates of students continuing their education from primary to lower-secondary, from lower to upper-secondary, and from upper-secondary to higher education tended to be rising during the pre-economic crisis period. But the rates dropped during the crisis and rose again after the crisis was over (Figure 4.8).

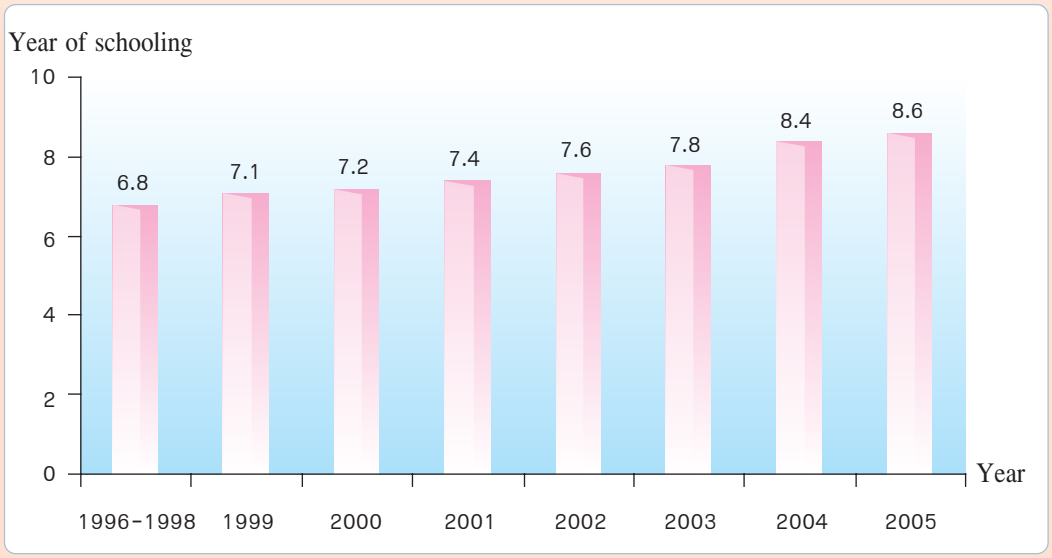
Figure 4.8 Rates of educational continuation by educational level, academic years 1994-2006



Sources: Office of the Education Council, Ministry of Education.

With the higher rate of educational continuation, coupled with an increase in the average duration of education among Thai population aged 15 and over from 6.8 years in 1996 to 8.6 years in 2005 (Figure 4.9), the proportion of labour force (2006) with primary schooling has dropped to 59.9%. It has been projected that the proportion of workers with primary education will drop further to only 39.9% in 2020, while those with higher education will rise from 14.0% in 2006 to 22.5% in 2020 (Table 4.4).

Figure 4.9 Average years of schooling of Thai people, 1996-2005



Source: Office of the Education Council.

Note: Data for 1996-2003 covered the population aged 15 years and over and 2004-2005 for population aged 15-59 years.

Table 4.4 Structure (percentage) of labour force by educational level, 1995-2020

Educational level	1995(1)	1997(1)	1999(1)	2001(1)	2003(1)	2005(1)	2006(1)	2010(2)	2020(2)
Primary and lower	78.0	75.2	69.8	66.3	63.8	61.4	59.9	55.9	39.9
Lower-secondary	8.9	10.1	12.0	12.7	13.7	13.8	14.1	14.7	14.6
Upper-secondary	3.3	3.6	5.0	6.2	7.2	8.1	8.8	8.7	14.3
Vocational	4.7*	4.8*	5.0*	3.4*	3.3*	3.3*	3.2*	6.6	8.7
Higher	5.1	6.2	8.2	11.3	11.9	13.4	14.0	14.1	22.5
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: (1) Data for 1995-2006 were derived from the Reports of the Workforce Survey, 3rd Round, National Statistical Office.

(2) Data for 2010-2020 were derived from the Report on Thailand's Social and Economic Trends, Thailand Development Research Institute.

Note: *Including graduates from vocational and teacher-training colleges for 1995-2006.

2.2.2 Education Equalities among Male and Female Children

At present, boys and girls have an equal educational opportunity. In 2004, the proportion of boys attending primary school was slightly higher than that for girls; on the contrary, at the higher educational level there were more female students than male students. However, the educational equalities among boys and girls in Thailand are inferior to those in other ASEAN countries, all countries in Europe and the USA (Table 4.5).

Table 4.5 Educational inequalities at the primary, secondary, and tertiary levels, 2000-2004

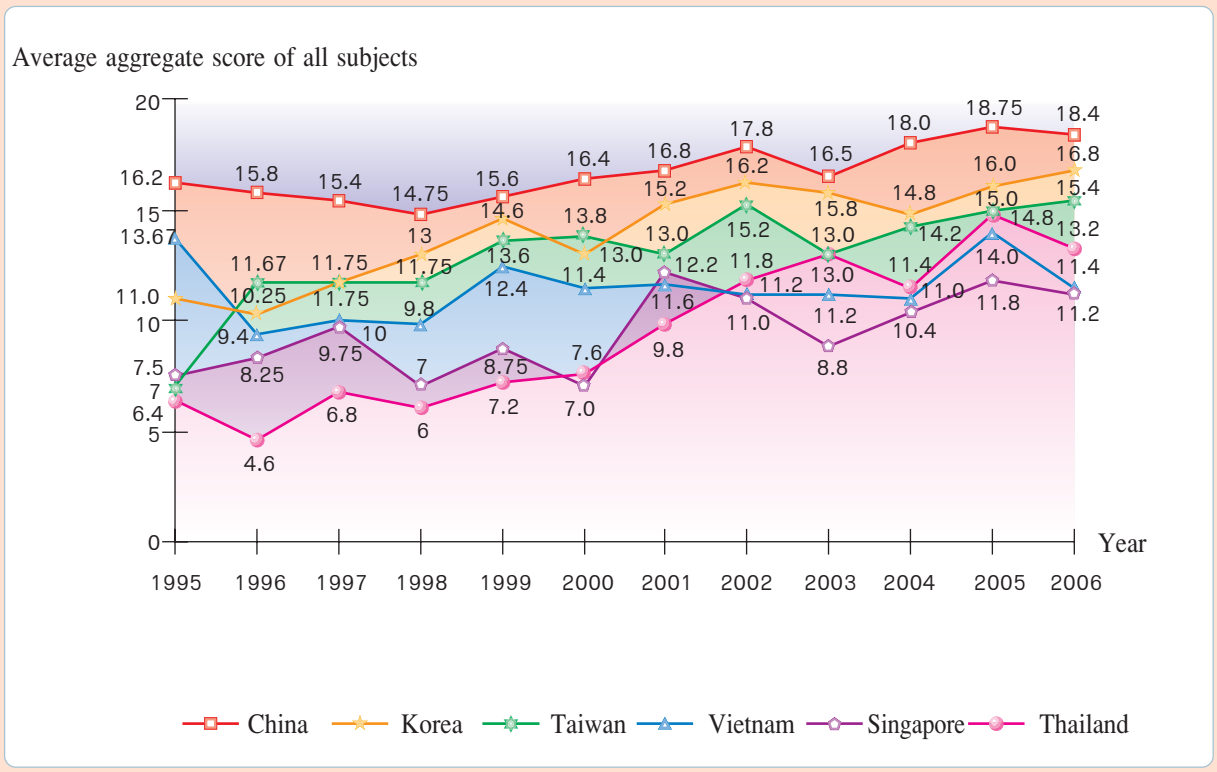
Group/country	2000/2001			2004		
	Ratio of female-to-male students			Ratio of female-to-male students		
	Primary	Secondary	Tertiary	Primary	Secondary	Tertiary
WHO/SEAR						
Sri Lanka	1.00	NA	NA	1.00	NA	NA
Maldives	1.01	1.13	NA	1.00	1.15	NA
Indonesia	0.99	0.96	0.77	0.98	0.99	0.79
Bangladesh	1.02	1.05	0.55	1.03	1.11	0.50
Thailand	0.93	1.01	1.12	0.97	1.01	1.17
India	NA	NA	0.66	0.94	NA	0.66
Myanmar	0.99	0.95	1.75	1.01	0.95	1.77
Nepal	0.87	NA	0.27	0.87	NA	0.41
Bhutan	NA	NA	NA	NA	NA	NA
North Korea	NA	NA	NA	NA	NA	NA
ASEAN						
Malaysia	1.00	1.11	1.08	1.00	1.14	1.41
Vietnam	0.94	NA	0.74	0.94	NA	0.77
Philippines	1.01	1.18	1.10	1.02	1.20	1.28
Indonesia	0.99	0.96	0.77	0.98	0.99	0.79
Singapore	NA	NA	NA	NA	NA	NA
Brunei	NA	NA	1.96	NA	NA	1.74
Thailand	0.93	1.01	1.12	0.97	1.01	1.17
Cambodia	0.90	0.59	0.38	0.96	0.73	0.45
Laos	0.92	0.81	0.59	0.73	NA	0.80
Myanmar	0.99	0.95	1.75	1.01	0.95	1.77
Worldwide: Top Ten						
Norway	1.00	1.01	1.52	1.00	1.01	1.54
Iceland	1.00	1.05	1.74	0.98	1.04	1.78
Australia	1.01	1.03	1.24	1.01	1.01	1.23
Ireland	1.00	NA	1.27	1.00	1.06	1.28
Sweden	0.99	1.04	1.52	1.00	1.03	1.55
Canada	1.00	1.01	1.35	1.00	0.99	1.36
Japan	1.00	1.01	0.85	1.00	1.01	0.89
U.S.A.	1.01	1.02	1.32	0.96	1.02	1.39
Switzerland	0.99	0.95	0.78	1.00	0.93	0.20
Netherlands	0.99	1.00	1.07	0.99	1.01	1.08

Sources: - Human Development Report, 2003.
- Human Development Report, 2006.
- Report on the Achievements of the MDGs, Thailand, 2004.

2.3 Quality of Education

The Thai educational system tends to focus on memorization rather than strengthening of analytical skills for problem solving and self-study, resulting in low educational achievements, below 50% for both primary and secondary levels. Thai children's capability is weaker in terms of rational and systematic analysis and synthesis (Table 4.6). Besides, the Thai educational quality cannot compete with that in other countries as evidenced in the results of the academic Olympics competition. In the contest, Thai students' mathematics and science capabilities were lowest among the six Asian countries participating in the event, except for 2002-2006 when Thailand was ranked fourth, better than Singapore and Vietnam (Figure 4.10). Most Thai students have a problem with answering a question that requires the application of knowledge for further analysis, and problem solving and the measuring of process skills. As a result, a lot of Thai people lack the skills for analysis which is a basis for creating life skills, leading to failure or inability to resolve a problem or situation related to health risks.

Figure 4.10 Results of Olympic scientific knowledge contest of students from Thailand and other Asian countries, 1995-2006



Source: Office of the Education Council, Ministry of Education.

Note: Average aggregate score of all subjects means an average score of 5 subjects (mathematics, chemistry, physics, biology and computer science) for each year.

Table 4.6 Learning achievements and scholastic aptitudes of primary and secondary school students, 2000-2006

Educational level / Learning achievement		Average score (percent)			
		Mathematics	Science	Thai language	English
1. Primary	2001	46.9	NA	54.3	49.6
	2002	49.9	NA	50.6	47.4
	2003	41.7	42.4	45.2	41.1
	2004	43.8	41.6	44.2	37.3
	2006	38.9	43.2	42.7	34.5
2. Lower-secondary	2000	31.2	40.4	53.0	38.9
	2001	32.4	NA	46.3	38.9
	2002	39.1	NA	46.7	45.3
	2003	35.0	38.1	54.0	37.9
	2004	34.8	37.2	38.3	32.3
	2006	31.1	39.3	43.9	30.8
3. Upper-secondary	2003	34.0	48.8*	44.5	39.1
	2005	28.5	34.0	48.6	29.8
	2006	29.6	34.9	50.3	32.4
Educational level / Learning aptitude		**Computational**	**Analytical**	**Language capability**	
- Upper-secondary	2000	38.3	43.1	37.2	
	2001	41.7	39.6	38.7	
	2003	38.9	38.3	40.7	
	2004	41.6	46.1	39.9	

Sources: - Office of the Basic Education Commission, Ministry of Education.
- National Institute for Educational Testing Services, Ministry of Education.

Notes:
1. Assessments of students' learning achievements for primary and lower-secondary levels, 2001-2002 were undertaken in three subjects: Thai language, English and mathematics.
2. For 2000-2004, the assessments of upper-secondary school students' scholastic aptitudes were undertaken in three aspects: computational, analytical and language capabilities.
3. For 2003, there was also an assessment of learning achievements for upper-secondary school students.
4. *For physical/biological sciences.

The changes in the educational system have affected the Thai health system in the following aspects:

1. Some Thai people lack the ability to screen health information in a well-informed manner resulting in the practice of risky health behaviours. At present, many Thai people consume food or something that is unhealthy such as alcohol, junk food, and tobacco (see Chapter 4, health behaviours).

2. Educational attainment of Thai labour force; in 2006 as many as 59.9% of Thai workers had completed only primary schooling which affects the development of labour and health. A lot of workers are unable to take care of their own health and protect themselves resulting in a rise in occupational injuries. In additional, the underprivileged such as the rural and urban poor have no access to the educational system; a number of them have no access to even primary schooling and they will be the group that has no access to health services; so they have to face a lot of health problems.

3. Situations and Trends of Population, Family and Migration

3.1 Population Structure Changing to Be an Elderly Society

The success in Thailand's family planning campaigns has led to an increase in the contraceptive prevalence rate from 14.4% in 1970 to 81.1% in 2006, resulting in a drastic reduction in the total fertility rate to below the replacement level (a couple having two children, only enough to replace themselves). And as a result, the population growth has continuously dropped from 3.2% prior to 1970 to 0.41% in 2006, below the level of 0.53% projected for 2020 (Figure 4.11). Such a decrease in the population growth has affected the number and age structure of population. Thailand will have a population of 72.3 million in 2025 (Figure 4.12), while the proportion of children aged 0-14 tends to drop whereas the working-age and elderly proportions are likely to escalate (Figure 4.13). This describes the phenomenon of declining dependency ratio for children but rising for the elderly. Though the overall dependency ratio keeps falling until 2010, it will rise again due to a greater proportion of the elderly (Figure 4.14). This will result in a change in Thailand's population pyramid from an expansive or wide-base to a constrictive or narrow-base one, similar to those in developed countries (Figure 4.15). Thailand thus has a tendency to very rapidly become an elderly society within 20 years (from 2010 to 2030). In 2010, Thailand will begin to become an elderly society,[2] only four years from now, while other developed countries except Japan spent more than 60 years to be so (Table 4.7), resulting in the working-age population bearing a higher burden in taking care of the elderly.

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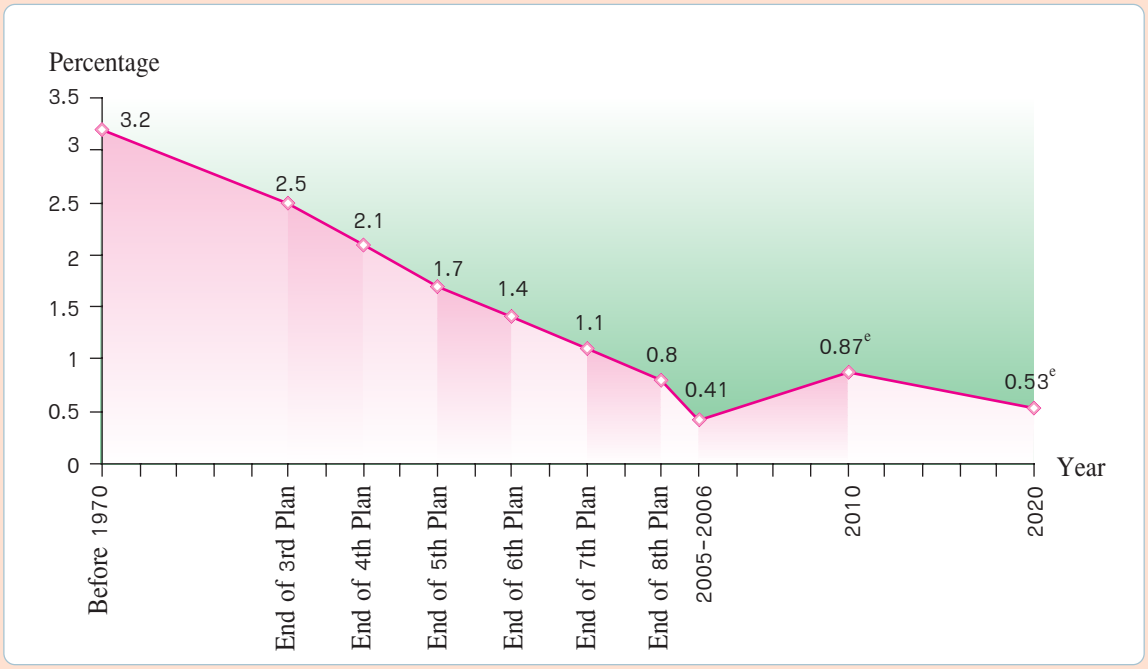
[2] The United Nations has defined that, for a country to become an elderly society, its ratio of population aged 65 years or over to the entire population ranges from 7% to 14% and it fully becomes an elderly society when the ratio exceeds 14%.

So the government has to develop a plan and strategy preparing to enter an elderly society, preparing young people to become active ageing people. Moreover, the health care system has to be prepared to cope with chronic diseases and illnesses of the elderly, which are more and more prevalent, such as hypertension, diabetes and heart disease. Studies are to be carried out to forecast the budget required for elderly health care, particularly under the universal health security scheme, due to the fact that the elderly tend to be sick and disabled in need of institutional-based long-term care with a greater proportion of budget, compared to that for other age groups. This is to ensure that it will not pose a budgetary burden for the country in the long run.

Besides, as Thailand is becoming an elderly society, there will be an opportunity for expansion of market for health-food supplements, herbal medicines and indigenous medicine as the elderly with deteriorating physical conditions will require more supplementary products or tonicums for promoting health, maintaining memory and relieving problems related to the bones and joints. So the government has to formulate measures to control such products which tend to become more widespread in the future.

Figure 4.11 Population growth rate and projection, Thailand, 1970-2020



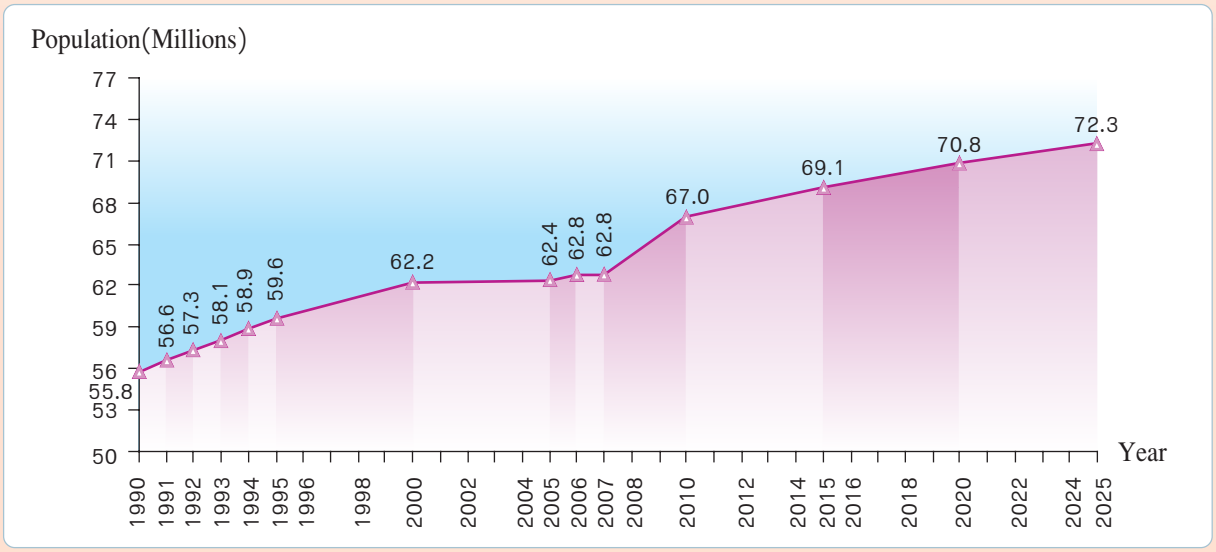
Sources: (1) Data before 1970 were derived from Niphon Debavalya, Before Getting the 1970 Population Policy.

(2) Data for end of the 3rd-8th Plans were derived from the Department of Health, MoPH.

(3) Data for 2005/2006 were derived from the Population Change Survey, National Statistical Office.

(4) Data for 2010-2020 were derived from Population Projections, Thailand, 1990-2020, NESDB.

Figure 4.12 Projection of population, Thailand, 1990-2025

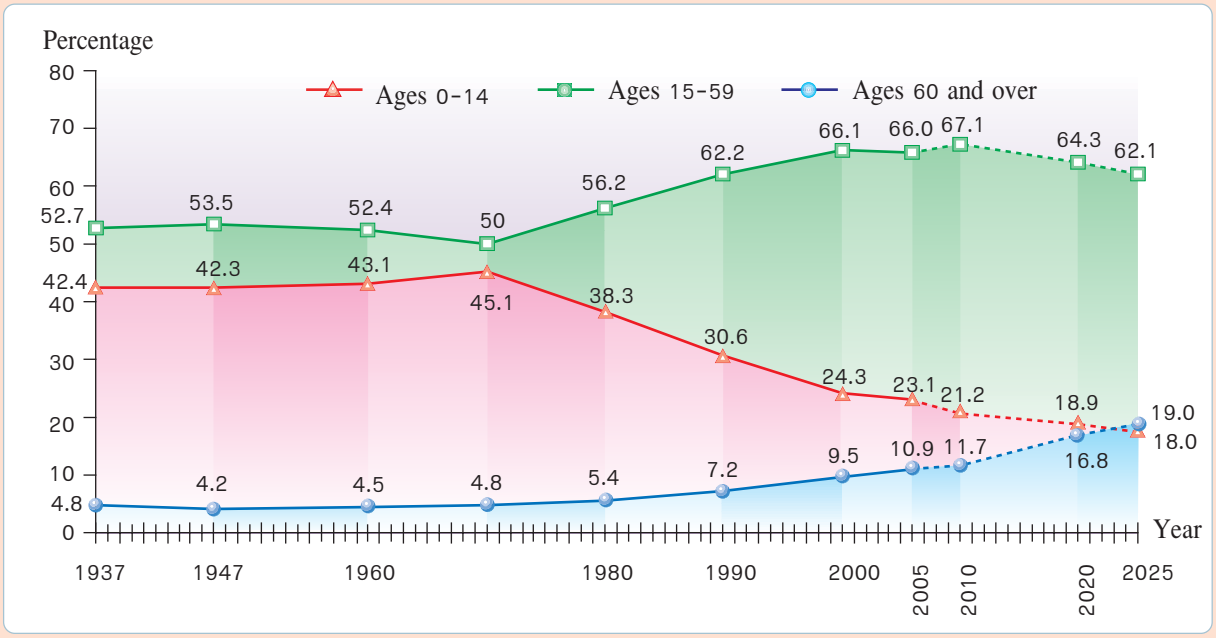


Source: Population Projections, Thailand, 2000-2025, NESDB.

Note: For 2005 and 2006 data were derived from the Bureau of Registration Administration. Ministry of Interior.

For 2007, data were derived from mid-2007 population estimate (1 July) of the Institute of Population and Social Research, Mahidol University.

Figure 4.13 Proportion of population by major age group, 1937-2025

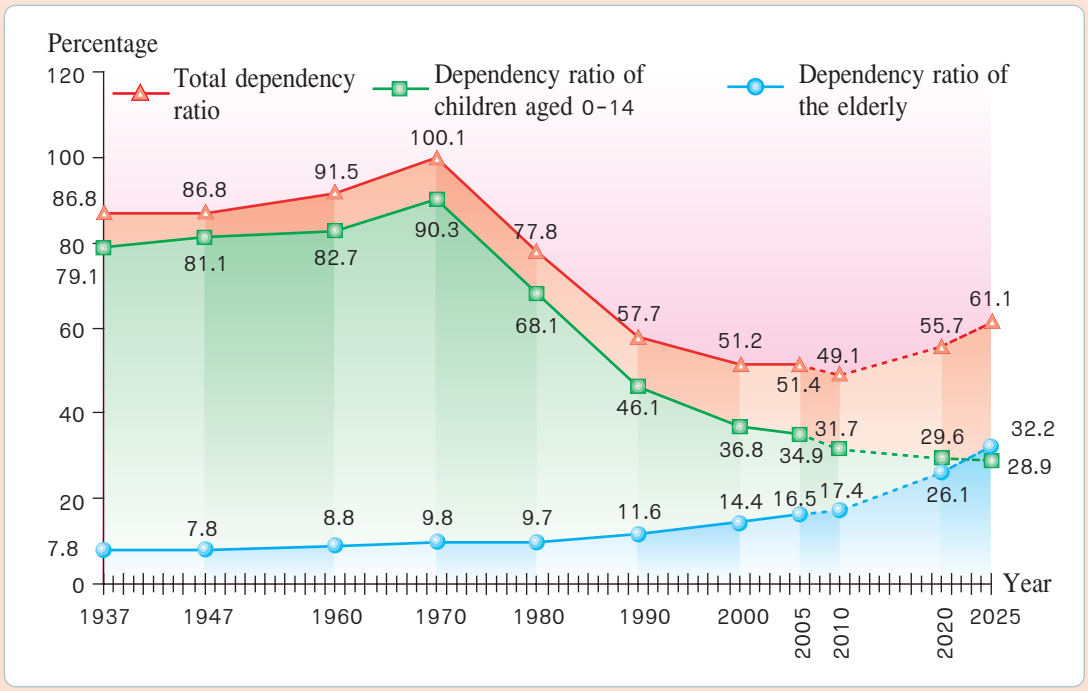


Sources: (1) Data for 1937, 1947, 1960, 1970, 1980, 1990 and 2000 were derived from the Population and Housing Censuses. National Statistical Office.

(2) Data for 2005 were derived from the Population Change Survey 2005/2006, National Statistical Office.

(3) Data for 2010, 2020 and 2025 were derived from Population Projections, Thailand, 2000-2025, NESDB.

Figure 4.14 Population dependency ratio, 1937-2025



Sources: (1) Data for 1937, 1947, 1960, 1970, 1980 and 1990 were derived from the Population and Housing Censuses. National Statistical Office.

(2) Data for 2005 were derived from the Population Change Survey 2005/2006, National Statistical Office.

(3) Data for 2010-2025 were derived from Population Projections. Thailand, 2000-2025, NESDB.

Figure 4.15 Proportions pyramids of Thailand in 1960,1990, 2000, 2010, 2020 and 2025 compared to those at present in Sweden, Denmark, and Japan

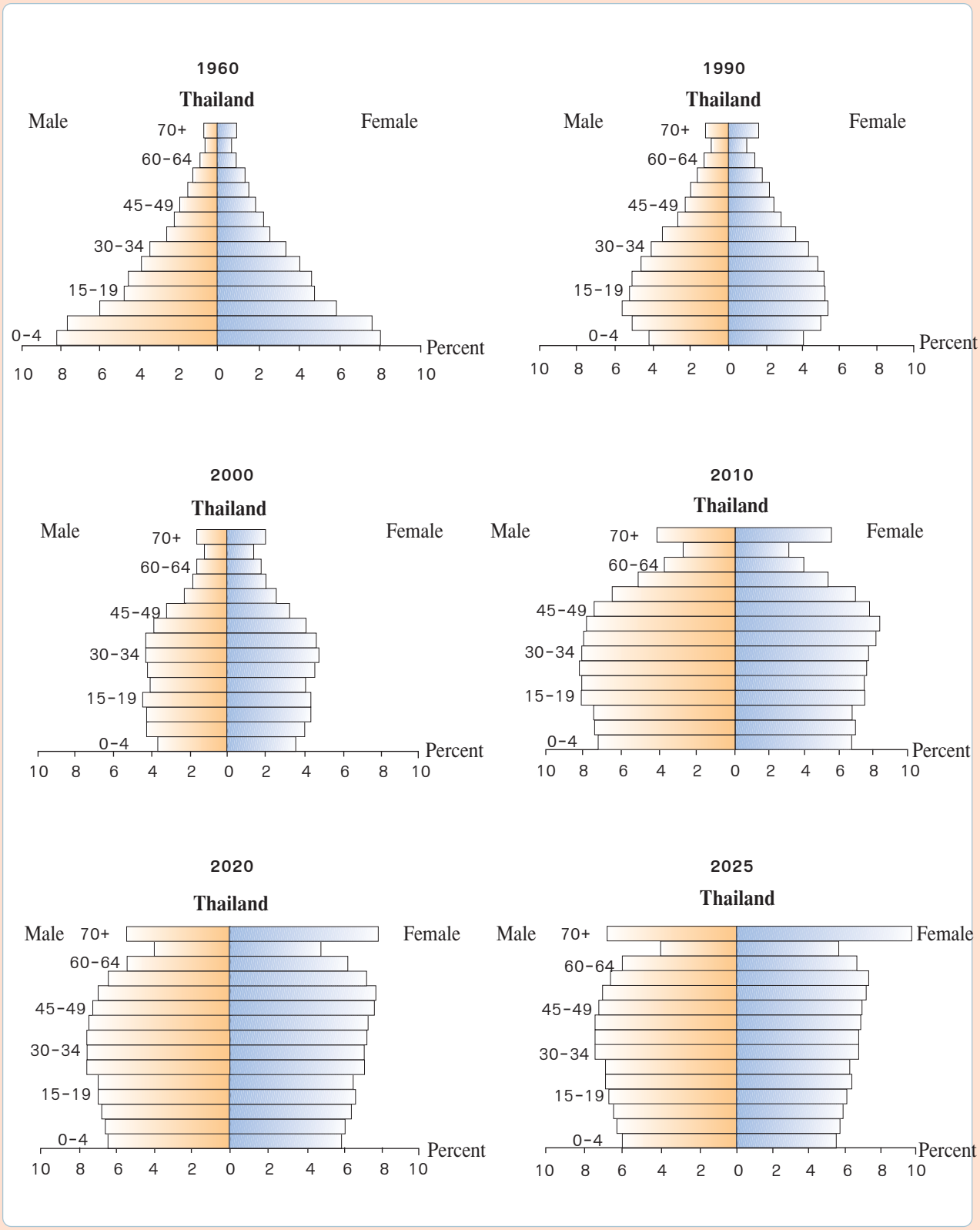
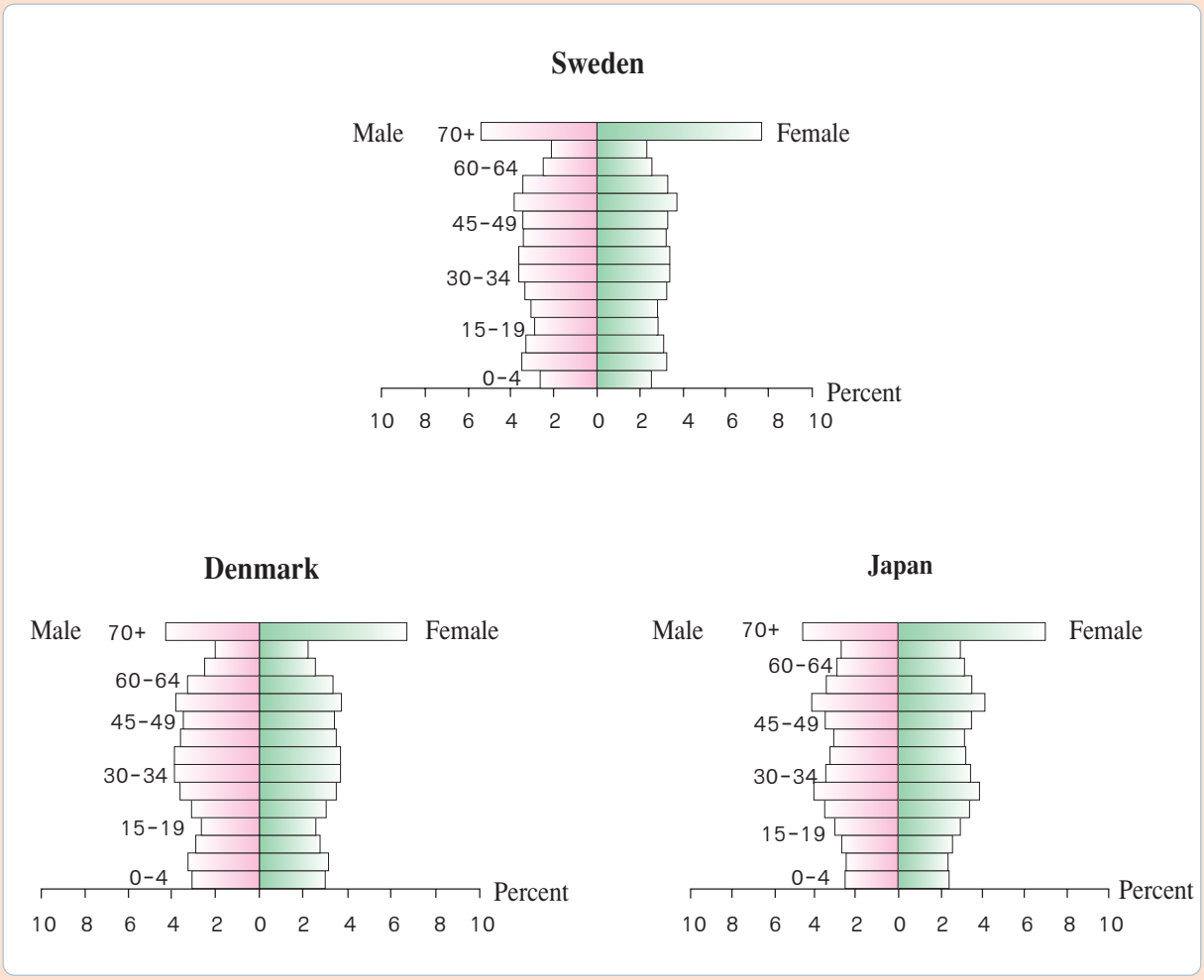


Figure 4.15 Proportions pyramids of Thailand in 1960,1990, 2000, 2010, 2020 and 2025 compared to those at present in Sweden, Denmark, and Japan (cont'd)



Sources: (1) Data for 1960, 1990 and 2000 were derived from the Population and Housing Censuses. National Statistical Office.

(2) Data for 2010, 2020 and 2025 were derived from the Population Projections for Thailand, 2000-2025 NESDB.

(3) United Nations (1999) World Population Prospects: 1998 Revision, Volume II: Sex and Age.

Table 4.7 Years in which the proportions of people aged 65 and over were or will be 7% and 14%, respectively, in developed and developing countries

Group of countries	Year for 7%	Year for 14%	Years to become an elderly society
Developed countries			
- France	1865	1980	115
- Sweden	1886	1971	85
- U.S.A.	1941	2013	72
- Italy	1924	1987	63
- Japan	1969	1994	26
Developing Countries			
- Korea	2000	2020	20
- Singapore	2000	2017	17
- Thailand	2010	2030	20
- China	2002	2027	25

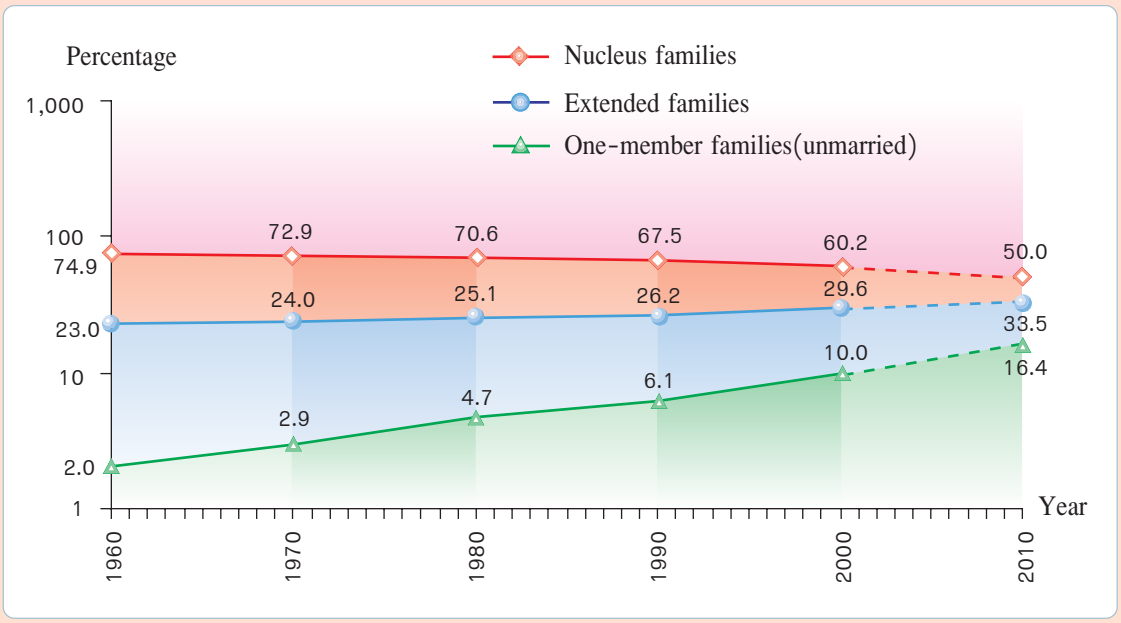
Source: World Population Prospects, The 2002 Revision Volume I: Comprehensive Table, United Nations. In Suwannee Khamman, "Last Chance for Thailand: Six Golden Years of Sustainable Development of Thai People", NESDB.

3.2 Thai Families

3.2.1 Family Structure

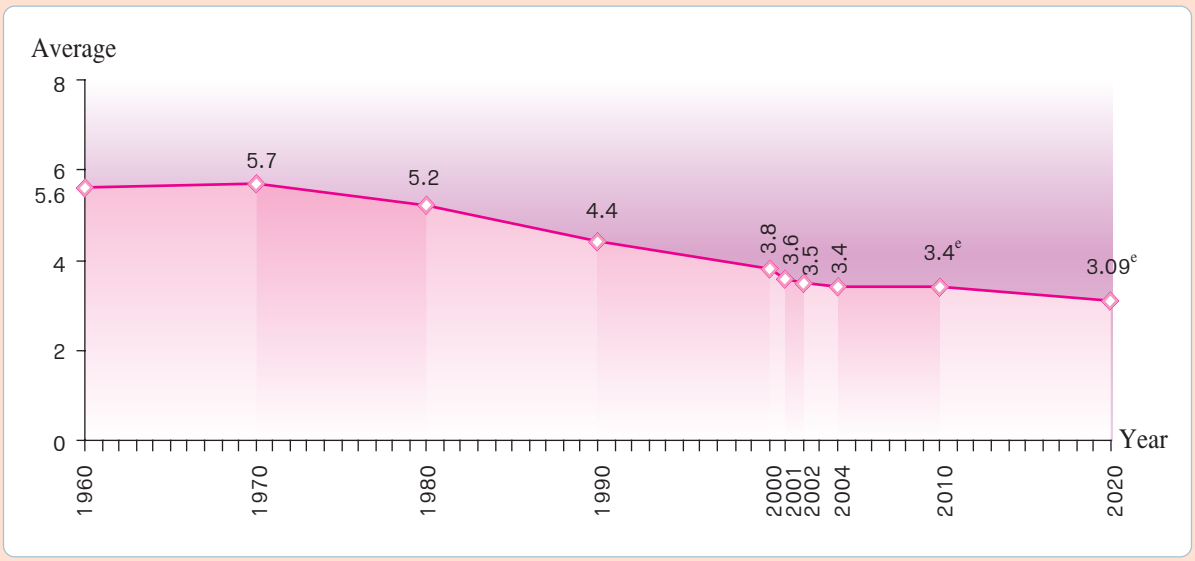
The family structure has become diverse and complex mostly being a nucleus family rather than extended family and there are more and more one-member families (Figure 4.16). The average family size has dropped to 3.4 persons in 2004 and expected to drop further to 3.09 persons in 2020 (Figure 4.17).

Figure 4.16 Proportions of families by type, 1960-2010



Source: Yothin Sawangdee, Change in Population Structure in Thai Households. Population and Development Bulletin, Vol. 25, No. 4, Apr.-May 2005.

Figure 4.17 Average family size and projections, Thailand, 1960-2020



Sources: (1) For 1960-2000, Population and Housing Censuses, National Statistical Office.

(2) For 2001-2004, Household Socio-Economic Surveys, National Statistical Office.

(3) For 2010-2020, Reports on Trends in Thailand's Economic and Social Status. Thailand Development Research Institute.

3.2.2 Family Relationship

The national development under the capitalism focussing on industrial development as well as consumerism and competition has changed the Thai family livelihood. More and more women have to work outside the home to financially support the family, resulting in family members having less time for living together and helping each other. A survey on parents in 1,066 families in Bangkok reveals that most parents work for 7-9 hours a day and 43% of the parents feel estranged from their children as they spend only 1 to 3 hours undertaking activities together.[3] Thus, there is a lack of family warmth and the family relationship has become weakened as evidenced by the rising rate of divorces, from 10.5% in 1994 to 25.1% in 2006. It is noteworthy that even though the population is growing, the number of marriages each year has fallen from 492,683 couples in 1994 to 355,460 couples in 2006 (Bureau of Registration Administration, Ministry of Interior). This is due to rising numbers of delayed marriages and cohabitation without wedding registration. Such a change in the family structure and relationship has an impact on the Thai health system as follows:

1) Rising numbers of abandoned children and elders have negatively affected their physical and mental health. The problems of divorce have caused broken homes resulting in more and more children and elders being abandoned particularly during the 1998/99 economic crisis and there was no declining trend after the crisis (Table 4.8). In fact, there are a lot more abandoned children and elders and they cannot have access to health care, which negatively affects their physical and mental health conditions.

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[3] Report from the Families Network Foundation and the Referendum Centre, Institute of Research and Development, Ramkhamhaeng University, 2003.

Table 4.8 Numbers and proportions of abandoned children and elders, 1993-2006

Year	Children abandoned		Elders abandoned	
	Number	Proportion per 100,000 children	Number	Proportion per 100,000 elders
1993	5,605	30.33	2,141	51.30
1994	5,748	31.19	2,200	49.11
1995	5,736	31.22	2,311	51.60
1996	5,896	32.25	2,504	53.50
1997	6,049	33.38	2,624	53.83
1998	6,341	35.15	2,619	51.47
1999	6,262	35.00	2,652	50.33
2000	6,096	34.42	2,896	53.41
2001	6,151	35.11	2,804	49.94
2002	6,110	35.24	2,884	49.33
2003	6,192	35.71	2,991	51.16
2004	6,035	35.43	2,860	49.75
2005	6,102	36.05	2,497	42.00
2006	4,366	25.92	1,390	22.78

Source: Ministry of Social Development and Human Security.

Note: Since 2005, the Ministry of Social Development and Human Security has transferred some welfare institutions to local administration organizations, resulting in difficulties in collecting such data.

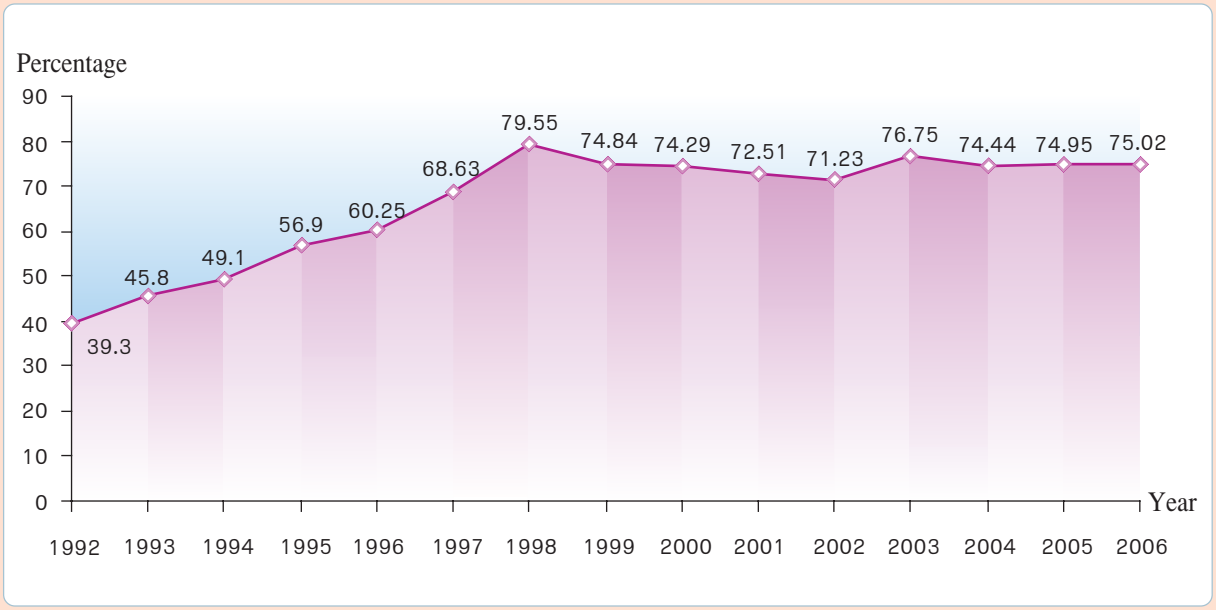
2) More family violence deteriorating women and children's physical and mental health status. As a lot of people cohabiting without marriage registration or traditional wedding, they are not prepared to live a marriage life, lacking family-life and problem-solving skills. Whenever a problem arises, more people tend to end up with physical or mental assaults and sexual abuse. A survey on 2,279 male and female householders in Bangkok, Suphan Buri, Chiang Mai, Nakhon Ratchasima and Nakhon Si Thammarat in 2004 revealed that as many as one-fifth of housewives (20.9%) were physically assaulted, and 8.7% of housewives were seriously assaulted (mentally abused and physically and sexually harassed). The impact was that most seriously assaulted women felt irritated, frustrated, depressed and frightened; some were physically injured. Interestingly, 6.5% of the women had suicidal ideation. For factors contributing to domestic violence, it was found that that almost half or 47.1% of the families with parents drinking alcohol would have domestic violence.

Therefore, the government should develop a medical service system to help more and more women and children who are domestically assaulted and carry out measures for effective campaigns in a continuous and serious manner for the families to stop drinking.

3.2.3 Child-Rearing Pattern in Family

The child-rearing pattern has also changed; parents do not take care of their children as they have no time. So more and more parents would take their children to be under the care of non-family members. A survey in 2002 on children and youths of the National Statistical Office revealed that among children aged 3-5 years 53.3% were reared at a nursery, a child development centre, or a school, and 28.6% by parents. And another survey conducted on 388 parents aged 21-40 years with children aged 2-12 years in Bangkok by Real Parenting in 2006 found similar results: 30.2% of parents raised children by themselves.[4] The results corresponded to the pre-elementary school attendance rate among children aged 3-5 years, rising steadily from 39.3% in 1992 to 75.0% in 2006 (Figure 4.18).

Figure 4.18 Rate of children aged 3-5 years attending pre-elementary school, 1992-2006



Source: Education Statistics in the Schooling System. Ministry of Education.

[4] Research and development report of Amarin Printing and Publishing Public Limited Company. Real Parenting Magazine, July 2006.

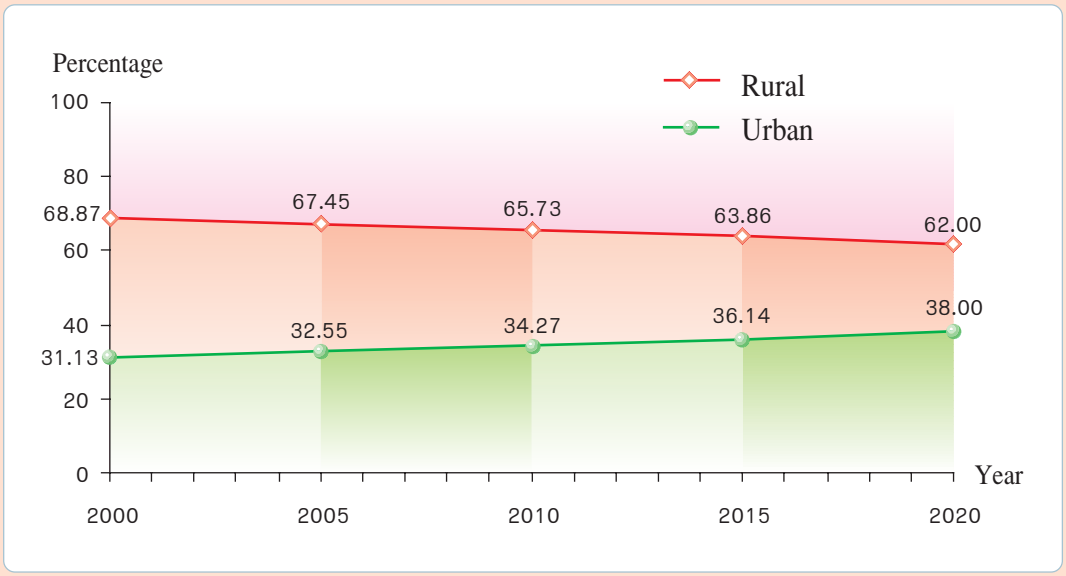
As most parents have no time to closely look after their children, they have to take children to the educational system with teachers taking care of them while parents are at work. Some have to leave their children at a child-care centre, which might be substandard; and some child caregivers have no spiritual linkages with the children, having an adverse effect on the level of development and intelligence of Thai children and youths. A cross-sectional study on 9,488 children aged 1-18 years in 2001, using a development screening test and an intelligence quotient test by age group, revealed that for children under 6 only 63% had normal and faster-than-normal development levels and most of children aged 6-18 had a rather low IQ (Chanpen Choprapawan, Holistic Child Development Research Project. A document distributed at the 10th Anniversary of Exhibition of the Thai Research Fund, 2003). That is why there are a lot of health problems such as homosexuality, HIV/AIDS, drug abuse in adolescents, and mental health.

3.3 Migration

3.3.1 Rural-to-Urban Migration

The national development with industrialization emphasis plays a major role in causing rural people to migrate to cities to seek jobs in the industrial and service sectors. The proportion of rural-to-urban migrants was 31.13% of all migrants in 2000; and it has been forecasted that, in 2020, 38% of the total population will reside in urban areas (Figure 4.19). Most of the migrants will move to Bangkok, followed by to Bangkok's vicinity, as well as to the eastern seaboard area.

Figure 4.19 Projection of urban and rural populations, Thailand, 2000-2020



Source: Population Projections, Thailand, 2000-2025, NESDB.

The 1997 economic crisis resulted in the shutdown or downsizing of a lot of business operations, leading to a reverse of labour migration from urban to rural domiciles, particularly to the Northeast and the North. In 1997, the migration of Thai population from urban to rural areas was as high as 37.2% of all migrants, while only 13.4% migrated from rural to urban areas. After the economic expansion in 2002, the proportion of urban-to-rural migration dropped to only 33.0% while the rural-to-urban migration rose to 19.2%. But in 2006, the urban-to-rural migration was as high as 35.6% while the rural-to-urban migration was only 14.4% (Table 4.9).

Table 4.9 Percentage of migrants by type of migration and current residential region, 1992-2006

Type of migration	Total	Current residential region				
		Bangkok	Central	North	Northeast	South
All migrants						
Urban to urban	100.0	100.0	100.0	100.0	100.0	100.0
Rural to urban	17.6	33.6	26.8	12.4	11.8	13.6
1992	15.5	NA	NA	NA	NA	NA
1994	15.0	78.4	9.8	10.0	6.9	14.4
1997	13.4	74.1	10.5	8.8	5.9	15.9
2002	19.2	67.0	21.1	14.1	9.6	18.6
2005	11.7	67.5	13.4	9.5	5.8	14.8
2006	14.4	64.9	18.2	10.7	6.3	15.2
Unknown[1] to urban	0.6	1.5	0.5	0.6	0.5	0.5
Rural to rural	29.7	-	31.2	28.8	26.9	43.5
Urban to rural						
1992	32.2	NA	NA	NA	NA	NA
1994	33.4	-	28.2	38.1	47.0	20.9
1997	37.2	-	32.0	39.6	55.5	20.3
2002	33.0	-	24.9	38.0	47.2	24.3
2005	39.1	-	24.6	42.0	55.5	23.7
2006	35.6	-	22.9	44.5	50.3	26.8
Unknown[1] to rural	2.1	-	0.4	3.0	4.2	0.4

Sources: Data for 1992, 1994, 1997, 2002, 2005 and 2006 were derived from the Reports on Surveys of Population Migration, 1992, 1994, 1997, 2002, 2005, and 2006. National Statistical Office.

Note: [1] Including immigrants from foreign countries.

Due to more rural-to-urban migration, the migrants have to change their rural lifestyles and adopt urban lifestyles. This has led to health problems in some workers who cannot properly adjust themselves to the changing conditions; such problems are mental disorders, peptic ulcer, hypertension, and certain diseases or conditions commonly found in urban slums, i.e. child malnutrition, diarrhoea and tuberculosis. In addition, most of the migrant workers working in factories are more likely to be exposed to occupational diseases related to industrial chemicals, such as cancer and chemical poisoning. A number of them have to live in an unhygienic environment and some of those who are involved in commercial sex are at increased risk of contracting and spreading HIV/AIDS.

The increasing rural-to-urban migration has created problems of mega-cities requiring a suitable urban development planning approach; and health services have to be provided to cover all target groups.

3.3.2 Transnational Labour Migration

At present, there is more transnational labour migration than in the past. More Thai workers tend to seek jobs overseas; the number of workers rose from 61,056 in 1990 to 202,296 in 1995, but dropped to only 160,846 in 2006 (Bureau of Overseas Workers Administration, Department of Employment). The number would be much greater if illegal workers were taken into account. Recently, they are more likely to go to work in Taiwan, Singapore, Malaysia, and the Middle East. Nevertheless, a lot of foreign workers have migrated to work in Thailand, both legally and illegally, especially low-wage labourers from neighbouring countries such as Myanmar, Laos, China and Cambodia. Since 2003, the government has allowed the registration of alien workers. In 2006, there were 705,293 registered foreign workers; 539,416 (76.5%) from Myanmar; 90,073 (12.8%) from Laos; and 75,804 (10.7%) from Cambodia. The provinces with the highest numbers of workers from Myanmar are Bangkok, Tak, Samut Sakhon, Chiang Mai, and Ranong, each having 20,000 to 90,000 workers (Department of Employment). The number of registered foreign workers has dropped to about one half and it is estimated that there are a lot of unregistered workers.

As Thailand has had more and more alien workers particularly along the borders, several infectious diseases are widespread such as malaria, diarrhoea, HIV/AIDS, poliomyelitis, and anthrax. Certain diseases that Thailand could once be able to control have re-emerged, such as filariasis; it was reported that 3% of Myanmar workers along the border were carriers of such a disease.

4. Quality of Life of Thai People

4.1 Consumption and Lifestyle Values

The influence of western culture has resulted in the deterioration of good Thai values such as giving more importance to materialism, imitating foreign-style consumption, neglecting Thainess, becoming extravagant and luxurious. Teenagers tend to have an attitude towards becoming rich fast,

lacking endurance, living a casual life, and lacking knowledge about changes. According to the 2003 child watch report of the Thai Research Fund, 60% of teenagers spent their time hanging out at shopping malls, going to night entertainment places, movies, owning a mobile phone, eating fast-food, surfing the Internet and playing games. As a result, they seemed to overspend in relation to their economic status; some consumed items non-beneficial to health and intelligence such as tobacco, alcohol and narcotic substances.

The media tends to play a more active role in shaping Thai people's lifestyle and leisure-time spending, particularly television and the Internet, while radio seems to be less significant in this regard (Table 4.10).

Table 4.10 Leisure-time spending of Thai people by administrative region, 2001 and 2004

Time spending category	Time spent by each person, hours/day					
	Municipal area		Non-municipal area		Whole country	
	2001	2004	2001	2004	2001	2004
- Watching TV or VDO	3.2	2.9	2.7	2.6	2.9	2.7
- Getting info from the Internet	2.0	2.0	1.7	1.8	1.9	1.9
- Going to sports, movies, music events	1.7	2.3	1.8	2.5	1.8	2.4
- Socializing with others	1.8	2.6	1.7	2.0	1.7	2.2
- Doing hobbies	1.6	1.9	1.5	1.9	1.6	1.9
- Playing sports	1.5	1.6	1.5	1.5	1.5	1.6
- Listening to music/radio	1.5	1.4	1.4	1.4	1.4	1.4

Source: Report on Survey of Leisure-Time Spending among People Aged 10 Years and Over, 2001 and 2004. National Statistical Office.

4.2 Beliefs and Culture

A lot of people tend to stay away from religious principles and pay less respect for Buddhist monks. A 2005 survey conducted by the National Statistical offer revealed that 43.5% of Thai people aged 15 years and over had never prayed, 54.9% never listened to a sermon or watched a Buddhist teaching (Dhamma) programme on television, even though as many as 65.7% still had faith in Buddhist monks when they met outside monasteries. Besides, a lot of them lack morality and tend to compete with, or took advantage of, each other or are more likely to become individualistic in trying to seek more political and financial powers. And unfortunately, the Thai culture relating to solicitude and respect for seniority tends to be diminishing to the level that a plan on conserving Thai culture has to be

developed. In addition, very little of certain local culture and wisdom has been transmitted to the new generation resulting in a lack of cultural preservation. Moreover, the new generation is less interested to learn, resulting in a lack of further development of local wisdom for widespread use, for example in the field of Thai herbal medicine.

4.3 Comparison of Quality of Life of Thai People and Those in Other Countries

The United Nation Development Programme (UNDP) has developed a Human Development Index (HDI), a quality of life measurement, based on social factors (education, life expectancy at birth and economic factors - GDP per capita). In 1990, the quality of life of Thai people stood at the "moderate" level, ranking 74th (HDI = 0.715) among 173 countries worldwide, and fourth among ASEAN member states after Singapore, Brunei and Malaysia. In 1995, the HDI ranking of Thailand rapidly jumped from 74th in 1990 to 59th among 174 nations, and stayed at the "high" level, ranking third (HDI = 0.838) among ASEAN nations, after Singapore and Brunei (Table 4.22). The major factor contributing to such a higher ranking is its high level of economic growth.

After the economic crisis, the quality of life of Thai people worsened between 1998 and 2004; Thailand's HDI dropped from "high" to "moderate" level (HDI = 0.745-0.784) and the ranking fell from 59th to 66th to 76th among 174 countries and 4th among ten ASEAN member states, after Singapore, Brunei and Malaysia (Table 4.11).

Table 4.11 Human Development indexs for Thailand and some other countries, 1990-2004

Group and Country	1990			Group and Country	1995			Group and Country	1998			Group and Country	1999			Group and Country	2001			Group and Country	2003			Group and Country	2004		
	Actual rank	In-group rank	HDI value		Actual rank	In-group rank	HDI value		Actual rank	In-group rank	HDI value		Actual rank	In-group rank	HDI value		Actual rank	In-group rank	HDI value		Actual rank	In-group rank	HDI value		Actual rank	In-group rank	HDI value
WHO/SEAR				**WHO/SEAR**				**WHO/SEAR**				**WHO/SEAR**				**WHO/SEAR**				**WHO/SEAR**				**WHO/SEAR**			
Thailand	74	1	0.715	Thailand	59	1	0.838	Thailand	74	1	0.768	Thailand	66	1	0.757	Thailand	74	1	0.768	Thailand	73	1	0.778	Thailand	74	1	0.784
Sri Lanka	86	2	0.663	Sri Lanka	90	2	0.716	Sri Lanka	99	3	0.730	Sri Lanka	81	3	0.735	Sri Lanka	99	3	0.730	Sri Lanka	93	2	0.751	Sri Lanka	93	2	0.755
Maldives	112	4	0.497	Maldives	95	3	0.683	Maldives	86	2	0.751	Maldives	77	2	0.739	Maldives	86	2	0.751	Maldives	96	3	0.745	Maldives	98	3	0.739
Indonesia	108	3	0.515	Indonesia	96	4	0.679	Indonesia	112	4	0.682	Indonesia	102	4	0.677	Indonesia	112	4	0.682	Indonesia	110	4	0.697	Indonesia	108	4	0.711
Myanmar	123	5	0.390	Myanmar	131	5	0.481	Myanmar	131	6	0.549	Myanmar	118	6	0.551	Myanmar	131	6	0.549	Myanmar	129	6	0.578	Myanmar	130	6	0.581
India	134	6	0.309	India	139	6	0.451	India	127	5	0.590	India	115	5	0.571	India	127	5	0.590	India	127	5	0.602	India	126	5	0.611
Bhutan	159	9	0.150	Bhutan	155	9	0.347	Bhutan	136	7	0.511	Bhutan	130	8	0.471	Bhutan	136	7	0.511	Bhutan	134	7	0.536	Bhutan	135	7	0.538
Nepal	152	8	0.170	Nepal	152	8	0.351	Nepal	143	9	0.499	Nepal	129	7	0.48	Nepal	143	9	0.499	Nepal	136	8	0.526	Nepal	138	9	0.527
Bangladesh	147	7	0.189	Bangladesh	147	7	0.371	Bangladesh	139	8	0.502	Bangladesh	132	9	0.47	Bangladesh	139	8	0.502	Bangladesh	139	9	0.520	Bangladesh	137	8	0.530
DPR Korea	-	-	-	DPR Korea	-	-	-	DPR Korea	-	-	-	DPR Korea	-	-	-	DPR Korea	-	-	-	DPR Korea	-	-	-	DPR Korea	-	-	-
ASEAN				**ASEAN**				**ASEAN**				**ASEAN**				**ASEAN**				**ASEAN**				**ASEAN**			
Singapore	43	1	0.849	Singapore	28	1	0.896	Singapore	24	1	0.881	Singapore	26	1	0.876	Singapore	28	1	0.884	Singapore	25	1	0.907	Singapore	25	1	0.916
Brunei	44	2	0.847	Brunei	35	2	0.880	Brunei	32	2	0.848	Brunei	32	2	0.857	Brunei	31	2	0.872	Brunei	33	2	0.866	Brunei	34	2	0.871
Malaysia	57	3	0.790	Malaysia	60	4	0.834	Malaysia	61	3	0.772	Malaysia	56	3	0.774	Malaysia	58	3	0.790	Malaysia	61	3	0.796	Malaysia	61	3	0.805
Thailand	74	4	0.715	Thailand	59	3	0.838	Thailand	74	4	0.768	Thailand	66	4	0.757	Thailand	74	4	0.768	Thailand	73	4	0.778	Thailand	74	4	0.784
Philippines	92	5	0.603	Philippines	98	6	0.677	Philippines	77	5	0.744	Philippines	70	5	0.749	Philippines	85	5	0.751	Philippines	84	5	0.758	Philippines	84	5	0.763
Vietnam	115	7	0.472	Vietnam	122	7	0.560	Vietnam	108	6	0.671	Vietnam	101	6	0.682	Vietnam	109	6	0.688	Vietnam	108	6	0.704	Vietnam	109	7	0.709
Indonesia	108	6	0.515	Indonesia	96	5	0.679	Indonesia	109	7	0.670	Indonesia	102	7	0.677	Indonesia	112	7	0.682	Indonesia	110	7	0.697	Indonesia	108	6	0.711
Myanmar	123	8	0.390	Myanmar	131	8	0.481	Myanmar	125	8	0.585	Myanmar	118	8	0.551	Myanmar	131	9	0.549	Myanmar	129	8	0.578	Myanmar	130	9	0.581
Cambodia	148	10	0.186	Cambodia	140	10	0.422	Cambodia	136	9	0.512	Cambodia	121	9	0.541	Cambodia	130	8	0.556	Cambodia	130	9	0.571	Cambodia	129	8	0.583
Laos	141	9	0.246	Laos	136	9	0.465	Laos	140	10	0.484	Laos	131	10	0.476	Laos	135	10	0.525	Laos	133	10	0.545	Laos	133	10	0.553
World (top ten)				**World (top ten)**				**World (top ten)**				**World (top ten)**				**World (top ten)**				**World (top ten)**				**World (top ten)**			
Japan	1	1	0.983	Canada	1	1	0.960	Canada	1	1	0.935	Norway	1	1	0.939	Norway	1	1	0.944	Norway	1	1	0.963	Norway	1	1	0.965
Canada	2	2	0.982	France	2	2	0.946	Norway	2	2	0.934	Australia	2	2	0.936	Iceland	2	2	0.942	Iceland	2	2	0.956	Iceland	2	2	0.960
Norway	3	3	0.979	Norway	3	3	0.943	U.S.A.	3	3	0.929	Canada	3	3	0.936	Sweden	3	3	0.941	Australia	3	3	0.955	Australia	3	3	0.957
Switzerland	4	4	0.978	U.S.A.	4	4	0.943	Australia	4	4	0.929	Sweden	4	4	0.936	Australia	4	4	0.939	Luxembourg	4	4	0.949	Ireland	4	4	0.956
Sweden	5	5	0.977	Iceland	5	5	0.942	Iceland	5	5	0.927	Belgium	5	5	0.935	Netherlands	5	5	0.938	Cannada	5	5	0.949	Sweden	5	5	0.951
U.S.A.	6	6	0.976	Finland	6	6	0.942	Sweden	6	6	0.926	U.S.A.	6	6	0.934	Belgium	6	6	0.937	Sweden	6	6	0.949	Cannada	6	6	0.950
Australia	7	7	0.972	Netherlands	7	7	0.941	Belgium	7	7	0.925	Iceland	7	7	0.932	U.S.A.	7	7	0.937	Switzerland	7	7	0.947	Japan	7	7	0.949
France	8	8	0.971	Japan	8	8	0.940	Netherlands	8	8	0.925	Netherlands	8	8	0.931	Cannada	8	8	0.937	Ireland	8	8	0.946	U.S.A.	8	8	0.948
Netherlands	9	9	0.970	New Zealand	9	9	0.939	Japan	9	9	0.924	Japan	9	9	0.928	Japan	9	9	0.932	Belgium	9	9	0.945	Switzerland	9	9	0.947
U.K.	10	10	0.964	Sweden	10	10	0.936	U.K.	10	10	0.918	Finland	10	10	0.925	New Zeland	10	10	0.932	U.S.A.	10	10	0.944	Netherlands	10	10	0.947

Sources : Human Development Report, 1993-2006

5. Situation and Trends of Environment and Livelihood

5.1 Infrastructure

5.1.1 Transportation

1) Land Transportation

In 2005, Thailand had a road network of approximately 182,848.7 km, of which 64,156.2 km was under the highway network and 118,692.6 km under the rural road network as well as a network of 1,889 km of four-lane roads leading to all regions of the country. It is considered that the road network has covered all localities nationwide.

In Bangkok, there are expressways of 175.9 km and another 146.3 km under construction expected to be completed by 2009. Two lines of electric rail mass transit system have been operational and another four lines are expected to be completed in the near future to help ease the traffic problems in Bangkok.

Besides, there is a railway system of 5,359.6 km.

2) Waterway Transportation

In 2006, Thailand had seven principal harbours and 11 ports with an adequate potential for waterway transport of industrial products. However, some improvements in the infrastructure of the ports may be needed to cope with future economic expansion.

3) Air Transportation

At present, Thailand has five international airports: Bangkok, Chiang Mai, Hat Yai, Phuket and Chiang Rai. The Bangkok International Airport is capable of handling 10,143 international passengers per hour and 8,685 domestic passengers per hour during rush hours, or 36.5 million passengers per year, which is quite crowded. However, the government opened Suvarnnabhumi Airport in September 2006 as a modern air transport hub in this region, with a capacity to handle 30 million passengers in the first year and up to 100 million passengers when the entire airport is completed. This is considered that Thailand is well-prepared in terms of air transport infrastructure.

5.1.2 Telecommunications

Thailand's telecommunications have rapidly expanded, especially during the past decade. In 2006, there were 7,073,450 fixed-line telephone numbers and 40,052,612 mobile phones nationwide; a rate of 112.6 fixed-line phones per 1,000 population and 637.5 mobile phones per 1,000 population, and the rate of computer possession was 66 sets per 1,000 population (Table 4.12). The access to the Internet has increased from 30 persons in 1991 to 8.46 million persons in 2006, a use rate of 13.5% or 14,226.2 per 100,000 population. The number of Internet users in Bangkok is highest among all regions nationwide (Table 4.13). But in comparison with other countries, such as Singapore and Malaysia, Thailand's telecommunication infrastructure and Internet uses are lower (Tables 4.12 and 4.14).

Table 4.12 Telecommunication infrastructure in some countries, 1996-2004

Country	No. of fixed-line telephones per 1,000 population					No. of mobile phones per 1,000 population					No. of computers per 1,000 population				
	1996	1997	1999	2002	2004	1996	1997	1999	2002	2004	1996	1997	1999	2002	2004
Singapore	498.4	529.0	484.1	472	432	147.5	229	381.45	761.1	894.7	233	316	390.9	596	601
Malaysia	192.5	192.5	219.3	206	174	88.4	101.9	145.05	372.9	571.2	53	65	94.5	137	216
Thailand	78.6	85.5	101.9	99*	112.6**	27.8	34.5	138.6	346.8*	637.5**	22	28	40.4	43	66
Philippines	30.7	42.7	37.9	46	42	12.9	17.7	36.97	189.1	398.5	11	13	19.5	25	42
Indonesia	17.8	24.7	29.1	34	45	3.0	5.4	9.83	48.5	134.8	6	9	13.4	13	19
Sweden	684.1	685.4	694.5	750	715	281.8	358.1	590.08	900.3	1,084.7	286	353	510.4	687	776
U.S.A.	636.6	625.6	709.8	701	606	161.9	205.6	314.87	496.9	621.1	403	450	538.9	739	778
Norway	564.9	609.1	711.9	754	472	296.1	383.0	627.03	787.0	1,036.0	307	363	506.8	657	743

Source: IMD. The World Competitiveness Yearbook, 1999 and 2006.

Notes: 1. * Data for 2003.

2. ** Data for 2006.

3. Data on computer use per 1,000 population are data for 2005.

Table 4.13 Internet access by administrative jurisdiction and region Thailand, 2001, 2003, 2004, 2005 and 2006

Administrative jurisdiction and region	2001[1]		2003[2]		2004[2]		2005[2]		2006[2]	
	No. of Internet users	Use rate per 100,000 population	No. of Internet users	Use rate per 100,000 population	No. of Internet users	Use rate per 100,000 population	No. of Internet users	Use rate per 100,000 population	No. of Internet users	Use rate per 100,000 population
Whole Kingdom	3,536,001	6,163.7	6,031,300	10,434.1	6,971,528	11,891.8	7,084,201	11,990.6	8,465,823	14,226.2
- Municipal areas	2,341,433	12,361.5	3,807,900	19,897.3	4,155,737	21,427.9	3,807,055	21,230.5	4,242,901	23,370.9
- Non-municipal areas	1,194,568	3,108.7	2,223,400	5,750.2	2,815,791	7,177.6	3,277,146	7,964.0	4,222,921	10,211.6
Bangkok Metropolis	1,234,542	16,774.1	2,005,700	26,862.3	1,999,943	26,585.4	1,630,752	25,895.8	1,774,375	27,961.7
Central Plains	830,389	6,322.6	1,336,300	10,077.3	1,517,514	11,212.0	1,706,396	11,857.5	2,028,575	13,906.6
North	516,114	4,988.6	1,003,200	9,682.4	1,210,949	11,423.6	1,285,577	11,902.9	1,581,412	14,656.7
Northeast	559,193	2,937.4	1,070,100	5,586.5	1,485,725	7,687.2	1,660,707	8,411.9	2,103,780	10,599.5
South	395,763	5,283.3	616,000	8,147.4	757,396	9,914.3	800,769	10,200.5	977,680	12,316.2
Internet use rate (%)	5.7		9.5		11.1		11.4		13.5	

Sources: - Survey on Household's Usage of Information Technology Equipment and Appliances, 2001 and 2003, National Statistical Office.

- Survey on Information and Communication Technology (Households), Quarter 1, 2004. National Statistical Office.
- Survey on Information and Communication Technology (Households), Quarter 3, 2005. National Statistical Office.
- Survey on Information and Communication Technology (Households), 2006. National Statistical Office.

Notes: [1] Population aged 11 years and older.

[2] Population aged 6 years and older.

Table 4.14 Comparison of the Internet usage in Asia-Pacific countries, 1998, 2000, 2002, and 2005

Country	No. of Internet users (millions)				Internet use rate (percent)			
	1998	2000	2002	2005	1998	2000	2002	2005
Australia (2006)	4.0	8.42	10.63	14.66	22.2	43.9	54.4	71.8
Singapore	0.55	1.85	2.31	2.42	18.3	44.6	51.9	53.9
Hong Kong	1.1	3.46	4.35	4.88	18.3	48.7	59.6	70.3
New Zealand	0.55	1.49	2.06	3.20	15.3	39.0	52.7	78.4
Taiwan	3.0	6.4	11.6*	13.21	14.3	28.8	51.8	59.9
Japan	14.0	47.08	56	86.3	10.8	37.2	44.1	67.7
Korea	2.0	16.4	25.6	33.9	4.6	34.5	53.8	69.4
Thailand (2006)	0.67	2.3	4.8	8.46	1.1	3.7	7.7	13.5
Malaysia	0.4	3.7	5.7*	11.02	2.0	16.9	25.1	41.2
Philippines	0.2	2.0	4.5	7.82	0.3	2.4	7.7	8.7
China (2006)	1.5	22.5	45.8	123.0	0.1	1.7	3.5	9.3
Indonesia	0.1	1.45	4.4	16.0	0.1	0.6	1.9	7.3
India	0.4	5.0	7.0*	60.6	< 0.1	0.5	0.6	4.6
Vietnam (2006)	0.15	0.04	0.4*	13.10	< 0.1	< 0.1	0.5	15.4

Sources: - Internet Users Worldwide, 2001 and 2002.
- The World Fact Book, 2006-2007.

Notes: 1. Internet use rate $= \frac{\text{No. of Internet users}}{\text{Total population}} \times 100$

2. * Data for 2001.

Besides, Thailand has got its own Thaicom satellites, cable TV systems, and free TV systems, making the communication system more expansive. However, the access to various media is still inequitable, but the trends are getting better (Table 4.15).

Table 4.15 Percentage of households with radios, TV sets and telephones, 1990-2004

Area	Radios					TV sets					Telephones				
	1990	1994	1998	2002	2004	1990	1994	1998	2002	2004	1990	1994	1998	2002	2004
Whole Kingdom	72.6	70.8	75.5	68.9	63.6	61.3	80.3	88.7	91.6	93.0	5.8	10.1	21.9	29.2	23.9
Bangkok and peripheral provinces	79.4	80.3	86.6	80.8	78.3	80.7	83.8	90.4	92.5	93.5	24.5	33.1	59.2	59.6	50.7
Municipal areas	81.2	81.1	85.5	76.2	68.6	84.6	89.3	92.9	94.0	95.2	16.5	29.4	49.8	40.8	39.7
Sanitary districts	76.0	74.6	78.5	-	-	70.8	86.3	90.5	-	-	4.2	12.2	28.7	-	-
Outside municipal and sanitary districts	69.8	67.0	71.4	64.1	58.5	53.6	77.6	87.6	90.6	92.2	0.9	2.4	9.3	11.0	12.9

Source: Reports on Household Socio-Economic Surveys, 1990, 1994, 1998, 2002, and 2004, NSO.

Note: In 2000, all sanitary districts were upgraded to municipalities; thus, there have been no data for sanitary districts since then.

The expansion of communication networks in Thailand is related to global development and part of evolution in the "globalization" or borderless world era.

In addition, advertisement business expansion through various media is annually worth tens of billions of baht. This business sector has strongly affected Thai people's consumption behaviours. New sales patterns have been created, especially **direct sales**, through various media, which are more difficult to control than those through shopping outlets.

People's behaviours in accepting information have also shifted from radio to television sources. The 2003 media survey conducted by NSO revealed that there were as many as 54.7 million TV viewers (94.5%), compared with only 24.8 million radio listeners (24.8%). Urban people were more interested in information about economic, social, political and health conditions than, previously, in entertainment programmes. In particular, new programme patterns such as live phone-in and discourse programmes, resulting in the emergence of new communities using media as a means for interaction, for example, Jo So 100 community, TV game show communities, and various other radio programme communities.

5.1.3 Public Utilities

1) **Electricity.** In 2005, approximately 99.0% (68,375 villages) of all villages across the country had a moderate or good level of electricity supply. Only 721 villages (1.0%) had not yet had access to the electricity system (Table 4.16).

Table 4.16 Villages with electricity, 1992-2005

Year	No. of Villages with available information	villages with electricity				Villages without electricity	
		Good level[1]		Moderate level[2]			
		No.	Percent	No.	Percent	No.	Percent
1992	59,354	54,719	92.2	2,466	4.2	2,169	3.6
1994	59,059	55,590	94.1	1,675	2.8	1,794	3.0
1996	60,215	57,523	95.5	1,198	2.0	1,494	2.5
1999	63,230	56,483	89.3	5,678	9.0	1,069	1.7
2001	66,193	60,128	90.8	4,698	7.1	1,367	2.1
2003	68,496	60,613	88.5	7,096	10.4	787	1.1
2005	69,096	64,807	93.8	3,568	5.2	721	1.0

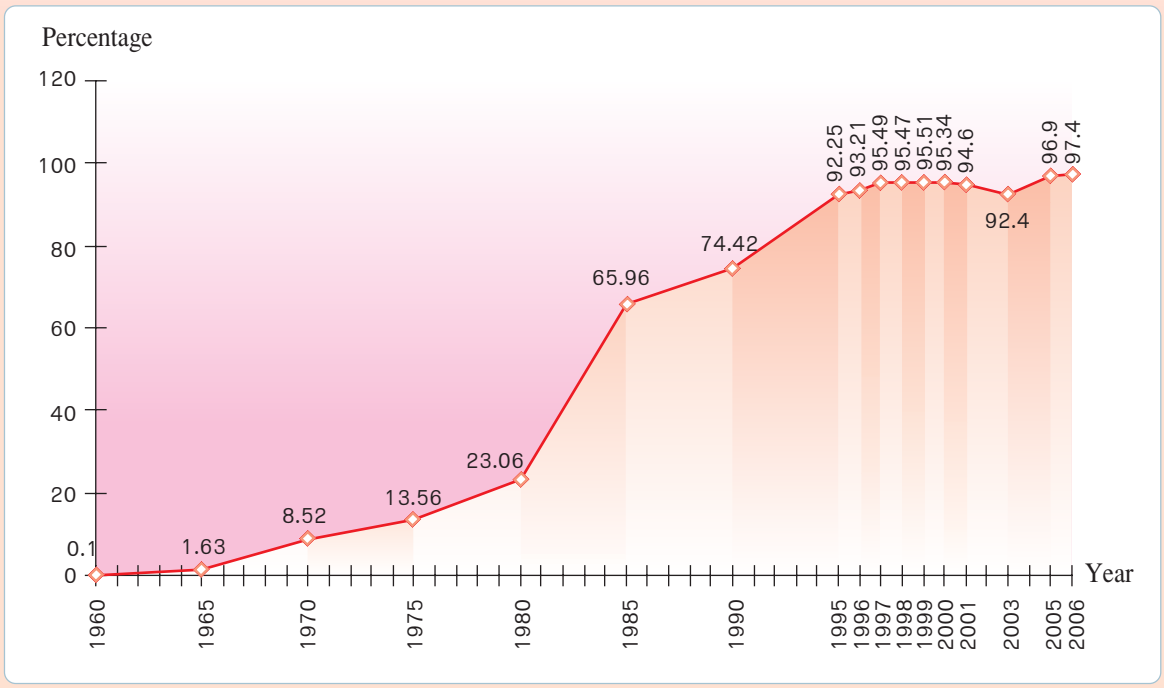
Source: Thai Rural Villages, 1992-2005, from Ko Cho Cho 2 Kho Database. Information Centre for Rural Development, Ministry of Interior.

Notes: [1] Good level: more than half of households in the village have electricity.

[2] Moderate level: less than half of households in the village have electricity.

2) **Drinking Water.** In 2006, 97.4% of households had adequate and safe drinking water (Figure 4.20) and 97.5% of them had adequate water for domestic use all year round.

Figure 4.20 Proportion of households with adequate and drinking water, 1960-2006



Sources: Data for 1960-2000 were derived from the Department of Health, MoPH.

Data for 2001, 2003, and 2005 were derived from Thai Rural Villages in 2001, 2003, and 2005. Information Centre for Rural Development, Ministry of Interior.

Data for 2006 were derived from the 2006 Basic Minimum Needs Report, Information Centre for Rural Development, Ministry of Interior.

Such changes in infrastructure have an impact on Thai people's health as follows:

(1) More problems of traffic accidents and higher number of vehicles as a result of transportation expansion with more roads and vehicles (see Chapter 5, section 2.6 on accident-related injuries).

(2) Disparities in access to health information as the Thai communication infrastructure is a lot inferior to those in other countries; certain segments of the population may not have access to health information, particularly those living in rural areas, compared with those in urban areas.

5.2 Biodiversity

Thailand's biodiversity is abundant in terms of genetics, species and ecological systems with about 15,000 species of plants and 25,000 species of animals, 7,800 species of bacteria, fungi and other microorganisms, and 15 eco-systems (National Resources and Environment Capital for Sustainable Development in the 10th National Development Plan, NESDB). So they have exploited lavishly without effective management and control measures. As a result, natural resources and biodiversity

have been deteriorated rapidly resulting in the distinction of as many as 14 animal species and the near-distinction of 684 animal/plant species, as well as in the deterioration of some eco-systems.

Thailand became the 188th member state of the Convention on Biological Diversity on 29 January 2004; so other member countries can now have access to the genetic resources of Thailand. Some countries have tried to take away some animal and plant species of Thailand's nature for research purposes, which may lead to the registration of intellectual property right. Thus, the government has to develop strong measures for protecting the country's interests in the long run. In addition, a good management system has to be established to link with a foreign country that owns the technology and Thailand that owns natural resources and local wisdom so as to safeguard the nation's benefits to the maximum extent possible.

Besides, the consumption of health products has been on a rising trend including the use of medicinal plants for health care and medicine production. Thus, this is a good opportunity to raise the level of knowledge of health care using local wisdom and creating value-added herbal products. The government has to promote and support research and development on Thai herbal medicine to raise the quality up to the international standards.

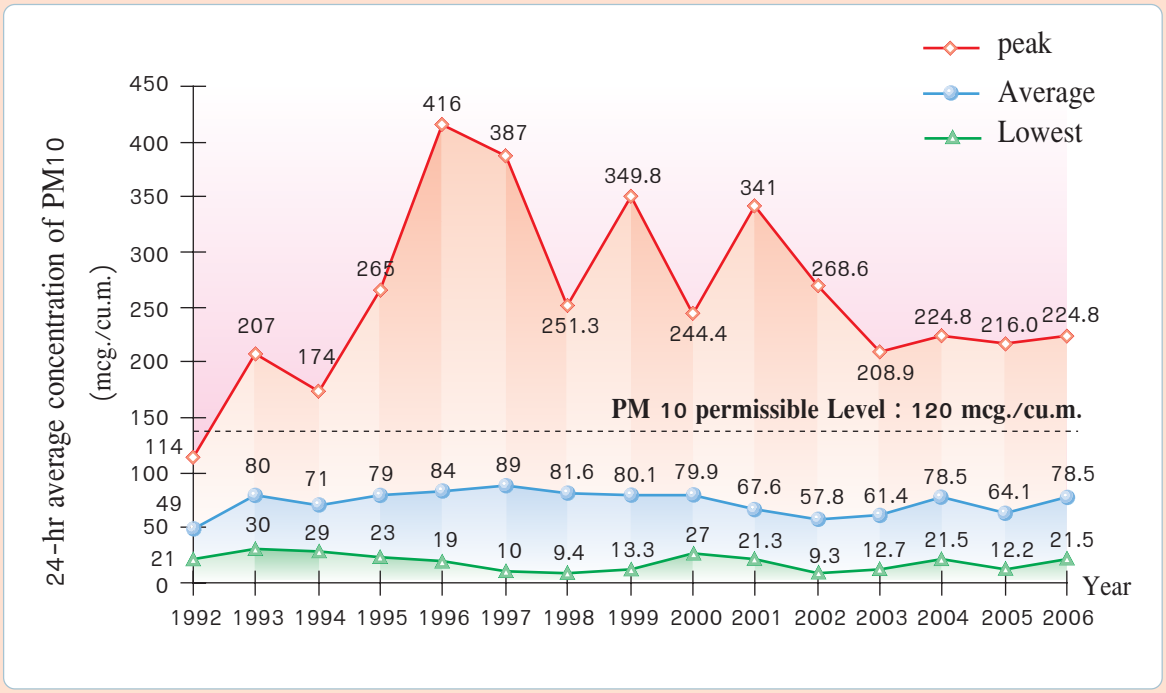
5.3 The Environment

5.3.1 Air Pollution

According to the Air Quality Monitoring programme conducted in Bangkok Metropolis and its vicinity as well as in other major cities, it has been found that dust is still a major problem, and the levels of carbon monoxide and ozone are occasionally higher than the maximum permissible levels. The levels of other pollutants such as lead and sulfur dioxide are within the allowable limits.

As the major cause of air pollution problem in Bangkok, dust or suspended particulate matter is particularly dispersed every where and near the roads; the problem seems to be more serious at places near the sources of pollution, i.e. motor vehicles and construction sites. In 2006, it was found that the 24-hr total average amounts of dust particles on the roadsides in Bangkok had been declining since 1997 due to decreased industrial and construction activities resulting from the economic crisis. During 1992-2006, the 24-hr average concentrations of particulate matter of less than 10 microns (PM10) on the roadsides of Bangkok were higher than the maximum permissible level at all monitoring stations (Figure 4.21), while the levels of carbon monoxide, sulfur dioxide and lead were found to be lower than the maximum allowable levels.

Figure 4.21 24-hr average concentration of <10-micron particulate matter on roadsides in Bangkok, 1992-2006



Source: Pollution Control Department, Ministry of Natural Resources and Environment.

In other provincial cities, the Pollution Control Department conducted the air quality measurement in 36 stations covering 20 provinces nationwide in 2006 and found that the 24-hr average peaks of PM10 detected were higher than the maximum permissible level in almost all areas (maximum permissible concentration for 24-hr average PM10 is 120 mcg./cu.m.). The highest PM10 pollution was detected at 298.2 mcg./cu.m. in Saraburi province, but the concentrations of nitrogen oxide, sulfur dioxide and carbon monoxide were still within the maximum permissible levels.

The major air pollutant in the area of Mae Moh, Lampang Province, is sulfur dioxide from lignite combustion in the electricity generation process. During 1996-1998, the number of times of the 1-hr average sulfur dioxide concentration found over the maximum permissible level declined from 51 to 16. In particular, during 1999-2006 no air samples were found to have the 1-hr average sulfur dioxide concentration over the permissible level, as the sources of pollutant had been under control. However, the PM10 pollution was still a problem, at 252.6 mcg./cu.m. in 2006.

The deteriorating quality of air has negatively affected the people's health as a result of inhaling PM10 dust. A study in six major cities in Thailand (Bangkok, Chiang Mai, Nakhon Sawan,

Khon Kaen, Nakhon Ratchasima and Songkhla) reveals that annually there are 2,330 premature deaths and 9,626 cases of bronchitis, with a health care cost of 28,009.6 million baht, or 2,000 baht/case/year; Bangkok having the highest proportion of healthcare cost, 65.0% of all costs for the six cities.[5]

5.3.2 Water Polution

At present, the quality of various waterways tends to be deteriorating, but the water is still usable for agricultural and industrial purposes, except for the lower stretches of the Chao Phraya and Tha Chin Rivers in the Central Plains, where the water is heavily polluted and the rivers can be used only for transportation purposes.

A report on water quality surveillance on 49 waterways and four stagnant water reservoirs (Kwan Phayao, Boraphet, Nong Han and Songkhla Lakes) in 1992-2006 revealed that overall the water quality was better than before; the proportion of samples with good water quality rose from 6.25% in 1992 to 36.67% in 2002, but fell slightly to 21.0% in 2006; the proportion of those with satisfactory quality rose from 18.75% in 1992 to 53.0% in 2006 - the water from such sources can be used for human consumption after proper treatment and disinfection (Table 4.17).

For the Chao Phraya River, during 1992-2005, the water quality was at the good and satisfactory levels, rising from 11.68% in 1994 to 61.0% in 2005, but in 2006 the proportion of samples with poor and very poor quality rose to 71.0% (Table 4.17). However, the problems encountered were the higher contents of coliform and faecal coliform bacteria, high levels of pollution in terms of organic chemical substances, and low levels of dissolved oxygen.

[5] Quoted in Thailand Health Profile 2002-2004, pp. 109-110.

Table 4.17 Percentage of water samples with various water-quality levels from the Chao Phraya and other rivers, 1992-2006

Year	Quality of other rivers				Quality of Chao Phraya river			
	Good	Satisfactory	Poor	Very poor	Good	Satisfactory	Poor	Very poor
1992	6.25	18.75	75.00	0.00	0.00	5.88	17.65	76.47
1993	8.33	19.44	61.11	11.11	0.00	12.50	50.00	37.50
1994	4.35	32.61	60.87	2.17	3.65	8.03	33.58	54.74
1995	10.87	21.74	56.52	10.87	4.17	15.28	36.11	44.44
1996	9.43	30.19	56.60	3.77	0.00	15.28	31.94	52.78
1997	20.75	35.85	37.74	5.66	3.70	16.67	31.48	48.15
1998	30.19	49.06	15.09	5.66	19.44	26.39	27.78	26.39
1999	20.75	35.85	39.62	3.77	12.04	24.07	34.26	29.63
2000	27.78	38.89	27.78	5.56	15.63	31.25	31.25	21.88
2001	18.52	40.74	33.33	7.41	31.94	22.22	26.39	19.44
2002	36.67	20.00	40.00	3.33	8.33	31.94	27.78	31.94
2003	32.0	31.00	31.0	6.0	25.0	32.0	13.0	30.0
2004	23.0	51.0	21.0	5.0	6.0	17.0	6.8	10.0
2005	17.0	49.0	29.0	5.0	35.0	26.0	35.0	4.0
2006	21.0	53.0	23.0	3.0	3.0	26.0	48.0	23.0

Source: Pollution Control Department, Ministry of Natural Resources and Environment.

Water pollution is detrimental to the public health and results in high healthcare costs. It was estimated that in 1999 the economic cost for the care of patients with diarrhoea, dysentery and typhoid was US$ 23 million or 0.02% GDP; US$ 7.5 million being the hospitalization cost (Table 4.18) including US$ 4.96 million for outpatient care and US$ 2.64 million for inpatient care (Table 4.19).

Table 4.18 Economic and health costs due to diarrhoea, dysentery and typhoid, 1999

Type of cost	Costs in million US dollars			
	Diarrhoea	Typhoid	Dysentery	Total
Total hospital costs	6.97	0.17	0.46	7.59
Loss of wages due to illness	0.45	0.06	0.03	0.53
Loss of wages due to premature deaths	14.34	0.06	0.54	14.94
Total	**21.75**	**0.28**	**1.03**	**23.06**

Source: Siripen Supakankunti, Pirus Pradithavani, and Tanawat Likitkererat. Valuing Health and Economic Costs of Water Pollution in Thailand, May 2001. (Draft in Thailand Environment Monitor: Water Resource Quality. The World Bank, 2001).

Table 4.19 Costs of patient hospitalization, 1999

Disease	Patient hospitalization costs in million US dollars				
	Outpatient, total	Outpatient, per case	Inpatient, total	Inpatient, per case	Inpatient & outpatient, total
Diarrhoea	4.69	4.5	2.28	24.0	6.97
Typhoid	0.03	9.7	0.14	32.5	0.17
Dysentery	0.24	4.5	0.22	31.5	0.46
Total	**4.96**		**2.64**		**7.59**

Source: Siripen Supakankunti, Pirus Pradithavani, and Tanawat Likitkererat. Valuing Health and Economic Costs of Water Pollution in Thailand, May 2001. (Draft in Thailand Environment Monitor: Water Resource Quality. The World Bank, 2001).

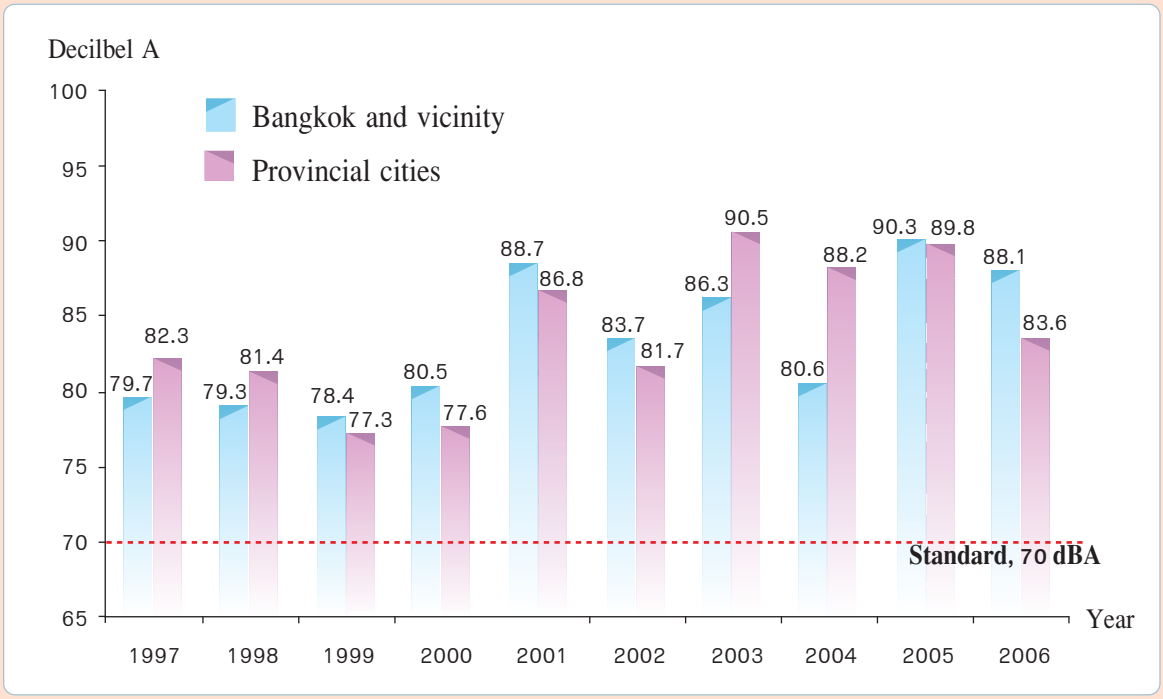
5.3.3 Noise Pollution

The most serious source of noise pollution is road traffic especially on major roads in Bangkok, its vicinity and other major cities with traffic congestions. A report on noise level monitoring in 1997-2006 of the Pollution Control Department revealed that, at 17 air quality and noise monitoring stations in 11 provinces, almost all stations had 24-hr average continuous equivalent noise levels (Leq)[6] higher than the maximum permissible level (Figure 4.22).

[6] Noise level in Leq 24-hr is an average value of continuous noise or sound energy for a 24-hr period.

The rising noise pollution has caused hearing loss among the people. A study conducted by Andrew W. Smith[7] reveals that the noise level exceeding 80 decibels is dangerous to hearing ability and Schuttz (1978)[8] indicates that the noise exceeding 70 decibels will cause severe annoyance in 22% to 95% of the people.

Figure 4.22 Noise levels (Leq 24-hr) on roadsides in Bangkok, its vicinity and major provincial cities, 1997-2006



Source: Pollution Control Department, Ministry of Natural Resources and Environment.

5.3.4 Pollution from Hazardous Substances

Most hazardous substances are imported for use in the industrial and agricultural sectors. In 1994-2003, the proportions of chemical imports for industrial and agricultural uses were 60.3% and 38.5%, respectively; only 1.2% were for household use. In 2006, the amounts of chemical imports for both sectors were 7.4 million tons and 3.7 million tons, respectively (Table 4.20). While there is a lack of good transportation, warehousing and use systems, such chemicals are released to the environment causing pollution and detrimental health effects. The Thailand Environment Monitor for 2004 revealed that there were high levels of cadmium contamination exceeding the maximum permissible level in soil and agricultural products along Mae Tao Creek in Mae Sot district of Tak province. The examination of 9,000 local residents in that area revealed that 13.9% of them had a rather

[7] Quoted in Thailand Health Profile, 1999-2000, pp. 113-114.

[8] Quoted in Thailand Health Profile, 1999-2000, pp. 113-114.

high level of urinary cadmium content, having a high risk of chronic kidney disease related to cadmium poisoning. Besides, there have been a number of frequent and serious chemical accidents, 23 reported in 2006 with a total of 215 injuries and 3 deaths.

Moreover, the health impact of increased chemical use in the industrial and agricultural sectors includes pesticide poisoning mostly among farmers (see Chapter 5, occupational and environmental diseases). In the future, it is likely that there will be more patients with chemical poisoning as the toxic substance will be accumulated in the body of affected people; their symptoms will occur in the long run such as abnormalities in the central nervous, immunology and gastrointestinal systems and cancer.

Table 4.20 Amounts of imported chemical substances, 1994-2006

Chemical substances	Imported amount (tons)											
	1994	1995	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1. For industrial use	4,874,115	5,020,611	4,822,042	4,602,197	5,006,919	6,031,927	5,547,467	6,356,872	6,785,320	6,699,363	7,118,639	7,458,183
• Inorganic chemical	839,228	966,346	1,050,327	836,241	1,080,753	1,777,212	1,200,203	1,331,981	1,527,059	1,623,335	1,786,195	1,797,061
• Organic chemical	2,152,448	2,391,862	2,159,141	2,275,283	2,280,271	2,362,797	2,313,657	2,640,466	2,866,077	3,163,521	3,422,214	3,473,087
• Colouring agents	111,468	99,302	100,151	68,971	87,427	107,855	104,806	125,674	137,679	164,592	155,033	157,177
• Paints and vanishes	47,112	29,628	37,624	21,051	24,866	32,018	133,258	37,672	87,632	64,803	44,873	43,097
• Anti-knock additives	42,843	49,016	44,878	33,058	36,785	34,066	35,157	35,984	38,608	45,335	44,814	42,709
• Plastic pallets	692,895	656,835	622,876	571,376	712,857	787,681	744,459	875,167	947,317	1,054,543	1,071,108	1,072,864
• Films, foils and plastic tapes	54,564	58,399	64,307	51,666	91,401	82,987	80,682	91,422	104,951	113,774	123,589	133,590
• Other chemicals	933,557	769,223	742,738	744,551	692,559	847,311	935,245	1,218,506	1,075,997	469,460	470,799	738,698
2. For agricultural use	3,047,576	3,188,235	3,033,190	2,905,710	3,610,583	3,378,739	3,510,837	3,736,767	4,787,320	3,993,174	3,666,432	3,782,886
• Pesticides	29,718	32,248	42,240	32,197	48,995	50,272	54,428	67,414	69,732	99,841	78,654	101,901
• Fertilizers	3,017,858	3,155,987	2,990,950	2,873,513	3,561,588	3,328,467	3,456,409	3,669,353	4,717,588	3,893,333	3,587,778	3,680,985
3. For household use	90,562	84,515	95,225	68,475	89,595	116,333	139,078	132,490	159,910	n.a	n.a	n.a
• Medicines	7,886	9,732	10,592	6,929	10,574	13,726	13,240	19,239	19,958	n.a	n.a	n.a
• Vitamins and hormones	3,282	3,752	3,763	2,938	3,844	5,223	5,397	5,590	5,783	5,111	6,100	6,526
• Other medical and pharmceutical products	15,747	4,734	5,018	3,253	4,235	6,557	18,043	6,069	6,517	n.a	n.a	n.a
• Soap and detergents	48,934	54,308	55,700	43,010	55,563	67,381	80,376	75,163	94,774	14,895	18,146	30,381
• Cosmetics	14,713	11,989	20,152	12,345	15,379	23,446	22,022	26,429	32,878	22,937	23,952	25,673
Total imports	8,012,253	8,293,361	7,950,457	7,576,382	8,707,097	9,526,999	9,197,382	10,226,129	11,732,550	n.a	n.a	n.a
Increase from previous year (Percent)	n.a	+3.5	- 8.9	- 4.7	+14.9	+9.4	-3.4	+11.2	+14.8	n.a	n.a	n.a

Source: Department of International Trade Negotiations, Ministry of Commerce.

Note: n.a.= Not Available

For 2001, the data were adjusted, according to the most recent report of the Department of Internatinnal Trade Negotiations, Ministry of Commerce.

Since 2004, the data have been adjusted and imported goods under "other chemical products"regrouped as soap and detergents and cosmetics, resulting in data changes.

Since 2004, no data are sailable for imports in the categories of medicines, medical products and other pharmaceutical due different counting units.

5.3.5 Pollution from Hazardous Wastes

The amount of hazardous wastes in Thailand increased from 0.9 million tons in 1990 to 1.8 million tons in 2006; of this amount, 1.4 million tons (77.8%) were released from the industrial sector and 0.4 million tons (22.2%) from residential communities. The amount of such industrial wastes is on the rise, whereas the capacity for hazardous waste treatment according to the sanitation principles has not been efficiently in place. In 2005, only 20% of hazardous wastes were sent for proper disposal, resulting in large amounts of such waste being illegally dumped into the environment with detrimental effects to the public health.

5.4 Environmental Sanitation

5.4.1 Housing Sanitaion

The number of Thailand's slum communities has risen from 1,587 in 1994 to 1,802 in 1997 and 2,696 in 2006, an increase of 13.5% and 49.6%, respectively. In 2006, there were 439,235 slum households, of which 34.1% (919 slums) were located in Bangkok Metropolis, 21.4% (577 slums) in Bangkok's vicinity, and 44.5% (1200 slums) in provincial areas. The number of low-income communities in all regions of Thailand has increased significantly except for Bangkok (Housing Information Division, National Housing Authority).

Regarding rural households, according to the 2006 survey on basic minimum needs (BMN), more households have had a better environmental condition. The number of durable households has risen from 90.6% in 1993 to 98.5% in 2006. The number of households with hygienic conditions has risen from 69.4% in 1992 to 89.3% in 2001, and to 97.3% in 2006.

The rapid increase in the number of slums has resulted in health-related environmental problems such as a lack of safe drinking water. Coupled with unhygienic behaviours, the incidence of diarrhoeal disease has been rising over the past 20 years, particularly among children under 5 years of age, from 3,031.3 per 100,000 population in 1984 to 10,476.55 per 100,000 population in 2006.

5.4.2 Safety in the Workplaces

In 2006, 36.2 million Thais or 55.6% of the nation's population were in the workforce and employed, including 13.7 million (37.8%) in the formal sector and 22.5 million (61.2%) in the non-formal sector.

In the formal sector, most of the workers in business workplaces were employees with only elementary schooling. So they could not protect or take care of themselves from occupational illnesses. The occupational injuries had a tendency to rise from 2% 1976 to 4.7% in 1993; the rate remained steady in the period after 1994 and then dropped to only 2.4% in 2006. But the number of deaths due to occupational injuries dropped steadily from 44.9 per 100,000 workers in 1979 to 11.19

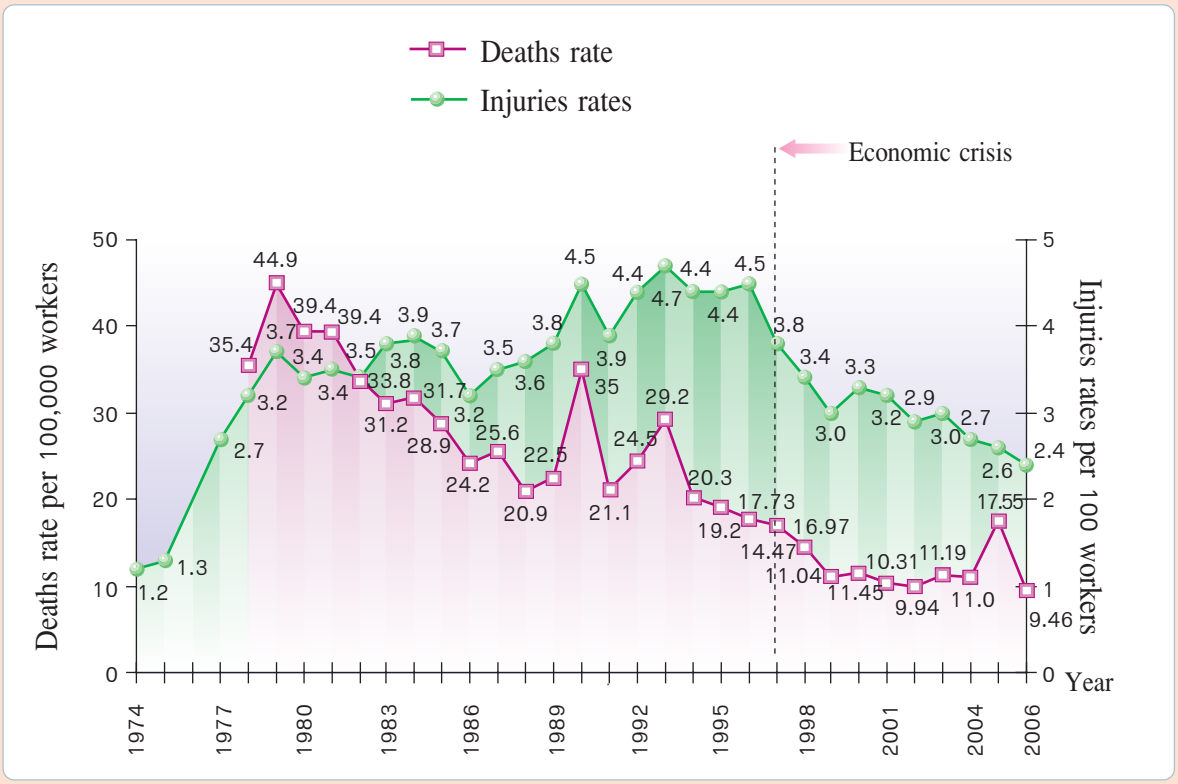
per 100,000 workers in 2003, but rose to 17.55 in 2005 (Table 4.21) and dropped to 9.46 in 2006 (Figure 4.23). The rate is considered to be high, compared with those in developed/industrialized countries such as England with a mortality of 1.3 per 100,000 workers and Finland with 4 per 100,000 workers (Chuchai Supawongse, Environmental Situation and Impact on Health in Thailand, 1996).

Table 4.21 Number and rate of occupational deaths and injuries in the workplaces, 1974-2006

Year	No. of workers covered	Workers injured		Deaths		Disabilities		Loss of some organs		Temporary absenteeism	
		No.	Percent	No.	Rate Per 100,000	No.	Rate Per 100,000	No.	Rate Per 100,000	No.	Rate Per 100,000
1974	272,848	3,200	1.2	95	34.8	-	-	401	146.9	2,704	991.0
1975	349,814	4,605	1.3	Data not available							
1976	496,700	10,136	2.0	Data not available							
1977	570,000	15,335	2.7	Data not available							
1978	590,640	19,134	3.2	209	35.4	9	1.5	1,119	18.9	17,797	3,013.2
1979	659,041	24,370	3.7	296	44.9	8	1.2	1,104	16.8	22,962	3,484.1
1980	745,513	25,334	3.4	294	39.4	13	1.7	1,191	16.0	23,836	3,197.3
1981	797,270	27,723	3.5	314	39.4	10	1.3	1,275	16.0	26,124	3,276.7
1982	824,565	28,323	3.4	279	33.8	14	1.7	1,085	131.2	26,945	3,267.8
1983	873,059	33,213	3.8	272	31.2	5	0.6	514	62.3	32,422	3,713.6
1984	994,190	39,182	3.9	315	31.7	20	2.0	1,305	131.3	37,542	3,776.1
1985	1,091,318	39,119	3.7	315	28.9	18	1.7	1,159	106.2	37,627	3,447.8
1986	1,179,812	37,445	3.2	285	24.2	10	0.8	978	82.9	36,172	3,065.9
1987	1,232,555	42,811	3.5	315	25.6	10	0.8	1,158	93.9	41,328	3,353.0
1988	1,346,203	48,912	3.6	282	20.9	7	0.5	1,179	87.6	47,444	3,524.3
1989	1,661,651	62,766	3.8	373	22.5	15	0.9	1,582	95.2	60,796	3,658.8
1990	1,826,995	80,065	4.5	640	35.0	30	1.6	1,509	82.6	77,886	4,263.1
1991	2,751,868	102,273	3.9	581	21.1	9	0.3	2,141	77.8	99,542	3,617.3
1992	3,020,415	131,800	4.4	740	24.5	15	0.5	2,010	66.5	129,035	4,272.1
1993	3,355,805	156,543	4.7	980	29.2	10	0.3	5,436	161.9	150,122	4,473.5
1994	4,248,414	186,394	4.4	863	20.3	23	0.5	4,548	107.0	180,960	4,259.5
1995	4,903,736	216,525	4.4	940	19.2	17	0.4	5,469	111.5	209,909	4,280.6
1996	5,425,422	245,616	4.5	962	17.73	18	0.3	5,042	92.93	239,574	4,416.1
1997	6,084,822	230,376	3.8	1,033	16.97	29	0.4	5,272	86.64	224,042	3,681.9
1998	5,418,182	186,445	3.4	784	14.47	19	0.3	3,692	68.14	181,956	3,358.1
1999	5,679,567	172,087	3.0	627	11.04	14	0.2	3,437	60.51	168,009	2,958.1
2000	5,417,041	179,566	3.3	620	11.45	16	0.3	3,516	64.91	175,414	3,238.2
2001	5,884,652	189,621	3.2	607	10.31	20	0.3	3,510	59.65	185,484	3,152.0
2002	6,541,105	190,979	2.9	650	9.94	14	0.2	3,424	52.54	186,891	2,857.2
2003	7,033,907	210,673	3.0	787	11.19	17	0.2	3,821	54.32	206,048	2,929.35
2004	7,831,463	215,534	2.7	861	11.00	23	0.3	3,775	48.20	210,875	2,692.66
2005	8,225,477	214,235	2.6	1,444	17.55	19	0.2	3,425	41.64	209,347	2,545.10
2006	8,537,801	204,257	2.4	808	9.46	21	0.2	3,413	39.97	200,015	2,342.70

Source: Workers' Compensation Office, Ministry of Labour.

Figure 4.23 Rates of occupational deaths and injuries in the workplaces, 1974-2006



Source: Ministry of Labour.

For non-formal labour force, most of the workers are in the agricultural sector, self-employed, home-based workers, etc., who are not taken care of by the government as expected. Among home-based workers, the problems of unsafe working conditions increased from 2.8% in 1999 to 33.2% in 2002 and 39.9% in 2005, most of which were related to eye-sight, working postures and dust inhalation (Work Surveys, 1999, 2002, and 2005, National Statistical Office).

Although at present the government has expanded the universal healthcare scheme to about 94% of the population, efforts should be rapidly undertaken to ensure that the uncovered sector of the population have access to the state health services.

5.4.3 Food and Water Supply

1) Food Safety

At present, people's food consumption culture has shifted from eating home-cooked food to eating out and eating pre-cooked or semi-cooked or ready-to-eat food. Cooking food rapidly in large quantities may involve unhygienic practices and unsanitary conditions of food establishments. The 2005 survey of 1,035 pre-cooked food samples, undertaken by the Department of Health, from food-stalls and supermarkets in 15 provinces revealed that 44.2 % of the foods were contaminated with

bacteria and did not meet the food standards. The 2006 study on the situation of food establishments revealed that only 60.2% (37,393 out of 62,140) of the restaurants and 65.2% (56,767 out of 87,075) of food-stalls met the "Clean Food Good Taste" criteria, and 59.6% (928 out of 1,557) of fresh markets met the healthy market standards.

Besides, it has been found that more chemicals are used in cooking, some without proper technical information, some even use toxic chemicals as evidenced in the toxic chemical residues being found in some fresh vegetables and fruits and fresh food over the permissible levels. The 2003-2006 food safety project report revealed that before the implementation of the project a lot of chemical residues were found in the food, but after the campaign against the use of 6 chemicals in food, it was found that, among fresh food, the contamination levels have decreased. However, high levels are noticed for meat-reddening substance and insecticides, especially in meats and agricultural products (Table 4.22).

Table 4.22 Chemical contamination of fresh foods in fresh markets nationwide under the Food Safety Project, 2003-2006

Chemical substance	Before project implementation		Project launch (2003)			2004			2006		
	Food samples		Food samples			Food samples			Food samples		
				Contaminated			Contaminated			Contaminated	
	Tested	Contaminated	Tested	No.	%	Tested	No.	%	Tested	No.	%
1. Meat-reddening	2,132	96.0	1,111	115	10.4	8,515	731	8.5	2,997	65	2.2
2. Bleaching agent	3,256	10.0	4,812	83	1.7	46,785	935	2.0	14,338	2	0.01
3. Fungicides	2,099	7.2	4,315	206	4.8	45,614	1,260	2.8	15,378	88	0.6
4. Borax	3,184	42.0	6,695	46	0.7	64,138	538	0.8	31,287	160	0.5
5. Formalin	2,471	10.0	3,800	46	1.2	38,342	735	1.9	13,743	206	1.5
6. Insecticides	2,268	20.3	8,437	508	6.0	80,540	4,383	5.4	82,049	2,580	3.1

Source: Food Safety Operations Centre, Ministry of Public Health.

However, despite the MoPH's stringent monitoring and control measures, the problems of chemical residues are still widespread even in fruits for domestic consumption and for export, 4.0% to 8.2% were found to be contaminated. And in imported fruits and vegetables, 2.9% of them were found to have residues higher than the permissible levels (Table 4.23).

Table 4.23 Monitoring of chemical safety in fresh vegetables and fruits, 2004-2006

Type	Chemical tested for	No. of samples tested	Results	Agency responsible	Year of study
1) Vegetables in Bangkok	Insecticides	903	74 samples (8.2%) exceeding MPL	FDA	2005
2) Vegetables and fruits of vendors	Pesticides, borax, anti-fungals, whitening agent synthetic coloring agents	2,048	677 samples (33.1%) with residues, 40 samples (5.9%) exceeding MPL	National Brain Bank Institute	2005
3) Imported vegetables and fruits	Pesticides	1,746	376 samples (21.5%) with residues, 11 samples (2.9%) exceeding MPL	DOA	2004-2006
4) Twelve vegetables and fruits for export	Pesticides	79,343	18,407 samples (23.2%) with residues, 737 samples (4.0%) exceeding MPL	DOA	2003-2006

Sources: - Food Safety Operations Centre, MoPH.
- Department of Agriculture (DOA), Ministry of Agriculture and Cooperatives.

Note: MPL = maximum permissible level

Such situation had a negative impact on consumer's health. Consuming unsafe unhygienic food resulted in a rising incidence of food poisoning from 4.35 per 100,000 population in 1976 to 216.26 per 100,000 population in 2006. With a high level accumulated toxic chemicals in the body, there will be an increased risk of cancer, mutation and infant deformity.

2) Water Supply Safety

Based on the Survey of Water Supply Situations of Thai People during 1986-2001, most Thais preferred rainwater for drinking, followed by artesian-well water and tap water. And in 2005, a similar preference was also found for rain water but followed by bottled water, which will play a more dominant role in the future, and tap water. Almost half of urban residents preferred bottled water, followed by tap water, whereas half of rural residents preferred rainwater, followed by bottled water (Table 4.24).

Table 4.24 Percentage of drinking water sources of Thai people by residential area, 1986-2005

Source of drinking water*	1986	1995			2000			2001			2005		
	Whole country	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
No. of surveyed households	3,181	809	3,260	4,069	5,291,871	10,645,933	15,937,804	27,183	143,904	171,087	50,000	32,000	82,000
Bottled water	n.a	23.4	8.2	11.2	40.6	9.2	19.5	35.5	9.7	13.7	48.8	20.0	29.0
Tap water	15.8	27.6	9.4	13.0	36.4	16.8	23.2	26.1	16.1	17.7	36.0	15.3	21.7
Rainwater	39.2	42.2	52.2	50.2	16.1	51.0	39.6	27.5	51.3	47.6	10.7	49.6	37.4
Artesian wells/ Private wells / Artesian wells/ Public wells	26.2	27.0	52.5	47.4	6.7	21.9	16.9	9.7	21.8	19.9	3.7	14.2	11.0
Natural water sources	19.0	0.9	2.7	2.3	0.2	1.1	0.8	0.2	0.6	0.5	0.1	0.4	0.2

Sources: 1. Data for 1986 and 1995 were derived from Reports on the 3rd and 4th National Nutrition Surveys. Department of Health, MoPH.

2. Data for 2000 were derived from the Population and Household Census. National Statistical Office.

3. Data for 2001 were derived from the Provincial Health Status Survey, 2001. Bureau of Policy and Strategy, MoPH.

4. Data for 2005 were derived from the report on Population Change Survey, 2005-2006. National Statistical Office.

Note: * More than one answer can be made.

With regard to the quality of drinking water in Thailand, the survey conducted by the Department of Health, MoPH, during 1995-2005, revealed that most water samples did not meet the drinking water standards, except for those of the Metropolitan Waterworks Authority, about 70% of which met the standard. This is mainly because of contamination with bacteria and chemicals such as cadmium, iron, lead and manganese, including unacceptable physical quality, i.e. turbidity and colour levels being higher than maximum allowable standards (Table 4.25).

Regarding the quality of bottled water, according to a survey conducted by the Food and Drug Administration and some Provincial Public Health Offices during 1995-2006, 71.7% of the water samples tested met the drinking water standards; no differences in terms of contamination were found among the water with and without FDA-licence logo. It was also found that only 57.3% of ice-cube samples tested met the standard (Table 4.24).

Besides, the report on domestic water quality surveillance of the Department of Health on water at restaurants, food-stalls, households and schools reveals that as high as 65% to 93% of water samples do not meet the drinking water standards (Table 4.26).

With this kind of problem, the people who use such unsafe/substandard water will be at risk of gastrointestinal diseases such as diarrhoea, dystery, etc.

Table 4.25 Quality of water for domestic use in Thailand, 1995-2006

Water type	1995		1996		1997		1998		1999		2000		2001		2002		2004		2005		2006	
	Samples tested	Samples meeting standard	Samples tested	Samples meeting standard	Samples tested	Samples meeting standard	Samples tested	Samples meeting standard	Samples tested	Samples meeting standard	Samples tested	Samples meeting standard	Samples tested	Samples meeting standard	Samples tested	Samples meeting standard	Samples tested	Samples meeting standard	Samples tested	Samples meeting standard	Samples tested	Samples meeting standard
Tap water, MWA	45	38 (84.4)	27	NA	75	56 (74.7)	118	81 (68.6)	81	70 (86.4)	-	-			-	-	-	-	-	-	-	-
Tap water, PWA	129	95 (73.6)	547	276 (50.4)	1,470	713 (48.5)	1,568	1,397 (89.1)	532	294 (55.3)					120	92 (76.7)	90	70 (77.8)	230	180 (80.4)	24	11 (45.8)
Tap water, municipality waterworks	8	3 (37.5)	68	10 (14.7)	68	-	51	18 (35.3)	161	89 (55.3)	900	442 (49.1)	570	504 (88.4)	203	171 (84.2)						
Tap water, sanitary district waterworks	43	22 (51.2)	327	90 (27.5)	496	232 (46.8)	370	164 (44.3)	51	18 (35.3)					-	-	-	-	-	-	-	-
Tap water, village waterworks	209	102 (48.8)	1,683	399 (23.7)	465	108 (23.2)	3,925	1,103 (28.1)	5,041	2,039 (40.4)	4,246	1,507 (35.5)	2,673	2,297 (85.9)	1,318	760 (57.7)	-	-	-	-	22	1 (4.5)
Shallow-well water	n.a.	n.a.	365	37 (10.1)	222	28 (12.6)	191	78 (40.8)	125	54 (43.2)	26	7 (26.9)	-	-	-	-	-	-	-	-	-	-
Artesian-well water	65	27 (41.5)	438	377 (86.1)	355	15 (4.2)	258	62 (24.0)	277	112 (40.4)	280	102 (36.4)	-	-	174	50 (28.7)	46	22 (47.8)	54	11 (20.4)	6	-
Rainwater	65	23 (35.4)	495	98 (19.8)	121	6 (5.0)	298	104 (34.9)	90	27 (30.0)	69	19 (27.5)	-	-	-	-	30	4 (13.3)	-	-	15	2 (13.3)
Bottled water	1,462	968 (66.2)	407	286 (70.3)	3,225	2,837 (88.0)	4,496	3,167 (70.4)	3,766	2,329 (61.8)	1,033	788 (76.3)	3,551	2,383 (67.1)	2,996	2,121 (70.8)	2,065	1,543 (74.7)	1,113	926 (83.2)	466	381 (81.7)
Ice cubes	32	9 (28.1)	42	30 (71.4)	187	170 (90.9)	401	203 (50.6)	335	174 (51.9)	285	138 (48.4)	299	156 (52.2)	273	170 (62.3)	380	248 (65.3)	218	121 (48.8)	129	54 (41.9)

Sources: Department of Health, MoPH.
Planning and Technical Administration Division and Food Control Division, FDA, MoPH.

Notes:
1. The figures in ( ) are percentages.
2. For 2006, results form a study of the Department of Health.
3. MWA=Metropolitan Waterworks Authority; PWA=Provincal Waterworks Authority.

Table 4.26 Monitoring of quality of water for domestic use, 2004

Type of water	Analysis type	Samples analyzed	Results = Percentage and no. of samples (in parentheses) and standard meeting	Agency responsible	Year of analysis
1. Drinking water in 950-ml, sealed bottles, and water provided to customers free of charge at restaurants and food-stalls	Chemical, physical, and bacterial	233	6.9% (16) meeting standards 93.1% (217) sub-standard 84.5% (197) with bacterial contamination	DOH	2004
2. Drinking water in 950-ml, sealed bottle, and 20-litre tap water, rainwater, artesian-well water and shallow-well water in households	Chemical, physical, and bacterial	121	14.9% (18) meeting standards 85.1% (103) sub-standard 71.1% (86) with bacterial contamination	DOH	2004
3. Tap water and drinking water in 20-litre sealed bottles in schools in Bangkok	Chemical, physical, and bacterial	44	84.1% (37) meeting standards 15.9% (7) sub-standard, all with bacterial contamination	DOH	2004
4. Tap water, asterian-well water, shallow-well water rainwater and drinking water in 20-litre sealed bottles in schools in provincial areas	Chemical, physical, and bacterial	294	34.7% (102) meeting standards 65.3% (192) sub-standard, all with bacterial contamination	DOH	2004

Sources: - Quality of Water Supply at Restaurants, Foodstalls, and Households, Department of Health, 2004.

- Situation of Water Supply Management and Quality in Schools, Department of Health, 2004.

5.4.4 Solid Waste and Sewage

In 2006, there were an estimated 14.59 million tons of solid wastes nationwide, of which about 3.06 million tons (21.0%) were generated in Bangkok, 4.71 million tons (32.3%) in municipal areas, and 6.82 million tons (46.7%) in non-municipal/sanitary district areas. Between 1992 and 2006, the total amount of solid wastes increased on average by 2.1% each year, mostly in Bangkok Metropolis and municipalities nationwide. Since 2001 the amount of solid wastes in non-municipal

areas has been slightly higher than that in municipal areas (Table 4.27). Solid waste disposal capacity is still limited; the Bangkok Metropolitan Administration is able to collect almost all of its solid wastes, but municipalities and non-municipal areas can collect only half of their wastes. Such conditions have an impact on the quality of life of provincial residents as they are offended by the putrid smell of such wastes; and a lot of such residents have health problems.

Table 4.27 Amount of solid wastes, 1992-2006

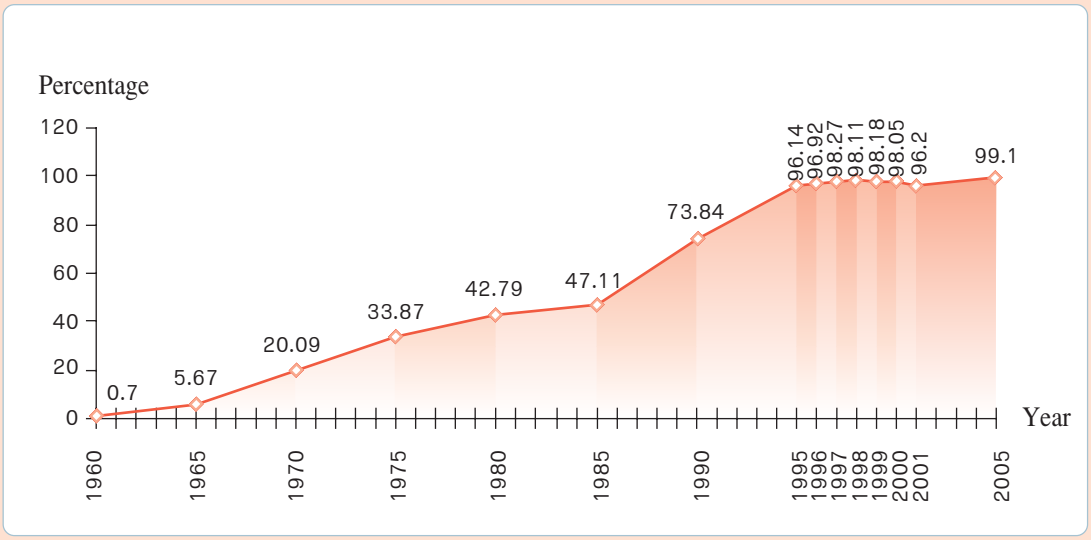
Area / Year	Bangkok		Municipal areas including Pattaya City		Sanitary districts		Outside municipal/sanitary district areas		Total	
	Amount (million tons)	Change (percent)	Amount (million tons)	Change (percent)	Amount (million tons)	Change (percent)	Amount (million tons)	Change (percent)	Amount (million tons)	Change (percent)
1992	2.19	-	1.16	-	1.62	-	5.81	-	10.78	-
1993	2.57	+ 17.3	1.25	+ 7.7	1.51	- 6.8	5.85	+ 0.7	11.18	+ 3.7
1994	2.56	- 0.4	2.05	+ 64.0	1.53	+ 1.3	5.91	+ 1.0	12.05	+ 7.8
1995	2.63	+ 2.7	2.30	+ 12.2	1.69	+ 10.5	5.96	+ 0.8	12.58	+ 4.4
1996	2.95	+ 12.2	2.43	+ 5.6	1.78	+ 5.3	5.97	+ 0.2	13.13	+ 4.4
1997	3.26	+ 10.5	3.0	+ 23.4	1.75	- 1.7	5.5	- 7.9	13.51	+ 2.9
1998	3.10	- 4.9	2.71	- 9.7	1.74	- 0.6	6.04	+ 9.8	13.59	+ 0.6
1999	3.28	+ 5.8	4.50	+ 66.0	-	-	6.04	-	13.82	+ 1.7
2000	3.33	+ 1.5	4.3	- 4.44	-	-	6.3	+ 4.3	13.93	+ 0.8
2001	3.40	+2.1	4.34	+0.9	-	-	6.36	+1.0	14.10	+1.2
2002	3.51	+3.2	4.37	+0.7	-	-	6.43	+1.1	14.31	+1.5
2003	3.41	-2.8	4.42	+1.1	-	-	6.50	+1.1	14.33	+0.1
2004	3.41	-	4.56	+3.2	-	-	6.60	+1.5	14.57	+1.7
2005	3.04	-10.8	4.61	+1.1	-	-	6.67	+1.1	14.32	-1.7
2006	3.06	+0.6	4.71	+2.2	-	-	6.82	+2.2	14.59	+1.9

Source: Waste & Hazardous Substance Management Bureau, Pollution Control Department.

Note: In 1999, all sanitary districts were upgraded to municipalities; since then only the figures for municipal areas appear.

Regarding human waste or night soil from urban households, problems are found to be related to its unsanitary transportation and disposal. In 2006, 99.1% of rural households had sanitary latrines as shown in Figure 4.24. Nationwide, 61.3% (46 provinces) of all 75 provinces had 100% of their households with sanitary latrines (Department of Health, 1999). However, a survey on latrine use of Thai people in 2001 revealed that 97.9% of them regularly used a sanitary latrine while at home; but when using public toilets, only 47.1% had a hygienic behaviour (Table 4.28).

Figure 4.24 Percentage of households with sanitary latrines, 1960-2005



Sources: - 1960-2000 from the Department of Health, MoPH.
- 2001 from the Provincial Health Status Survey, 2001. Bureau of Policy and Strategy, MoPH.
- 2005 from the Report on Population Characteristics from the Population Change Survey, 2005-2006. Bureau of Policy and Strategy, MoPH.

Table 4.28 Latrine use behaviour of Thai people, 2006

Description	Correct use (percent)	Incorrect use (percent)
1. Flushing the toilet	94.9	5.1
2. Disposal of toilet paper	78.3	21.7
3. Handwashing	47.1	52.9
4. Sitting on the toilet	83.0	17.0
Correct behaviour in 4 aspects	**47.1**	**52.9**

Source: Department of Health, MoPH.

6. Political and Administrative Situations and Trends

6.1 Political System

Even though the Constitution of the Kingdom of Thailand, B.E. 2540 (1997) was in force for eight years, good governance in Thai society was not attained as intended due to the unprecedented stability of the mechanism of state administration or government, which had complete control over all civil service system and major agencies of the country. However, the legislative mechanism, which was the core agency responsible for selecting members or commissioners of state's independent agencies, was also influenced by the executive branch, resulting in their lack of independence according to the constitution. The operations of the public and political sectors as well as the examination mechanisms of independent agencies and the public were under the influence of the patronage system including cronyism and nepotism. The groups that were close to the government had benefited from government policies, while the examination process was inefficient and the public was suspicious of the state administration inclining towards the widespread malfeasance and there is no public forum to express their opinions. As a result, the public pressure had built up, society being frustrated and divided, calling for another round of political reform that would lead to politics with morality. Such movement, however, could not stop the conflicts which tended to become violent. Thus, the Council for Democratic Reform with the King as Head of State seized the state power abrogating the 1997 constitution, the Senate, the House of Representatives, the Cabinet and the Constitutional Court, and enacting the 2006 Interim Constitution, under which the interim cabinet was established to undertake the state administration for one year. During that period of time, the drafting of another constitution was expedited with a wide public participation in every step. The draft constitution of 2007 was accepted in the referendum and, upon the endorsement of His Majesty the King, the 2007 constitution has become effective on 24 August 2007. A general election under the new constitution will be held in December 2007.

6.2 Public Administration System

6.2.1 Public Sector Development

It has been found that the personnel cost in the public sector has been rising resulting in very little budget remaining for national development and the civil service system being incapable of responding to the needs of the people as well as being inefficient, slow, and corrupt. Such a situation led to the 2001 major public sector reform; the restructuring of ministries, sub-ministries and departments was undertaken so as to have a clean system with minimized redundancy of roles and missions of public agencies according to the Reorganization of Ministries, Sub-ministries and Departments Act, B.E. 2545 (2002). In addition, a framework for modern administration of state affairs based on the principles of good governance and modern administration was laid down according

to the Procedure for State Administration Act (No. 5), B.E. 2545 (2002). Later on, the public sector development effort has focused on the well-being of people and prosperity of the country as per the Royal Decree on Criteria and Methods for Good Governance, B.E. 2546 (2003), which is regarded as the beginning of development of the modern Thai civil service system so that it will have a higher capacity, in terms of public service quality, optimization of role/mission and size, enhancement of performance capacity and standard, and opening of the civil service system to the democratic process. An evaluation has revealed that overall state agencies have their performance in a "good" level and above, on average. In 2004, their performance was markedly higher than that for 2003; the average score increasing from 2.61 in 2003 to 3.82 in 2004. The results of achievements in various aspects of development are as shown in Table 4.29.

Table 4.29 Achievements of public sector development, 2003-2005

Target	Results of operation		
	2003	2004	2005
1. Development of public service quality			
- Reduce steps and time in providing services to the public by more than 50% on average by 2007	44.1 %	47.8 %	51.8 %
- Satisfaction of service recipients (new indicator, 2004)	-	76.58 %	76.64 %
2. Adjustment of role, mission and size as appropriate			
• **Role and mission**			
- No. of non-core functions is reduced by not less than 80% by 2007	-	-	73.0 %
- Not less than 90% of public agencies have implemented "measure 3/1" of the State Administration Act (No.5) of 2002 or the Royal Decree on Good Governance of 2003 by 2007	68.5 %	-	100.0 %
- Not less than 100 laws that are unnecessary or obstructing national development will be amended or deregulated by 2007	For all agencies: amendment of 194 acts and 447 announcements/ rules/ regulations	For all agencies: amendment of 89 acts, 22 royal decrees; 301 announcements, 1,201 regulations, rules and orders (totalling 1,434)	For all agencies: amendment of 233 acts, and 127 pending submission to the House of Representatives

Target	Results of operation		
	2003	2004	2005
• **State budget** - Maintain the proportion of state budget in relation to GDP at not to exceed 18% on average for the period 2003-2007	17.5 %	18.0 %	17.5 %
• **Public sector workforce** - Reduce the number of government officials by at least 10% by 2007	0.04 % (reduced by 691)	3.84 % (reduced by 45,330)	4.35 % (reduced by 50,000 compared with that in 2002)
3. Enhancement of performance competency and standard to the international levels	25.5 %	All state agencies have evaluation results at the good level or above	-
• Each agency has at least one certification for its quality/standard by 2007 such as PSO and ISO	26.2 %	36 %	60.0 %
• At least 80% of State officials have their competencies enhanced as per specified criteria on average by 2007	55.3 %	100 %	80 %
• At least 90% of state agencies have their service systems improved or operational using the e-government system by 2007	45.6 %	94.7 %	80 %
4. Response to public administration in the democratic system	77.9 %	98.0 %	-
- On average 80% of the people have confidence and faith in the transparency and cleanliness in the public administration by 2007 with the disclosure of information to the public in a systematic manner	75.2 %	94.0 %	Evaluation results in the highest level
- At least 80% of state agencies have measures or activities that are open to public participation by 2007	65.4 %	79.3 %	Evaluation results in the high level
- The number of conflicts or complaints between the administration and the people increases by not to exceed 20% each year on average for the period 2003-2007	-	-	Evaluation results: decreasing or none in the highest level

Sources: 1. Report on progress in the public sector development in the three-year period of the Public Sector Development Commission. In the report on monitoring and evaluation of the 9th National Economic and Social Development Plan (2002-2006). NESDB.
2. Office of the Public Sector Development Commission, 2007.

The transform of the public administration system according to the modern administration principles has caused all state health facilities to accelerate the improvement of public service quality in a more efficient manner.

6.2.2 Efficiency of the Public Administration System in the Thai Business Sector Development: A Comparison with Other Countries

Low efficiency in the public sector results in a higher operating cost in the private sector. A study conducted by Saowanee Thairungroj and colleagues revealed that business operators had to spend a lot of time when dealing with public agencies. On average they spent 14% of their time each year, small-size businesses spending more than medium and large-scale businesses.[9] For this reason, they had to pay bribes to state officials to expedite transactions, resulting in a higher cost in business operations. However, after the 2001 public sector reform, the situation is getting better; a study on international competition conducted by the International Institute for Management Development (IMD) for the period 1997-2005 revealed that the efficiency score of the Thai public sector in the development of the business sector has increased from 2.91 in 1997 to 3.86 in 2005, or from rank 28th in 1997 to rank 16th in 2005, and dropped slightly to 3.64 or rank 21st in 2006 (Figure 4.25). Nevertheless, the efficiency level in Thailand is lower than those in developed countries or certain ASEAN countries, i.e. Singapore and Malaysia (Table 4.30).

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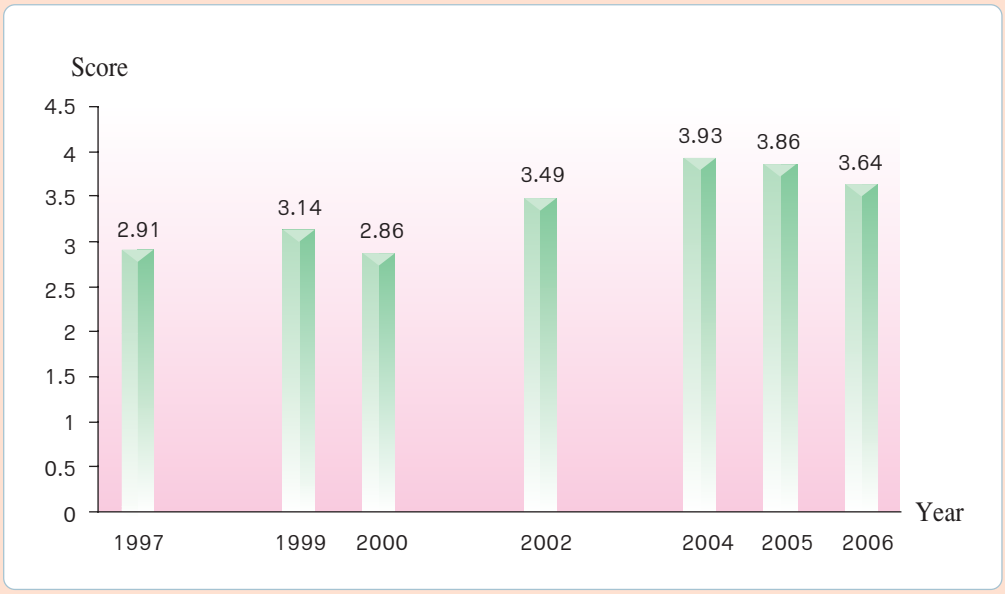
[9] Saowanee Thairungroj et al. The Business Environment and Attitudes of Business Operators towards Public Sector Services. Faculty of Economics. University of the Thai Chamber of Commerce, 1999.

Figure 4.25 Ability and ranking of Thai public sector's competitiveness for business sector development, 1997-2006



	1997	1999	2000	2002	2004	2005	2006
Rank of the Thai public sector's competitiveness for business sector development	28	24	31	24	19	16	21

Source: IMD. The World Competitiveness Yearbook, 1997-2006.

Table 4.30 Efficiency of the state service system in the business sector development in various countries, 1997-2006

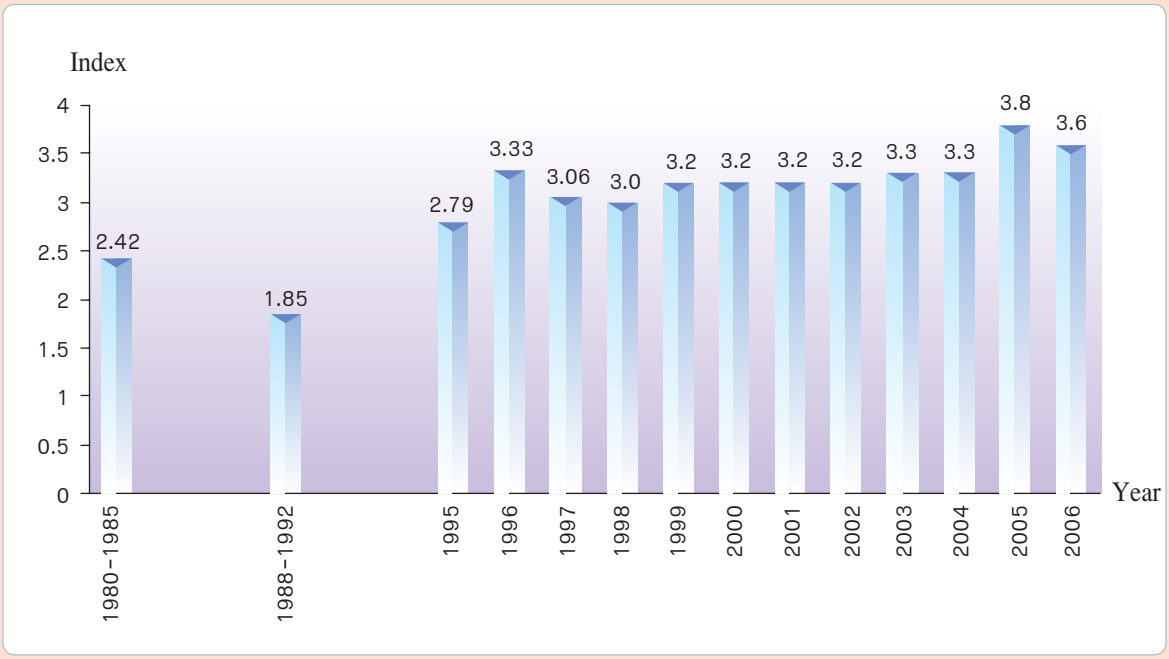
Group and country	1997 Actual rank	1997 In-group rank	1997 Score	Group and country	1999 Actual rank	1999 In-group rank	1999 Score	Group and country	2002 Actual rank	2002 In-group rank	2002 Score	Group and country	2004 Actual rank	2004 In-group rank	2004 Score	Group and country	2006 Actual rank	2006 In-group rank	2006 Score
ASEAN				**ASEAN**				**ASEAN**				**ASEAN**				**ASEAN**			
Singapore	1	1	6.88	Singapore	1	1	7.45	Singapore	1	1	7.46	Singapore	4	1	5.95	Singapore	2	1	6.67
Malaysia	15	2	4.69	Malaysia	16	2	4.20	Malaysia	13	2	4.59	Malaysia	10	2	4.82	Malaysia	11	3	4.87
Thailand	28	4	2.91	Thailand	24	3	3.14	Thailand	24	3	3.49	Thailand	19	3	3.93	Thailand	21	2	3.64
Philippines	27	3	2.96	Philippines	34	4	2.32	Philippines	41	5	2.00	Philippines	49	4	1.86	Philippines	53	4	1.67
Indonesia	32	5	2.67	Indonesia	39	5	1.80	Indonesia	32	4	2.83	Indonesia	56	5	1.50	Indonesia	48	5	1.83
Brunei	-	-	-	Brunei	-	-	-	Brunei	-	-	-	Brunei	-	-	-	Brunei	-	-	-
Vietnam	-	-	-	Vietnam	-	-	-	Vietnam	-	-	-	Vietnam	-	-	-	Vietnam	-	-	-
Myanmar	-	-	-	Myanmar	-	-	-	Myanmar	-	-	-	Myanmar	-	-	-	Myanmar	-	-	-
Cambodia	-	-	-	Cambodia	-	-	-	Cambodia	-	-	-	Cambodia	-	-	-	Cambodia	-	-	-
Laos	-	-	-	Laos	-	-	-	Laos	-	-	-	Laos	-	-	-	Laos	-	-	-
World (top ten)				**World (top ten)**				**World (top ten)**				**World (top ten)**				**World (top ten)**			
Singapore	1	1	6.88	Singapore	1	1	7.45	Singapore	1	1	7.46	Denmark	1	1	6.41	Iceland	1	1	6.74
Hong Kong	2	2	6.63	Finland	2	2	7.03	Finland	2	2	6.83	Iceland	2	2	6.40	Singapore	2	2	6.67
Finland	3	3	6.49	Hong Kong	3	3	6.28	Iceland	3	3	6.09	Finland	3	3	6.09	Hong Kong	3	3	6.62
Denmark	4	4	6.09	Denmark	4	4	5.87	Luxembourg	4	4	5.95	Singapore	4	4	5.95	Finland	4	4	6.54
New Zealand	5	5	6.08	Switzerland	5	5	5.54	Denmark	5	5	5.77	Hong Kong	5	5	5.45	Denmark	5	5	6.54
Iceland	6	6	5.89	Luxembourg	6	6	5.33	Switzerland	6	6	5.71	Australia	6	6	5.11	Norway	6	6	5.66
Ireland	7	7	5.80	Iceland	7	7	5.19	Sweden	7	7	5.70	Canada	7	7	4.89	Estonia	7	7	5.22
Norway	8	8	5.67	Ireland	8	8	5.16	Ireland	8	8	5.32	Sweden	8	8	4.85	Ireland	8	8	5.07
Netherlands	9	9	5.41	Netherlands	9	9	4.98	Hong Kong	9	9	5.21	Estonia	9	9	4.84	Australia	9	9	5.02
Switzerland	10	10	5.38	Australia	10	10	4.97	Netherlands	10	10	5.06	Malaysia	10	10	4.82	Sweden	10	10	4.97

Source: IMD. The World Competitiveness Yearbook, 1997-2006.

6.2.3 Transparency and Corruption in Public Sector Agencies

As the government has monopolized public services, it is hard to examine such systems and results in wastages. Most state officials have low salaries with a lot of debts and thus they tend to adopt malpractice that leads to illegally taking kickbacks, which is a problem of transparency and corruption in the public service system. The inspection systems of the State Audit Office and the National Counter Corruption Commission are not strong enough to cope with such problems. Surveys conducted by the Transparency International in 1980-2005 revealed that Thailand is getting better in terms of transparency and corruption, its corruption perceptions index has risen from 2.42 during the period 1980-1985 to 3.8 in 2005, but dropped slightly to 3.6 in 2006, ranking 63rd among 163 countries under survey (Figure 4.26). Such a ranking was, however, rather low in terms of transparency, with a high level of corruption, compared with developed countries and certain ASEAN countries, i.e. Singapore and Malaysia (Table 4.31).

Figure 4.26 Corruption perceptions index, Thailand, 1980-2006



Source: Transparency International, 1998-2006.

Table 4.31 Corruption perceptions indexes in various countries, 1998-2006

Group and country	1998 Actual rank	1998 In-group rank	1998 CPI value	Group and country	2000 Actual rank	2000 In-group rank	2000 CPI value	Group and country	2002 Actual rank	2002 In-group rank	2002 CPI value	Group and country	2004 Actual rank	2004 In-group rank	2004 CPI value	Group and country	2005 Actual rank	2005 In-group rank	2005 CPI value	Group and country	2006 Actual rank	2006 In-group rank	2006 CPI value
ASEAN				**ASEAN**				**ASEAN**				**ASEAN**				**ASEAN**				**ASEAN**			
Singapore	7	1	9.1	Singapore	6	1	9.1	Singapore	5	1	9.3	Singapore	5	1	9.3	Singapore	5	1	9.4	Singapore	5	1	9.4
Malaysia	29	2	5.3	Malaysia	36	2	4.8	Malaysia	33	2	4.9	Malaysia	39	2	5.0	Malaysia	39	2	5.1	Malaysia	44	2	5.0
Thailand	61	4	3.0	Thailand	60	3	3.2	Thailand	64	3	3.2	Thailand	64	3	3.6	Thailand	59	3	3.8	Thailand	65	3	3.6
Philippines	55	3	3.3	Philippines	69	4	2.8	Philippines	77	4	2.6	Philippines	102	4	2.6	Philippines	117	5	2.5	Philippines	126	5	2.5
Indonesia	80	6	2.0	Indonesia	85	6	1.7	Indonesia	96	6	1.9	Indonesia	133	6	2.0	Indonesia	137	7	2.2	Indonesia	134	6	2.4
Brunei	-	-	-	Brunei	-	-	-	Brunei	-	-	-	Brunei	-	-	-	Brunei	-	-	-	Brunei	-	-	-
Vietnam	74	5	2.5	Vietnam	76	5	2.5	Vietnam	85	5	2.4	Vietnam	102	4	2.6	Vietnam	107	4	2.6	Vietnam	118	5	2.6
Myanmar	-	-	-	Myanmar	-	-	-	Myanmar	-	-	-	Myanmar	142	7	1.7	Myanmar	155	8	1.8	Myanmar	162	8	1.9
Cambodia	-	-	-	Cambodia	-	-	-	Cambodia	-	-	-	Cambodia	-	-	-	Cambodia	130	6	2.3	Cambodia	152	7	2.1
Laos	-	-	-	Laos	-	-	-	Laos	-	-	-	Laos	-	-	-	Laos	-	-	-	Laos	114	4	2.6
World (top ten)				**World (top ten)**				**World (top ten)**				**World (top ten)**				**World (top ten)**				**World (top ten)**			
Denmark	1	1	10.0	Finland	1	1	10.0	Finland	1	1	9.7	Finland	1	1	9.7	Iceland	1	1	9.7	Finland	1	1	9.6
Finland	2	2	9.6	Denmark	2	2	9.8	Denmark	2	2	9.5	New Zealand	2	2	9.6	Finland	2	2	9.6	Iceland	2	2	9.6
Sweden	3	3	9.5	New Zealand	3	3	9.4	New Zealand	2	2	9.5	Denmark	3	3	9.5	New Zealand	2	2	9.6	New Zealand	3	3	9.6
New Zealand	4	4	9.4	Sweden	3	3	9.4	Iceland	4	4	9.4	Iceland	3	3	9.5	Denmark	4	4	9.5	Denmark	4	4	9.5
Iceland	5	5	9.3	Canada	5	5	9.2	Singapore	5	5	9.3	Singapore	5	5	9.3	Singapore	5	5	9.4	Singapore	5	5	9.4
Canada	6	6	9.2	Iceland	6	6	9.1	Sweden	5	5	9.3	Sweden	6	6	9.2	Sweden	6	6	9.2	Sweden	6	6	9.2
Singapore	7	7	9.1	Norway	6	6	9.1	Canada	7	7	9.0	Switzerland	7	7	9.1	Switzerland	7	7	9.1	Switzerland	7	7	9.1
Netherlands	8	8	9.0	Singapore	6	6	9.1	Luxembourg	7	7	9.0	Norway	8	8	8.9	Norway	8	8	8.9	Norway	8	8	8.8
Norway	8	8	9.0	Netherlands	9	9	8.9	Netherlands	7	7	9.0	Australia	9	9	8.8	Australia	9	9	8.8	Australia	9	9	8.7
Switzerland	10	10	8.9	U.K.	10	10	8.7	U.K.	10	10	8.7	Netherlands	10	10	8.7	Austria	10	10	8.7	Netherlands	10	10	8.7

Sources: Transparency International and Dr. Johann Graf Lambsdarff Gottingen University, Germany, 1998-2006

Notes:
1. Corruption perceptions index were computed based on the perception of businesses, risk analysts and the general public; scores range form 1 to 10, "0" meaning highly corrupt and "10" meaning "highly clean"
2. Surveys used refers to the number of surveys that assessed a country's performance and expert assessments were used and at least 3 were required for a country to be included in the CPI.

In addition, the Global Competitiveness Report 2001/2002-2005/2006 of the World Economic Forum (WEF) stated that, in the perspectives of chief executive officers (CEOs) and senior executives of private businesses in Thailand, briberies or illegal payments (seven types) had a tendency to decline in all aspects. However, the most commonly found type of illegal payment was the payment for setting a policy for self-benefit and for winning a concession contract, while those rarely found were payments for setting up public utility services. Thus, it means that executives perceive that the corruption in this aspect has declined which might be due to the fact that the public utility services in Thailand has been much expanded and there is no need for the business sector to make any payment for such services (Table 4.32).

Table 4.32 Images of bribery in Thailand, 2001-2006

Image	2001-02	2002-03	2003-04	2004-05	2005-06
1. Bribery for winning a contract on state investment project	3.7 (-)	3.8 (-)	4.1 (+)	4.3	4.5 (+)
2. Bribery for obtaining an import/ export permit	3.7 (-)	4.3 (-)	4.3 (-)	4.1 (-)	4.8 (+)
3. Bribery for setting policy for self-benefit	- -	4.3 (-)	4.4 (+)	4.1 (-)	- -
4. Bribery for favoured lawsuit proceedings	- -	4.7 (-)	5.0 (+)	4.7	5.2 (+)
5. Bribery for tax avoidance	4.2 (-)	4.8 (-)	5.1 (+)	5.2 (+)	5.4 (+)
6. Bribery for getting a loan	4.6 (-)	5.1 (+)	5.3 (+)	5.3 (+)	- -
7. Bribery for receiving public utility services	4.7 (-)	5.5 (+)	5.8 (+)	5.7 (+)	5.6 (+)

Source: World Economic Forum 2001-2006. In the report on monitoring and evaluation of the 9th National Economic and Social Development Plan (2002-2006). NESDB.

Note: (-) or (+) means an image of bribe taking and corruption; (-) worse than the national average and (+) better than the national average.

6.3 Decentralization

Even through the Planning and Steps of Decentralization to Local Administration Organizations Act of B.E. 2542 (1999) is not abrogated like the 1997 Constitution, the Act might need to be amended to correspond with the new constitution, which might take another 1 or 2 years at least. This would delay or obstruct the process of decentralization particularly that related to health, which as a matter of fact has made no progress to date.

7. Situations and Trends of Technology

7.1 Technology Development

Advances in technology have been rapidly made resulting in innovations being developed and having an impact on health development as modern technologies have been used freely in the treatment and prevention of diseases, namely:

7.1.1 **Information and communication technology (ICT).** For health programmes, ICT has been used for medical and health consultation including diagnoses and medical treatment with telemedicine and diagnostic imaging technology.

7.1.2 **Genetics and biotechnology.** Rapid developments have been made in this area such as digital-genomics convergence that integrates computer technology into biology. This might be a new dimension of curative care, moving from treatment to prevention: adding disease-prevention elements to food, soap or cosmetics, rather than taking medication orally for treatment of illness; organ transplantation (such as for bone marrow); stem-cell treatment for patients with heart disease and leukemia; using recombinant DNA, polymerase chain reaction (PCR) and genomics for producing a new vaccine and medicine; and farming of genetically modified plants.

7.1.3 **Material technology.** New materials have been produced in response to needs in a more efficient manner. In the field of public health, the technology has been used in producing medical materials and equipment such as artificial leg/foot bones for more efficient medical care of patients which also helps improve their quality of life.

7.1.4 **Nanotechnology.** A more active role has been played by this kind of technology which is believed to be used in producing a molecular machine comprising atoms to be inserted into the human body for destroying cancerous cells or eliminating blood vessel-clogging lipids without surgery, or in producing a small particle for carrying medication to the diseased part of the body without affecting other parts.

Such technological changes have resulted in Thailand freely importing medical and healthcare technologies with no limitation or any mechanism for screening or inspecting the appropriateness of imported high-cost technologies. Moreover, policy-makers lack evidence-based information for making decisions on various technologies resulting in a lack of suitable selection process. And there is

no law related to the monitoring and control of the appropriate use of medical and health technologies, causing a rapid rise in healthcare spending, particularly for curative care for hospitalized patients. It was found that the costs of medical supplies/equipment imports rose from 2,493.2 million baht in 1991 to 15,799.1 million baht in 2005.

7.2 Utilization Efficiency, Diffusion and Equality, and Access to Technology

The weakness of the public sector is in controlling the use of high-cost technologies in a cost effective manner, doctors prescribing a diagnosis and treatment without due consideration for its worthiness which negatively affects professional ethics and for clients' confidence. Moreover, an investment is needed for personnel development and monitoring of the adverse effects of the utilization of high-cost technologies. Unequal distribution of medical equipment has also been noted, mostly clustered in major cities and more in the private sector, not the public sector (see Chapter 6, section 3 on health technologies). This has affected the access to high-cost health technologies of the poor and uninsured; for example, the poor (who have terminal stage of chronic renal failure) are not entitled to kidney dialysis service while the insured under the social security scheme or the civil servants medical benefit scheme have such entitlement.

8. Health Behaviours

Risk factors of Thai people have an impact on their lives and are a national problem affecting the country's economic and social security. It is noteworthy that in all groups of countries, risk factors related to behaviour are clearly a burden of diseases. In the group of developing countries with high mortality rates the top risk factor is malnutrition, while the group of more advanced developing countries face other risk behaviours of alcohol and tobacco use, and in the group of developed countries all risk factors are related to behaviour (Table 4.33).

Table 4.33 Top ten risk factors: percentage of disability-adjusted life years (DALYs) in three groups of countries, 2000

Order	Developing countries with high mortality rates	Percent	Developing countries with low mortality rates	Percent	Developed countries	Percent
1	Underweight	14.9	Alcohol	6.2	Smoking	12.2
2	Unsafe sex	10.2	Blood pressure	5.0	Blood pressure	10.9
3	Unsafe water, sanitation and hygiene	5.5	Smoking	4.0	Alcohol	9.2
4	Indoor smoke from solid fuels	3.6	Underweight	3.1	Cholesterol	7.6
5	Zinc deficiency	3.2	Overweight	2.7	Overweight	7.4
6	Iron deficiency	3.1	Cholesterol	2.1	Low fruit and vegetable intake	3.9
7	Vitamin A deficiency	3.0	Low fruit and vegetable intake	1.9	Physical inactivity	3.3
8	Blood pressure	2.5	Indoor smoke from solid fuels	1.9	Illicit drugs	1.8
9	Smoking	2.0	Iron deficiency	1.8	Unsafe sex	0.8
10	Cholesterol	1.9	Unsafe water, sanitation and hygiene	1.8	Iron deficiency	0.7
	Top 10 risk factors	49.9		30.5		57.8

Source: World Health Report 2002.

A study on major burdens of diseases of Thai people conducted in 1999 and 2004 by the International Health Policy Programme, using 15 leading risk factors for males and females, revealed that alcohol abuse and unsafe sex were the cause of burden of disease among males and unsafe sex and high body mass index were the cause of burden of disease among females (Table 4.34).

Table 4.34 DALYs from risk factors among Thai people, 1999 and 2004

Order	Risk factor	DALYS in males				Order	Risk factor	DALYs in females			
		2004		1999				2004		1999	
		DALYs		DALYs				DALYs		DALYs	
		($X10^5$)	Percent	($X10^5$)	Percent			($X10^5$)	Percent	($X10^5$)	Percent
1	Alcohol abuse	7.6	13	5.1	9	1	Unsafe sex	3.9	9	4.5	11
2	Unsafe sex	5.4	9	8.6	16	2	Hypertension	2.5	6	2.4	6
3	Smoking	5.0	9	4.4	8	3	High body mass index	2.5	6	2.3	6
4	Non-use of helmet	3.6	6	3.3	6	4	High Cholesterol	1.1	3	1.1	3
5	Hypertension	2.9	5	2.6	5	5	Non-use of helmet	0.8	2	0.7	2
6	High body mass index	1.4	2	1.3	2	6	Physical inactivity	0.7	2	0.6	2
7	High Cholesterol	1.2	2	1.1	2	7	Smoking	0.7	2	0.5	1
8	Low fruit and vegetable intake	1.1	2	0.9	2	8	Low fruit and vegetable intake	0.7	2	0.5	1
9	Substance abuse	0.7	1	3.3	6	9	Alcohol abuse	0.4	1	0.4	1
10	Physical inactivity	0.5	1	0.6	1	10	Air pollution	0.4	1	0.7	2
11	Air pollution	0.5	1	0.5	1	11	Unsafe water and sanitation	0.3	1	0.3	1
12	Unsafe water and sanitation	0.2	0	0.3	1	12	Substance abuse	0.2	0	0.4	1
13	Non-use of safety belt	0.2	0	0.3	1	13	Malnutrition, international standard	0.1	0	0.3	1
14	Malnutrition, international standard	0.2	0	0.4	1	14	Malnutrition, Thai standard	0.1	0	0.1	0
15	Malnutrition, Thai standard	0.1	0	0.2	0	15	Non-use of safety belt	0.0	0	0.1	0

* Male DALYs: N = 5.3 Million, Female DALYs: N = 3.9 Million

Source: Working Group on Burden of Disease and Risk Factors in Thailand. Office of the International Health Policy Programme, 2006.

It is noteworthy that most of the risks for disease burden are health behaviors which are further elaborated as follows:

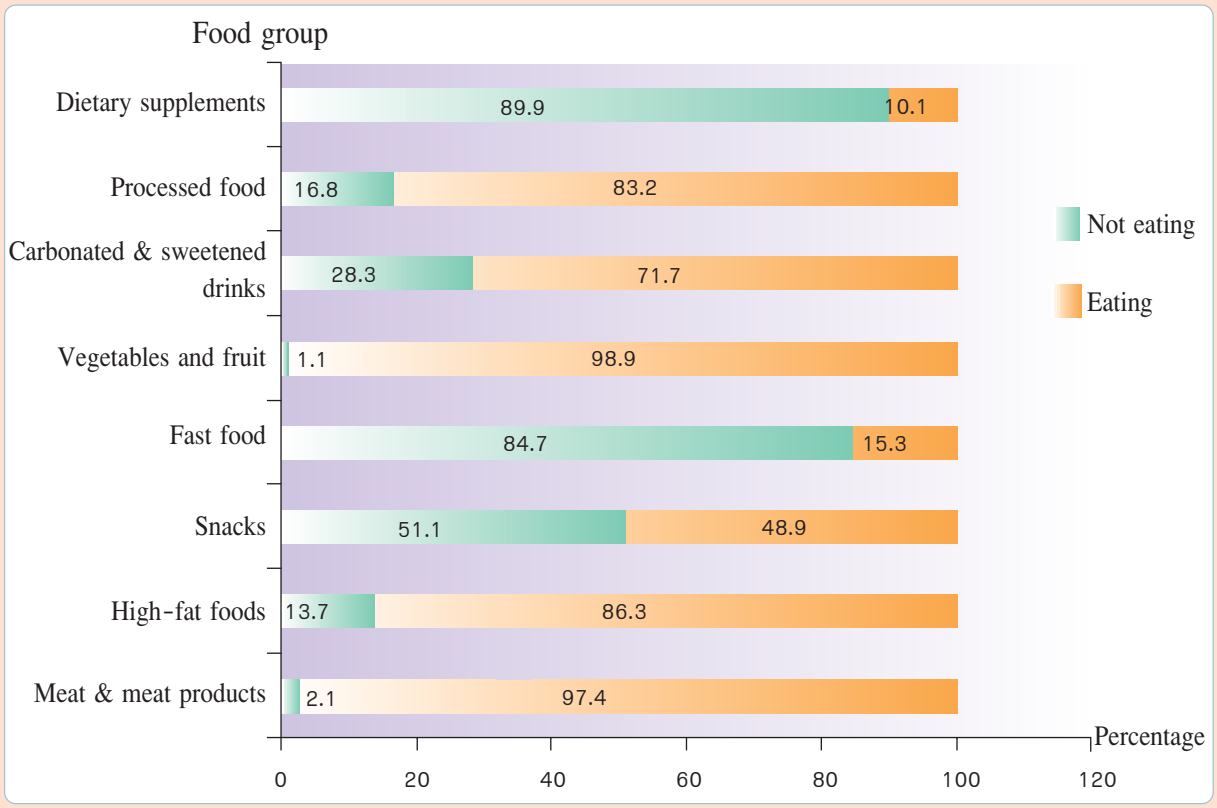
8.1 Food Consumption

The food consumption behaviors of Thai people have changed according to changing lifestyles and are different in urban and rural residents. Urban residents tend to take more meat and fat, while taking less vegetables and fruit. Teenagers prefer western foods to local or Thai food. More rushing lifestyles have pushed them to take ready-to-cook or semi-cooked food. The trend is rising in both urban and rural areas. Regarding food expenditures, Bangkok residents have 50% of their food spending on ready-to-eat or pre-cooked food while rural residents spend only 20% for such food.[10]

The 2005 survey on the types of food consumed by people aged 6 years and over conducted by the National Statistical Office revealed that the food groups that over 80% of respondents consumed were vegetables and fruit (98.9%), meat and meat products (97.4%), high-fat foods (86.3%), and processed foods (83.2%), followed by carbonated and sweetened drinks (71.7%), snacks (49.0%), while other groups were consumed in lower proportions, i.e. fast foods (15.3%) and dietary supplements (10.1%) (Figure 4.27).

[10] Patthanee Vinijjakul and Wongsawat Kosalwat. Food and Nutrition in Review and Revision of Strategic Plan for Health Research in Thailand, 2003.

Figure 4.27 Percentage of population aged six years and above and food consumption behaviour by food group



Source: Report on Thai People's Health Behaviour Survey, 2005: Food Consumption Behaviour. National Statistical Office.

However, the third round of the Thai people's health examination survey conducted in 2003-2004 revealed that Thais aged 15 years and over, both male and female, had a vegetable and food intake lower than the recommended daily requirement levels for health promotion and disease prevention (400-800 grams per day), i.e. 268 grams/day among males and 283 grams/day among females. The amounts consumed were found to be decreasing as they got older, lowest among the age group 80 and over at about 200 grams per day (Table 4.35).

Table 4.35 Amounts of daily fruit and vegetable intake in Thai people aged 15 years and above, by age and sex

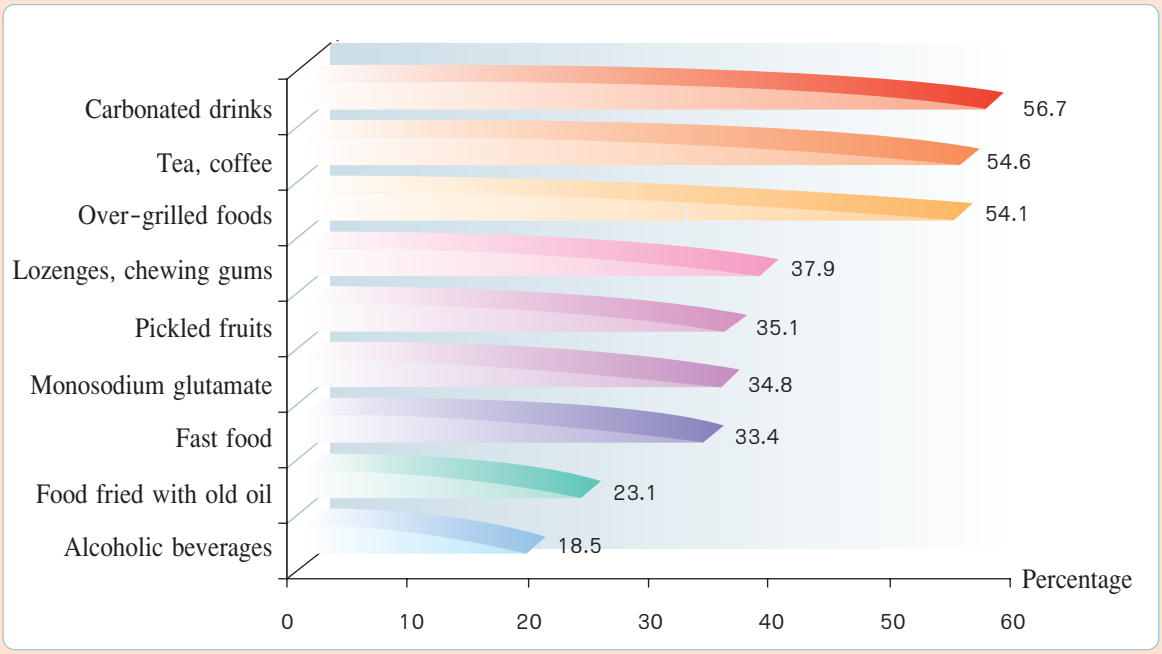
Age (years)	Average fruit and vegetable intake (grams/day)	
	Males	Females
15-29	285	300
30-44	272	293
45-59	261	283
60-69	238	245
70-79	216	215
80 years and over	203	193
Total	**268**	**283**

Source: Report on National Health Examination Survey, Third Round, Thailand (2003-2004). Ministry of Public Health.

A Cheevajit poll conducted on Bangkok residents in 2006 revealed that while the body was normal 38.7% of respondents had an eat-as-you-wish behaviour, eating the food that was not essential to health; indispensable items regularly consumed were carbonated drinks, tea, coffee, followed by over-grilled foods (Figure 4.28).

It was found that most people would change their food consumption behaviour when they got sick by avoiding spicy, fried and high-cholesterol foods and some meat but took more fruits and vegetables, some people would also take dietary supplements, vitamin C, vitamin B-complex, calcium and some medicinal herbs such as Fa Ta Lai Jone (green chiretta or Andrographis paniculata), Dok Kham Foi (safflower or Carthamus tinctorius), Ma Kham Khaek (senna or Cassia angustifolia) and Chinese traditional medicines. However, it is worrisome that 37.5% of respondents would revert to the food they liked with no nutritional consideration after they had recovered.

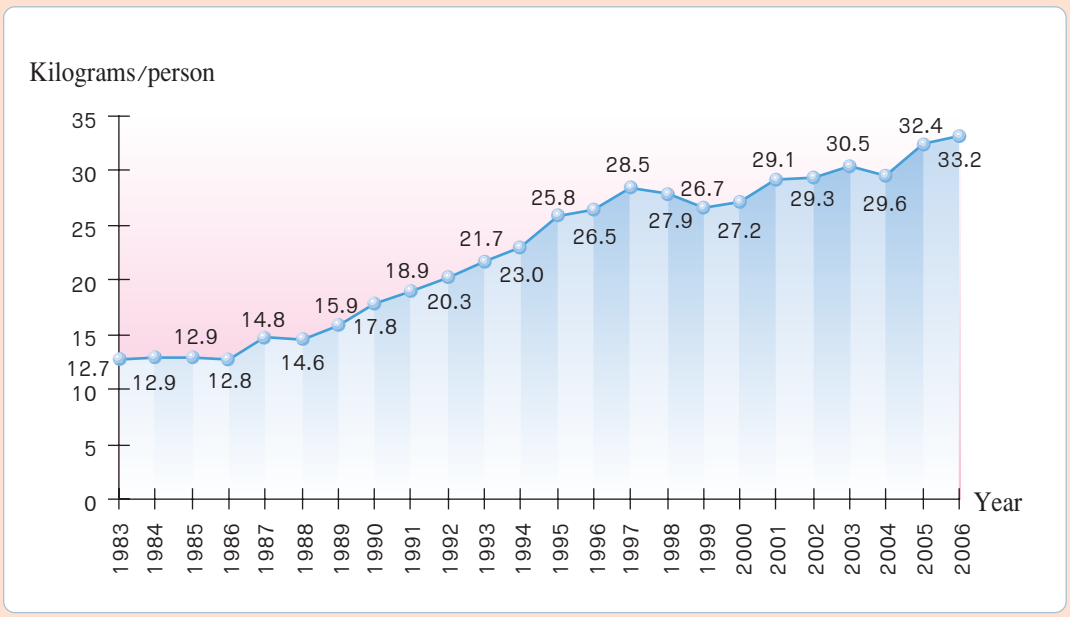
Figure 4.28 Food items that had to be regularly consumed



Source: Cheevajit Poll, Third Project. Amarin Printing & Publishing (Public Limited Company).

Besides, it was found that Thai people tended to consume more sugar and food prepared from flour and sugar. The sugar consumption rate during the past two decades has risen 2.6-fold from 12.7 kg/person/yr in 1983 to 33.2 kg/person/yr in 2006 (Figure 4.29).

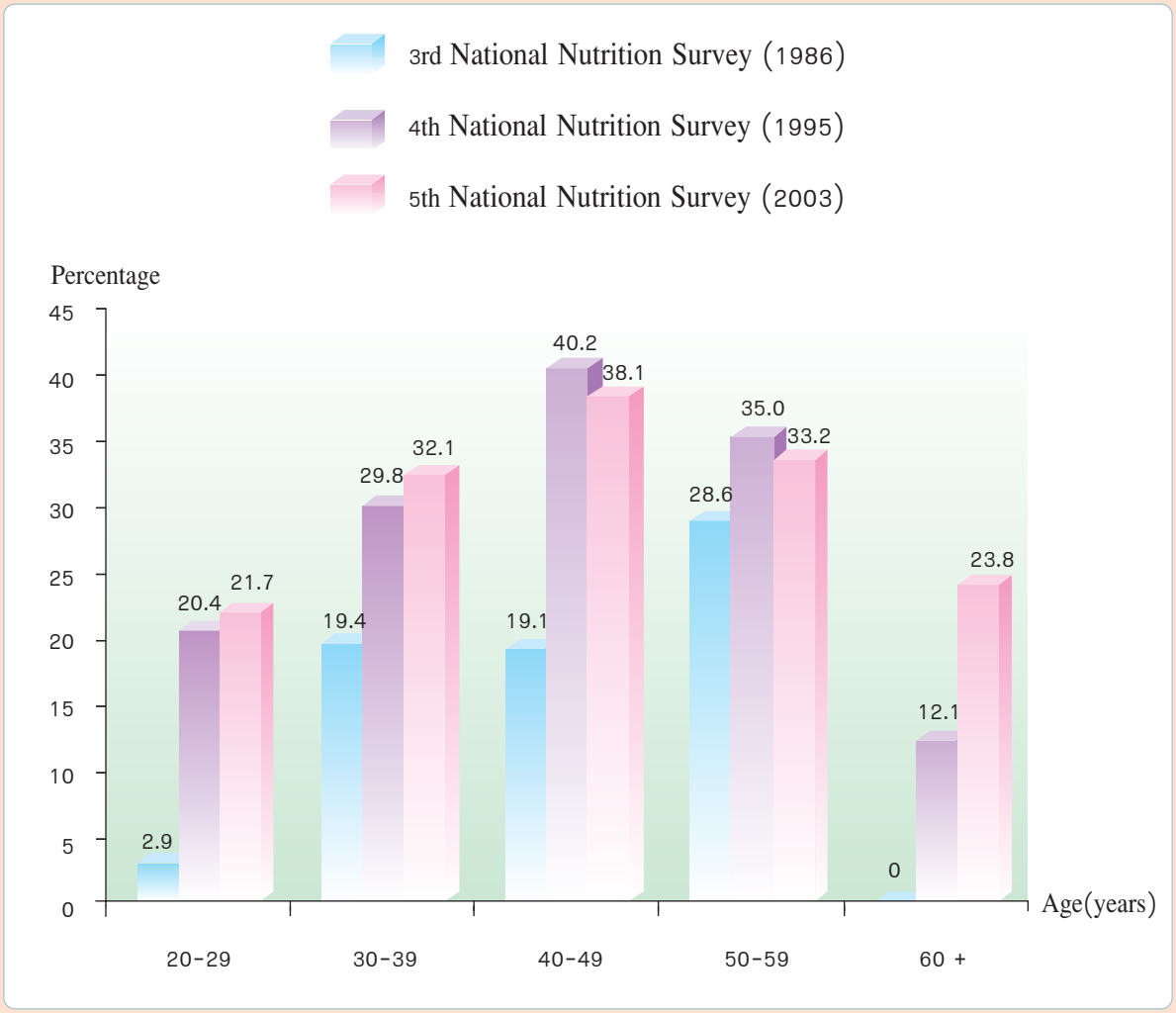
Figure 4.29 Quantity of sugar intake in Thailand, 1983-2006



Source: Production Management Centre. Office of the Sugar Cane and Sugar Commission.

Consuming food rich in fat content and calorie is a risk factor of cardiovascular diseases. According to the third through fifth national nutrition surveys in Thailand, the prevalence of obesity has been on the rise particularly in the age groups 20-29, 30-39 and 60 and over (Figure 4.30). An analysis of risk factors for cardiovascular diseases among Thai people aged 35-59 revealed a rising prevalence of people with high blood cholesterol, high blood sugar, overweight and obesity (Table 4.36). Bangkok residents, both males and females, had a highest prevalence of overweight and obesity, while the northern people had the lowest. The residents in municipal areas had a higher overweight/obesity prevalence, compared with rural residents.[11]

Figure 4.30 Prevalence rate of obesity in Thailand by age group, 1986, 1995, and 2003



Source: Department of Health, MoPH.

Note: Obesity in population aged >20 years: BMI ≥ 25 kilograms/square meter.

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[11] Piyamit Srithara et.al. Cardiovascular Research Group in Review and Revision of Strategic Plan for Health Research in Thailand, 2003.

Table 4.36 Changes and prevalence of cardiovascular disease risk factors in Thai people aged 35-59 years

Risk factor	1st health survey (1991-1992)	2nd health survey (1996-1997)	Inter-Asia study (2000-2001)	3rd health survey (2003-2004)
Cholesterol (mg/dl)	189	198	201	207
Blood sugar (mg/dl)	87	92	99	100
Body mass index (BMI) (kg/m^2)	22.8	23.8	24.4	24.6
Overweight (percent)	20	25	30	38
Obesity (percent)	5	8	9	10

Sources: 1. Piyamit Srithara et al. Cardiovascular Research Group in Review and Revision of Strategic Plan for Health Research in Thailand, 2003.

2. Report on National Health Examination Survey, Third Round, Thailand (2003-2004). Ministry of Public Health.

Note: Population adjustment for 2000.

Snack consumption tends to be rising among Thai children under 5 and primary schoolchildren, resulting in a high dental health prevalence. During 2000-2001, 87.4% of 6-year-old children entering the schooling system had on average 6.0 decayed, missing and filled teeth (DMFT) per child, compared with only 71.6% with 4.9 DMFT per child in 1984 (Tables 4.37 and 4.38). And during 1995-2001, the DoH's dental health survey revealed that only 6% to 15% of children aged 5-6 had no tooth decay and that on average 12-year-old children had 1.6 to 2 DMFT per child. Besides, a survey on sweetened food consumption behaviour of Thai children under 5 in 2006 revealed that 61.7% of the underfives preferred high-sugar snacks and drinks, the average sugar content in snacks and drinks was 40.4 grams/day, which is higher than the suitable sugar consumption level (not exceeding 24 gm/d). This has resulted in a poor child health status: 46.1% with caries and 10.6% overnourished.[12] Another survey on child and youth situation conducted in 2004-2005 revealed that 26.95% and 20.28% of primary schoolchildren consumed crispy snacks and carbonated drinks regularly, respectively.[13]

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[12] Sunee Wongkongkathep et al. Sweetened Food Consumption Behaviour in Thai Children Under 5, 2006.

[13] Ramjitti Institute. Child and Youth Situation Reports, 2004-2005, 2006.

Table 4.37 Percentage of people with caries by age group, according to National Dental Surveys, 1984, 1989, 1994 and 2000-2001

Age group (years)	Percentage			
	1984	1989	1994	2000-2001
3*	-	66.5	61.7	65.7
6*	71.6	83.1	85.1	87.4
6**	74.4	82.8	85.3	87.5
6	30.3	19.2	11.1	-
12	45.8	49.2	53.9	57.3
18	63.1	63.3	63.7	62.1
35 - 44	80.2	76.8	85.7	85.6
60 and over	95.2	93.9	95.0	95.6

Sources: Reports on the 2nd, 3rd, 4th, and 5th National Dental Health Surveys. Department of Health, MoPH.

Notes: * Baby or deciduous teeth ** Mixed (permanent and baby teeth)

Other age groups - only permanent teeth

Table 4.38 Average DMFT in various age groups according to National Dental Surveys, 1984, 1989, 1994 and 2000-2001

Age group (years)	Average DMFT (teeth/person)			
	1984	1989	1994	2000-2001
3*	-	4.0	3.4	3.6
6*	4.9	5.6	5.7	6.0
6**	0.5	0.3	0.3	-
12	1.5	1.5	1.6	1.6
18	3.0	2.7	2.4	2.1
35 - 44	5.4	5.4	6.5	6.1
60 and over	16.3	16.2	15.8	14.4

Sources: Reports on the 2nd, 3rd, 4th, and 5th National Dental Health Surveys. Department of Health, MoPH.

Notes: * Baby or deciduous teeth ** Mixed (permanent and baby teeth)

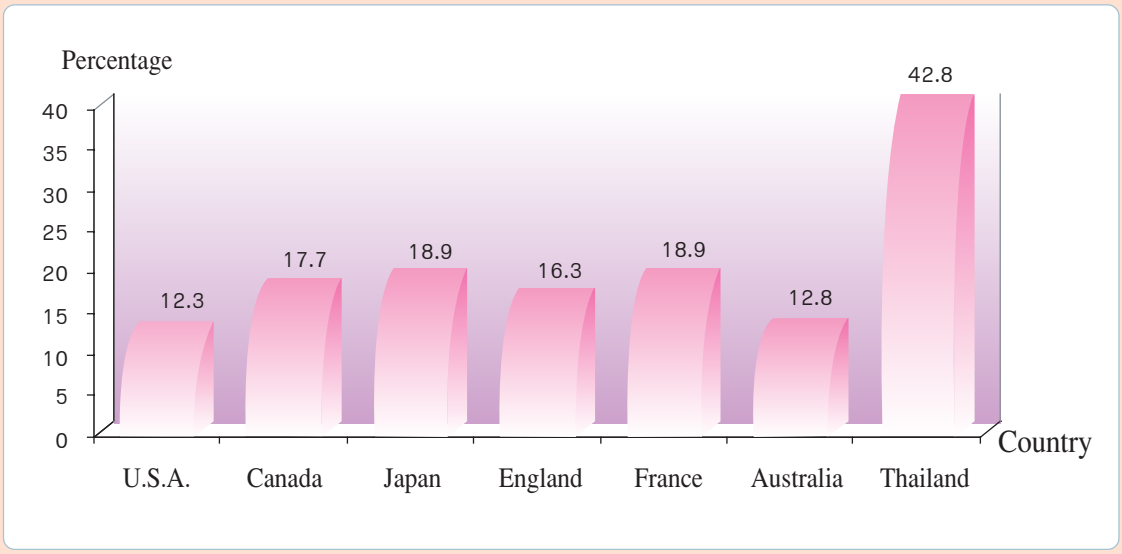
Other age groups - only permanent teeth.

8.2 Drug Consumption

In 2005, drug consumption of Thai people accounted for approximately 103,517 million baht in wholesale prices or 186,331 million baht in retail prices, or 42.8% of the overall national health expenditure (see Chapter 6, item 3, health technologies). This proportion is rather high, compared with only 10% to 20% in developed countries (Figure 4.31). During the period 1988-2005, the rising rates of drug consumption exceeded the increasing rates of national health spending and economic growth.

In general, an analysis of drug consumption patterns of Thai people revealed that about two-thirds of the consumption was done according to the decision or advice of professionals, such as doctors, pharmacists and other health personnel; the remainder was done as suggested by relatives, friends, or advertisements. Nevertheless, medication use according to the advice of health professionals is escalating (Table 4.39).

Figure 4.31 Proportion of expenditure on drugs and health in Thailand and other countries



Source: OECD Health Data 2006

Note: From OECD are data on OTC drug dispensary and outpatients, but for Thailand the data cover outpatient, inpatient and OTC drug use.

Table 4.39 Drug distribution in Thailand: percentage of drug values distributed through drug outlets

Type	1994 (Percent)	1995 (Percent)	1996 (Percent)	1997 (Percent)	1998 (Percent)	1999 (Percent)	2000 (Percent)	2001 (Percent)	2002 (Percent)	2003 (Percent)	2004 (Percent)	2005 (Percent)	2006 (Percent)
Drugstores	40	34	34	34	34	32	32	30	30	26	26	26	24
Public and private hospitals	43	46	52	52	52	58	58	60	60	64	64	64	66
Private clinics	10	15	9	9	9	} 7	} 7	} 8	} 8	} 9	} 9	} 9	} 8
GPO	2	2	2	2	2								
Others	5	3	3	3	3	3	3	2	2	1	1	1	2

Source: IMS Company Thailand.

No matter through whom the people get medication, it is evident that irrational use and over-use of drugs, particularly antibiotics, are found at all levels. A study on drug use in children with respiratory infections hospitalized nationwide revealed that 38.6% of the patients had ever taken antibiotics before coming to hospital. Other studies also indicated antibiotic use prior to visiting a doctor or health official, particularly for cases with respiratory and gastrointestinal tract diseases. Most of the cases had used drugs unnecessarily or inadequately.[14] Some inpatients with infectious diseases were given antibiotics without suitable indications (Table 4.40), partly due to advertising influence (Figure 4.32) while very little effort has been made to disseminate drug information to the public though various media including newspaper, radio, television and magazines. Although such efforts have been made more intensively, most people get drug information from drug business operators.

Besides, the third round health examination survey in Thailand (2003-2004) revealed that 8 to 9 million Thai people aged 15 years and above were on a certain kind of medication for at least a month. The proportion of people with regular drug use were found to increase with age, a higher proportion in females than in males. In addition, it was found that among people of all ages, the most commonly used medicine was "painkillers" (the older the more was used), followed by "health tonics" whose prevalence also rose with age (Table 4.41).

Table 4.40 Use of antibiotics without appropriate indications, compiled from 11 reports

Drug group	Study site (hospital)	Study period	No. of patients	Inappropriate use (percent)
Ceftriaxone	Phra Pokklao	Oct 98 - Sep 99	9	77.8
Parenteral antibiotics	Ban Mi	June - Nov 97	203	39.4
Ciprofloxacin	Lampang	Nov - Dec 95	24	50.0
Parenterala antibiotics	Chainat	Jan - June 93	219	44.7
Ceftazidime	Yasothon	July - Sep 99	48	60.4
Ceftazidime	Lampang	July - Sep 96	49	40.0
Cephalosporins	Taksin	Mar 91 - Feb 92	144	13.2-15.3
Ceftazidime	Nakhon Ratchasima	May - Aug 96	114	25.0
Ceftazidime	Phra Phutthachinnarat	Mar - Apr 2000	59	37.5
Ceftriaxone	Lampang	Oct 94	17	41.0
Cephalosporins	Uttaradit	Oct 95 - Sep 96	258	70.2

Source: Drug System in Thailand, 2002.

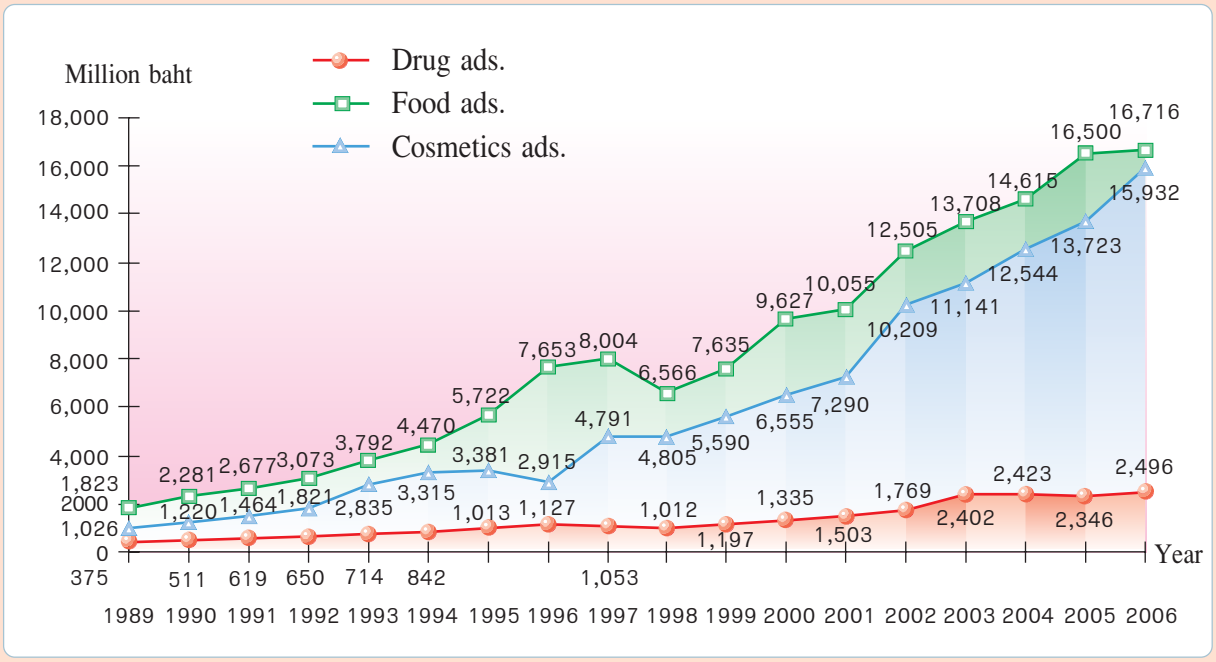
[14] Committee on Drug System Study Project in Thailand. Drug System in Thailand, 2002

Table 4.41 Percentage of people regularly taking medication by age, sex and type of medicine

Age (years)	Percentage of people on medication					
	Painkillers	Tranquilizers	Sedatives	Anti-obesity	Tonics	Others
Males						
15-29	1.4	0.4	0.4	0.2	1.5	3.3
30-44	3.6	0.4	0.8	0.1	0.8	7.8
45-59	5.2	0.5	0.7	0.2	1.5	15.8
60-69	7.9	0.5	1.3	0.0	4.0	27.6
70-79	8.0	0.6	1.8	0.1	6.2	29.8
80+	8.4	0.3	2.7	0.2	6.6	34.4
All ages	**3.8**	**0.4**	**0.7**	**0.1**	**1.7**	**10.6**
Females						
15-29	2.2	0.1	0.1	0.3	2.6	8.9
30-44	3.8	0.4	0.5	0.1	2.1	14.4
45-59	6.5	0.8	2.1	0.1	3.3	26.1
60-69	10.0	1.5	2.9	0.2	6.7	33.3
70-79	12.7	1.1	2.7	0.1	8.4	36.7
80+	10.6	0.5	2.2	0.0	10.6	30.2
All ages	**4.9**	**0.5**	**1.0**	**0.2**	**3.4**	**18.1**

Source: Report on National Health Examination Survey, Third Round, Thailand (2003 -2004). Ministry of Public Health.

Figure 4.32 Billings of drug, food and cosmetic advertisements, 1989-2006



Source: Media Data Resources (MDR).

Notes: 1. Food means alcoholic beverages, milk, energy drinks, snacks, soft drinks, candies, seasonings, instant noodles, coffee, food, cooking oil, canned food, dairy products, chocolates and cigarettes, liquid foods and others.

2. Cosmetic means shampoo, soap, general cosmetic, body powder and skin moisturizing cream.

8.3 Tobacco Consumption

Although Thailand has got laws related to tobacco products control, including laws on protection of health of non-smokers, the number of smokers is still high. In 2006, Thai people totally smoked 36,367 million cigarettes or an average of 87.6 packs/person/year (Table 4.42), rising from 71 packs/person/year for 2001-2002. The proportion of cigarette smokers changed slightly, decreasing from 20.5% in 1999 to 20.3% in 2006, the increase was noted for both males and females. It is noteworthy that although the smoking rate among youths (aged 15-24 years) is lower than those among the working-age group (aged 25-59 years) and the elderly (aged 60 and older), it was found that their smoking rate for 2001-2006 was higher than that for 1999-2001 in both males and females. This has indicated that smoking has more widely spread among youths.

However, when considering the age of first smoking, males started smoking at a younger age then did females, but there is a tendency that males would start later while females would start earlier (Tables 4.43 and 4.44). This is consistent with the WHO forecast which indicates that the

smoking rate among females in developing countries in 2025 will increase from 8% to 20%, but the rate among males will drop from 60% to 45%. A survey conducted the Kasikorn Research Centre[15] revealed that, in 2003, the motivation for smoking among Bangkok residents included stress, alcohol use, anger, uneasiness, visiting night spots and seeing movies with smoking scene. It was also found that one-third of youths aged under 13 years indicated seeing a movie with a smoking scene was the cause of their smoking desire. A regular male smoked 9.0-10.6 cigarettes per day on average; males smoking more than females (Figure 4.33). Regarding the type of cigarettes smoked the most, it was found that after the economic crisis a number of smokers shifted from using local brands to foreign brands and self-rolled cigarettes (Table 4.45). The market share of imported cigarettes has increased from 4.1% in 1997 to 22.6% in 2006; vice versa the market share of cigarettes produced by the Tobacco Monopoly of Thailand has dropped from 95.9% in 1997 to 77.4% in 2006 (Table 4.46). The smoking of self-rolled cigarette might result from people's lower income after the economic crisis; and more people turned away from factory-produced cigarettes to self-rolled ones.

Tobacco use has also had an impact on the economy. A study conducted by the Kasikorn Research Centre[15] found that, for Bangkok residents, spending on cigarettes was 15.07% of total monthly income. On average a Bangkok resident spent about 150 baht a month on cigarettes, the value of cigarette market in Bangkok was about 500 million baht for 2003. Despite intensive campaigns against smoking during the past two decades, the cigarette spending has been rising steadily. According to a World Bank report, tobacco causes an economic loss worth 200,000 million US dollars worldwide each year, which is higher than the revenue from tobacco sales; one-third of which occurred in developing countries.[16]

In Thailand, approximately 42,000 people die each year from smoking-related illnesses or 115 deaths per day (6 deaths per hour).[17] Research studies have revealed that smoking is the cause of serious illnesses; 90% of male cancer patients, 82% of larynx cancer patients, and 80% of pharynx cancer patients had ever smoked.

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[15] Kasikorn Research Centre. Smoking Behaviours of Bangkok's Residents, 2003.

[16] Prakit Vateesatogkit. What Will Occur With Tobacco in the Future. In New Generations Do Not Smoke Journal, 7: Jan-Feb 2000.

[17] Based on the estimates calculated by Prof. Dr. Prakit Vateesatogkit. Statistics on Smoking among Thai People. Action on Smoking and Health Foundation (photocopied document).

Table 4.42 Tobacco consumption of Thai people, 1988-2006

Description	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Total tobacco consumption (million cigarettes)	34,090	38,718	38,887	38,825	40,068	42,245.2	44,849.6	45,755.3	47,235.9	48,336.6	39,057.1	36,166.1	36,469.7	29,502	29,682	31,366	34,174	34,237	36,367
consumption (packs/person/year)	91.5	100.6	98.4	95.8	96.5	101.7	108.0	110.2	113.8	116.4	98.8	87.1	87.8	71.0	71.5	75.5	82.3	82.4	87.6
Quantity imports (million packs)	-	-	-	12	51	60	71	71	77	99	172	261	239	261	262	293	508	574	454
Value of imports (million bath)	-	-	-	-	716.8	968.5	787.0	1,032.1	952.2	907.3	2,755.6	4,289.8	4,586.3	6,151.9	6,136	6,472	8,698.7	9,810.3	9,548.8
Cigarettes domestically produced																			
Million cigarettes	32,505.41	37,198.47	38,235.21	39,719.55	39,591.40	41,219.63	44,542.46	43,183.83	47,751.79	47,125.75	34,568.73	32,023.63	31,796.45	29,742.35	29,598.67	31,498.95	33,685.42	34,030.0	29,148.80
Million packs	1,625.27	1,859.92	1,911.76	1,986.0	1,979.57	2,060.98	2,227.12	2,159.19	2,387.59	2,356.28	1,728.44	1,601.18	1,589.82	1,487.12	1,479.93	1,574.95	1,684.27	1,701.50	1,457.44
Sales value (million bath)	18,674	20,996	23,640	26,910	27,613	28,890	35,117	34,869	40,340	46,977	44,670	40,700	42,600	42,617	45,219	46,739	45,062	44,541	42,273
Tobacco tax (million bath)	11,467	12,989	14,785	17,060	16,991	17,439	22,375	22,911	26,134	28,296	25,816	23,100.6	23,540.2	23,912.2	25,641	26,349	33,922	34,936	32,250
Profits sent to Ministry of Finance(million bath)	1,069	2,595	2,064	2,244	3,202	2,802	2,954	3,588	3,445	3,600	4,657	5,000	5,310	5,232	4,958	5,948	6,232	6,090	5,211
Excise tax (percent)	35-56.5	35-56.5	35-56.5	55	55	60	60	62	68	70	70	71.5	71.5	75	75	75	75	79	79

Sources : - Thailand Tobacco Monopoly and the Excise Department, Ministry of Finance

- Statistics on Trade and Economic Indicattors of Thailand, Department of Business Economics.

Table 4.43 Number and proportion of smokers, 1976-2006

Year	Population (millions)	No. of smokers			Proportion of smokers (percent)		
		Total	Males	Females	Total	Males	Females
1976	28.7[1]	8.6	7.7	0.9	30.1	54.7	6.1
1981	35.1[1]	9.8	9.0	0.8	27.8	51.2	4.4
1986	38.0[2]	10.4	9.6	0.8	27.4	50.4	4.2
1988	40.5[2]	10.1	9.4	0.7	25.0	46.7	3.5
1991	43.3[2]	11.4	10.6	0.8	26.3	49.0	3.8
	38.3[3]	11.3	10.5	0.8	29.7	55.3	4.3
1993	45.7[2]	10.4	9.8	0.6	22.8	43.2	2.5
	40.7[3]	10.4	9.8	0.6	25.5	48.5	2.8
1996	48.0[2]	11.2	10.6	0.6	23.4	44.6	2.5
1999	49.9[2]	10.2	9.6	0.6	20.5	38.9	2.4
2001	51.2[2]	10.5	10.0	0.5	20.6	39.3	2.2
2003	35.8[2]	7.7	7.1	0.6	21.6	44.1	2.9
2004	49.4[3]	11.3	10.7	0.6	21.1	40.1	2.4
2006	54.5[2]	11.0	10.3	0.7	20.3	38.8	2.6

Sources: 1. Health and Welfare Surveys. National Statistical Office.

2. Preliminary Results of Survey on Population's Tobacco and Liquor Consumption, 2001. National Statistical Office.

Notes: 1. [1]Population aged 10 and over.

[2]Population aged 11 and over.

[3]Population aged 15 and over.

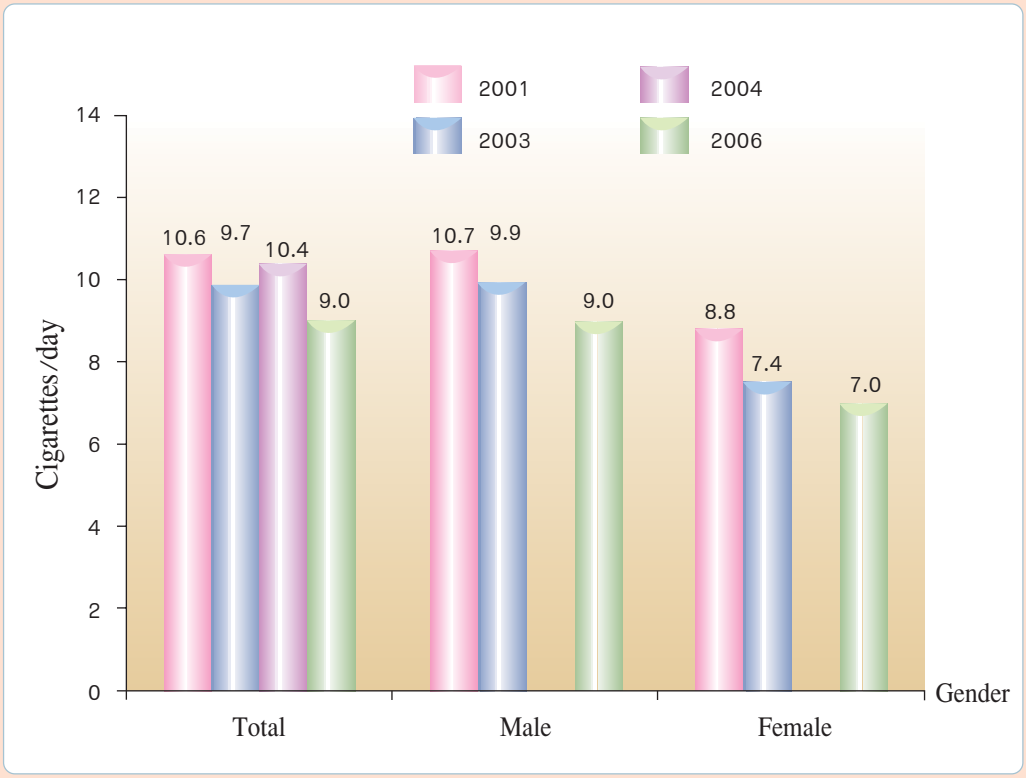
2. In the 2003 Health and Welfare Survey, the interview was undertaken only when the interviewee was present; thus, the total population surveyed was smaller than the overall population of the country.

Table 4.44 Proportion of regular smokers in population aged 11 years and over by age group and gender, 1999, 2001, 2003, 2004 and 2006

Age group (years)	Proportion of smokers (percent)															Change in regular smoking rates					
	1999			2001			2003			2004			2006			1999-2001			2001-2006		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
11-14	0.2	0.5	-	0.1	0.2	0.1	0.2	0.2	0.1	0.2	0.3	0.0	0.4	0.6	0.2	-0.1	-0.3	+0.1	+0.3	+0.4	+0.1
15-24	12.3	24.0	0.3	13.5	26.0	0.6	15.2	32.1	0.9	15.1	29.0	0.8	14.1	26.4	1.3	+1.2	+2.0	+0.3	+0.6	+0.4	+0.7
25-59	26.3	49.8	3.0	26.2	49.9	2.6	25.3	51.8	3.4	26.3	49.6	3.0	25.0	48.3	3.0	-0.1	+0.1	-0.4	-1.2	-1.6	+0.4
60 and over	23.3	45.1	4.8	21.1	40.9	4.3	21.5	43.3	4.6	20.6	40.3	3.9	19.2	38.1	4.0	-2.2	-4.2	-0.5	-1.9	-2.8	-0.3
Total	20.5	38.9	2.4	20.6	39.3	2.2	21.6	44.1	2.9	21.1	40.1	2.4	20.3	38.8	2.6	+0.1	+0.4	-0.2	-0.3	-0.5	+0.4
Age at first smoking	18.2	17.9	22.2	18.5	18.3	21.9	18.4	18.2	21.5	18.4	18.2	21.7	18.3	18.2	20.2						

Sources: 1. Report on Survey of Population's Tobacco Use Behaviours, 1999. National Statistical Office.
2. Report on Survey of Population's Tobacco and Liquor Consumption, 2001. National Statistical Office.
3. Reports on Health and Welfare Surveys, 2003 and 2006. National Statistical Office.
4. Report on Survey of Population's Tobacco and Liquor Consumption, 2004. National Statistical Office.

Figure 4.33 Average number of cigarettes smoked per day by a regular smoker aged 11 years and over by gender, 2001, 2003, 2004 and 2006



Sources: 1. Preliminary Results of Population's Smoking and Drinking Behaviours Survey, 2001. National Statistical Office.

2. Health and Welfare Surveys, 2003 and 2006. National Statistical Office.

3. Report on Population's Smoking and Drinking Behaviours Survey, 2004. National Statistical Office.

Note: For 2004, survey on population aged 15 years and over; no analysis by sex.

Table 4.45 Percentage of population aged 11 and over using tobacco products regularly by product category most frequently used

Product category (most frequently used)	Before the crisis		After the crisis		
	1993	1996	1999	2001	2004
Local cigarettes	44.9	55.6	44.3	46.0	46.2
Imported cigarettes	0.9	1.1	1.3	1.2	1.3
Self-rolled cigarettes	54.0	42.5	54.1	52.7	50.0
Cigars	< 0.1	0.2	0.1	} 0.1	} 2.5
Pipe	0.1	0.2	0.2		
Unknown	0.1	0.4	-		

Sources: 1. Report on Health and welfare Survey. National Statistical Office.

2. Report on Survey of Population's Tobacco Use Behaviours, 1999. National Statistical Office.

3. Preliminary Results of Population's Tobacco and Liquor Consumption Survey, 2001. National Statistical Office.

4. Report on Population's Tobacco and Liquor Consumption Survey, 2004. National Statistical Office.

Table 4.46 Market shares of domestic and imported cigarettes, 1991-2006

Fiscal year	Market share (percent)	
	Local cigarettes	Imported cigarettes
1991	99.4	0.6
1992	97.4	2.5
1993	97.2	2.8
1994	97.0	3.0
1995	96.7	3.2
1996	96.8	3.1
1997	95.9	4.1
1998	91.5	8.4
1999	86.4	13.5
2000	86.7	13.3
2001	85.0	15.0
2002	84.7	15.3
2003	85.9	14.1
2004	80.1	19.9
2005	77.7	22.3
2006	77.4	22.6

Source: Thailand Tobacco Monopoly, Ministry of Finance.

8.4 Alcoholic Beverage Consumption

Alcohol abuse is number one cause of burden of disease among males and number nine among females in Thailand (Table 4.34). Thai people tend to consume more alcoholic beverages. In the past decade, alcohol use rose from 721.8 million litres in 1988 to 1,604.3 million litres in 1997, a two-fold increase. After the economic crisis, alcohol consumption had a declining trend from 1,689.8 million litres in 1998 to 1,340.9 million litres in 1999. However, after the economic recovery in 2006, alcohol use appears to rise to 2,479.7 million litres. The Food and Agriculture Organization estimated that the amount of alcohol consumed per capita per day of Thai people in 2000 was ranked fifth, compared with those in France, the U.S.A., Japan and the Philippines[18] (Figure 4.34).

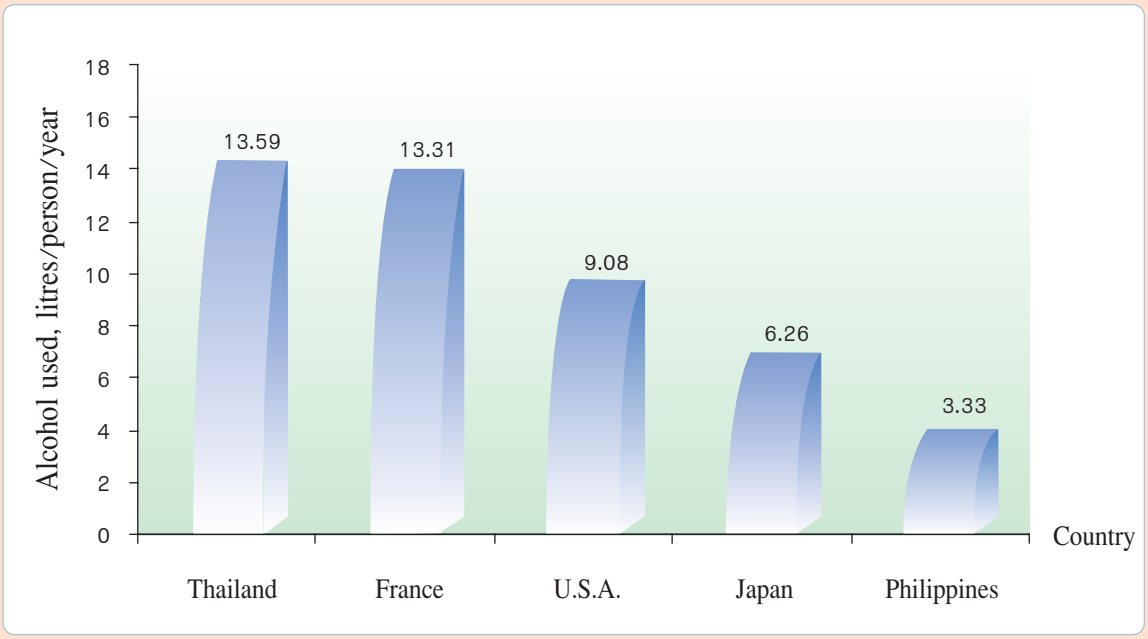
By type of alcoholic beverages, the rate of liquor consumption seemed to be stable while those for beer and wine were rising (Table 4.47 and Figure 4.35) as a result of the government's free trade policy beginning in 1992. After that many more beer brewery and winery plants have been operational (Figure 4.36); coupled with lower prices, the sales volumes and amounts of beer consumed were higher than those for liquor.

[18] Yongyout Kachondham. Advertisements of Alcoholic Drinks and Losses. Thai Health Promotion Foundation, 2004.

A survey conducted by the NSO revealed a similar result, i.e. the proportion of drinkers increased from 31.5% in 1991 to 35.3% in 2004, but dropped to 29.2% in 2006 (Table 4.48). It is noteworthy that during the ten-year period (1996-2006), the proportion of female drinkers has risen in all age groups, particularly those aged 15-19 years, increasing from 1.0% to 2.9% (Table 4.49).

Regarding drinking frequency among drinkers, it was found that about half of them drank occasionally, but the proportion of regular drinkers was rising from 8.6% in 1996 to 13.0% in 2006 (Table 4.50). The 2003/2004 health examination survey revealed that, among the population aged 15 years and above, 16.6% of males and 2.1% of females drank alcohol at a dangerous level, on overage 39.7 gm/d for males and 6.3 gm/d for females. A future study conducted by Dr. Virasakdi Chongsuvivatwong of the Faculty of Medicine, Prince of Songkla University, revealed that alcohol use has been rising in both sexes and all age groups, females having a chance to drink more alcohol, more than 3-4 times per week. The reasons are socializing, following friends' behaviour, testing and being influenced by advertisements. The values or billings of alcohol advertisements have been rising, particularly during 2000-2006, to more than 2000 million baht each year (Table 4.51). Thus, in 2006 the government proposed an alcohol consumption control law to the National Legislative Assembly so as to ban alcohol advertisements in all kinds of media and to ban the sale of alcohol to any one aged less than 20 years.

Figure 4.34 Comparison of alcohol consumption per person, 2000



Source: WHO Alcohol Consumption Database, referred to in Yongyout Kachondham. "Advertisements and Consumption of Alcohol and Losses." Thai Health Promotion Foundation, 2003.

Table 4.47 Alcohol consumption in Thailand, 1988-2006

Category	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2004	2005	2006
Total liquor consumption (million litres)	561.85	499.61	611.92	681.76	670.92	678.01	557.63	743.82	795.63	736.61	734.87	666.27	641.48	760.55	711.28	616.93	595.57	477.95
Average liquor consumption per person (litres)	15.7	13.9	16.3	17.6	17.0	16.7	13.8	17.4	18.4	16.7	16.5	14.7	14.0	16.4	14.7	12.6	12.2	9.7
Total beer consumption (million litres)	157.80	178.53	260.80	278.47	320.15	419.75	509.36	616.38	714.89	863.91	950.69	666.27	1,148.40	1,149.18	1,248.55	1,535.99	1,620.68	1,983.67
Average beer consumption per person (litres)	4.4	5.0	6.9	7.2	8.1	10.3	12.1	14.4	16.5	19.6	21.3	14.7	25.1	24.8	25.8	31.5	33.3	40.3
Total wine consumption (million litres)	2.14	0.89	0.83	1.49	1.52	1.51	1.39	2.39	4.40	3.85	4.30	8.39	12.91	16.34	19.20	27.04	26.50	18.80
Average wine consumption per person (litres)	0.06	0.03	0.02	0.04	0.04	0.04	0.03	0.06	0.10	0.09	0.10	0.20	0.30	0.35	0.40	0.55	0.54	0.38
Total alcohol consumption (million litres)	721.80	679.04	873.56	961.73	992.59	1,099.28	1,088.39	1,362.60	1,514.93	1,604.38	1,689.87	1,340.94	1,802.81	1,926.08	1,979.03	2,170.95	2,242.76	2,479.70
Average alcohol consumption per person (litres)	20.2	18.9	23.3	24.8	25.2	27.1	25.9	31.9	35.0	36.4	37.9	29.5	39.3	41.6	40.9	44.7	46.1	50.3
Amount of imported liquor(thousand litres)	-	-	-	-	12,783.3	14,801.3	18,165.9	20,700.4	33,334.5	32,749.2	17,467.4	28,728.5	39,728.3	48,921.7	57,154.1	NA	NA	NA
Taxes on imported liquor(million bath)	-	-	-	-	1,105.5	1,227.2	1,671.1	1,603.3	2,536.6	2,525.0	1,959.9	2,998.5	3,358.3	5,377.7	6,146.1	7,918.24	7,741.39	8,245.50

Source: The Excise Department, ministry of Finance.

Note: Average consumption per person aged 15 and over.

Table 4.48 Number and proportion of alcoholic beverage drinkers, 1991-2006

Year	Population (millions)	No. of drinkers (millions)			Proportion of drinkers (percent)		
		Total	Males	Females	Total	Males	Females
1991	39.5	12.4	10.5	1.8	31.5	53.7	9.5
1996	43.4	13.7	11.9	1.7	31.6	55.4	8.1
2001	46.9	15.3	13.0	2.3	32.6	55.9	9.8
2003	35.8	12.7	9.8	2.8	35.5	60.8	14.5
2004	49.4	16.1	13.6	2.5	35.3	59.3	11.7
2006	54.5	15.9	13.3	2.6	29.2	50.3	9.1

Sources: 1. Reports on Health and Welfare Surveys, 1991, 1996, 2001, 2003 and 2006. National Statistical Office.

2. Report on Smoking and Drinking Survey, 2004. National Statistical Office.

Note: In the 2003 Health and Welfare Survey, the interview was undertaken only when the interviewee was present; thus, the total population surveyed was smaller than the overall population of the country.

Table 4.49 Alcohol drinking rate among population aged 11 and over by age and sex

Age group (years)	1991		1996		2001		2003		2004		2006	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
11-14	-	-	0.2	0.05	-	-	0.5	0.4	0.5	0.3	0.9	0.4
15-19	21.7	2.1	20.8	1.0	19.9	1.9	33.5	5.6	25.5	3.3	24.2	2.9
20-24	59.5	5.4	56.0	5.7	55.8	7.2	70.4	11.8	59.7	10.1	58.1	8.2
25-29	66.7	9.2	67.6	6.9	68.1	10.2	75.7	16.8	72.8	13.1	64.2	9.8
30-34	68.6	11.9	67.7	9.5	67.0	12.3	76.5	20.0	72.9	13.5	66.1	12.0
35-39	66.2	15.3	69.0	12.2	69.2	14.2	73.3	19.2	73.6	17.6	64.8	14.3
40-49	65.1	15.6	65.8	12.9	67.5	14.2	73.0	21.7	73.7	17.4	64.6	13.2
50-59	56.1	14.2	59.9	10.1	58.7	11.5	64.5	14.4	70.2	13.5	56.3	10.0
60 and over	38.0	8.5	36.8	6.3	37.0	5.7	41.9	8.6	62.7	10.4	33.2	5.9
Total	**53.7**	**9.5**	**50.1**	**7.4**	**55.9**	**9.8**	**60.8**	**14.5**	**59.3**	**11.7**	**50.3**	**9.1**

Source: A reanalysis of the Health and Welfare Survey Database. National Statistical Office.

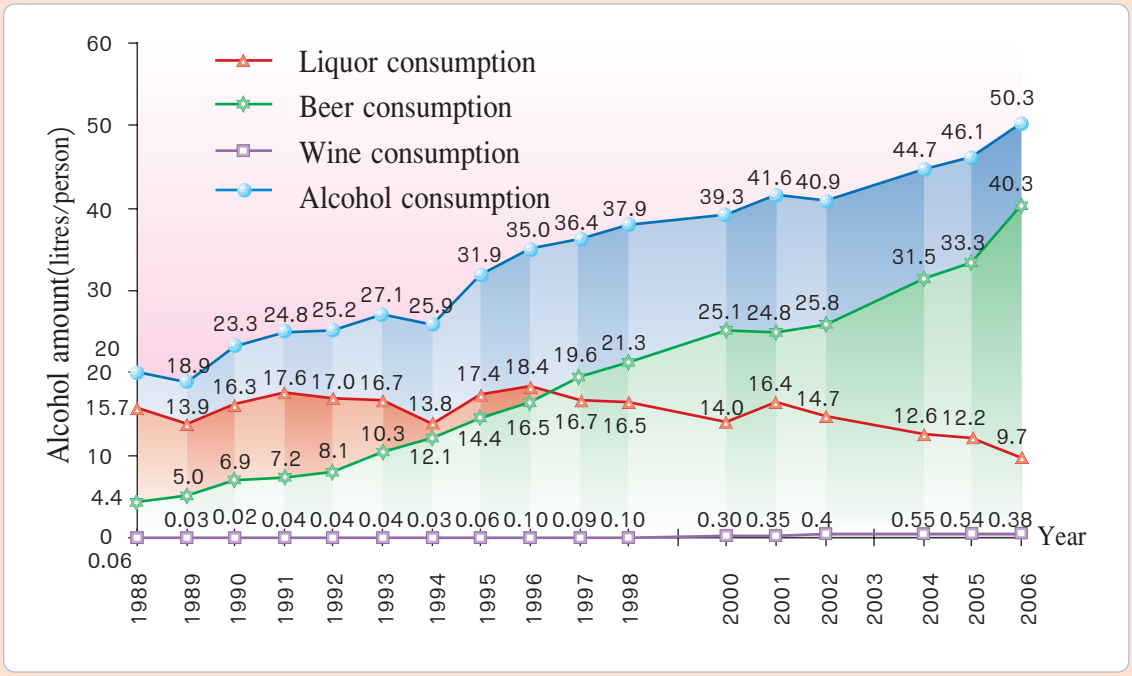
Table 4.50 Percentage of drinking population by frequency of drinking, 1996, 2001, 2003, 2004 and 2006

Drinking frequency	1996[1]	2001[2]	2003[1]	2004[2]	2006[2]
Every day	8.6	7.9	9.4	9.5	13.0
Quite frequent (3-4 times/wk.)	10.7	9.9	10.7	10.2	11.2
Some day (1-2 times/wk.)	17.4	17.2	17.7	18.6	21.1
1-2 times/month	16.4	15.3	12.2	16.3	13.2
Occasionally	46.2	49.4	50.0	45.5	41.5
Unknown	0.6	0.3	-	-	-

Sources: 1. Reports on Health and Welfare Surveys, 1996, 2003 and 2006. National Statistical Office.
2. Report on Population's Smoking and Drinking Behaviours Survey, 2001. National Statistical Office.

Notes: [1]Population aged 15 years and over.
[2]Population aged 11 years and over.

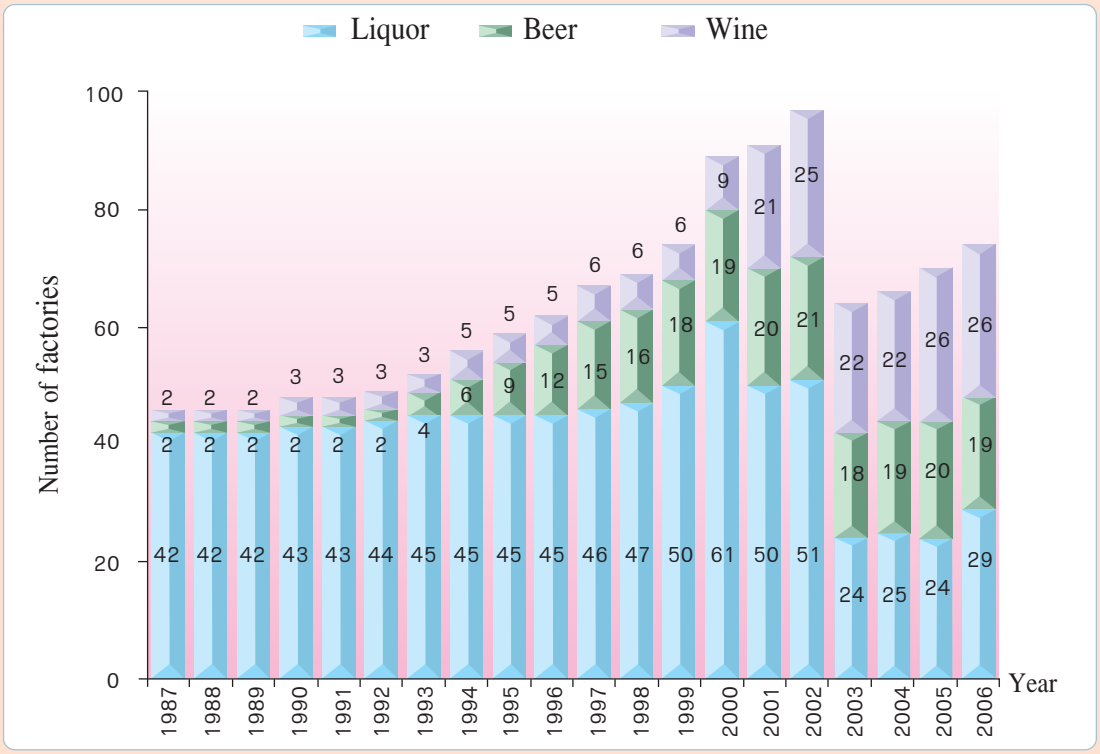
Figure 4.35 Sales quantities of liquor, beer and wine, and amount of alcohol consumed per person aged 15 years and over, 1988-2006



Source: The Excise Department, Ministry of Finance.

Note: Average consumption per person aged 15 years and over.

Figure 4.36 Numbers of liquor, beer and wine factories, 1987-2006



Source: Department of Industrial Works, Ministry of Industry.

Note: In 2003-2006, the number of liquor factories decreased due to factory closure and merger.

Table 4.51 Alcohol advertisements billings, 1989-2006

Year	Advertisement billings (million baht)	Increase (percent)
1989	255	-
1990	347	+36.1
1991	460	+32.6
1992	514	+11.7
1993	705	+37.2
1994	772	+9.5
1995	1,318	+70.7
1996	2,169	+64.6
1997	1,859	-14.3
1998	1,264	-32.0
1999	1,812	+43.4
2000	2,522	+39.2
2001	1,910	-24.3
2002	2,180	+14.1
2003	2,025	-7.1
2004	2,007	-0.9
2005	2,302	+14.7
2006	2,000	-13.1

Source: Media Data Resources (MDR).

8.5 Consumption of Caffeine Drinks

As a result of all kinds of sales promotion, the volume of caffeine drinks consumed rose from 131.10 million litres in 1992 to 310.05 million litres in 1997. During the economic crisis, the consumption of such drinks dropped markedly, but after the economic recovery, the consumption rose again to 991.06 million litres in 2006 (Table 4.52).

Table 4.52 Volumes of caffeine drinks (energy drinks) in Thailand, 1992-2006

Year	Production volume (million litres)	Sales volume (million litres)	Per capita consumption (litres/yr.)	Change in per capita consumption (percent)
1992	138.40	131.10	3.32	-
1993	173.75	329.26	8.10	+144.0
1994	183.62	181.84	4.33	-46.5
1995	209.31	217.08	5.08	+17.3
1996	180.87	182.92	4.22	-16.9
1997	308.08	310.05	7.03	+66.6
1998	134.73	126.12	2.82	-59.9
1999	174.59	155.44	3.42	+21.3
2000	337.56	332.47	7.25	+112.0
2001	364.84	355.14	7.66	+5.6
2002	366.30	433.59	8.95	+16.8
2003	445.47	433.21	8.90	-0.6
2004	741.35	786.80	16.14	+81.3
2005	1,020.81	968.07	19.88	+23.2
2006	1,003.80	991.06	20.12	+1.2

Source: The Excise Department, Ministry of Finance.

Note: Per capita consumption among population aged 15 years and over.

In 2000, the Food and Drug Administration, the Institute of Nutrition of Mahidol University, and the Health Systems Research Institute jointly conducted a survey on consumption behaviour of caffeine drinks among Thai people aged 12 years and over. It was found that approximately two-fifths of respondents (38.6%) drank caffeine drinks, approximately two-thirds (66.6%) drank coffee or tea, and approximately three-fourths (77.0%) drank carbonated caffeine drinks. Moreover, it was found that the prevalence of Thais drinking all three kinds of drinks was 23.7% of respondents, 36.6% for males and 11.1% for females, four times higher in males (Table 4.53); the reasons being for sleepiness prevention, refreshment and favouring their good taste.

Table 4.53 Number and prevalence of caffeine drinkers aged 13-70 years by sex

Drinking behaviour	Caffeine drinkers			Coffee and tea drinkers			Carbonated caffeine drinkers		
	Males	Females	Total	Males	Females	Total	Males	Females	Total
Drinking	1,257	442	1,699	1,541	1,592	3,133	1,656	1,925	3,581
Used to drink	266	192	458	202	209	411	175	200	375
Never drink	648	1,830	2,478	428	663	1,091	338	337	675
Total	2,171	2,464	4,635	2,171	2,464	4,635	2,169	2,462	4,631
Prevalence									
Drinking	57.9%	17.9%	36.7%	71.0%	64.6%	67.6%	76.3%	78.2%	77.3%
Used to drink	12.3%	7.8%	9.9%	9.3%	8.5%	8.9%	8.1%	8.1%	8.1%
Never drink	29.8%	74.3%	53.5%	19.7%	26.9%	23.5%	15.6%	13.7%	14.6%
Adjusted Prevalence*									
Drinking	59.8%	17.8%	38.6%	70.1%	63.1%	66.6%	76.3%	77.6%	77.0%
Used to drink	10.9%	7.5%	9.2%	9.1%	8.3%	8.7%	7.6%	7.7%	7.6%
Never drink	29.3%	74.7%	52.3%	20.8%	28.6%	24.8%	16.1%	14.7%	15.4%

Sources: Food and Drug Administration, Institution of Nutrition of Mahidol University and Health Systems Research Institute. Report on Consumption Behaviours of Thai Drinking Caffeine Drinks, 2000.

Note: *Adjusted prevalence was calculated based on the proportion of the population by sex.

8.6 Substance Abuse

The narcotic problem is getting more and more complex in relation to economic and social changes by ramifying into communities, business facilities or even educational institutions. In Thailand, despite the fact that there are numerous legal measures and continuos campaigns for drug control and suppression, the illicit drug problem is still prevalent. Currently, the major narcotic widely used is methamphetamine or "ya ba" in Thai. Although the country is encountering the economic crisis, drug trafficking is on the rise. Significant examples include a rising number of methamphetamine-crime arrests, especially in northern border areas where the proportion of arrests has risen from 16.7% in 1995 to 46.0% in 2006 (Table 4.54).

Table 4.54 Statistics of methamphetamine seizures, 1993-2006

Year	Whole country (tablets)	The North	
		Tablets	Percent
1993	7,000,000	40,000	0.6
1994	4,000,000	600,000	15.0
1995	6,000,000	1,000,000	16.7
1996	9,000,000	3,500,000	38.9
1997	15,000,000	9,000,000	60.0
1998	31,770,127	17,689,136	55.7
1999	49,887,050	33,137,431	66.4
2000	83,000,000	34,000,000	41.0
2001	93,800,000	55,670,540	59.3
2002	95,900,000	37,810,500	39.4
2003	71,400,000	33,227,800	46.5
2004	31,169,919	10,021,603	32.1
2005	17,225,511	7,375,668	42.8
2006	13,480,000	6,195,800	46.0

Source: Office of the Narcotics Control Board.

In 2003 the number of new drug abuse treatment admissions to drug dependence treatment facilities was highest as the government stepped up efforts to send drug addicts into treatment facilities more than those in 2001-2002 (Table 4.55). The serious concern, however, is a remarkable increase in the number of students taking drugs, specially stimulant or methamphetamine, escalating from 0.2% in 1985 to 1.5% in 1999 or a 7.5-fold increase (Table 4.56).

Table 4.55 Number of substance abuse treatment admissions at dependence treatment facilities in Thailand, 1987-2006

Year	No. of all admissions	No. of readmissions	New admissions	
			No.	Percentage of total admissions
1987	57,874	42,748	14,895	25.7
1988	61,218	46,766	13,779	22.5
1989	60,000	44,048	13,723	22.9
1990	58,327	41,942	13,984	24.0
1991	66,465	46,253	18,398	27.7
1992	63,978	44,816	19,162	30.0
1993	82,620	51,053	29,468	35.7
1994	80,618	49,644	30,189	37.4
1995	101,145	61,490	38,565	38.1
1996	81,050	50,774	29,223	36.1
1997	62,362	39,075	21,956	35.2
1998	73,079	45,001	28,060	38.4
1999	64,232	37,150	27,082	42.2
2000	67,155	38,778	28,377	42.3
2001	72,646	41,265	31,381	43.2
2002	68,623	32,772	35,851	52.2
2003	319,748	n.a.	n.a.	n.a.
2004	41,499	n.a.	n.a.	n.a.
2005	43,343	n.a.	n.a.	n.a.
2006	49,772	11,323	38,449	77.2

Sources: 1. Department of Medical Services, MoPH.
2. Department of Health Service Support, Ministry of Public Health.

Note: During 2003-2005, there was a change in the system for drug abuse monitoring, no data were collected on the type of drug abuse treatment admissions.

Table 4.56 Percentage of secondary school students with substance abuse, 1985-1999

Types of drug/ narcotic	1985 (n=155,541)	1987 (n=30,097)	1989 (n=4,986)	1996 (n=15,306)	1999 (n=24,110)
Tobacco	9.16	6.73	7.62	7.60	5.28
Liquor	9.79	5.96	7.97	14.00	13.56
Marijuana	1.05	0.92	1.78	1.18	0.80
Inhalants	0.52	1.78	2.38	0.85	0.44
Stimulants or methamphetamines	0.18	0.73	0.60	1.64	1.52
Dry liquor (LSD)	0.19	0.28	0.28	0.55	0.37
Tranquilizers	0.12	0.26	0.40	0.92	0.42
Heroin	0.74	0.12	0.46	0.33	0.19

Source: Survey on Substance Abuse among Secondary School Students. Department of General Education and Office of the Narcotics Control Board, 1999.

According to the estimates on the number of students with illicit drug use nationwide by the ABAC-KSC Internet Research Institute (ABAC Poll) in 2001, about 6.2% of students had drug use behaviour. Methamphetamine was the drug that they used the most (58.5%; Table 4.57).

Table 4.57 Estimated number of students using drugs by drug category, 2001

Rank	Narcotic category	Estimated number of students	Percent
1	Methamphetamines	219,284	58.5
2	Marijuana	158,065	42.2
3	Tranquilizers, e.g. Domicum, Valium	125,918	33.6
4	Inhalants, rubber glue, lacquer	62,354	16.6
5	"Ecstasy" drug	42,443	11.3
6	"Love" drug	39,349	10.5
7	"K" drug (ketamine)	32,655	8.7
8	Heroin	28,402	7.6
9	Opiates	20,807	5.6
10	Cocaine	18,249	4.9
11	Morphine	18,231	4.9

Source: Estimation of Students Using Drugs: A Case Study of Students from All Educational Institutions Nationwide. ABAC-KSC Internet Research Institute (ABAC Poll), 2001.

Note: There were totally 374,653 students using drugs.

However, after the government implemented the war on drug policy in 2001, the Office of the Narcotics Control Board estimated that the proportion of drug users had declined from 16.4% in 2001 to 6.9% in 2003, a more-than-50% decrease (Table 4.58).

Table 4.58 Number of substance abusers nationwide by type of use duration, 2001 and 2003

Substance	2001			2003		
	Abusers in thousands (and percent)			Abusers in thousands (and percent)		
	Ever used	Ever used in 1 year	Ever used in 30 days	Ever used	Ever used in 1 year	Ever used in 30 days
Any kind of drug	**7,312.2(16.4)**	**1,942.1(4.3)**	**998.7(2.2)**	**3,155.5(6.9)**	**455.5(1.0)**	**257.8(0.6)**
Methamphetamines	3,491.6(7.8)	1,092.5(2.4)	490.3(1.1)	1,094.0(2.4)	83.8(0.2)	34.1(0.1)
Drug E or Love	360.1(0.8)	46.5(0.1)	17.7(0.0)	19.7(0.3)	13.3(0.0)	7.4(0.0)
Ketamine	40.7(0.1)	7.2(0.0)	1.2(0.0)	23.4(0.1)	1.0(0.0)	0.04(0.0)
Cocaine	52.8(0.1)	4.9(0.0)	1.1(0.0)	29.4(0.1)	7.4(0.0)	1.0(0.0)
Marijuana	5,425.3(12.1)	667.2(1.5)	210.0(0.5)	2,019.1(4.4)	83.4(0.2)	18.7(0.0)
Krathom (Mitragyna speciosa)	2,105.8(4.7)	643.8(1.4)	364.2(0.8)	1,160.0(2.6)	344.7(0.8)	221.6(0.5)
Opium	907.0(2.0)	38.6(0.1)	12.3(0.0)	323.7(0.7)	0.6(0.0)	0.3(0.0)
Heroin	274.2(0.6)	22.7(0.1)	9.4(0.0)	192.6(0.4)	1.4(0.0)	-
Thinner, glue, benzene	933.9(2.1)	199.7(0.4)	101.2(0.2)	447.9(1.1)	21.2(0.1)	13.2(0.0)

Source: Office of the Narcotics Control Board. Report on Estimation of Drug Users in Thailand, 2003.

8.7 Physical Activity and Relaxation

8.7.1 Physical Activity

The 2004 survey of the National Statistical Office revealed that **approximately 29.1% of Thai people regularly exercised**[19] (Table 4.59). However, when considering the trend in regular exercise for 1987-2004, it was found that **Thai people had a fluctuating rate of exercise**, ranging from 20 to 30% on average (Table 4.59), **males exercising more than females** (Figure 4.37) and more than half of the people exercising were under 15 years of age; the prevalence of exercise decreased with age (Figure 4.37).

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[19] Exercise or physical activity means any movement of the body or part of body for health promotion, entertainment, and socialization, using simple activities or simple rules, such as walking, running, rope-jumping, body-stretching, and weight-lifting (except for exercise while working or body movement in daily life activities).

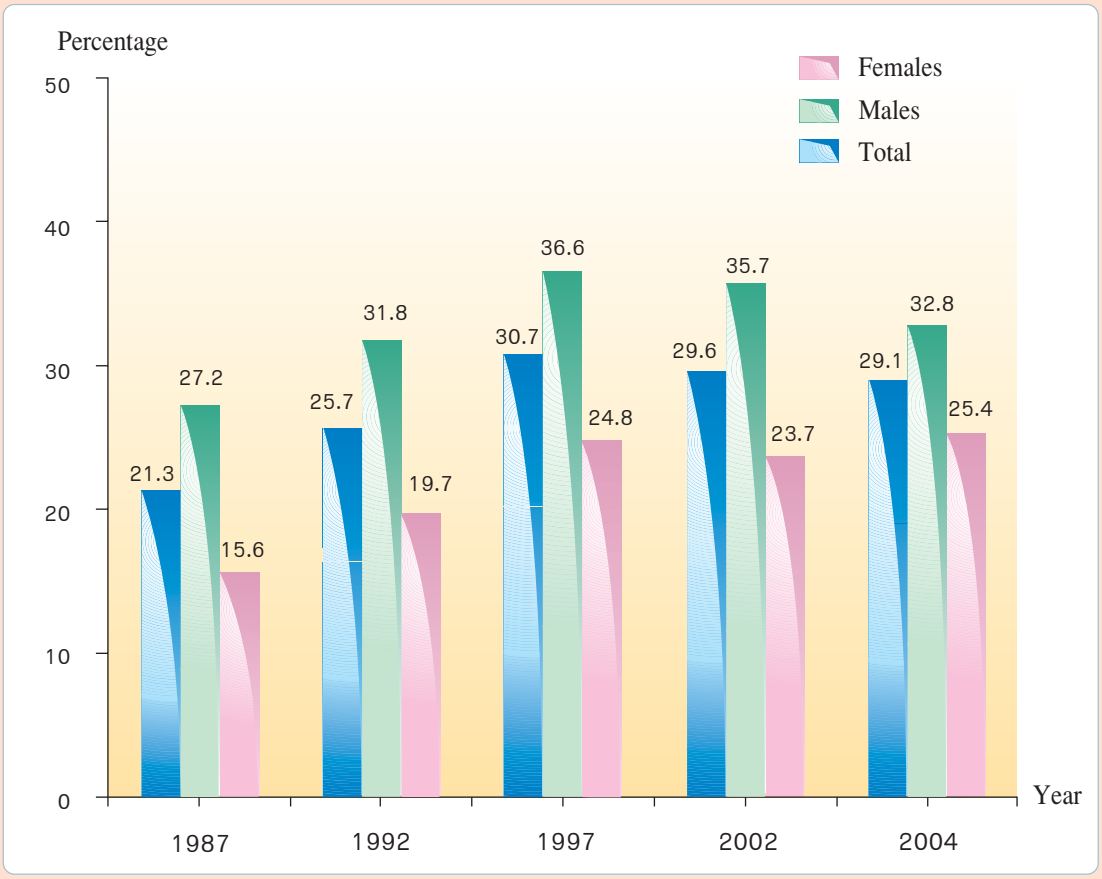
Table 4.59 Percentage of Thai people who regularly exercised, 1987-2004

Year	People regularly exercising	
	Percent	Change (percent)
1987	21.3	-
1992	25.7	+20.7
1997	30.7	+19.5
2002	29.6	-3.6
2004	29.1	-1.7

Sources: 1. Reports on Surveys of People Aged 6 Years and Above Playing or Watching Sports, 1987, 1992, 1997 and 2002. National Statistical Office.

2. Report on Exercise Behaviour of People Aged 11 Years and Above, 2004. National Statistical Office.

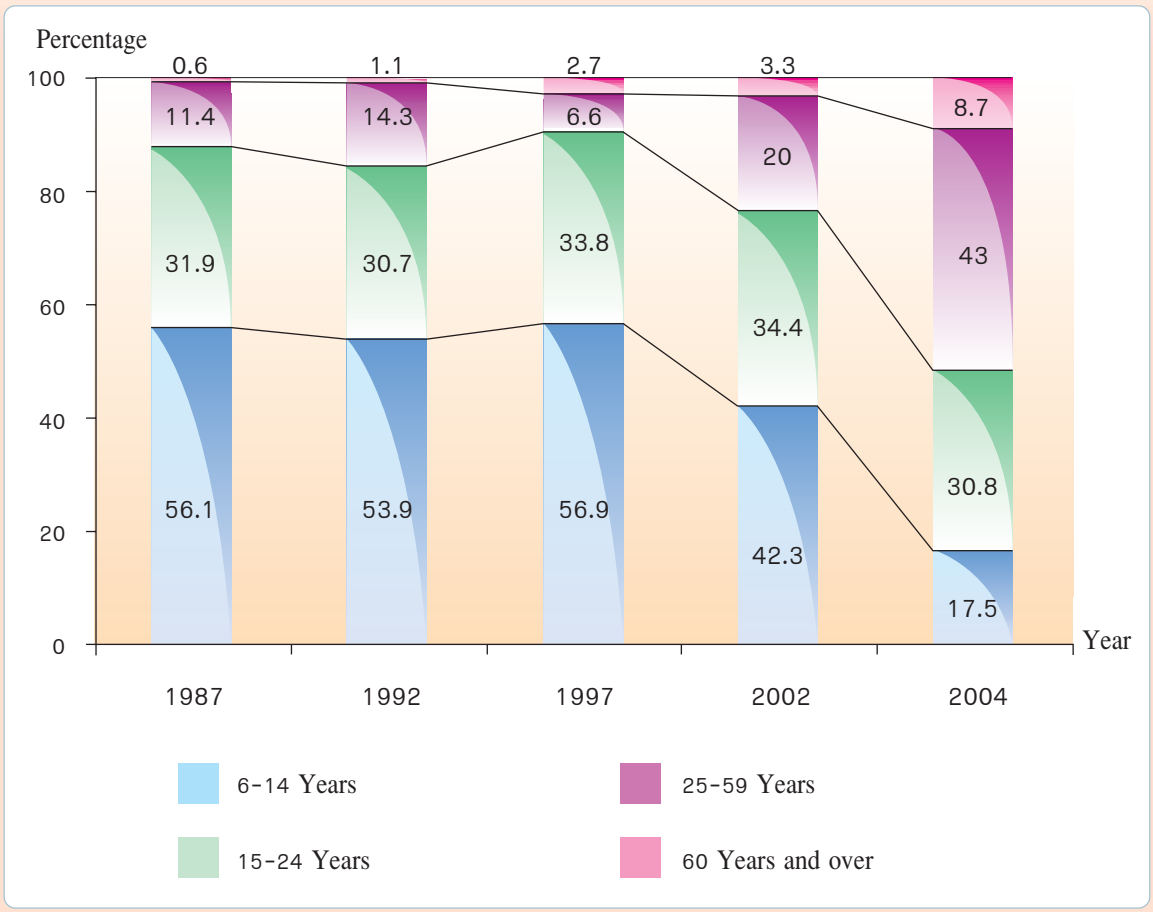
Figure 4.37 Percentage of Thai people who regularly exercised, by sex, 1987-2004



Sources: 1. Reports on Surveys of People Aged 6 Years and Above Playing or Watching Sports, 1987, 1992, 1997 and 2002. National Statistical Office.

2. Report on Exercise Behaviour of People Aged 11 Years and Above, 2004. National Statistical Office.

Figure 4.38 Percentage of Thai people who regularly exercised by age group, 1987-2004

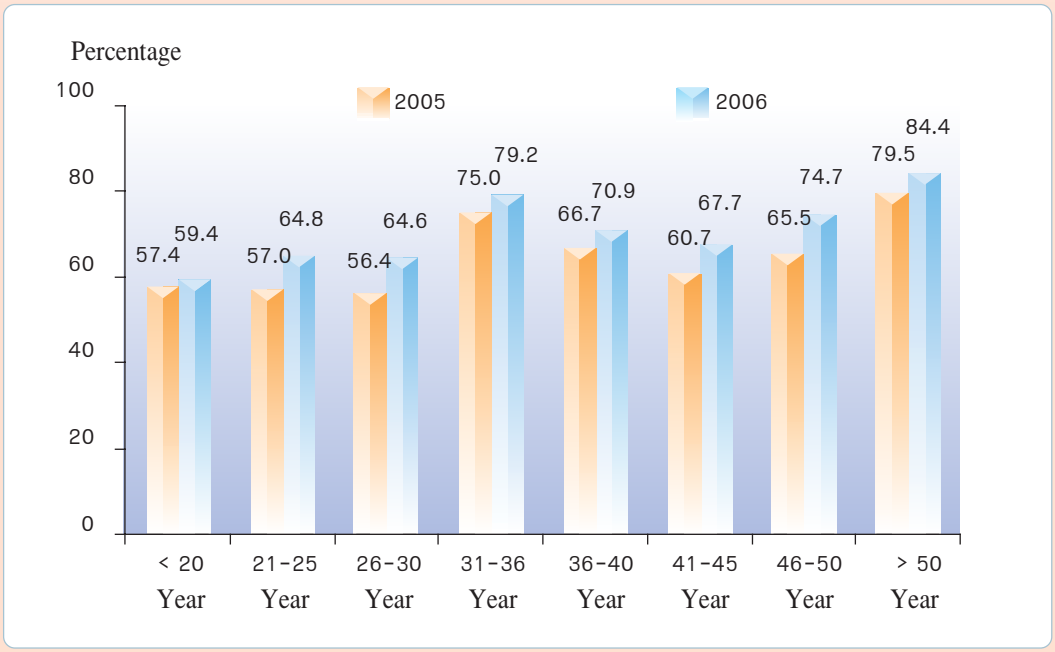


Sources: 1. Reports on Surveys of People Aged 6 Years and Above Playing or Watching Sports, 1987, 1992, 1997 and 2002. National Statistical Office.

2. Report on Exercise Behaviour of People Aged 11 Years and Above, 2004. National Statistical Office.

Besides, exercise bahaviour surveys on Bangkok residents conducted by Cheewajit Poll in 2005 and 2006 revealed that the prevalence of exercise increased by 4.2% on average and the time spent was 2.44 hrs per session, a two-fold increase. By age group, teenagers were the laziest to exercise, an increase of only 2.0% (Figure 4.39). Most students tend to overlook self-healthcare as they deem that they are already healthy and thus do not pay any attention to exercise as expected. This is different from the working-age group who are specially interested in exercise, always getting themselves fit as a way to get relieved from stress.

Figure 4.39 Proportion of Bangkok residents regularly exercising, 2005-2006



Source: Cheewajit Poll, third Project. Amarin Printing and Publishing (Public Limited Company).

Considering the exercise behaviour based on the criteria of **physical activity for health, it was found that more than 60% of the people exercise more than three days a week and approximately 80% to 90% exercise for 30 minutes or longer each day** (Tables 4.60 and 4.61). Regarding the continuity of exercise, it was found that 67.5% of the people had exercised continuously for over seven months and 18.1% for 1 to 3 months (Figure 4.40).

Table 4.60 Percentage of population aged 6 years and over exercising each week, 1987-2004

Days exercised	1987	1992	2002	2004
<3 days/wk	38.4	37.0	31.8	34.2
3+ days/wk	61.6	62.9	68.2	65.8
Total	**100.0**	**100.0**	**100.0**	**100.0**

Sources: 1. Reports on Surveys of People Aged 6 Years and Above Playing or Watching Sports, 1987, 1992 and 2002. National Statistical Office.

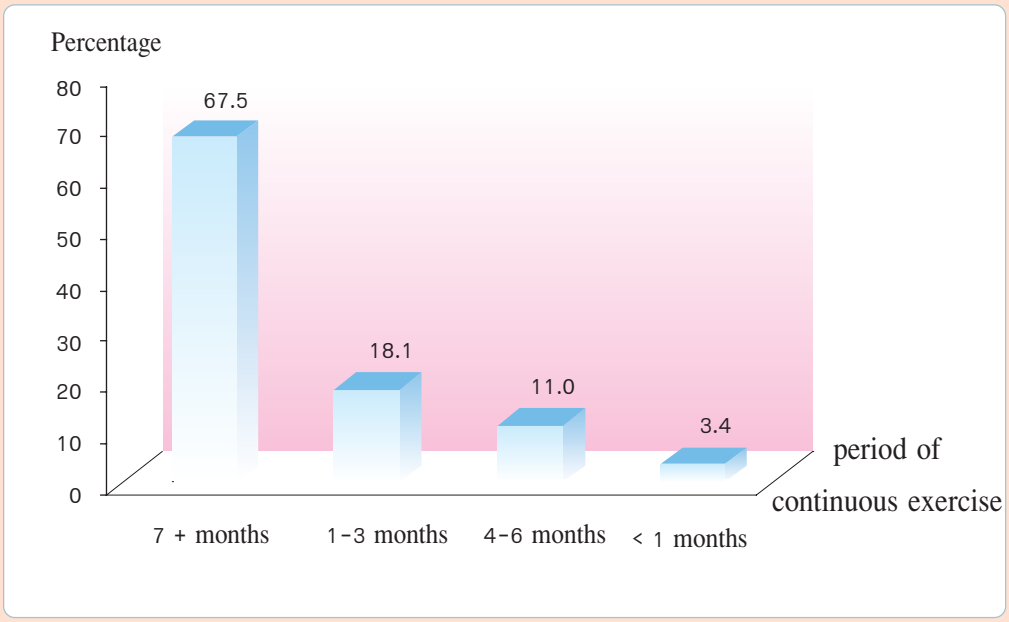
2. Report on Exercise Behaviour of People Aged 11 Years and Above, 2004. National Statistical Office.

Table 4.61 Percentage of population aged 6 years and over exercising each day, 1987-2002

Time period Exercised each day	1987			1992			1997			2002		
	Total	Males	Females	Total	Males	Females	Total	Males	Females	Total	Males	Females
< 30 minutes	25.8	21.3	34.9	21.1	17.7	26.5	12.0	10.3	14.7	4.1	3.0	5.7
≥ 30 minutes	74.2	78.7	65.1	78.8	82.2	73.5	87.9	89.6	85.2	95.9	97.0	94.3
Unspecified	-	-	-	0.1	0.1	-	0.1	0.1	0.1	-	-	-
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Sources: Reports on Surveys of People Aged 6 Years and Above Playing or Watching Sports, 1987, 1992, 1997 and 2002. National Statistical Office.

Figure 4.40 Percentage of Thai people regularly exercising by period of time of continuous exercise, 2004



Source: Report on Exercise Behaviour Survey on People Aged 11 Years and Over, 2004. National Statistical Office.

The types of exercise most favored are jogging and aerobics while other sports and walking are less popular (Table 4.62). Where they want to play or exercise depends on the type of exercise, their own readiness and venue's convenience. However, it was found that **sports playgrounds of educational institutions** are mostly used for exercising, followed by empty spaces in a community and residential compounds.

Table 4.62 Percentage of people that exercised by type of exercise, 2001 and 2004

Type	2001	2004
Playing sports	55	51
Jogging	16	18
Aerobics	4	14
Walking	16	12

Source: Report on Exercise Behaviour Survey on People Aged 11 Years and Over, 2004. National Statistical Office.

The Ministry of Public Health has set a policy to promote and support the people to exercise simultaneously across the country and organized four major campaigns on exercise for health. Continuous support has also been provided to organize sports and exercise events, resulting in an increase in the number of people taking exercise from 0.3 million in 2002 to 8.6 million in 2003 and 43.1 million in 2004. As the MoPH set the target of the people participating in the third power of exercise for health campaign at 33 million, but in 2005 the number decreased to only 8.8 million (Table 4.63).

Table 4.63 Number of people participating in power of exercise for health campaigns

Region of campaign	No. of people participating			
	1st campaign (2002)	2nd campaign (2003)	3rd campaign (2004)	4th campaign (2005)
Central	46,894	76,986	290,100	83,719
Provincial	271,873	8,584,103	42,820,543	8,717,208
Total	**318,767**	**8,661,089**	**43,110,643**	**8,801,017**

Sources: 1. Bureau of Health promotion, Department of Health.
2. Health Education Division, Department of Health Service Support.
3. Office of the Secretary, Department of Disease Control.

8.7.2 Relaxation

A survey on health status of working-age population in 1996-1997 demonstrated that the average sleeping time period was 7.6 hours. Half the working-age population spent 7-8 hours on sleeping. It was also found that when they got older, the proportion of people sleeping for more than eight hours would decrease. A sleeping time around that range was also noted in the 2004 survey conducted by the National Statistical Office: males and females aged 10 years and older on average slept for 8.3 hours, children slept on average as long as 9.3 hours, followed by the elderly, youths and working-age people, respectively (Tables 4.64 and 4.65).

With regard to time spending for recreation, it was found in 2004 that each person spent 3.6 hours on average, a 1.8-fold increase compared with that for 2001, males spending more time than females (Table 4.65).

Table 4.64 Proportion of working-age population by daily sleeping time, 1996-1997

Age, years	Less than 6 hrs		6-7 hrs		8 hrs and over	
	Males	Females	Males	Females	Males	Females
13-19	1.8	2.0	17.8	23.6	80.4	74.5
20-34	6.3	6.7	37.5	34.1	56.2	59.2
35-44	7.6	8.2	39.5	41.1	52.9	50.7
45-59	9.9	13.8	36.6	43.4	53.5	42.8

Source: Data reanalyzed from the database of Survey on Health Status of Working-age Population, 1996-1997. Thailand Health Research Institute and Bureau of Policy and Strategy, MoPH, 1998.

Table 4.65 Average time periods (hours) spent on sleeping and recreation each day by sex and age group, 2001 and 2004

Activity	10-14		15-24		25-59		60+		Total	
	2001	2004	2001	2004	2001	2004	2001	2004	2001	2004
Males										
Sleeping	9.2	9.3	8.4	8.5	8.4	8.2	10.6	8.8	8.7	8.4
Recreation*	2.2	4.6	2.4	4.4	2.0	3.3	2.4	4.3	2.2	3.8
Females										
Sleeping	9.2	9.1	8.4	8.2	8.4	7.9	10.6	8.8	8.7	8.2
Recreation*	1.7	4.2	1.6	3.5	1.8	3.1	2.4	4.1	1.8	3.4
Total										
Sleeping	9.3	9.2	8.6	8.4	8.5	8.0	10.4	8.8	8.8	8.3
Recreation*	2.0	4.4	2.1	4.0	1.9	3.2	2.4	4.2	2.0	3.6

Source: Reports on the Time Spending of the People Surveys, 2001 and 2004. National Statistical Office.

Note: * Including social and cultural activities.

8.8 Driving Behaviours

8.8.1 Use of Safety Belt

A survey on safety-belt use among all driver categories reveals that, even through the law requires that all drivers and passengers use safety belts at all times, the safety-belt use rate has dropped from 35.8% in 1996 to only 31.3% in 2006 (Table 4.66).

8.8.2 Use of Helmet

The rate of constant use of helmet among motorcyclists was found to be declining, similar to that for safety belt, i.e. helmet use rate has declined from 29.0% in 1996 (the year in which the Helmet Use Royal Decree was first in effect) to only 18.6% in 2006 (Table 4.67).

Table 4.66 Proportion of drivers aged 14 years and over using safety belts

Use of safety belt	1991[1]	1996[1]	1997[2]	2000[3]	2001[1]	2003[1]	2004[4]	2006[1]
Vehicles with safety belts								
- Constant use	4.3	35.8	35.7	25.9	27.1	23.5	30.4	31.3
- Occasional use	11.7	28.0	29.6	32.2	44.2	39.7	16.9	45.2
- Non-use	12.6	6.3	34.7	13.9	12.1	32.2	11.5	21.9
Vehicles without safety belts	64.6	29.9	-	-	4.4	2.4	-	1.6

Sources: (1) Data for 1991, 1996, 2001, 2003 and 2006 were derived from Health and Welfare Surveys. National Statistical Office.

(2) Data for 1997 were derived from Prapapen Suwan et al. Study on Behaviours and Environmental Conditions for Health Promotion among Youths, Housewives and Factory Workers, 1997. Faculty of Public Health, Mahidol University.

(3) Data for 2000 were derived from the Survey of Health Behaviour of Working-age Population (15-59 years). Health Education Division, Department of Health Service Support.

(4) Data for 2004 were derived from the Smoking and Drinking Behaviour Survey, 2004. National Statistical Office.

Note: Data for 2001 were derived from a survey on safety-belt use of drivers and passengers aged 15 and over in front seats.

Table 4.67 Proportion of motorcyclists aged 14 years and over using helmets while driving

Use of helmets	1991[1]	1996[1]	2000[2]	2001[1]	2003[1]	2004[3]	2006[1]
- Constant use	7.2	29.0	32.0	16.1	16.0	34.4	18.6
- Occasional use	21.7	55.4	44.2	64.3	49.5	31.0	59.7
- Non-use	11.0	6.0	15.8	10.3	32.8	15.9	21.7
- No helmet	59.8	9.3	-	9.1	-	-	-

Sources: (1) Data for 1991, 1996, 2001, 2003 and 2006 were derived from Health and Welfare Surveys. National Statistical Office.

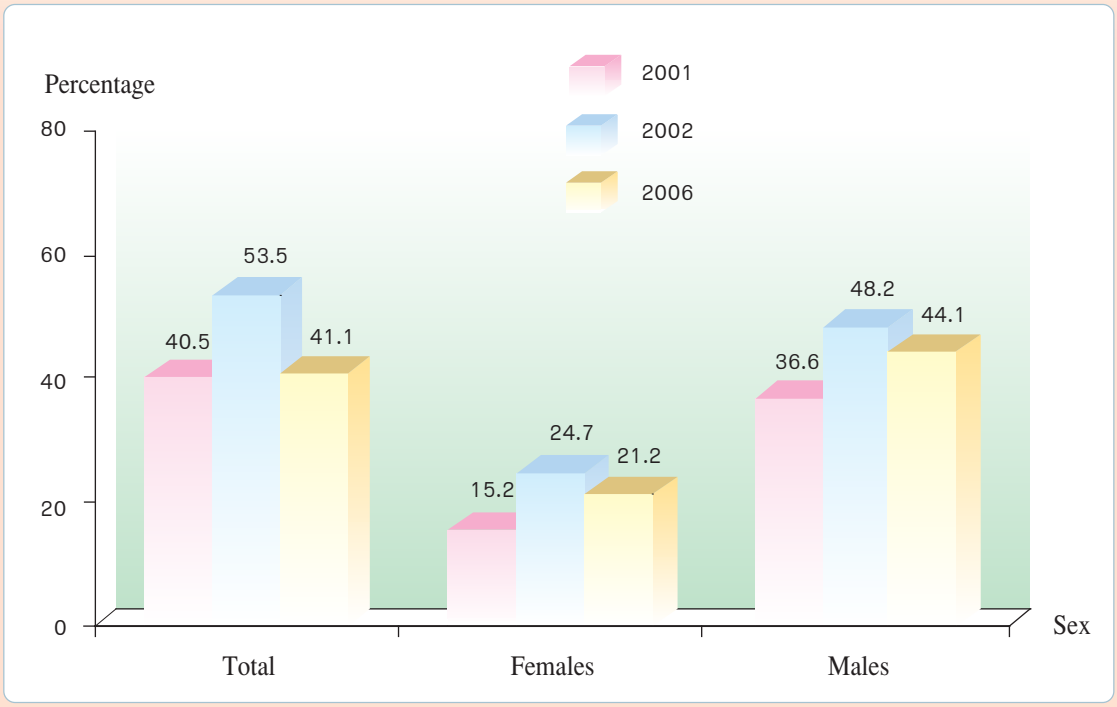
(2) Data for 2000 were derived from the Survey of Health Behaviours of Working-age Population (15-59 years). Health Education Division. Department of Health Service Support.

(3) Data for 2004 were derived from the Smoking and Drinking Behaviour Survey, 2004. National Statistical Office.

Note: Data for 2001 were derived from a survey on helmet use among motorcyclists and passengers aged 15 and over.

Alcohol drinking and drunk driving are a major factor causing road traffic accidents/injures. Even though Thailand has launched campaigns against drunk driving, having law prohibiting driving for any person with a blood alcohol concentration exceeding the specified limit, the number of drunk drivers has risen by 30%, i.e. rising from 40.5% in 2001 to 41.1% in 2006; males being twice more likely to do so than females (Figure 4.41).

Figure 4.41 Proportion of drunk drivers by sex, 2001, 2002 and 2006



Source: Reports on Health and Welfare Surveys, 2001, 2003 and 2006. National Statistical Office.

8.9 Sexual Behaviours

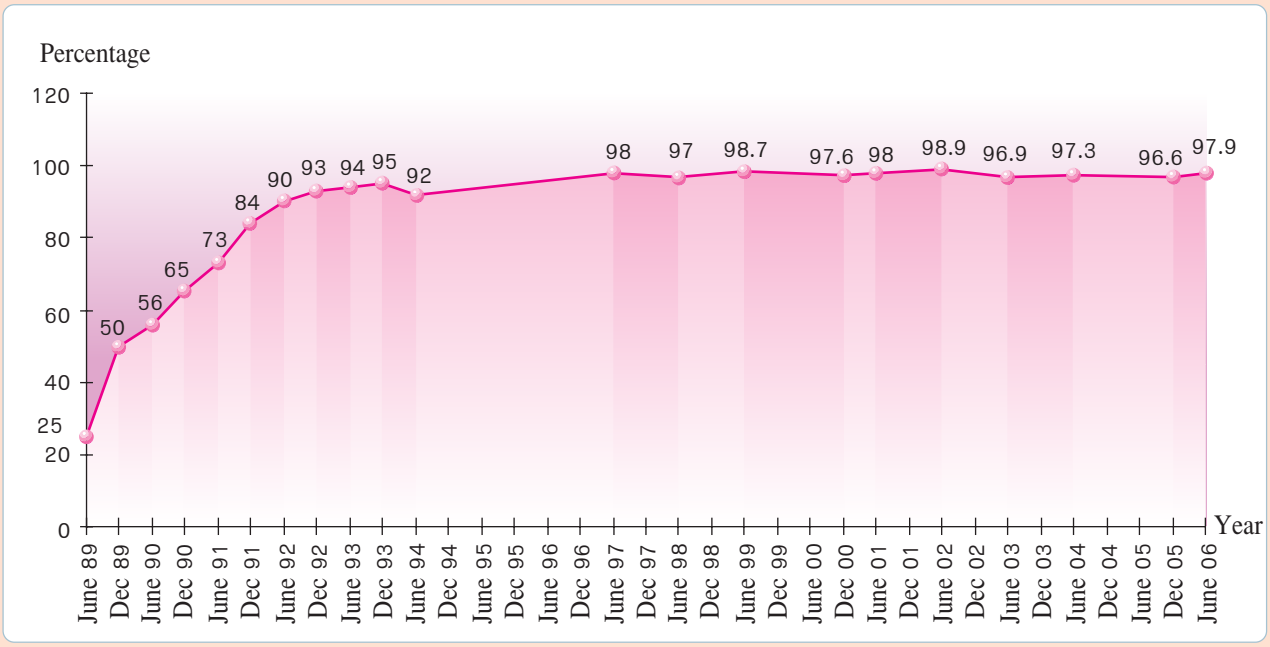
Unsafe sex is a primary health risk in spreading sexually transmitted infections (STIs), especially HIV/AIDS. Thanks to intensive campaigns, people are more aware of self-protection when having sex with a female commercial sex worker (CSW). This brings about a higher condom use rate in CSWs from 25% in 1989 to 97.9% in 2006 (Figure 4.42). However, it has been recently discovered that people are more likely to have sex with other women who are not CSWs. In particular, youths tend to have first sex at a younger age and practise unsafe sex.

According to Thailand's surveillance of HIV/AIDS risk behaviours in the past 12 years (1995-2006), the proportions of military recruits and male industrial workers having sex with CSWs and other women were **declining** except for a slightly rising rate in 2003 and a rising trend of military recruits having sex with other women (Figures 4.43 and 4.44). The constant condom use rate among military recruits having sex with CSWs was higher than with other women they superficially knew (Figures 4.45 and 4.46). Regarding female industrial workers and pregnant women attending an antenatal clinic (ANC), there was a **reduction** in sexual relation with several partners (Figures 4.47 and 4.48). And the rate of constant condom use when having sex with other males was increasing except for 2003 when the rate decreased markedly (Figures 4.49 and 4.48).

For male teenagers, it was revealed that there was a reduction in sexual relations with various groups of females, girlfriends, lovers, close friends, CSWs and others (Figure 4.50). They were

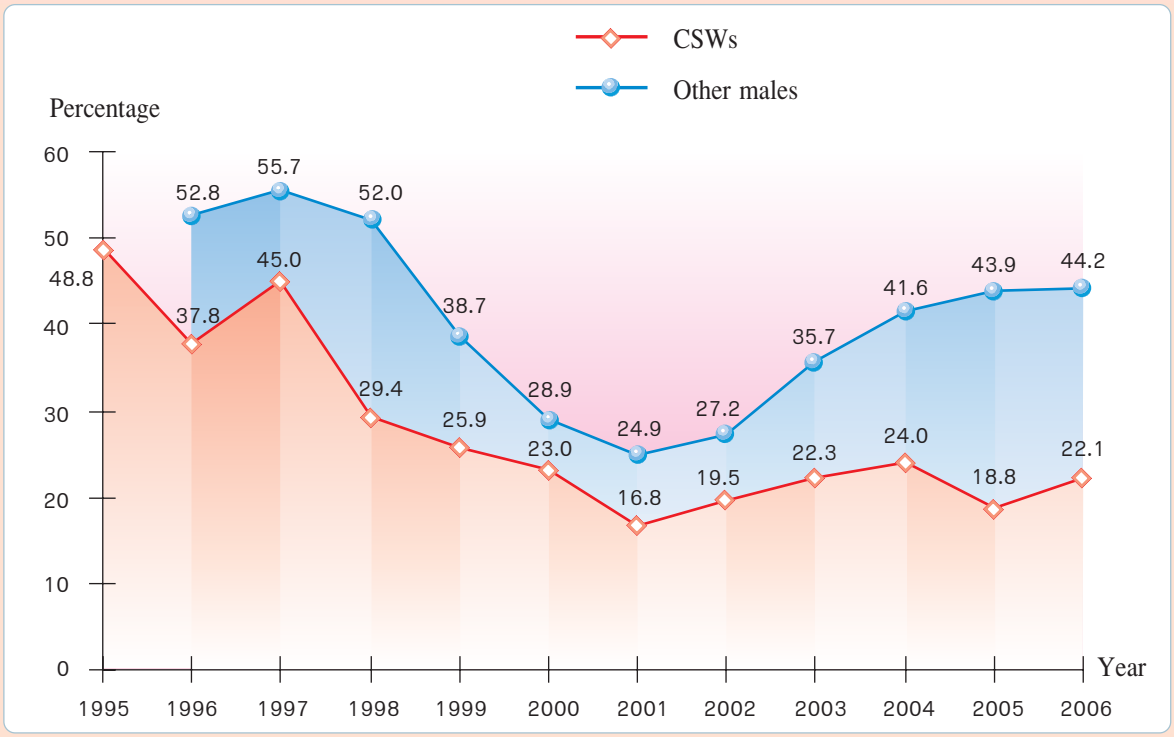
more likely to use a condom when having sex with CSWs than with other kinds of sex partners (Figure 4.51). But a survey conducted by the ABAC Poll Research Centre of Assumption University (2006) on pre-mature sex among youths (aged 15-24) in Bangkok and its vicinity reveals that two-thirds (45.0%) of respondents have ever had sex before and 55.0% have not. Among those with sexual experience, most of them (85%) have had their first sexual encounter with their lovers, followed by schoolmates (7.5%) and friends in other schools/institutions (3.5%), citing sex-stimulating situations such as love (66.9%), followed by intimacy (34.2%), desire to experiment (28.8%), alcohol drinking (9.9%), watching sex movie or obscene media (7.1%) and friend's persuasion (4.9%) as the reasons for having sex. Besides, another survey conducted by the Institute for Population and Social Research (2006) reveals that 67% of male teenagers and 44% of female teenagers (18-19 years old) in Bangkok have ever had sex before; their age with the first sex encounter was 15.5 years in males and 16.5 years in females (Figure 4.52)

Figure 4.42 Condom use rate among female commercial sex workers, 1989-2006



Source: Bureau of Epidemiology, Department of Disease Control, MoPH.

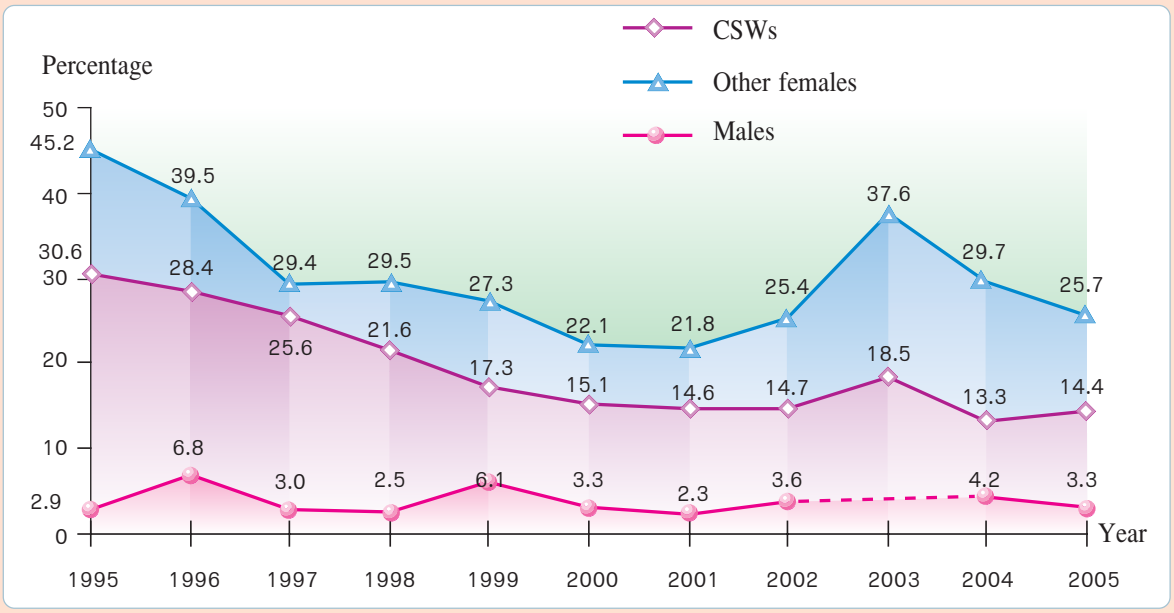
Figure 4.43 Proportion of military recruits' sex partners in the past year according to survey on HIV/AIDS risk behaviours in Thailand, 1st-12th rounds, 1995-2006



Source: Bureau of Epidemiology, Department of Disease Control, MoPH.

Note: The Bureau of Epidemiology deployed the new data analysis method for the 1st-12th rounds of survey (1995-2006).

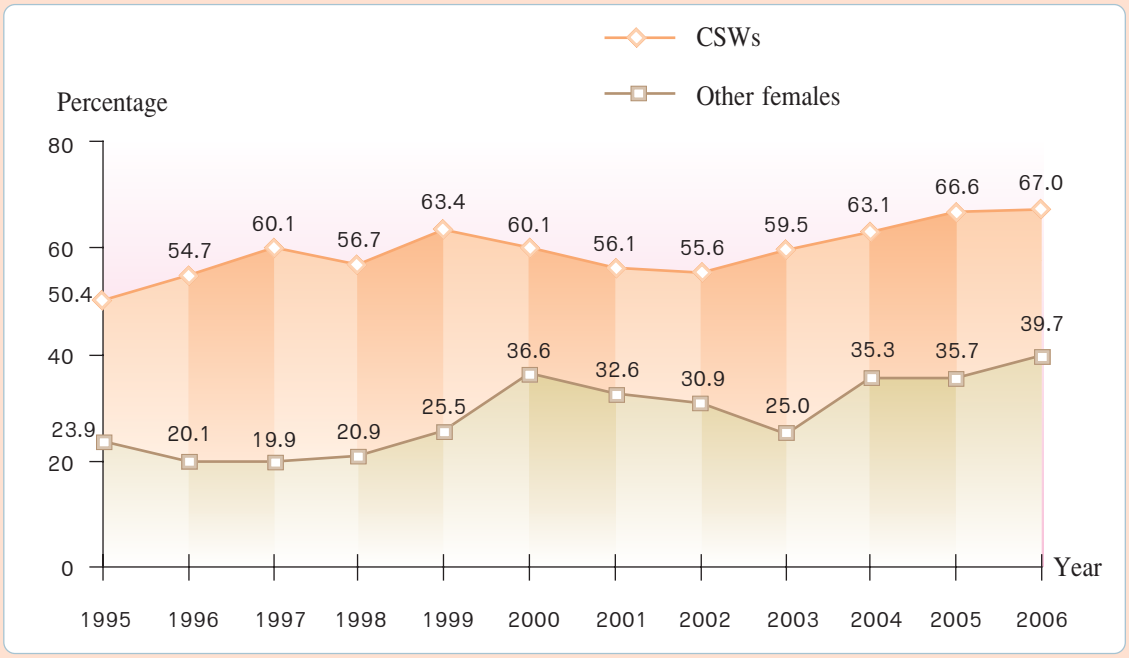
Figure 4.44 Proportion of male industrial workers' sex partners in the past year according to survey on HIV/AIDS risk behaviours in Thailand, 1st-11th rounds, 1995-2005



Source: Bureau of Epidemiology, Department of Disease Control, MoPH.

Note: The Bureau of Epidemiology deployed the new data analysis method for the 1st-11th rounds of survey (1995-2005).

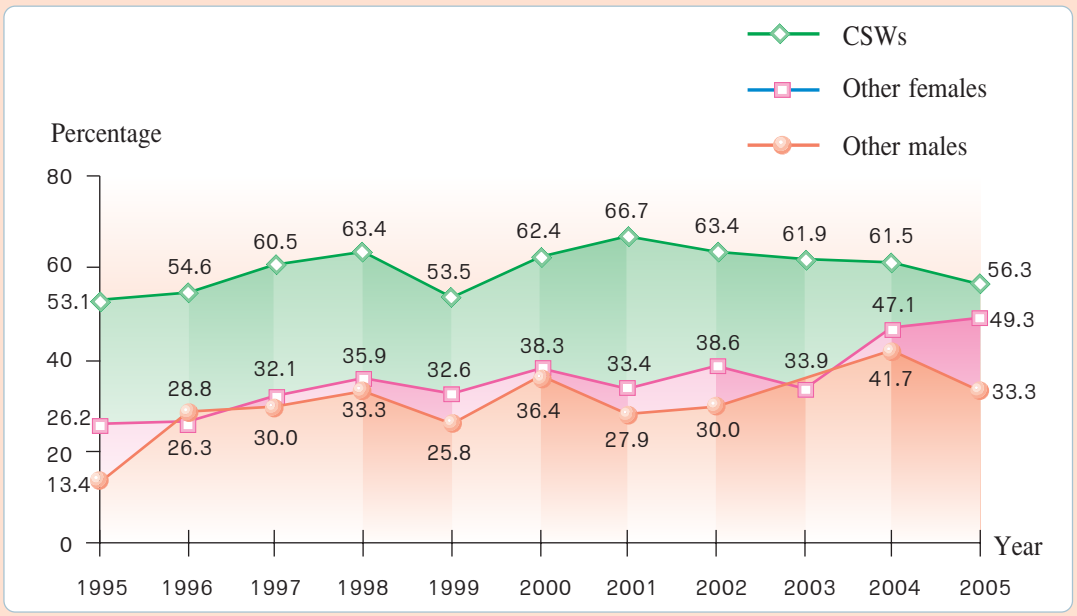
Figure 4.45 Rate of constant condom use during sexual encounters in the past year of military recruits according to survey on HIV/AIDS risk behaviours in Thailand, 1st-12th rounds, 1995-2006



Source: Bureau of Epidemiology, Department of Disease Control.

Note: The Bureau of Epidemiology deployed the new data analysis method for the 1st-12th rounds of survey (1995-2006).

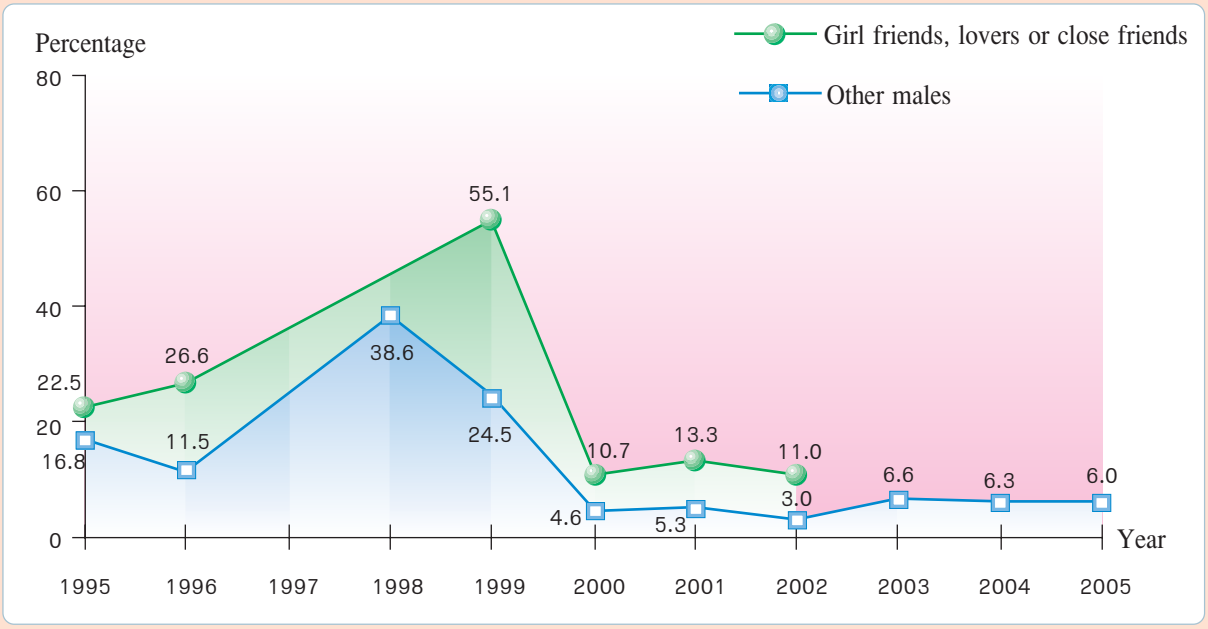
Figure 4.46 Rate of constant condom use during sexual encounters in the past year of male industrial workers according to survey on HIV/AIDS risk behaviours in Thailand, 1st-11th rounds, 1995-2005



Source: Bureau of Epidemiology Division, Department of Disease Control.

Note: The Bureau of Epidemiology deployed the new data analysis method for the 1st-11th rounds of survey (1995-2005).

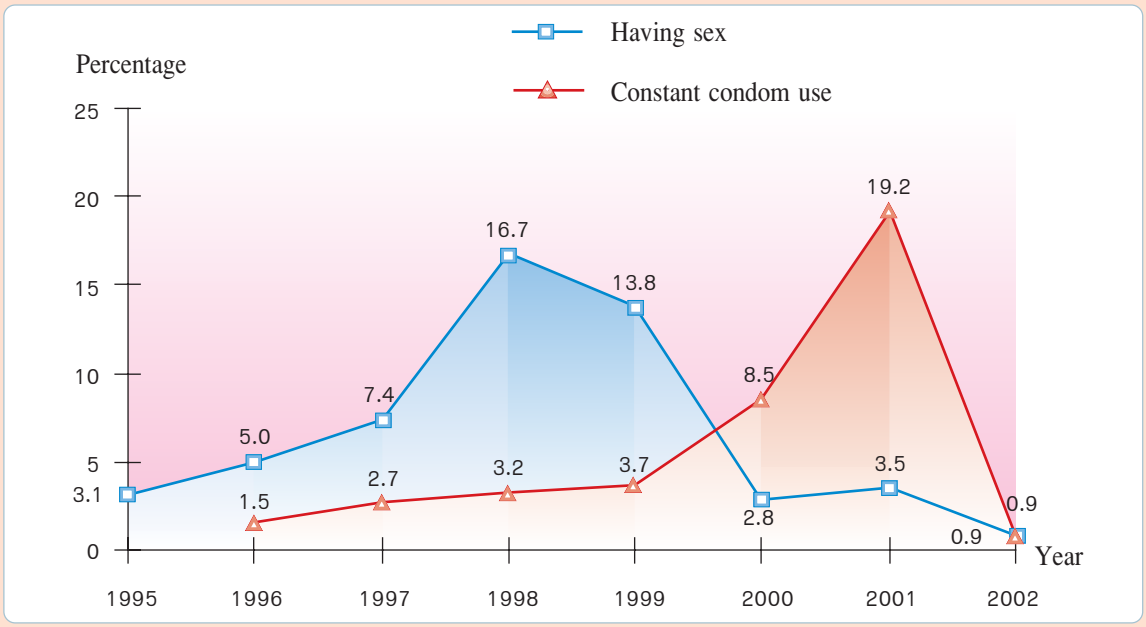
Figure 4.47 Proportion of female industrial workers having sexual encounters in the past year according to survey on HIV/AIDS risk behaviours in Thailand, 1st-11th rounds, 1995-2005



Source: Bureau of Epidemiology, Department of Disease Control.

Note: The Bureau of Epidemiology deployed the new data analysis method for the 1st-11th rounds of survey (1995-2005).

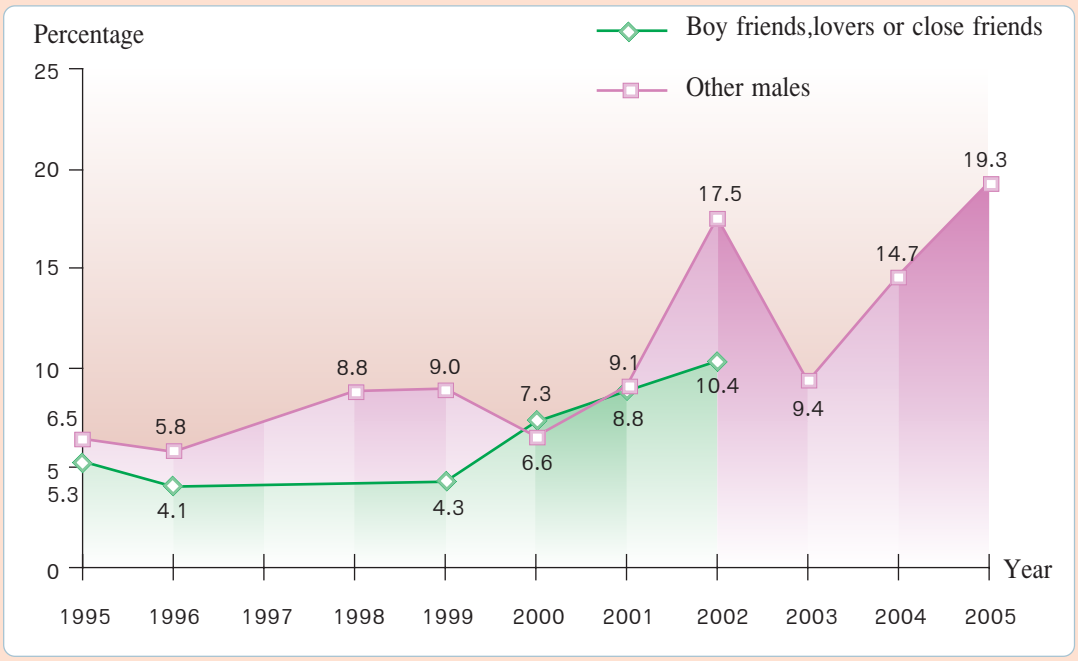
Figure 4.48 Proportion of pregnant women attending ANC having sex with other males and constant condom use rate according to survey on HIV/AIDS risk behaviour in Thailand, 1st -8th rounds, 1995-2002



Source: Bureau of Epidemiology, Department of Disease Control, MoPH.

Note: The Bureau of Epidemiology deployed the new data analysis method for the 1st-8th rounds of survey (1995-2002)

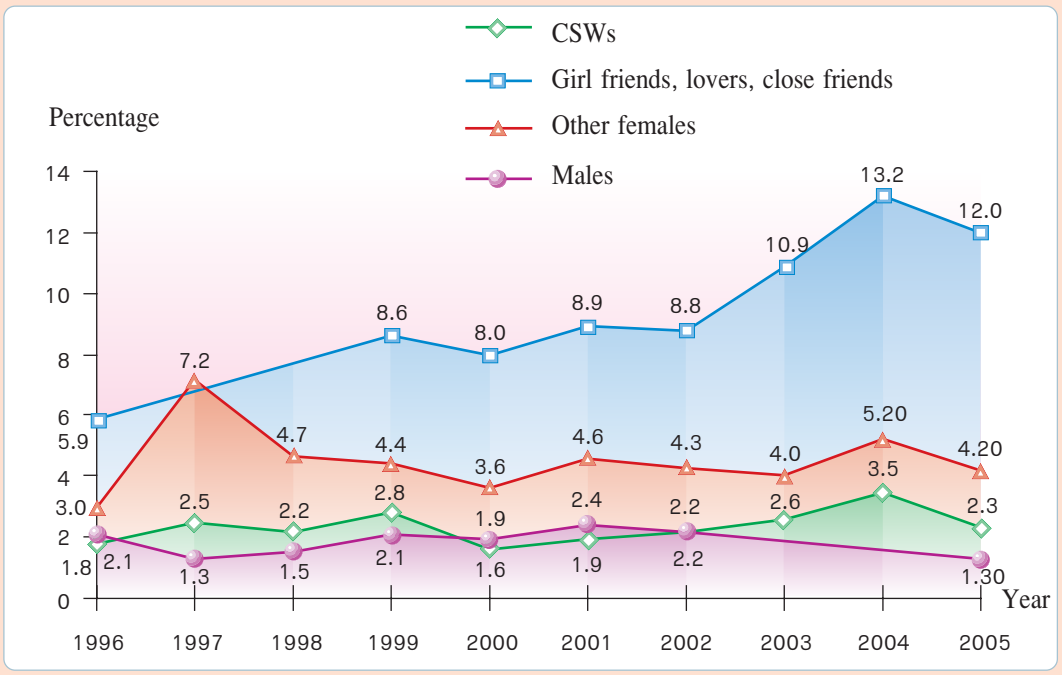
Figure 4.49 Rate of constant condom use during sexual encounters in the past year of female industrial workers according to survey HIV/AIDS risk behaviour, 1st-11th rounds, 1995-2005



Source: Bureau of Epidemiology, Department of Disease Control, MoPH.

Note: The Bureau of Epidemiology deployed the new data analysis method for the 1st-11th rounds of survey (1995-2005).

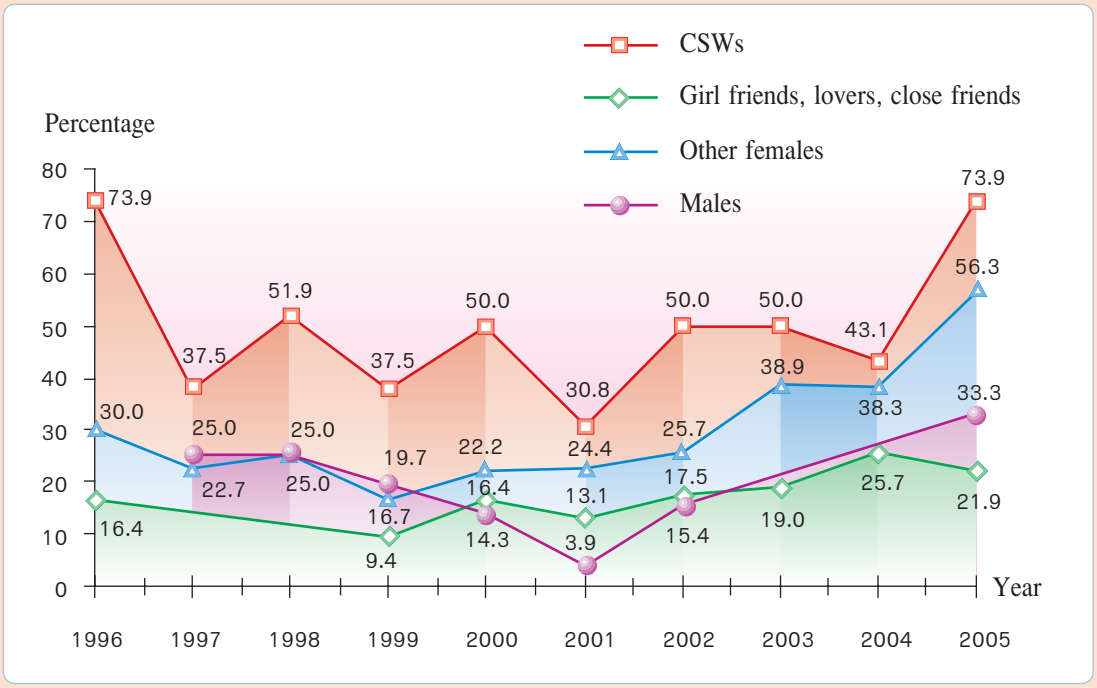
Figure 4.50 Proportion of male secondary school students (mathayomsueksa 5 or grade 11) having sex in the past year according to surveys on HIV/AIDS risk behaviours in Thailand, 2nd-11th rounds, 1996-2005



Source: Bureau of Epidemiology, Department of Disease Control, MoPH.

Note: The Bureau of Epidemiology deployed the new data analysis method for the 2nd-11th rounds of survey (1996-2005).

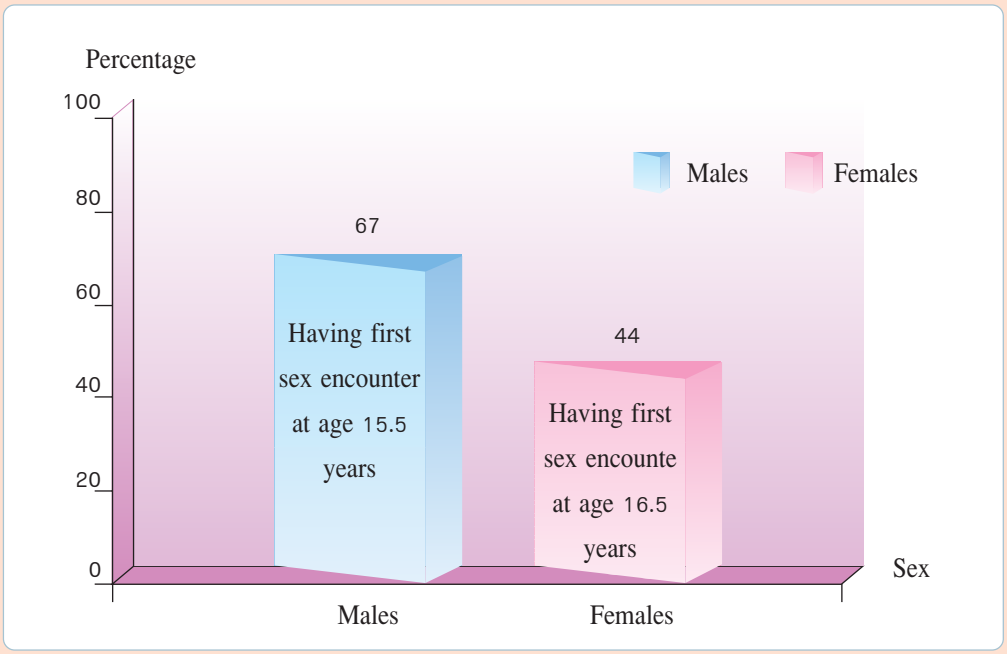
Figure 4.51 Rate of constant condom use during sexual encounters in the past year of male secondary school students (mathayomsueksa 5 or grade 11) according to survey on HIV/AIDS risk behaviours in Thailand, 2nd-11th rounds, 1996-2005



Source: Bureau of Epidemiology, Department of Disease Control.

Note: The Bureau of Epidemiology deployed the new data analysis method for the 2nd-11th rounds of survey (1996-2005).

Figure 4.52 Percentage of teenagers (18-19 yrs) having had sex experience and average age at first sex encounter in Bangkok by sex, 2006



Source: Survey on HIV/AIDS Risk Factors and Knowledge about Antiretrovirals in Thailand, 2006.

8.10 Self-Healthcare and Healthcare Seeking Behaviour

People's healthcare seeking behaviours have been changing. Overall, the proportion of people seeking care at public health facilities rose from 15.5% in 1970 to 33.7% in 1996, while the rate of self-medication decreased from 51.4% in 1970 to 37.9% in 1996; and the rate of health care seeking at private clinics and hospitals slightly fell from 22.7% in 1970 to 18.7% in 1996. Nonetheless, after the universal coverage of healthcare scheme was launched, there has been a change in the health service delivery system; the proportion of people seeking treatment at state-run health facilities has risen from 33.7% in 1996 to 46.2% in 2006, while the self-medication rate has dropped from 37.9% to 25.1% for the same period (Table 4.68).

Table 4.68 Pattern of healthcare seeking behaviours among Thai people when ill (percent)

Care or health facility attendedwhen ill	1970 IPSR	1979 IPSR	1985 IPSR	1991 HWS	1996 PHS	1996 HWS	2001 HWS	2003 HWS	2004 HWS	2006 HWS
Both rural and urban areas										
Nothing	2.7	4.2	15.9	15.9	0.5	6.9	5.4	5.9	5.3	5.1
Traditional care or others	7.7	6.3	2.4	5.7	4.2	2.8	2.5	2.9	4.4	2.3
Self-medication	51.4	42.3	28.6	38.3	17.1	37.9	24.2	21.5	20.9	25.1
Health centres	4.4	16.8	14.7	14.8	34.5	20.8	17.4	23.9	24.6	16.3
Public hospitals	11.1	10.0	32.5	12.9	19.4	12.9	34.8	33.1	30.2	29.9
Private clinics/hospitals	22.7	20.4	21.8	12.4	24.2	18.7	15.0	19.4	22.7	26.3
Rural areas										
Nothing				15.6	0.4	6.7	5.8	6.0	5.0	
Traditional care or others				5.8	6.2	2.5	2.6	3.0	4.4	
Self-medication				38.6	11.6	38.4	22.1	19.9	18.7	
Health centres				17.0	49.6	24.6	22.3	29.5	30.8	
Public hospitals				12.8	20.0	13.8	35.2	34.4	31.0	
Private clinics/hospitals				10.2	12.3	14.0	11.4	15.4	19.5	
Urban areas										
Nothing				17.9	0.7	7.5	4.4	5.4	6.1	
Traditional care or others				4.7	1.3	4.3	2.1	2.6	4.7	
Self-medication				36.9	25.2	36.0	29.4	25.6	27.0	
Health centres				2.7	12.8	3.5	5.5	9.6	7.1	
Public hospitals				13.1	18.5	8.9	33.9	30.2	28.3	
Private clinics/hospitals				24.7	41.6	39.8	24.0	29.8	32.0	

Sources: 1. IPSR: Institute for Population and Social Research, Mahidol University, 1988.
2. HWS: The Health and Welfare Survey, NSO, 1991, 1996, 2001, 2003, 2004 and 2006.
3. PHS: Provincial Health Survey, BHPP 1996.

Notes: 1. Different definition of illness in different sources.
2. More than one answer could be mentioned.

8.11 Trends in Health Behaviour of Thai People

When considering Thai people's health behaviours based on the framework of risk factors and burden of disease, i.e. food consumption, drug consumption, tobacco use, alcohol drinking, caffeinated beverage drinking, substance abuse, exercise and relaxation, driving behaviour, sex behaviour, self-health care and healthcare seeking behaviour, the trends of such factors are as follows:

Food consumption: Thai people have low fruit and vegetable intake in relation to the recommended level of fruit and vegetable consumption for health promotion and disease prevention purposes (400-800 grams/day), but have a tendency to take more high-carbohydrate and high-sugar food as well as more snacks, especially among children.

Drug consumption: Thai people tend to use medications irrationally, particularly antibiotics (overconsumption and underconsumption), and use certain medicines such as painkillers for a long period of time.

Tobacco use. The smoking prevalence of Thai people is on the rise in both males and females, the age at smoking initiation for females being lower than before.

Alcohol consumption: The rates of alcohol drinking among Thai males and females are on the rise, particularly those for beer and wine; the rapidly rising rate of caffeinated beverage consumption is also noted.

Substance abuse: The trends have been on the rise, especially for methamphetamines among youths; but after the government's strong drug suppression measures, the number of any abusers tend to be declining.

Exercise: The proportion of Thai people regularly taking exercise is unstable; however, two-thirds of regular exercisers have had such practice for more than seven months.

Relaxation: About half of the working-age population have 7-8 hours of sleep each day and the sleeping periods decline when they get older.

Rood safety: The trends in the use of safety belts (for automobile drivers) and helmets (for motorcyclists) are declining, while the rising trends are noted for drunk driving.

Sex behaviour: The rate of condom use among commercial sex workers is on the rise, but such rates among conscripts as well as male and female industrial workers when having sex with partners (other than sex workers) are unstable, essentially among teenagers who have had sex prematurely.

Self-healthcare and healthcare seeking: When sick, more Thai people tend to seek medical treatment at state health facilities, and fewer people will go to private clinics/hospitals or seek self-medication.

Chapter 5
Health Status and Health Problems of Thai People

1. Overall Health Status Indicators

Over the past three decades, the overall health status of Thai people has a promising trend of improvement as evidenced by the following:

1.1 Life Expectancy at Birth

In 2004, the life expectancy at birth of Thai people was 70.3 years. Though higher than that of the people in other developing countries and of the world population, life expectancy of Thai people is still lower than that for several other ASEAN countries (Table 5.1). However, during 1964-2006, Thais' life expectancy at birth substantially increased from 55.9 years to 69.9 years for males and 62.0 years to 77.6 years for females. In 2025, it is expected that the life expectancy of Thai citizens will reach 74.8 years for males and 80.3 years for females (Table 5.2).

The World Health Report 2003 also revealed that, in 2002, Thailand's healthy life expectancy (HALE) was 60.1 years: 57.7 for males and 62.4 for females, which were lower than those for several other ASEAN countries (Table 5.1).

Table 5.1 Life expectancy at birth (in years) of Thai people in comparison with those for other countries

Group of countries	Life expectancy at birth					Health life expectancy[6]		
	1998[1]	2001[2]	2002[3]	2003[4]	2004[5]	Both sexes	Male	Female
WHO / SEAR								
Sri Lanka	73.3	72.3	72.5	74.0	74.3	61.6	59.2	64.0
Thailand	68.9	68.9	69.1	70.0	70.3	60.1	57.7	62.4
Indonesia	65.6	66.2	66.6	66.8	67.2	58.1	57.4	58.9
Maldives	65.0	66.8	67.2	66.6	67.0	57.8	59.0	56.6
India	62.9	63.3	63.7	63.3	63.6	53.5	53.3	53.6
Bhutan	61.2	62.5	63.0	62.9	63.4	52.9	52.9	52.9
Myanmar	60.6	57.0	57.2	60.2	60.5	51.7	49.9	53.5
Bangladesh	58.6	60.5	61.1	62.8	63.3	54.3	55.3	53.3
Nepal	57.8	59.1	59.6	61.6	62.1	51.8	52.5	51.1
ASEAN								
Singapore	77.3	77.8	78.0	78.7	78.9	70.1	68.8	71.3
Brunei	75.7	76.1	76.2	76.4	76.6	65.3	65.1	65.5
Malaysia	72.2	72.8	73.0	73.2		63.2	61.6	64.8
Thailand	68.9	68.9	69.1	70.0	70.3	60.1	57.7	62.4
Philippines	68.6	69.5	69.8	70.4	70.7	59.3	57.1	61.5
Vietnam	67.8	68.6	69.0	70.5	70.8	61.3	59.8	62.9
Indonesia	65.6	66.2	66.6	66.8	67.2	58.1	57.4	58.9
Myanmar	60.6	57.0	57.2	60.2	60.5	51.7	49.9	53.5
Laos	53.7	53.9	54.3	54.7	55.1	47.0	47.1	47.0
Cambodia	53.5	57.4	57.4	56.2	56.5	47.5	45.6	49.5
High human development								
Japan	80.0	81.3	81.5	82.0	82.2	75.0	72.3	77.7
Canada	79.1	79.2	79.3	80.0	80.2	72.0	70.1	74.0
Ireland	79.1	79.6	79.9	80.7	80.9	72.8	72.1	73.6
Sweden	78.7	79.9	80.0	80.2	80.3	73.3	71.9	74.8
Switzerland	78.7	79.0	79.1	80.5	80.7	73.2	71.1	75.3
World	66.9	66.7	66.9	67.1	67.3	-	-	-
High human development	77.0	77.1	77.4	78.0	78.0	-	-	-
Medium human development	66.9	67.0	67.2	67.2	67.3	-	-	-

Source :
[1] UNDP, Human Development Report 2000.
[2] UNDP, Human Development Report 2003.
[3] UNDP, Human Development Report 2004.
[4] UNDP, Human Development Report 2005.
[5] UNDP, Human Development Report 2006.
[6] WHO, World Health Report 2003.

Table 5.2 Life expectancy at birth (in years) of Thai people

Year	Males	Females	Females-Males difference
1964-1965[1]	55.9	62.0	6.1
1974-1976[1]	58.0	63.8	5.8
1985-1986[1]	63.8	68.9	5.1
1989[1]	65.6	70.9	5.3
1991[1]	67.7	72.4	4.7
1995-1996[1]	69.9	74.9	5.0
2005-2006[1]	69.9	77.6	7.7
2005-2010[2]	69.6	76.2	6.6
2010-2015[2]	71.3	77.5	6.3
2015-2020[2]	73.1	78.9	5.8
2020-2025[2]	74.8	80.3	5.5

Sources: [1] Reports on Population Change Surveys, 1964-1965, 1974-1976, 1985-1986, 1989, 1991, 1995, 1996 and 2005-2006. National Statistical Office.

[2] Population Projection for Thailand, 2000-2025. Office of the National Economic and Social Development Board, 2003.

1.2 Maternal Mortality

The maternal mortality ratio (MMR) in Thailand has declined from 374.3 per 100,000 live births in 1962 to 9.8 per 100,000 live births in 2006 (Figure 5.1). However, MMR estimates from several surveys are higher than the reported figure. For example, the 1995-1996 RAMOS[1] survey on mortality among women of reproductive age revealed a MMR of 44.1, while the Safe Motherhood Project[2] reported the MMR at 16.3 and the 2003 study of Yongjuea Laosirithavorn[3] reported a MMR of 52.2 for the same period.

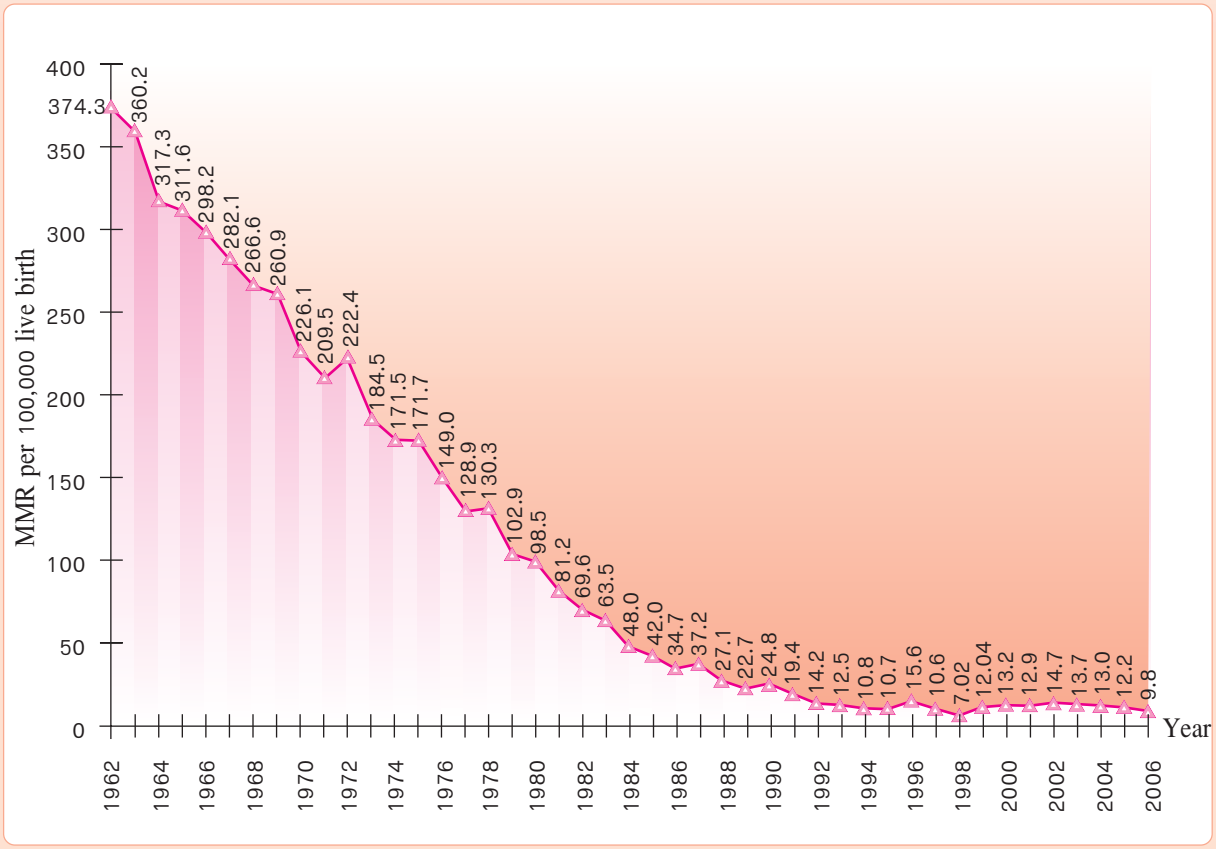
---

[1] Survey on Mortality among Women of Reproductive Age Using the Reproductive Age Mortality Survey Method. Bureau of Health Promotion, Department of Health.

[2] Bureau of Health Promotion, Department of Health. Report on Maternal Mortality in Thailand. Safe Motherhood Project, 1995-1996.

[3] Yongjuer Laosirithavorn. Situation and Report on Maternal Mortality Resulting from Pregnancy and Childbirth in Thailand, 1995-1996, 2003.

Figure 5.1 Maternal mortality ratio, Thailand, 1962-2006



Source: Bureau of Policy and Strategy, Office of the Permanent Secretary, MoPH.

1.3 Infant Mortality

In Thailand, the infant mortality rate (IMR, per 1,000 live births) rapidly declined from 84.3 in 1964 to 40.7 in 1984 and to 11.3 in 2005-2006 (Figure 5.2). However, although IMR for Thailand is lower than the global average, it is still higher than that for some other countries in the same region such as Singapore and Malaysia (Table 5.3).

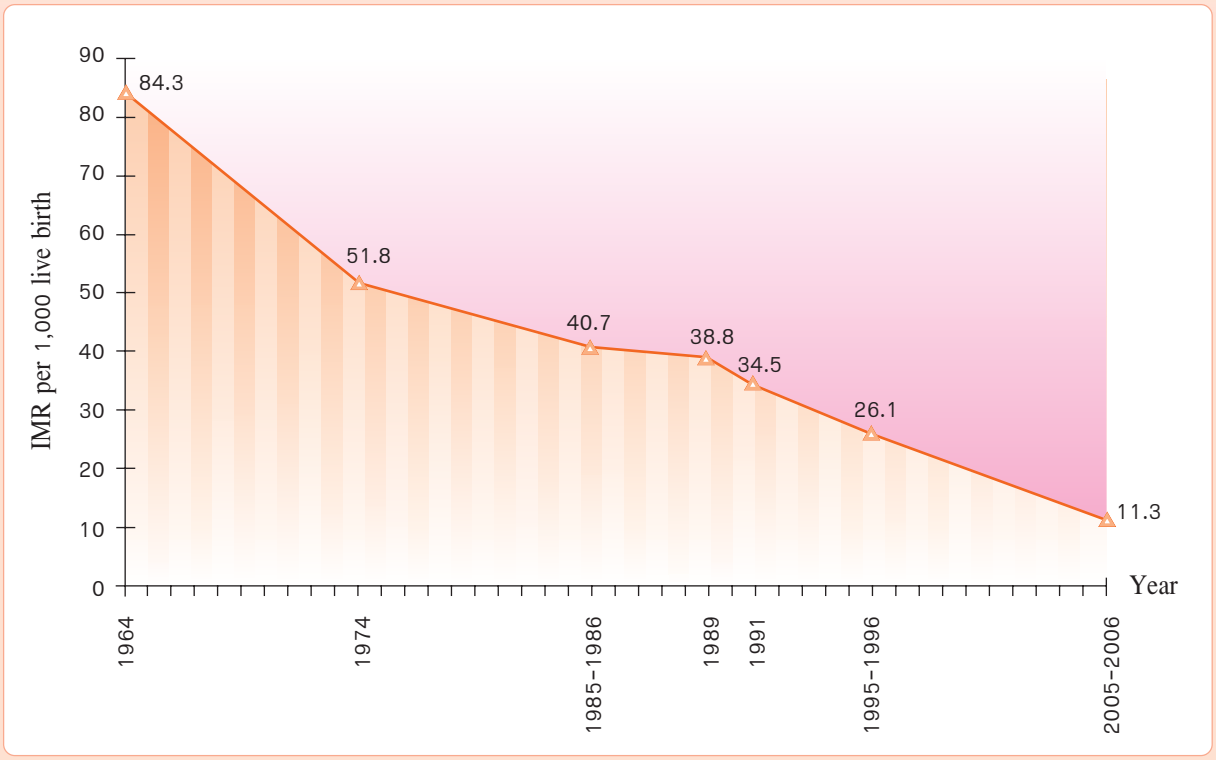
Table 5.3 Infant mortality rate and child mortality rate for Thailand in comparison with those for other countries, 1980, 2001, 2002, 2003 and 2004

Group of countries	IMP per 1,000 live births					CMR per 1,000 live births				
	1980	2001	2002	2003	2004	1980	2001	2002	2003	2004
WHO / SEAR										
North Korea	32	42	42	42	42	43	55	65	55	55
Sri Lanka	34	17	16	13	12	48	19	19	15	14
Thailand	**49**	**24**	**24**	**23**	**18**	**58**	**28**	**28**	**26**	**21**
Indonesia	90	33	32	31	30	125	45	43	41	38
Myanmar	109	77	77	76	76	134	109	108	107	106
India	115	67	65	63	62	173	93	90	87	85
Nepal	132	66	62	61	59	195	91	83	82	76
Bangladesh	132	51	48	46	56	205	77	73	69	77
ASEAN										
Singapore	12	3	3	3	3	13	4	4	5	3
Malaysia	30	8	8	7	10	42	8	8	7	12
Thailand	**49**	**24**	**24**	**23**	**18**	**58**	**28**	**28**	**26**	**21**
Philippines	52	29	28	27	26	81	38	37	36	34
Vietnam	57	30	20	19	17	70	38	26	23	23
Indonesia	90	33	32	31	30	125	45	43	41	38
Myanmar	109	77	77	76	76	134	109	108	107	106
Laos	127	87	87	82	65	200	100	100	91	83
High income										
Sweden	7	3	3	3	3	8	3	3	4	4
Japan	8	3	3	3	3	10	5	5	5	4
Switzerland	9	5	5	4	5	11	6	6	6	5
Canada	10	5	5	5	5	13	7	7	7	6
Ireland	11	6	6	5	5	14	6	6	7	6
Word	80	56	55	57	54	121	81	81	86	79
High income	13	5	5	5	6	15	7	7	7	7
Middle income	57	31	30	30	30	80	38	37	37	37
Low income	116	80	79	80	79	171	121	121	123	122

Source: World Bank, World Development Indicators, 1999, 2000/2001, 2002, 2003, 2004, 2005, 2006

Note: CMR per 1,000 live births among children under five years of age.

Figure 5.2 Infant mortality rate for Thailand, 1964-2006

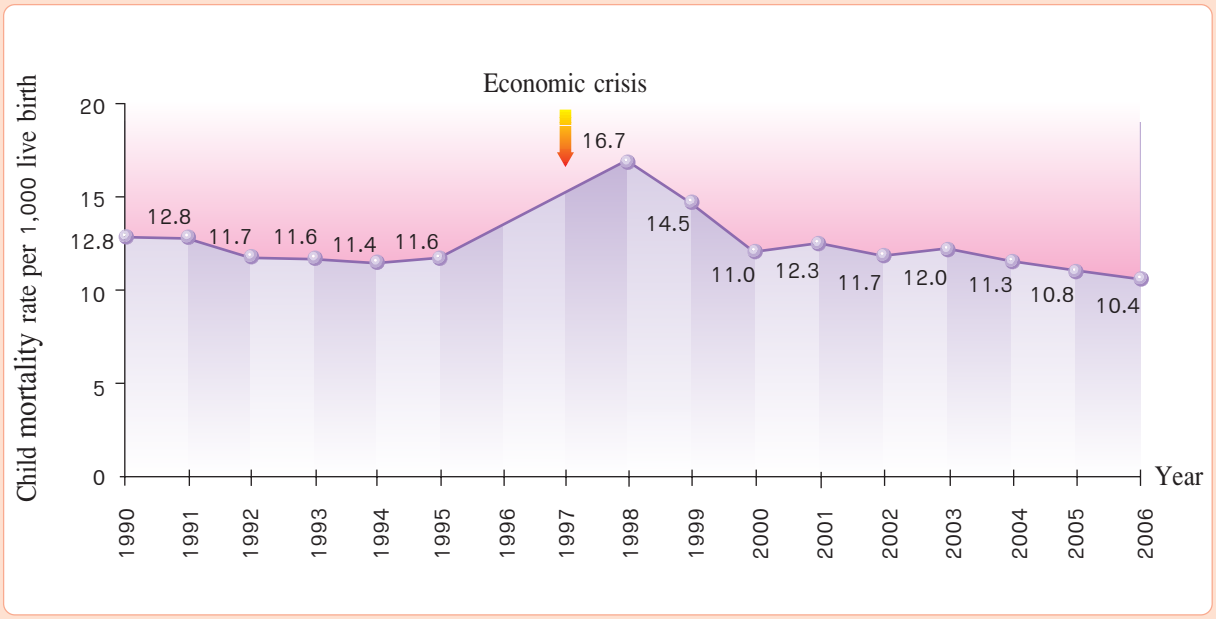


Source: Estimates were derived from the data from the Population Changes Survey. National Statistical Office.

1.4 Children Mortality Rate

The child mortality rate (among children aged under 5 years per 1,000 live births) has insignificantly changed from 12.8 in 1990 to 10.4 in 2006. It is noteworthy that, during the first stage of the economic crisis, the rate rose to 16.7 in 1998 and has had a tendency to drop since 1999 (Figure 5.3). However, even though the Thai CMR is lower than the global average, it is still higher than that for other countries in this region such as Singapore and Malaysia (Table 5.3). It is also noted that the rate reported by the civil registration office tends to be lower than reality, whereas the rate of 15.7 was derived from the 2006 population change survey.

Figure 5.3 Child mortality rate in Thailand, 1990-2006



Source: Bureau of Policy and Strategy, Office of the Permanent Secretary, MoPH.

Note: In 1996-1997, there was some adjustment in the data processing system of the civil registration office and, as a result, there were no child death data processing for those years, possibly resulting in the higher CMR for 1998.

1.5 Causes of Death

A study on the causes of death among Thai people during a one-year period between 1997 and 1999 in 16 provinces using the verbal autopsy method, conducted by the MoPH Bureau of Policy and Strategy, revealed that only **29.3% of specified causes of death were consistent with those stated in the death certificates**. The categories of diseases with high levels of consistency were "unclear causes", followed by cancer and tumors, external causes and infectious diseases, whereas other categories had a very low consistency level.

For all age groups, the study revealed that the number one cause of death was the diseases of **circulatory system** (18.6% of all causes), more than half of which were due to cerebrovascular diseases; the second leading cause was cancer and tumors (16.2%), nearly half of which were liver/bile-duct and lung cancers; the third leading cause was infectious diseases (15.5%), most of which were HIV infection particularly among teenage and young adult males, followed by tuberculosis; and the fourth leading cause was external causes among children and youths (12.4%), i.e. accidental drowning among school-age children and road traffic accidents among teenagers and adults, most of which were associated with motorcycles.

An analysis of the differences in causes of death in males and females revealed a proportion of 21.4% for diseases of the circulatory system, followed by 16.5% for cancer/tumors in females, and 18.2% for infectious diseases, followed by 16.6% for diseases of the circulatory system in males, whereas external causes ranked third for males and fifth for females.

By age group and sex, **the causes of death** are as shown in the table below:

Age group (years)	Major causes of death	
	Males	**Females**
0 - 4	Low birth weight, perinatal asphyxia	Low birth weight, congenital heart defect
5 - 14	Road traffic accidents, accidental drowning	Accidental drowning, HIV/AIDS
15 - 29	Road traffic accidents, HIV/AIDS	HIV/AIDS, road traffic accidents
30 - 44	HIV/AIDS, road traffic accidents	HIV/AIDS, road traffic accidents
45 - 59	Liver/bile-duct cancer, HIV/AIDS	Cerebrovascular diseases, liver cancer
60 - 69	Liver cancer, cerebrovascular diseases	Cerebrovascular diseases, diabetes
70 - 79	Cerebrovascular diseases, chronic obstructive pulmonary disease	Cerebrovascular diseases, diabetes
80 and over	Cerebrovascular diseases, chronic obstructive pulmonary disease	Cerebrovascular diseases, ischemic heart disease

1.6 Causes of Illness

Surveys on people's illnesses conducted by the National Statistical Office between 1991 and 2006 revealed that the most prevalent illness was diseases of the respiratory tract, followed by musculoskeletal diseases and gastrointestional diseases. However, when considering the trends in illness, it was found that the prevalence of cardiovascular diseases, endocrine system diseases, allergies and neuropsychiatric diseases were on the rise (Table 5.4).

Table 5.4 Percentage of people with illnesses by major group of diseases, 1991-2006

Group of diseases	1991	1996	2001	2003	2004	2005	2006
Respiratory tract diseases	38.1	45.7	39.6	40.2	44.8	45.0	44.3
Musculoskeletal diseases	15.7	13.2	14.0	14.9	11.8	12.2	11.4
Gastrointestinal diseases	15.4	11.3	10.0	10.3	9.1	9.3	9.4
Cardiovascular diseases	3.0	6.6	6.6	6.3	5.2	5.9	6.3
Endocrine system diseases	1.4	3.3	4.7	4.4	3.1	4.4	4.1
Oral/dental, eye, ear, nose and throat diseases	4.7	3.2	3.6	2.6	3.3	3.2	2.7
Infectious diseases	2.2	2.1	1.8	1.3	2.1	1.7	0.9
Urinary tract diseases	1.4	1.8	1.3	1.3	1.1	0.9	1.0
Allergies	0.7	1.5	1.8	2.1	1.8	1.9	2.3
Neuropsychiatric diseases	0.8	1.3	1.5	1.7	1.6	1.9	2.1
Skin diseases	3.2	1.2	1.5	1.1	1.0	1.2	1.4
Female genital diseases	1.4	0.8	0.9	0.9	0.8	0.8	0.7

Source: Reports on Health and Welfare Surveys, 1991, 1996, 2001, 2003, 2004, 2005 and 2006. National Statistical Office.

1.7 Disabilities

A survey conducted by the National Statistical Office revealed that the proportion of people with disability was rising from 0.5% in 1974 to 1.7% in 2002 (Table 5.5). However, other surveys have reported higher prevalence, compared with that reported by NSO. For example, the 1991-1992 health examination survey on the Thai population revealed a 6.3% disability prevalence[4] (excluding mental/intellectual disabilities); and if all kinds of disabilities are taken into account, the overall prevalence of disabilities will be 8.1% of the total population.

Besides, Suwit Wibulpolprasert and colleagues (1997) projected that the prevalence of people with disabilities had increased at a rate higher than that of the population growth. The physical and movement disabilities were most commonly found, which is associated with the socio-economic changes and the country's epidemiologic transition.[5] Regarding the characteristics of disability, the 2002 report on disabilities and crippling conditions revealed that most of the disabled persons had impaired vision in both eyes, hearing impairment, paresis, atrophied/inflexible limbs, and blurred vision in one eye (Figure 5.4).

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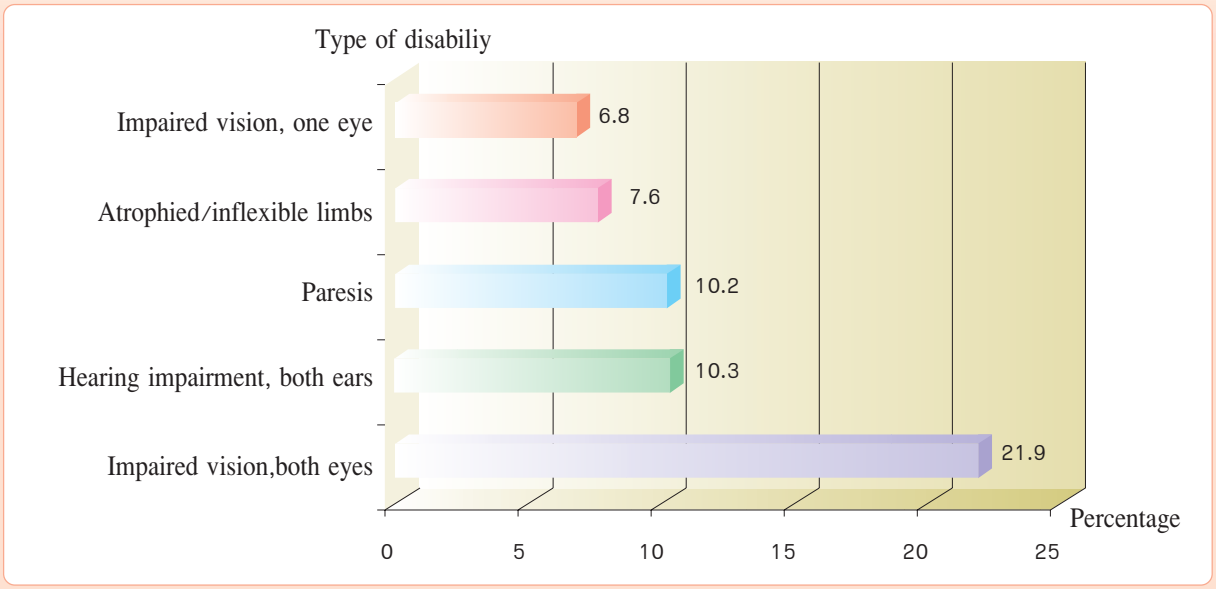
[4] Chanpen Choprapawon (editor). Report on the First Nationwide Health Examination Survey on Thai People, 1991-1992. Thai Health Research Institute and Health Systems Research Institute, 1992.

[5] Suwit Wibulpolprasert et al. Medical Rehabilitation Service System for the Disabled, 1997.

Figure 5.4 Proportion of people with disabilities (first five major types), 2001



Source: Report on Disabilities and Crippling Conditions Survey, 2002. National Statistical Office.

In addition, the 2001 survey on illnesses among the disabled revealed that cardiovascular disease was most common (22.2%), followed by musculoskeletal diseases (19.4%), respiratory system diseases (14.8%), and neuropsychiatric disorders (11.8%). It is noteworthy that cardiovascular and neuropsychiatric diseases were more common in males, whereas musculoskeletal diseases were more common in females (Table 5.6).

Table 5.5 Number and percentage of Thai people with disabilities, 1974-2002

Year of survey	Population (thousands)	People with disabilities (thousands)	Percentage of total population
1974	39,796.9	209.0	0.5
1976	42,066.9	245.0	0.6
1977	44,211.5	296.2	0.7
1978	45,344.2	324.6	0.7
1981	47,621.4	367.5	0.8
1986	51,960.0	385.9	0.7
1991	57,046.5	1,057.0	1.8
1996	59,902.8	1,024.1	1.7
2001	62,871.0	1,100.8	1.8
2002	63,303.0	1,098.0	1.7

Source: Health and Welfare Survey Projects, 1974-2002. National Statistical Office.

Table 5.6 Proportion (percentage) of disabled persons with commonly found diseases or symptoms by sex, 2001

Disease/symptom	Total	Males	Females
- Cardiovascular diseases	22.2	25.6	18.3
- Musculoskeletal diseases	19.4	17.6	21.6
- Respiratory tract diseases	14.8	14.6	14.9
- Neuropsychiatric disorders	11.8	14.1	9.0

Source: Report on Disabilities Survey, 2001, National Statistical Office.

1.8 Epidemiologic Transition

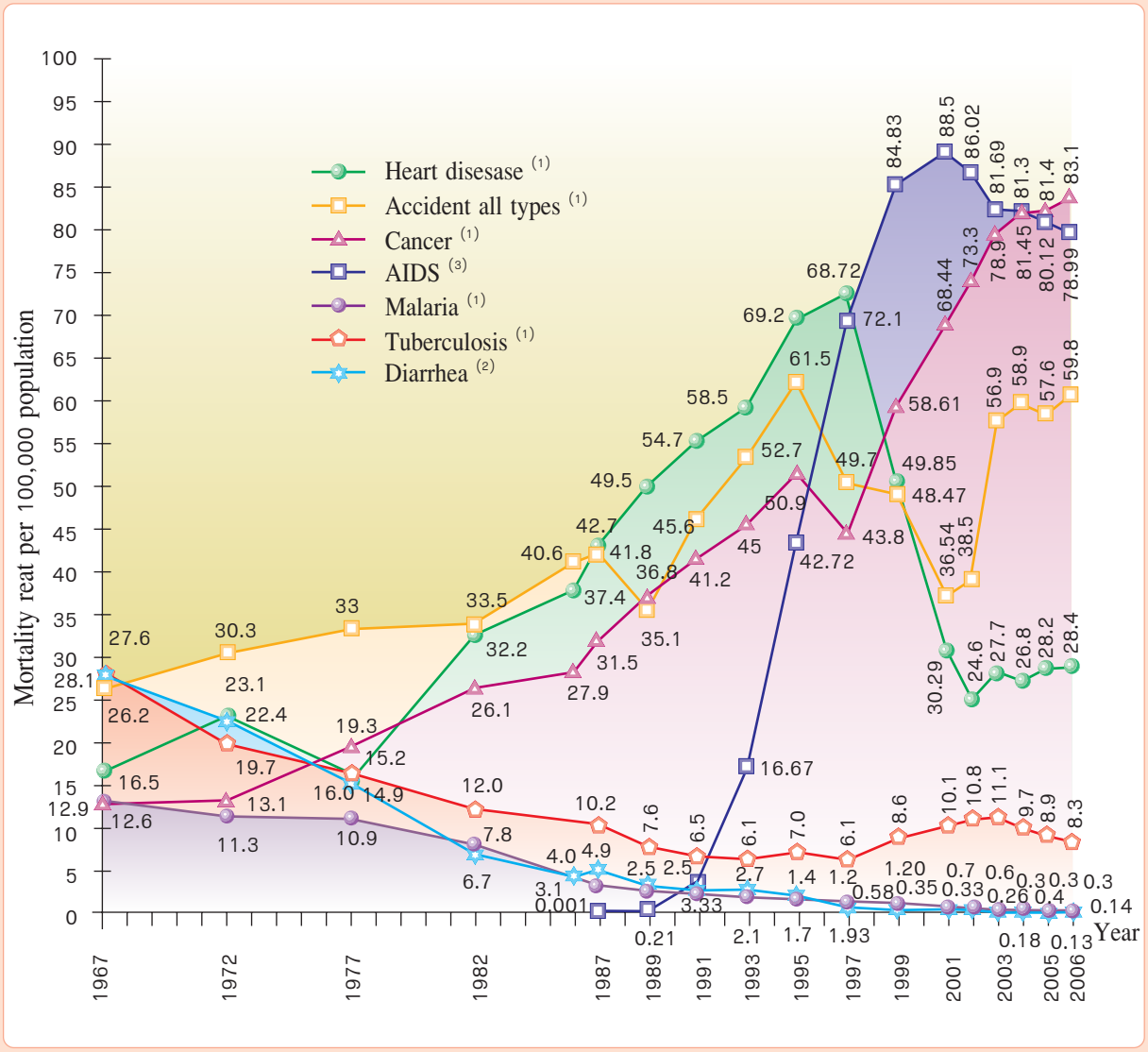
Overall, according to a death certificates analysis, the major and rising causes of death among Thai citizens are non-communicable diseases, accidents, and HIV/AIDS (which is currently a major health problem of the country). The prevalence rates of communicable diseases, which used to be significant health problems, have been declining except for re-emerging diseases such as tuberculosis that is associated with HIV/AIDS (Figure 5.5). This is consistent with the results of the Burden of Disease Study which revealed that the disease burdens in terms of disability-adjusted life years (DALY) from non-communicable diseases were three times as much as those from communicable diseases, and that the longer the people live, the greater the tendency for them to have non-communicable diseases (Table 5.7).

Table 5.7 Percentage of causes of disability-adjusted life years (DALY) lost of Thai people by age group, 2004

Cause of DALY lost	Percentage of DALY lost by age group					
	0 - 4	5 - 14	15 - 44	45 - 59	60 and over	Total
- Communicable diseases	55.3	33.6	25.6	14.6	10.3	20.2
- Non-communicable diseases	32.9	34.7	50.7	73.7	85.8	65.1
- Accidents	11.7	31.6	23.7	11.7	3.9	14.8

Source: Working Group on Burden of Disease and Risk Factors, Thailand. International Health Policy Programme, 2006.

Figure 5.5 Mortality rates due to major causes of death, Thailand, 1967-2006



Sources: (1) Bureau of Policy and Strategy, Office of the Permanent Secretary, MoPH.

(2) Bureau of Epidemiology, Department of Disease Control, MoPH.

(3) Working Group on Forecast of HIV-infected Cases. Forecast of HIV-infected Cases in Thailand, 2000-2020, 2001.

1.9 Disability-Adjusted Life Years of Thai People

In measuring the health status of Thai people using DALY[6] as the indicator, it was found that **the number one cause of DALY is HIV/AIDS for males, cerebrovascular diseases for females**, the second and third causes were road traffic injuries and alcohol abuse-related diseases respectively among males, and HIV/AIDS and diabetes respectively among females (Table 5.8).

Besides, when considering the health problems by age group, the differences in life-threatening problems are as follows:

- Age group 0-14 years: major health problems are low birth weight and perinatal asphyxia;
- Age group 15-29 years: major health problems are HIV/AIDS, road traffic injuries, drug abuse, schizophrenia, and alcohol abuse;
- Age group 30-59 years: major health problems are HIV/AIDS, road traffic injuries, diabetes, and liver cancer;
- Age group 60 years and over: major health problems are cerebrovascular diseases, emphysema, and diabetes.

Table 5.8 Major diseases attributable to disability-adjusted life years (DALY) of Thai people by sex, 2004

No.	Male			Female		
	Disease	DALYs	Percent	Disease	DALYs	Percent
1	HIV/AIDS	645,426	12.1	Cerebrovascular disease	307,131	7.9
2	Road traffic injuries	600,004	11.3	HIV/AIDS	290,711	7.5
3	Alcohol abuse	329,068	6.2	Diabetes	267,549	6.9
4	Cerebrovascular diseases	305,105	5.7	Depression	191,490	4.9
5	Liver cancer	294,868	5.5	Liver cancer	140,480	3.6
6	Ischemic heart disease	178,011	3.3	Road traffic injuries	135,832	3.5
7	Chronic obstructive pulmonary disease	175,549	3.3	Ischemic heart disease	117,790	3.0
8	Diabetes	168,702	3.2	Knee osteoarthritis	117,042	3.0
9	Depression	136,895	2.6	Chronic obstructive pulmonary disease	112,663	2.9
10	Cirrhosis	133,046	2.5	Cataract	110,572	2.8

Source: Working Group on Burden of Disease and Risk Factors, Thailand. International Health Policy Programme, 2006.

[6] Disability-Adjusted Life Years (DALY): One DALY is one lost year of healthy life; calculated from the formula "DALYs = years lost to premature death + years lost to illness or disability".

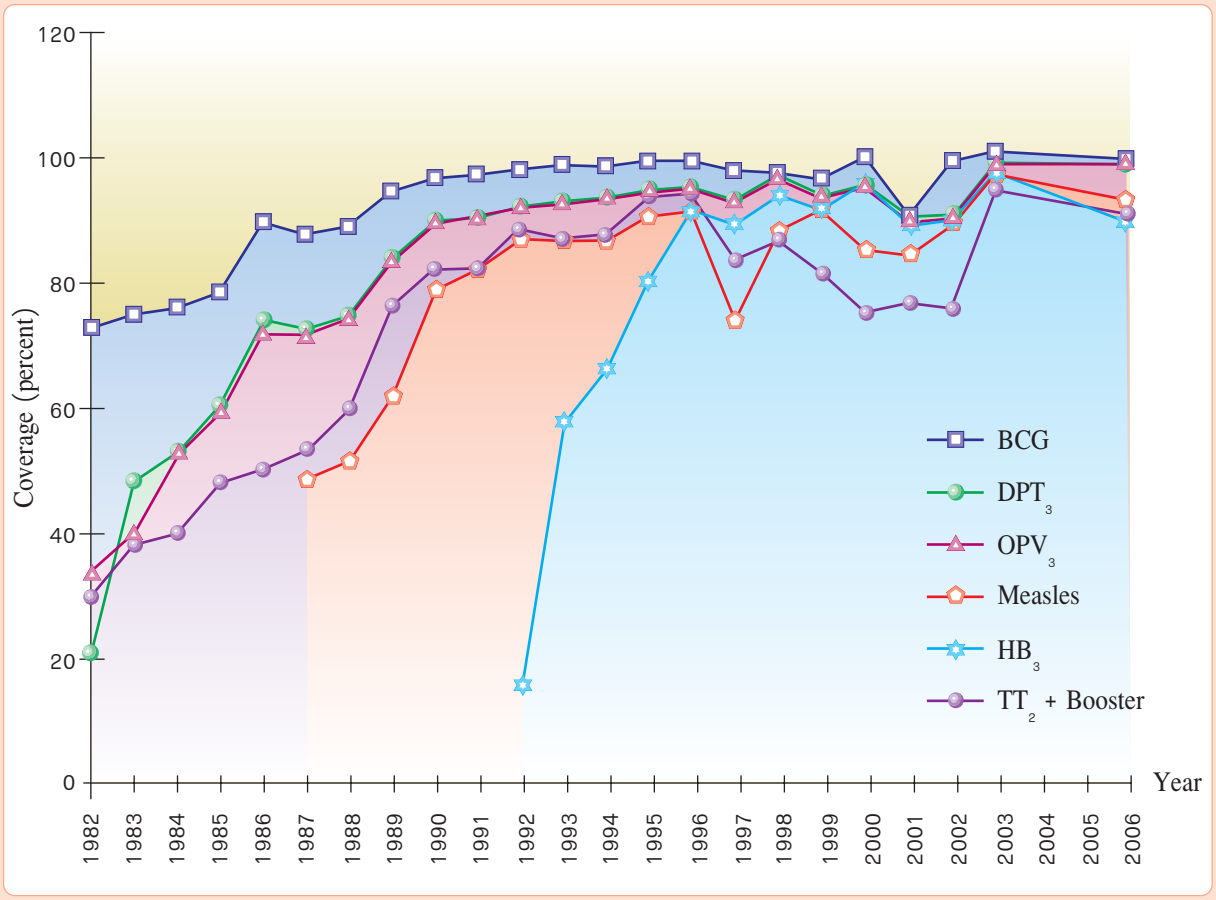
2. Major Health Problems

2.1 Communicable Diseases

2.1.1 Vaccine-preventable Diseases

Since the Ministry of Public Health launched the Expanded Programme on Immunization (EPI) in target population groups, the immunization coverage has remarkably improved (Table 5.9 and Figure 5.6).

Figure 5.6 Coverage of immunization: BCG, DPT_3, OPV_3, HB_3 measles among children and TT_2+ booster among pregnant women, 1982-2006



Sources: (1) Department of Disease Control, Ministry of Public Health.
(2) Bureau of Policy and Strategy, Office of the Permanent Secretary, MoPH.

Table 5.9 Coverage of immunization against vaccine-preventable diseases in different target groups, 1982-2006

Activity	Coverage (percent) in fiscal year																						
	1982[1]	1983[1]	1984[1]	1985[1]	1986[1]	1987[1]	1988[1]	1989[1]	1990[1]	1991[1]	1992[1]	1993[1]	1994[1]	1995[1]	1996[2]	1997[2]	1998[2]	1999[2]	2000[2]	2001[2]	2002[2]	2003[3]	2006[4]
Children																							
<1 yr																							
BCG (%)	73	75	76	78.4	89.5	87.4	88.6	94.1	96.3	96.8	97.4	98.1	97.9	98.4	98.4	96.9	96.5	95.6	98.8	89.4	98.1	99.5	98.0
DPT_3 (%)	21	48	53	60.5	73.9	72.8	74.8	84.2	89.4	89.8	91.5	92.2	92.9	93.7	94.3	92.5	95.9	92.1	94.4	89.1	89.8	97.6	97.1
OPV_3 (%)	34	40	53	59.3	71.8	71.3	73.8	83.2	89.3	89.8	91.5	92.2	92.7	93.7	94.3	92.3	95.8	93.0	94.5	89.3	89.7	97.6	97.6
Measles (%)	-	-	-	-	-	48.2	51.1	61.4	78.4	81.5	86.3	86.1	86.0	89.8	90.8	73.0	87.2	90.5	83.8	83.1	83.7	96.1	91.4
HB_3 (%)	-	-	-	-	-	-	-	-	-	-	15.4	57.1	65.5	79.3*	90.7	88.5	93.0	90.4	94.9	87.9	88.8	96.0	88.3
Pregnant women																							
TT_2 + Booster (%)	30	38	40	48	50	53.1	59.6	75.9	81.6	81.6	87.8	86.4	86.9	92.8	93.0	82.5	85.7	80.4	74.0	75.5	74.5	93.3	89.2

Sources: [1] Data for 1982-1995 were derived from the Department of Communicable Disease Control, Ministry of Public Health.

[2] Data for 1996-2002 were derived from the Bureau of Policy and Strategy, Office of the Permanent Secretary MoPH.

* Data from the 1st Provincial Health Survey (1995).

[3] Data for 2003 were derived from the survey on coverage of the basic immunization program and the polio immunization campaign, 2003. Department of Disease control, MoPH.

[4] Data for 2006 were derived from the child situation survey, Thailand, Dec 2005-Feb 2006. National Statistical Office.

As a result of such a high immunization coverage, the morbidity rates of vaccine-preventable diseases have a tendency to decline (Table 5.10 and Figure 5.8), However, it is noteworthy that in 2001-2002, the incidence of measles increased slightly partly due to an epidemic among the hilltribe people (Figure 5.7).

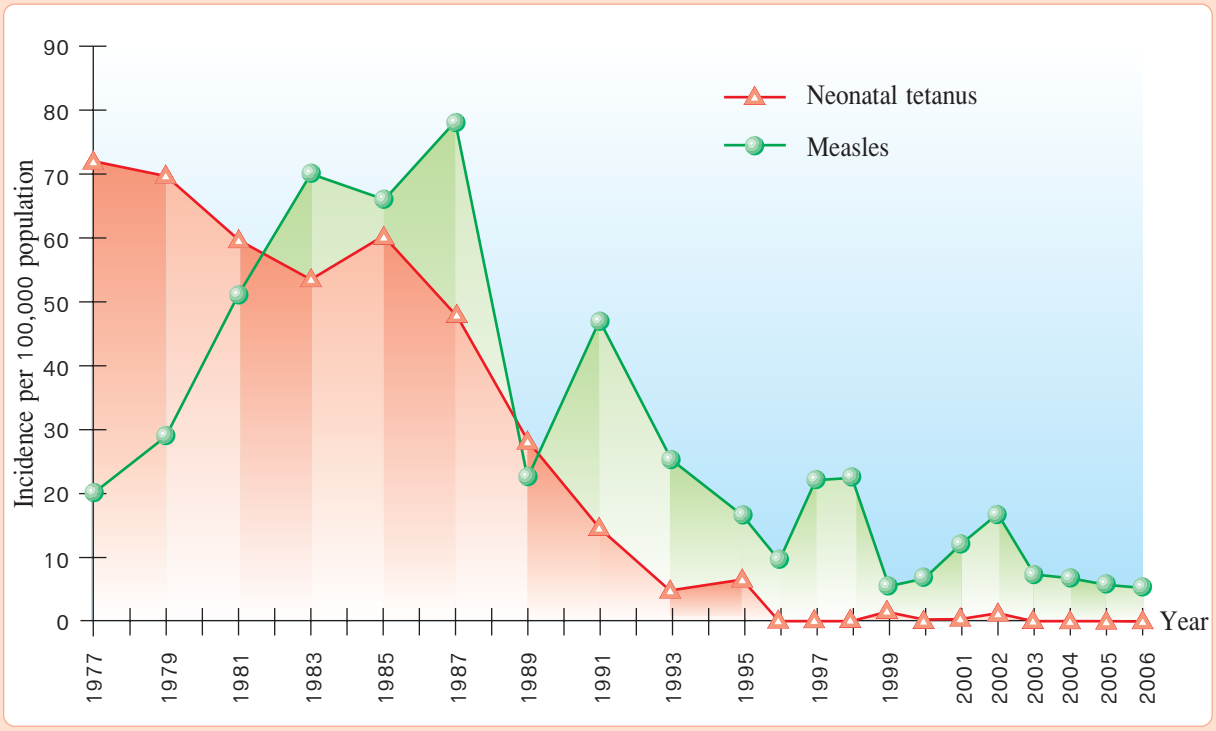
Besides, it was noted that hepatitis B infection had a rising incidence, probably resulting from a more extensive surveillance effort (Figure 5.9).

Table 5.10 Incidence rates of major vaccine-preventable diseases in Thailand, 1977-2006

Incidence of vaccine-preventable diseases per 100,000 population						
Year	**Measles**	**Neonatal tetanus**	**Diphtheria**	**Pertussis**	**Poliomyelitis**	**Hepatitis B**
1977	20.2	72.1	5.2	7.2	2.1	n.a.
1979	28.9	70.0	4.4	11.2	2.3	0.09
1981	51.1	59.8	1.6	6.2	0.5	0.14
1983	70.2	53.6	2.1	9.8	0.3	0.12
1985	66.2	60.4	1.4	4.8	0.1	0.55
1987	78.3	47.9	1.0	2.7	0.04	1.57
1989	22.5	28.1	0.1	2.2	0.03	3.30
1991	46.9	14.5	0.09	0.5	0.009	5.98
1993	25.2	4.7	0.04	0.6	0.015	4.39
1995	16.4	6.4	0.03	0.2	0.003	3.13
1996	9.5	0.05	0.08	0.13	0.03	2.20
1997	22.03	0.04	0.06	0.17	0.00	2.27
1998	22.39	0.03	0.08	0.16	0.00	2.53
1999	5.38	1.55	0.08	0.08	0.00	2.60
2000	6.67	0.03	0.02	0.16	0.00	2.71
2001	11.86	0.36	0.02	0.12	0.00	2.80
2002	16.48	1.14	0.02	0.02	0.00	3.44
2003	7.17	0.01	0.01	0.04	0.00	3.68
2004	6.66	0.02	0.02	0.03	0.00	4.54
2005	5.67	0.01	0.00	0.04	0.00	4.41
2006	5.31	0.00	0.00	0.11	0.00	5.48

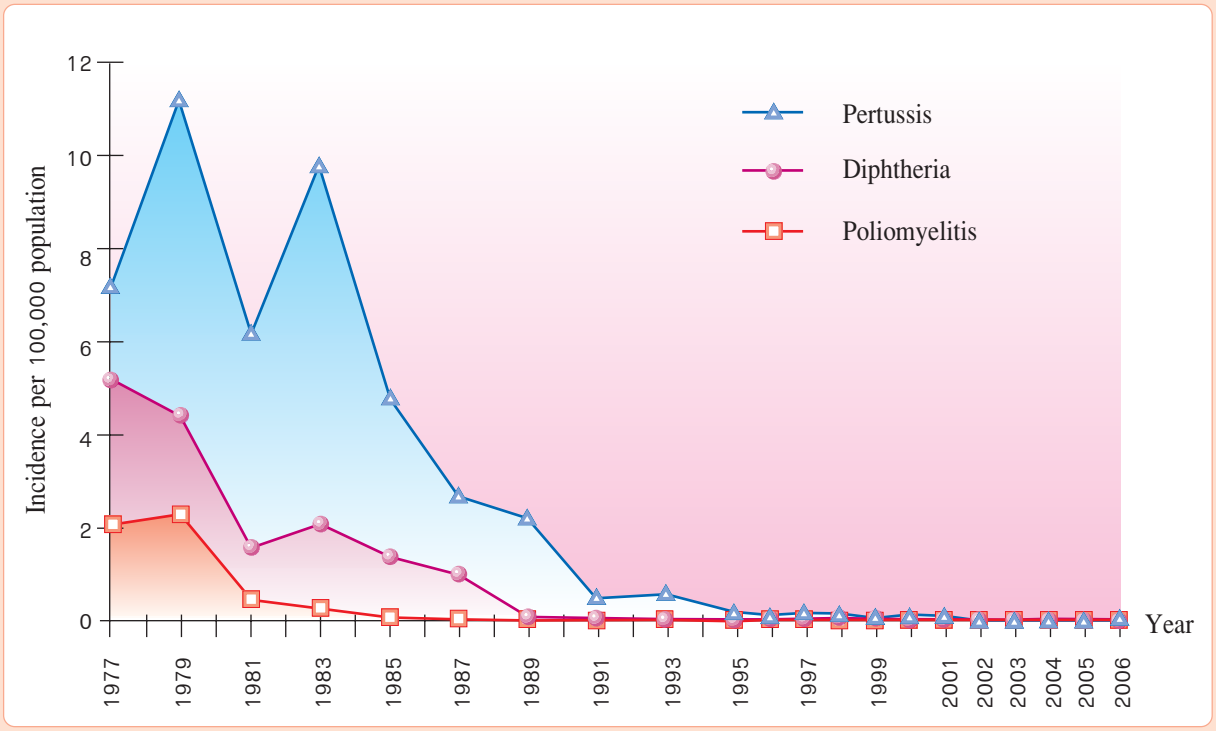
Source: Bureau of Epidemiology, Department of Disease Control, MoPH.

Figure 5.7 Incidence of neonatal tetanus and measles in Thailand, 1977-2006



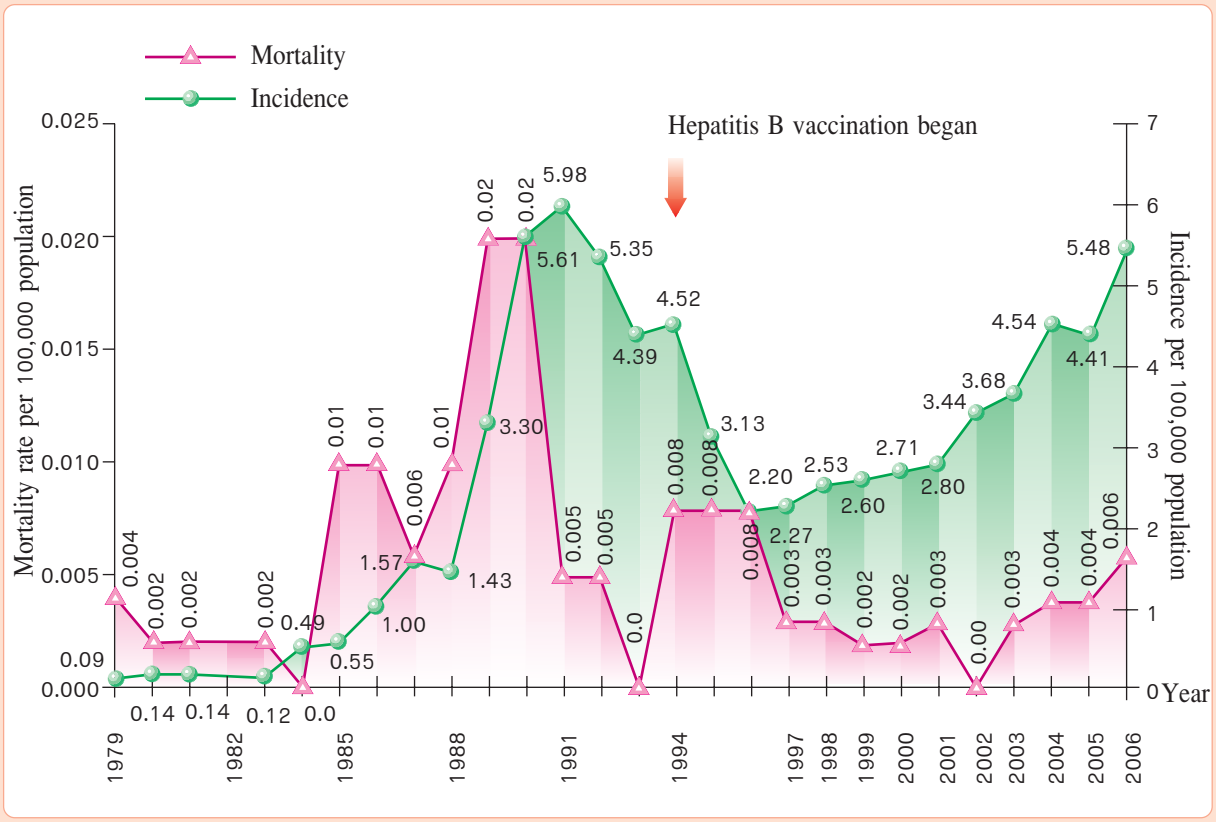
Source: Bureau of Epidemiology, Department of Disease Control.

Figure 5.8 Incidence of pertussis, diphtheria, and poliomyelitis in Thailand, 1977-2006



Source: Bureau of Epidemiology, Department of Disease Control.

Figure 5.9 Incidence and mortality rates of hepatitis B in Thailand, 1979-2006



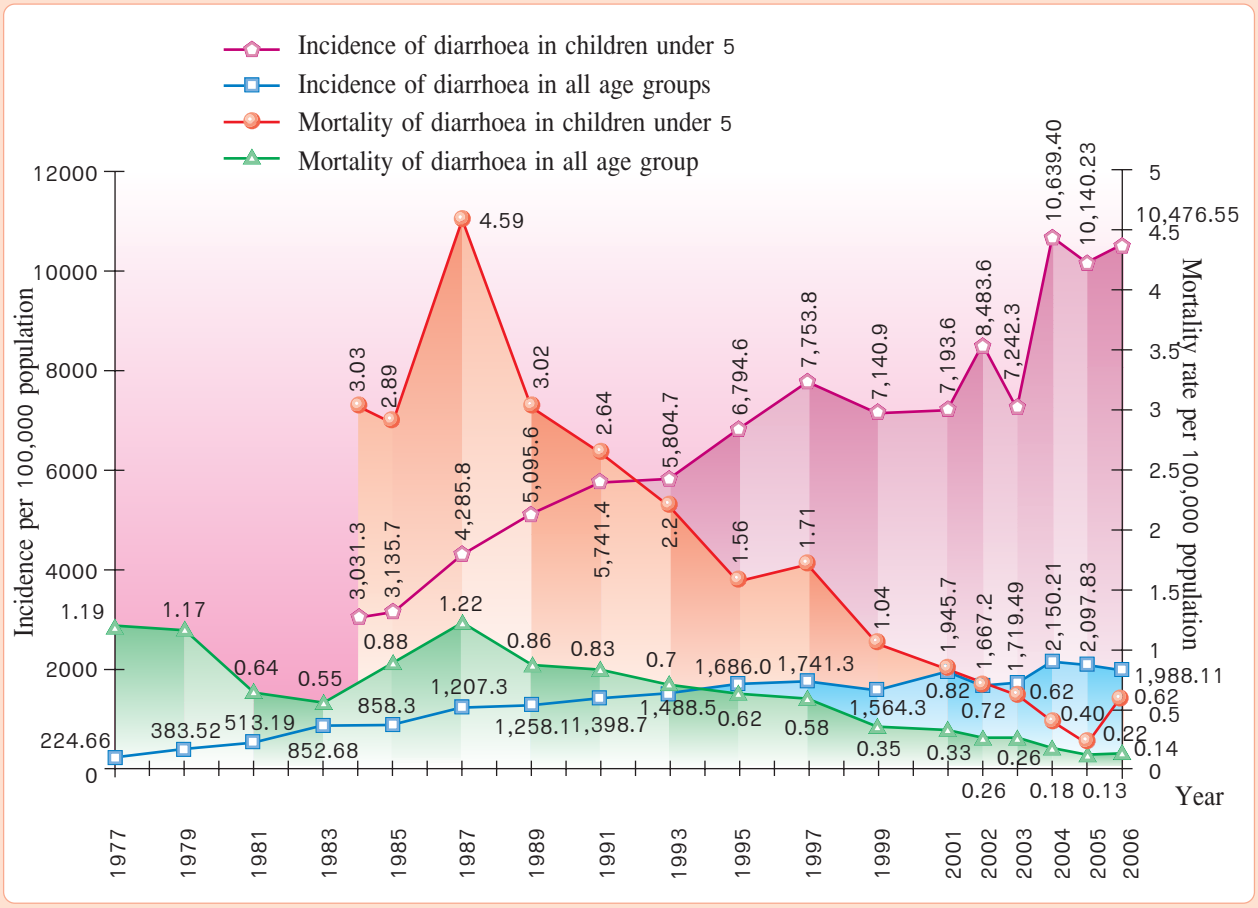
Source: Bureau of Epidemiology, Department of Disease Control.

2.1.2 Diarrhoea

Acute diarrhoea is still a crucial public health problem with a relatively slight change in incidence among both children and adults, particularly among children under five years of age whose incidence is higher than that in adults (Figure 5.10). A recent provincial health status survey revealed that the diarrhoea incidence in children was declining from 6.0 episodes/person/ year in 1995 to 3.6 episodes/person/year in 2001.[7] Nevertheless, the incidence was still higher than the target of not exceeding 1 episode/person/year (Table 5.11). However, the mortality rate has been declining considerably due to improved and extensive coverage health services as well as the success of the campaign on oral rehydration therapy (ORT).

[7] Bureau of Policy and Strategy, Ministry of Public Health. In-depth Analysis of the Data of Provincial Health Status Survey, 2003.

Figure 5.10 Incidence and mortality rates of diarrhoea in Thailand, 1977-2006



Source: Bureau of Epidemiology, Department of Disease Control.

Table 5.11 Episodes of illness with diarrhoea among children under 5 years of age, 1995-2001

Type of areas	Illness (episodes/person/year)			
	1995	1996	2001	Target, 8th Plan
Municipality	4.9	3.1	3.4	
Non-municipality	5.2	3.4	3.9	
Total	**6.0**	**3.4**	**3.6**	**Not exceeding 1**

Source: Provincial Health Status Surveys, 1995, 1996, and 2001.

2.1.3 Helminthiasis

Overall, the prevalence of intestinal parasitic diseases has been declining, except for liver fluke whose prevalence is relatively increasing in the North (Table 5.12). A survey on liver fluke situation, using the modified Kato-Katz method of faecal examination, revealed that 90.6% of those who had liver fluke infestation had a parasitic egg count of less than 1,000 eggs per gram of faeces.[8]

However, another report on helminthiasis surveillance in Nan province, under the Phufa Development Programme according to the initiation of HRH Princess Maha Chakri Sirindhorn, between 2002 and 2004, revealed that among three groups of people (primary schoolchildren, students at the Hilltribe Community Learning Centre, and the general public) the people in that locality still have helminthic diseases at a prevalence rate higher than the set target of 20% (Table 5.13).

Table 5.12 Prevalence rates of common helminthiasis

Helminthiasis	Prevalence, percent			
	1981	1991	1996	2001
Hookworm disease	40.56	27.69	21.6	11.4
Ascariasis (roundworm)	4.04	1.46	1.9	1.2
Trichuriasis (whipworm)	4.46	4.34	3.9	1.5
Liver fluke - whole country	14.7	15.2	11.8	9.6
- Liver fluke, Northeast	34.6	24.01	15.3	15.7
- Liver fluke, North	5.6	22.9	29.7	19.3

Source: Department of Disease Control, Ministry of Public Health.

[8] Department of Disease Control. Evaluation of the Helminthiasis Control Project in Thailand at the End of the 8th National Health Development Plan, 2001. Division of General Communicable Diseases, Department of Disease Control, 2001.

Table 5.13 Prevalence of helminthiasis in Nan province

Helminthiasis	Prevalence (percent) in population groups								
	2002			2003			2004		
	1	2	3	1	2	3	1	2	3
Liver and intestinal fluke infections	22.5	1.0	65.3	19.6	3.4	58.4	5.5	1.6	42.1
Hookworm infection	41.4	37.0	45.8	25.0	14.1	44.1	21.5	9.1	38.3
Ascariasis (roundworm)	35.5	88.0	12.4	38.1	86.9	19.5	49.3	60.5	27.3
Trichuriasis (whipworm)	37.9	62.5	6.8	37.3	48.3	12.1	47.3	63.4	13.7
Enterobiasis (pinworm)	1.9	0.8	1.2	1.2	0.2	0.2	1.5	0.3	0.9
Taeniasis (tapeworm)	0.2	0.0	4.2	0.4	0.0	3.6	0.1	0.0	4.2

Source: Report on helminthiasis surveillance in Nan province, under the Phufa Development Programme according to the initiation of HRH Princess Maha Chakri Sirindhorn, between 2002 and 2004.

Note: Population groups:

1 = primary schoolchildren;

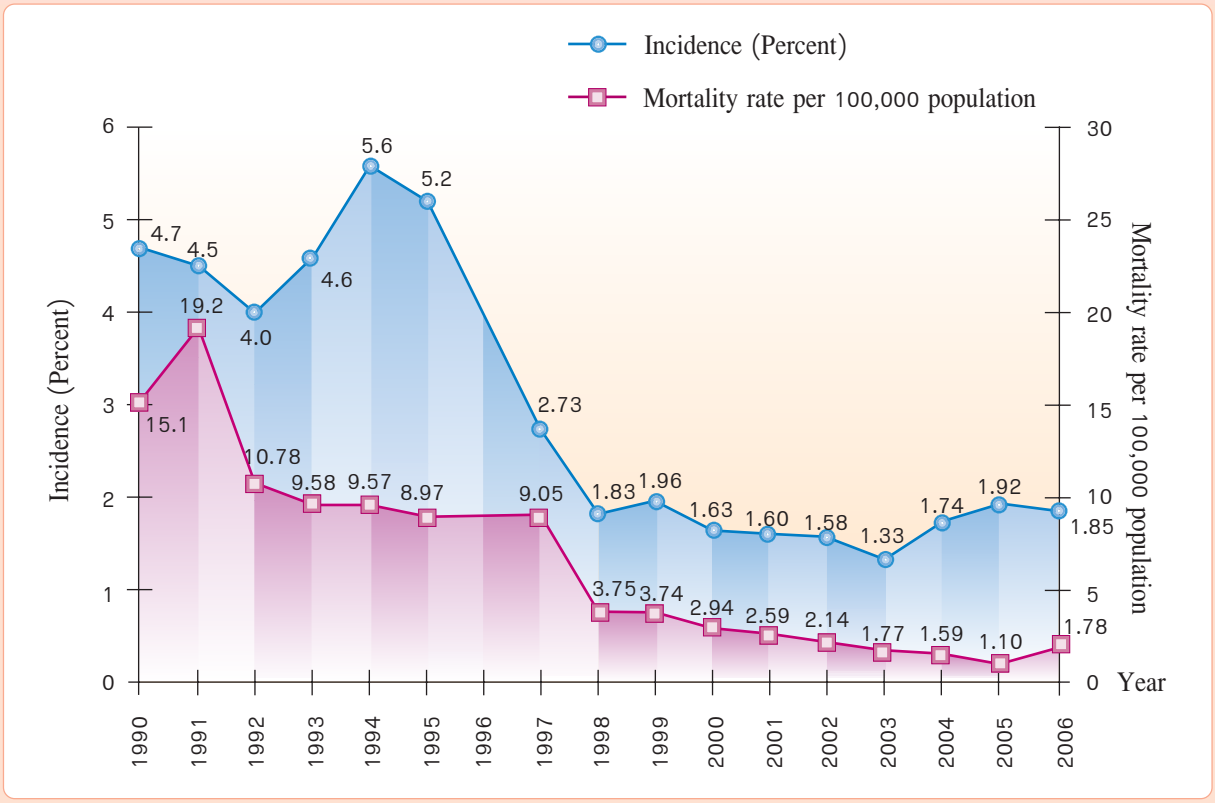
2 = students at Hilltribe Community Learning Centre; and

3 = general public.

2.1.4 Acute Respiratory Infection among Children

Currently, acute respiratory infection is still a crucial public health problem in Thailand. **Pneumonia is the number one cause of death, among all infectious diseases, in children under five**. The incidence of pneumonia in children has fallen from 5.2% in 1995 to 1.85% in 2006; and its mortality rate (per 100,000 population) has steadily dropped from 15.1 in 1990 to 1.78 in 2006 (Figure 5.11).

Figure 5.11 Incidence and mortality of pneumonia in children under five in Thailand, 1990-2006



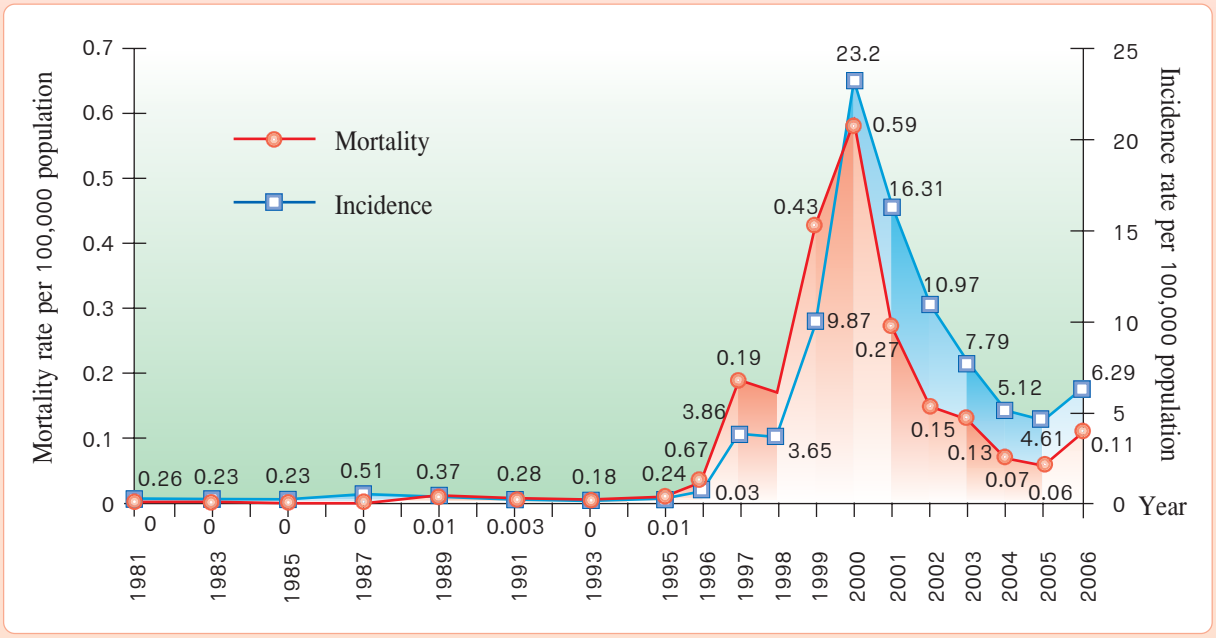
Sources: (1) Department of Disease Control, Ministry of Public Health.

(2) Bureau of Epidemiology, Department of Disease Control.

2.1.5 Leptospirosis

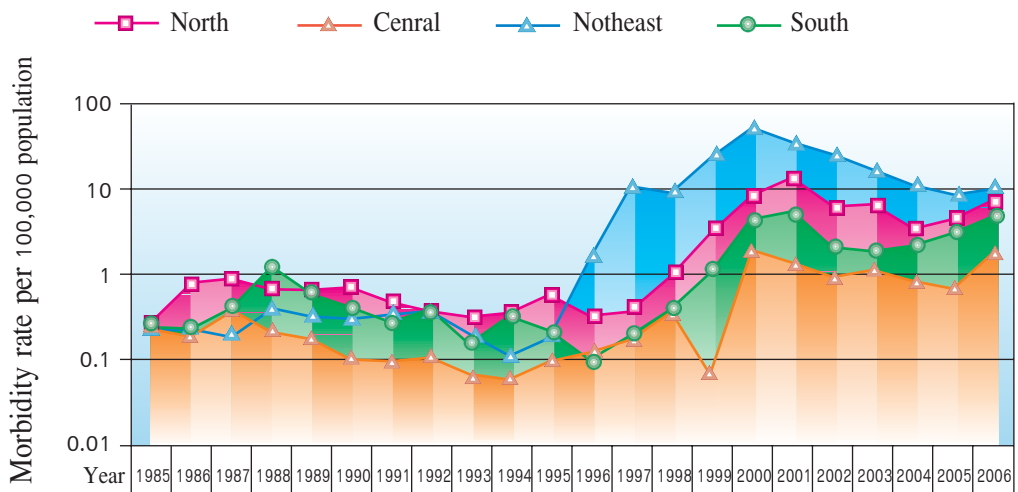
Leptospirosis is a re-emerging infectious disease having an incidence rate between 0.2 and 0.7 per 100,000 population during the period 1981-1996. But the incidence and mortality rates was on the rise, i.e. the incidence per 100,000 population rising from 0.67 in 1996 to 23.2 in 2000, but dropping to 6.29 in 2006 (Figure 5.12). Over 90% of the patients live in the Northeastern region of the country (Figure 5.13). However, for the period 2001-2006, both the incidence and mortality rates were declining.

Figure 5.12 Incidence and mortality rates of leptospirosis in Thailand, 1981-2006



Source: Bureau of Epidemiology, Department of Disease Control.

Figure 5.13 Morbidity rate of leptospirosis by region in Thailand, 1985-2006



Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
North	0.27	0.78	0.89	0.67	0.66	0.7	0.49	0.36	0.32	0.36	0.58	0.33	0.37	0.94	3.08	8.72	13.91	6.43	6.76	3.48	4.55	7.87
Cenral	0.23	0.2	0.4	0.21	0.18	0.1	0.1	0.11	0.07	0.06	0.1	0.12	0.18	0.38	0.07	2.00	1.43	0.99	1.17	0.85	0.71	1.95
Notheast	0.22	0.23	0.19	0.41	0.32	0.3	0.33	0.38	0.2	0.11	0.18	1.59	10.97	9.42	25.02	54.60	36.30	26.48	17.7	11.28	9.02	10.20
South	0.23	0.23	0.4	1.2	0.58	0.4	0.28	0.38	0.15	0.32	0.22	0.1	0.19	0.39	1.08	4.55	5.61	2.08	1.9	2.21	3.1	4.93

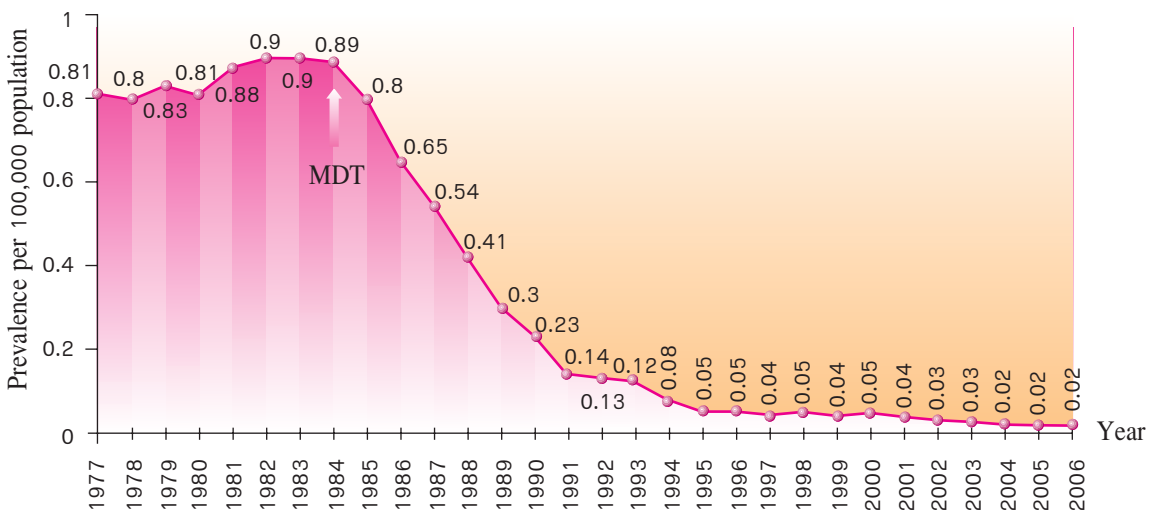
Source: Bureau of Epidemiology, Department of Disease Control.

2.1.6 Leprosy

The Leprosy Control Programme in Thailand has been implemented for over 40 years with the initiation of His Majesty the King and support of the World Health Organization as well as several NGOs. The Programme has been quite successful in reducing the leprosy prevalence rate from 5 per 1,000 population in 1955 to 0.02 per 1,000 population in 2006 - a nearly 100-fold reduction (Figure 5.14). The disease is no longer regarded as a public health problem in Thailand.

The success of the Programme has been partially attributable to the introduction of the short-course multiple-drug therapeutic (MDT) regimens, recommended by the World Health Organization since 1984.

Figure 5.14 Incidence of Leprosy in Thailand, 1977-2006



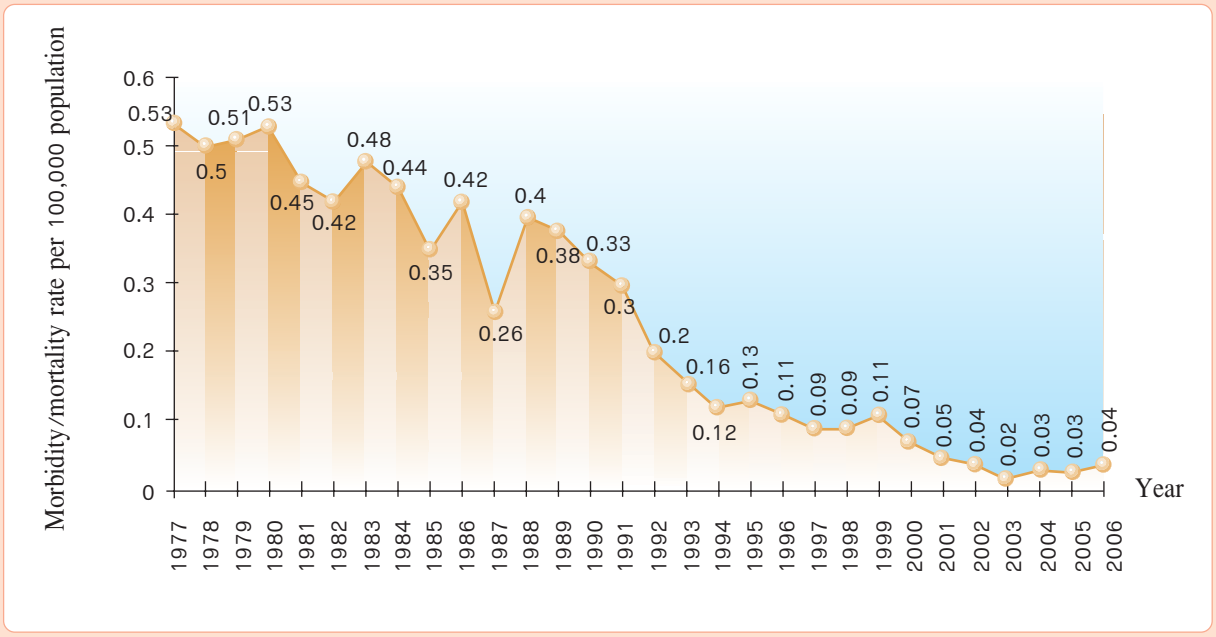
Source: Department of Disease Control, Ministry of Public Health.

Note: MDT = Multiple-drug therapy

2.1.7 Rabies

As a result of the Rabies Control Programme implemented by the Ministry of Public Health in collaboration with the Department of Livestock Development of the Ministry of Agriculture and Cooperatives, the rabies morbidity/mortality rate has dropped considerably from 0.53 per 100,000 population in 1977 to 0.04 per 100,000 population in 2006 (Figure 5.15).

Figure 5.15 Morbidity/mortality rate of rabies in Thailand, 1977-2006



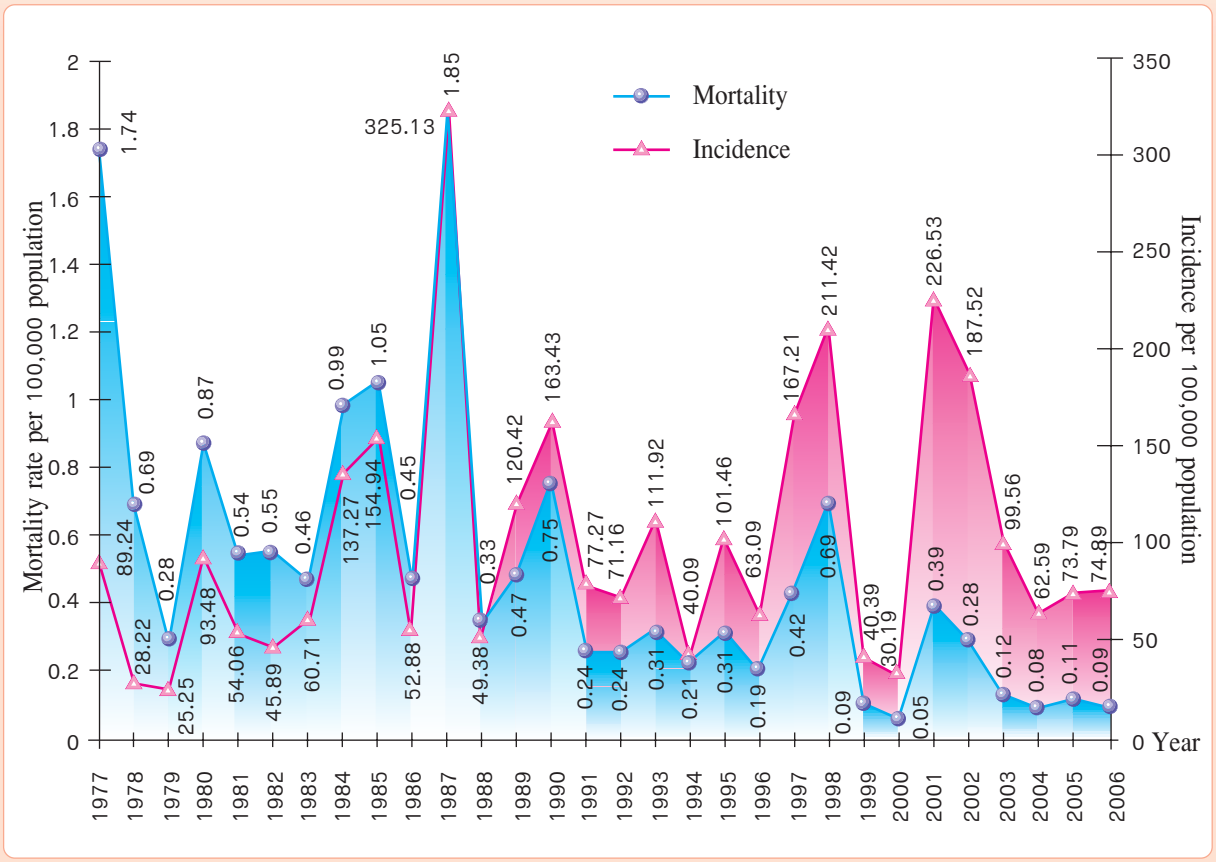
Source: Bureau of Epidemiology, Department of Disease Control.

2.2 Vector-Borne Diseases

2.2.1 Dengue Haemorrhagic Fever

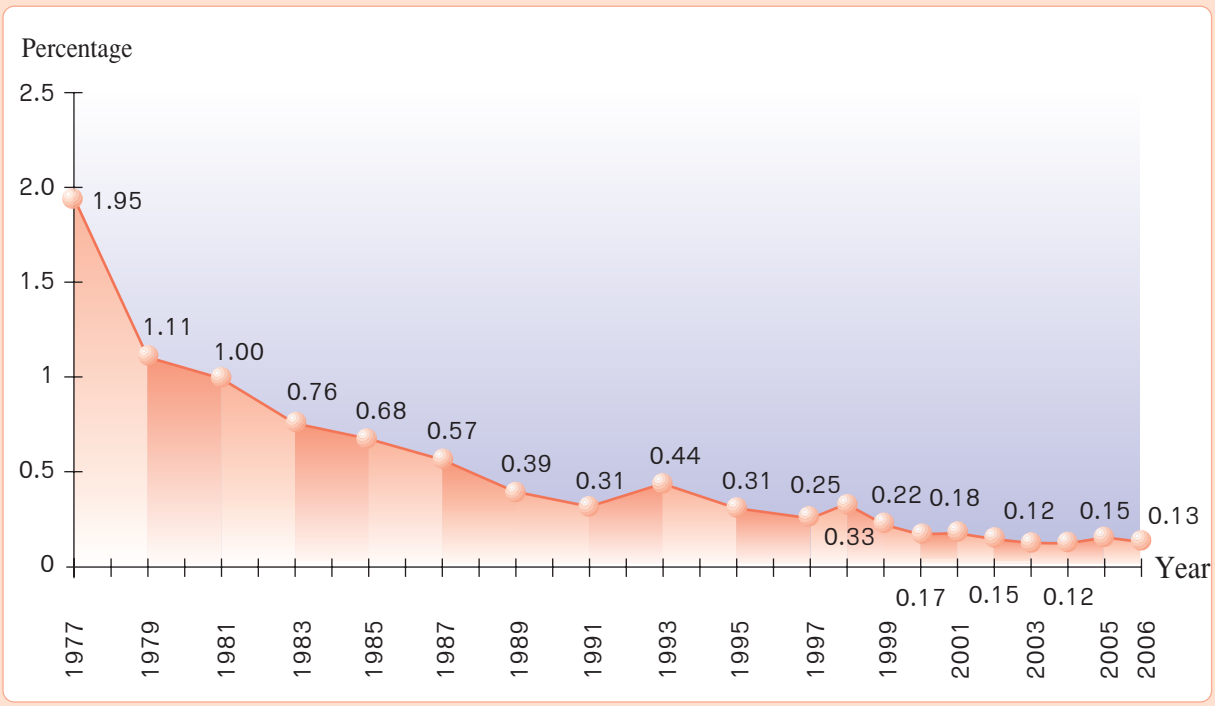
Dengue haemorrhagic fever has been a major public health problem of the country over the past 30 years without a declining trend. In particular, for the periods 1997- 1998 and 2001-2002, there was a rising trend with epidemics occurring for two years and non-epidemic for the following two years. However, the DHF case-fatality rate has been declining (Figure 5.16).

Figure 5.16 Incidence and mortality rates of dengue haemorrhagic fever, Thailand, 1977-2006



Source: Bureau of Epidemiology, Department of Disease Control.

Figure 5.17 Case-fatality rate of dengue haemorrhagic fever, 1977-2006

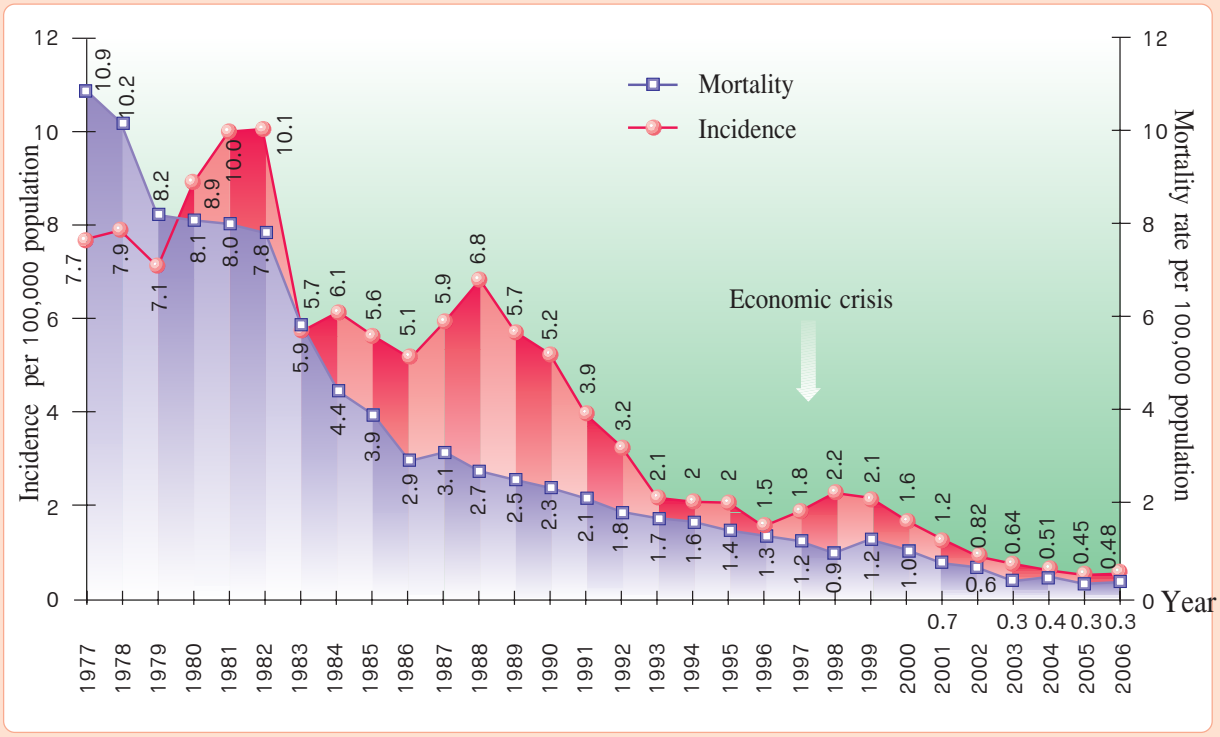


Source: Bureau of Epidemiology, Department of Disease Control.

2.2.2 Malaria

Thailand has succeeded, to a certain extent, in controlling malaria, leading to a considerable reduction in incidence and mortality rates (Figure 5.18). However, in some regions particularly the Thai-Myanmar and Thai-Cambodian border areas, the problem remains critical, especially drug resistance. It is noted that **during 1997-1999 the malaria incidence rose slightly but the mortality rate was stable**. This phenomenon is postulated to be related to the discontinuation of DDT spraying, EI Nino phenomena and the restructuring of communicable disease control programmes. As a result, Malaria Units were upgraded/restructured to be "Vector-borne Disease Control Units", which are extensively responsible for the prevention and control of dengue hemorrhagic fever, filariasis and encephalitis. In the beginning, there might be some problems, but since 2000, the incidence and mortality rates have been declining.

Figure 5.18 Incidence and mortality rates of malaria in Thailand, 1977-2006



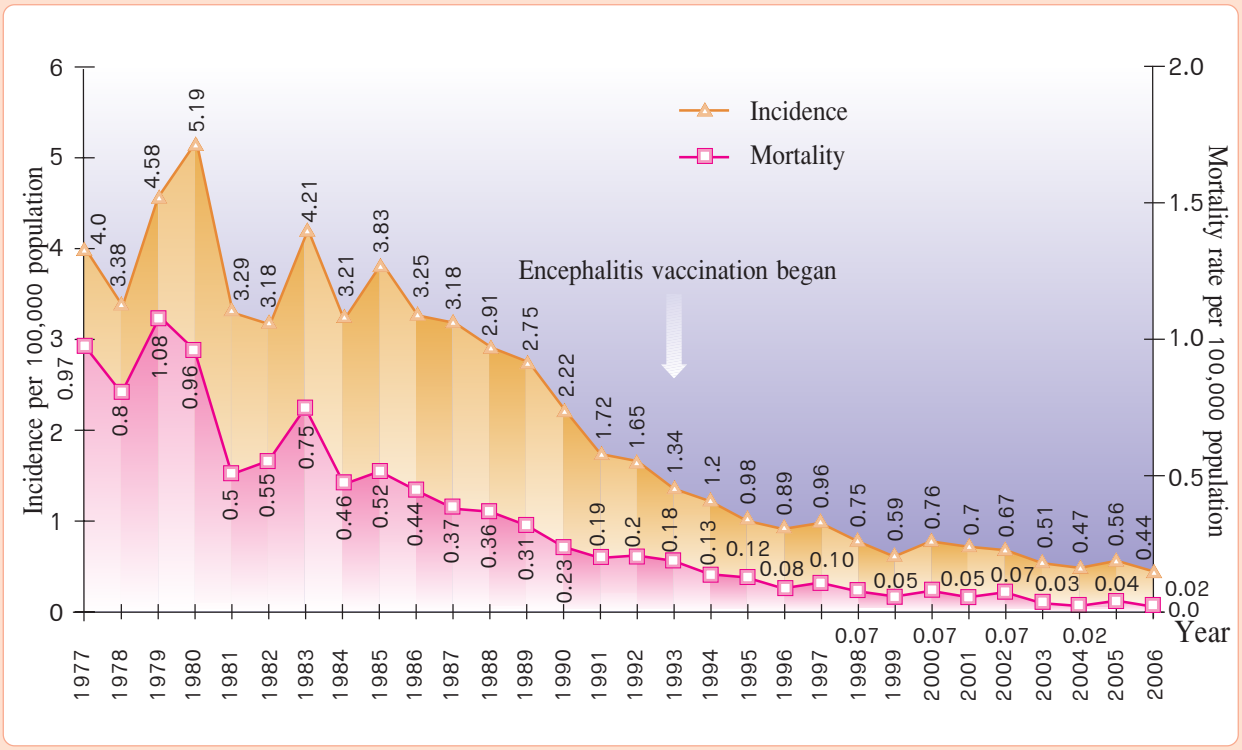
Sources: (1) Department of Disease Control, Ministry of Public Health.

(2) Bureau of Policy and Strategy, Ministry of Public Health.

2.2.3 Encephalitis

As a result of economic and social development and intensive campaigns on immunization for target groups of children in high-risk areas, the incidence and mortality rates of encephalitis have significantly declined (Figure 5.19). In 2006, the incidence of encephalitis was recorded at 0.44 per 100,000 population and the mortality at 0.02 per 100,000 population.

Figure 5.19 Incidence and mortality rates of encephalitis in Thailand, 1977-2006

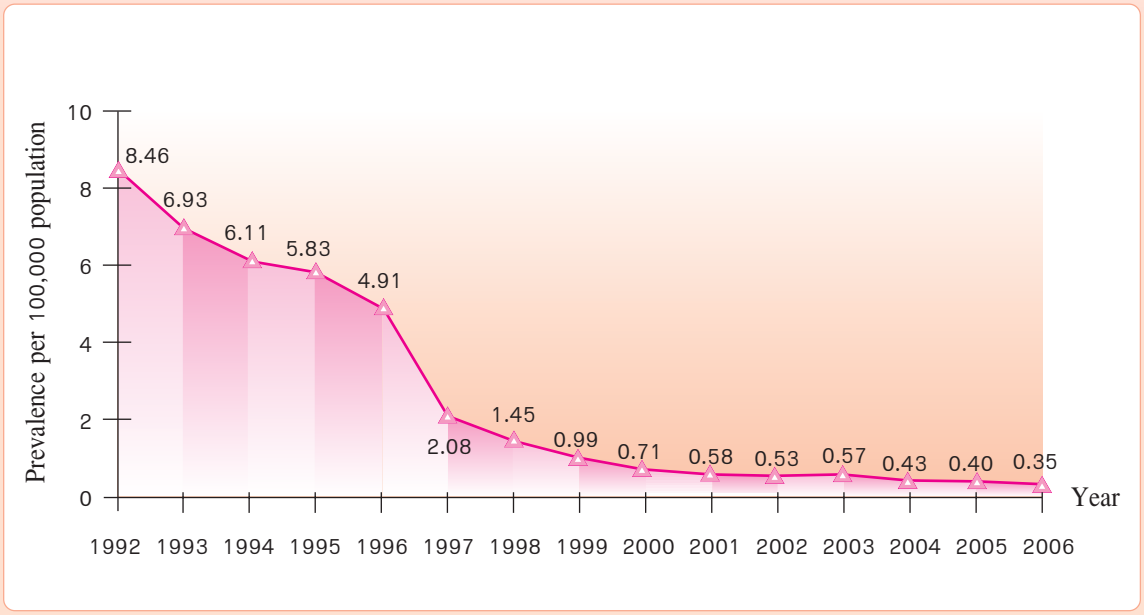


Source: Bureau of Epidemiology, Department of Disease Control.

2.2.4 Filariasis

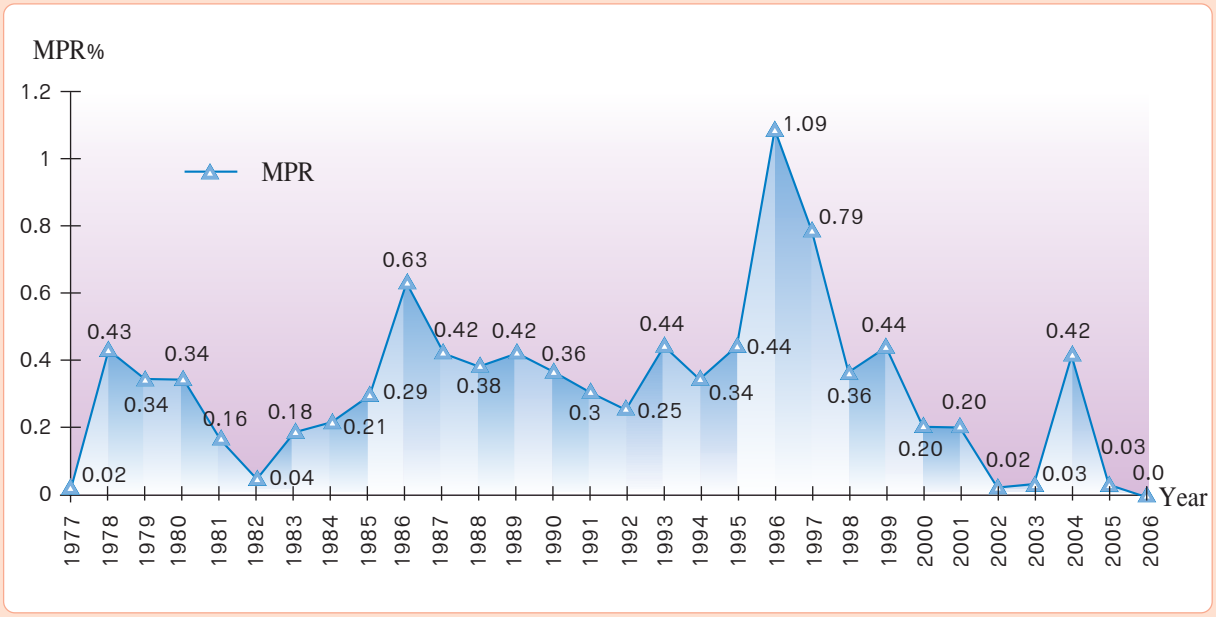
Overall, the filariasis control efforts have been able to reduce the prevalence rate (per 100,000 population) from 8.46 in 1992 to 0.35 in 2006 (Figure 5.20) and reduce the microfilaria positivity rate in alien workers to less than 1% over the period of almost 30 years (1977-2006), except that in 1996 the rate was greater than 1% as a result of intensive health checkups for foreign workers (Figure 5.21). However, filariasis is still a public health problem in some areas, particularly the provinces along the Thai-Myanmar and Thai-Malaysian borders. This is largely because of the environmental conditions favorable to mosquito breeding and the border areas being the places where workers especially from Myanmar cross over to find jobs in Thailand.

Figure 5.20 Prevalence rate of filariasis, Thailand, 1992-2006



Source: Department of Disease Control, Ministry of Public Health.

Figure 5.21 Microfilaria positivity rate in alien workers, 1977-2006



Source: Department of Disease Control, Ministry of Public Health.

2.3 HIV/AIDS, Tuberculosis and Sexually Transmitted Infections

1) HIV/AIDS

(1) HIV Infection Situation

According to the report on sentinel surveillance of HIV infection in the seven major target groups of population, implemented in all provinces during the period 1989-2006, the situation and trends can be summarized as follows:

Blood Donors. The prevalence increased from 0.28% in 1989 to the peak of 0.81% in 1992, and then gradually dropped to 0.29% in 2006 (Figure 5.22).

Pregnant Women Attending Antenatal Care Clinics. The prevalence climbed from 0.68% in 1991 to the peak of 2.29% in 1995, and then gradually reduced to 0.87% in 2006 (Figure 5.22).

Injecting Drug Users. The prevalence was approximately 30-43% throughout the period 1989-1997. After 1997, the prevalence rose to the peak of 50.77% in 1999, and fell to 36.33% in 2006 (Figure 5.23).

Male Clients Attending STI Clinics. The prevalence jumped from 2.50% in 1990 to the peak of 8.5% in 1994 and remained stable at 7-9% during 1995-1999, but declined to 3.39% in 2006 (Figure 5.23).

Direct Female Commercial Sex Workers (CSWs). The prevalence rose from 3.47% in 1989 to the peak of 33.15% in 1994, and fell to 4.59% in 2006 (Figure 5.23).

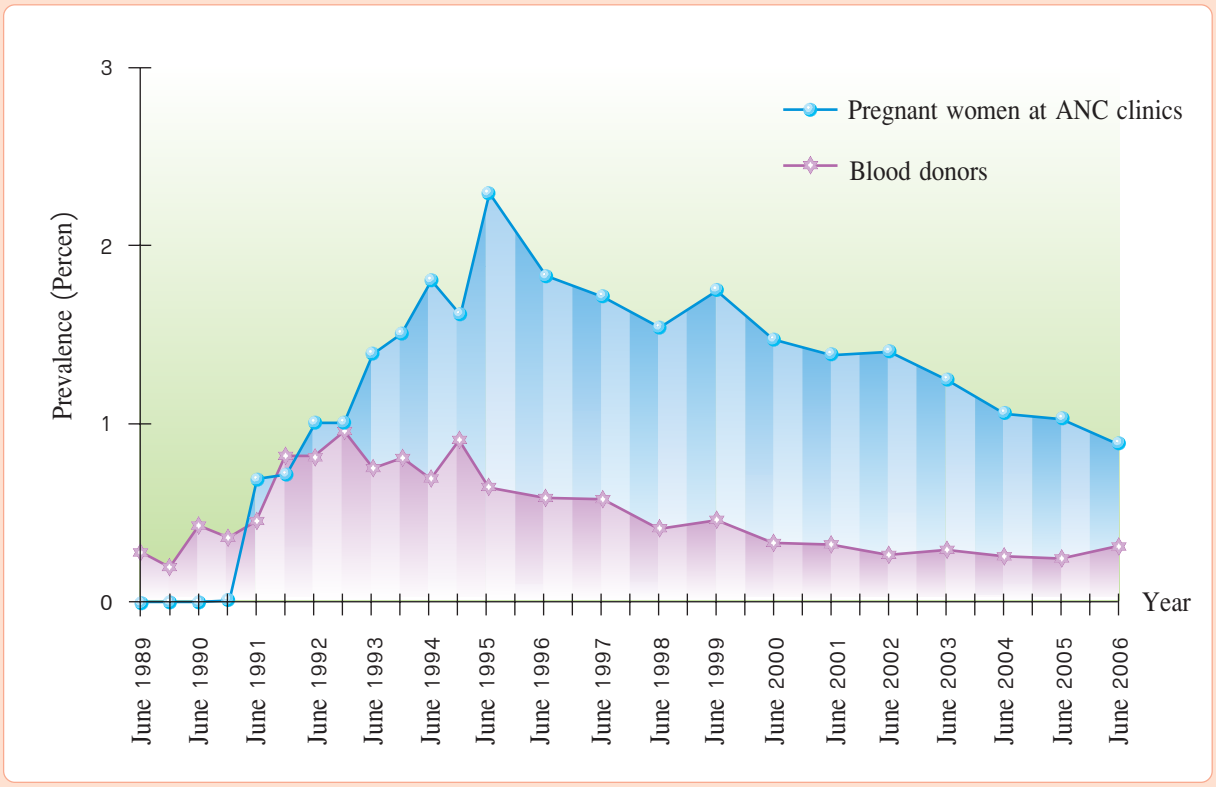
Indirect Female CSWs. The prevalence escalated from 2% in 1990 to the peak of 10.14% in 1996. Since then the rate has gradually declined to 2.27% in 2006 (Figure 5.23).

Military Recruits or Conscripts. The prevalence increased from 1.6% in 1990 to the peak of 4% in 1993, and since then has dropped to 0.4% in 2006 (Figure 5.24).

It is noteworthy that the HIV/AIDS epidemic in Thailand originated in homosexual males during the period 1986-1987, then it spread to injecting drug users, female commercial sex workers, male sex seekers and, eventually, to families.

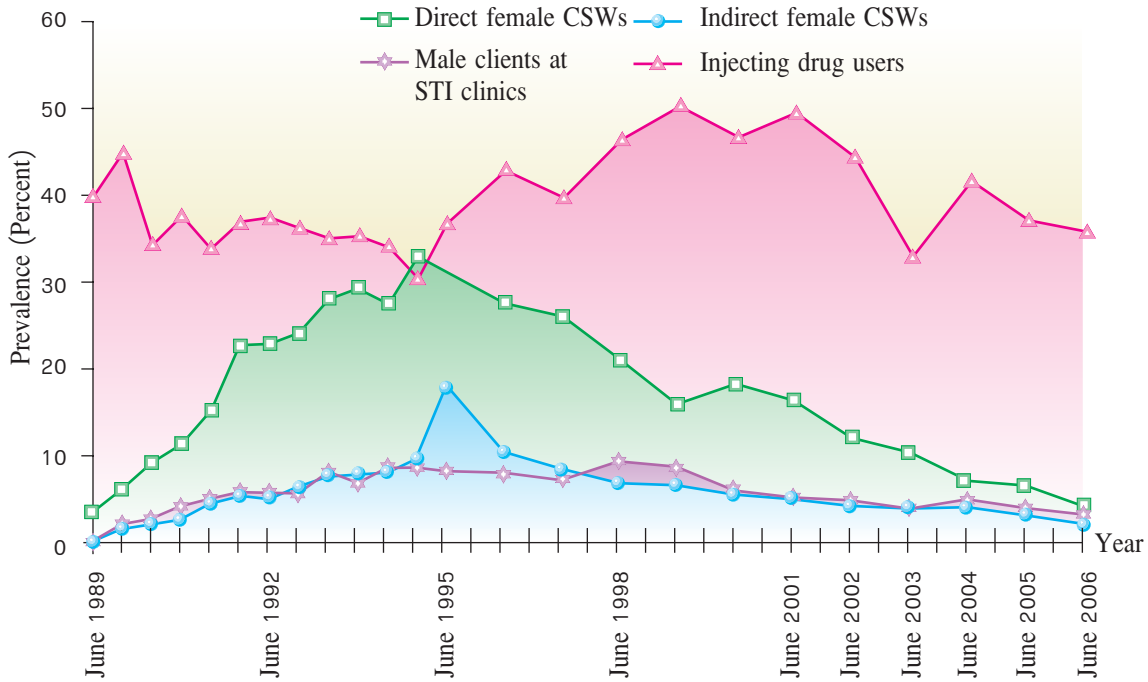
Nevertheless, the reduction in the HIV transmission in the heterosexual group during 1995-1996 was possibly a result of intensive health education campaigns among the high-risk group, coupled with the 100% condom use campaigns among female CSWs (Figure 5.29).

Figure 5.22 Prevalence of HIV infections in blood donors and pregnant women at the ANC clinics in government hospitals, 1989-2006



Source: Bureau of Epidemiology, Department of Disease Control.

Figure 5.23 Prevalence of HIV infections in direct and indirect female CSWs, male clients at STI clinics, and injecting drug users, Thailand, 1989-2006

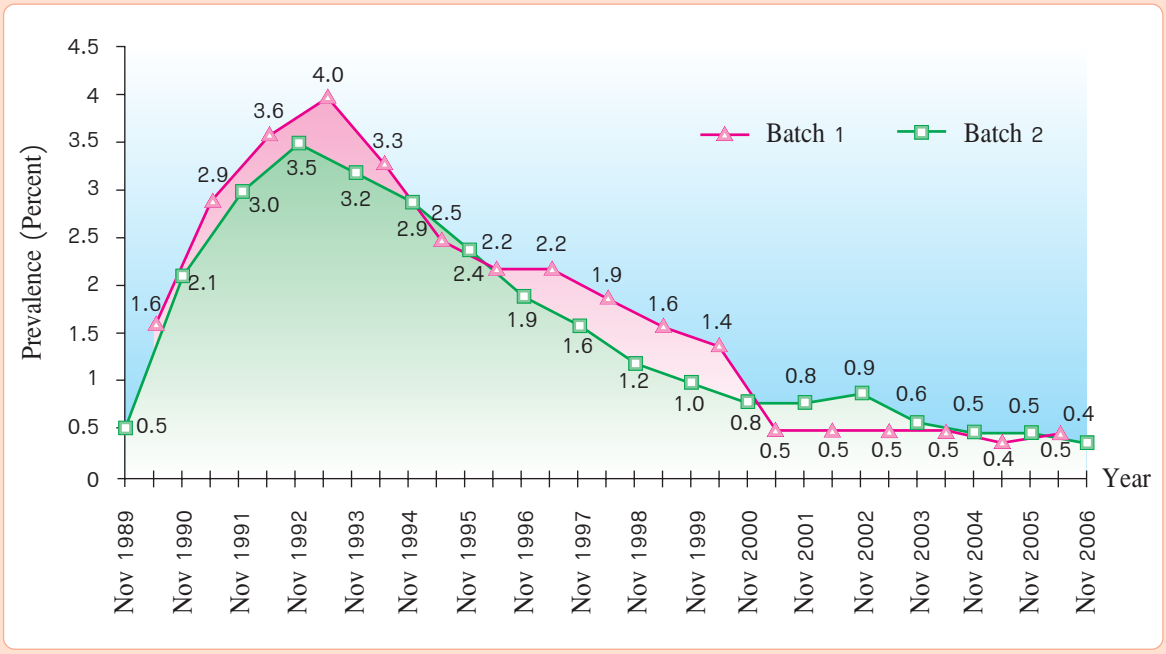


Group	June 1989	June 1990	June 1991	June 1992	June 1993	June 1994	June 1995	June 1996	June 1997	June 1998	June 1999	June 2000	June 2001	June 2002	June 2003	June 2004	June 2005	June 2006
Direct female CSWs	3.47	9.30	15.24	22.97	28.25	27.64	33.15[1]	27.78	26.14	21.13	16.00	18.46	16.56	12.34	10.63	7.36	6.80	4.59
Indirect female CSWs	0.00	2.00	4.34	5.02	7.58	8.00	9.48[1]	10.14	8.22	6.74	6.56	5.51	5.03	4.07	3.88	4.00	3.37	2.27
Male clients at STI clinics	0.00	2.50	5.05	5.71	8.00	8.50	8.16	8.00	7.07	9.30	8.71	5.96	5.08	4.76	4.00	5.00	4.13	3.39
Injecting drug users	40.09	34.51	34.04	37.50	35.21	34.27	37.00	43.26	40.00	46.88	50.77	47.17	50.00	44.91	33.33	42.22	37.64	36.33
Pregnant women at ANC clinics	0.00	0.00	0.68	1.00	1.39	1.80	2.29	1.81	1.71	1.53	1.74	1.46	1.37	1.39	1.23	1.04	1.01	0.87
Blood donors	0.28	0.43	0.45	0.81	0.74	0.68	0.63	0.56	0.56	0.39	0.44	0.31	0.30	0.24	0.27	0.23	0.22	0.29

Source: Bureau of Epidemiology, Department of Disease Control.

Note: [1] Data for December 1994.

Figure 5.24 Prevalence of HIV infections in Thai male military recruits, November 1989-November 2006



Sources: Armed Forces Research Institute of Medical Sciences, Royal Thai Army Medical Department. Institute of Pathology, Phra Mongkutklao Medical Centre, Royal Thai Army.

(2) Prevalence of AIDS Cases

According to the report on the number of AIDS patients during 1984-2006 by geographic region, the highest prevalence rate (per 100,000 population) was reported in the North, while the lowest rate was reported in the Northeast (Figure 5.25).

Nonetheless, the number of reported cases remains lower than actuality; as a matter of fact only 30-60%[9] of all the cases are actually reported about 3 months after the case is detected.

(3) Projection of the Numbers of HIV-Infected Persons and AIDS Cases

The Ministry of Public Health and the Office of the National Economic and Social Development Board (NESDB), using the Asian Epidemic Model (AEM) technique, have estimated that in 2020 cumulatively there will be 1,250,000 HIV-infected individuals in Thailand (1,180,000 adults and 70,000 children), and of them all 1,100,000 will have died and only 157,000 will remain alive. From now on, each year there will be an additional 8,000 new HIV infections (including 500 children) and 16,500 new AIDS cases (1,500 children) and 18,000 deaths (Figure 5.26).

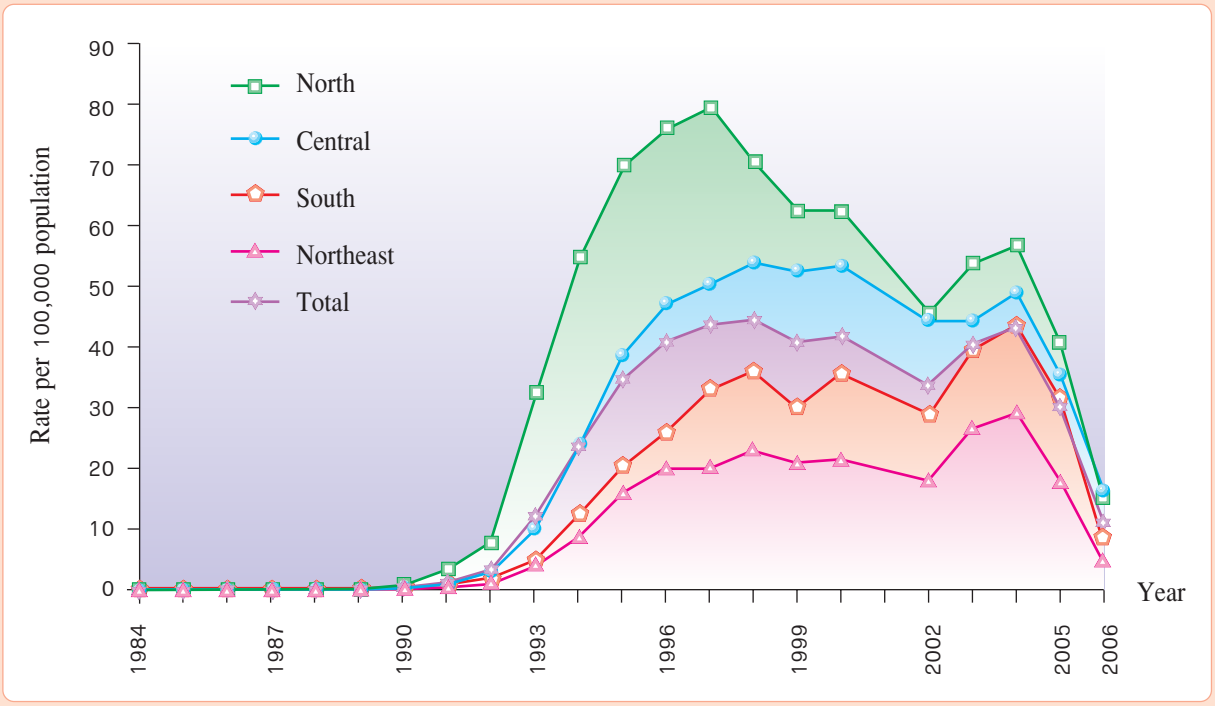
[9] Division of Epidemiology, MOPH. Assessment of the Completeness of AIDS Patients Reporting, 2000.

Table 5.14 Projection of the numbers of HIV-infected persons, AIDS cases and deaths, 2003-2020

Category	Number, 2003	Number, 2020
HIV-infected persons, cumulative	1,055,000	1,250,000
Deaths due to HIV/AIDS, cumulative	450,000	1,100,000
Persons living with HIV/AIDS	604,000	157,000
New HIV infections	21,000	8,000
New AIDS cases	50,500	16,500
Deaths due to HIV/AIDS	52,000	18,000

Source: Department of Disease Control, Ministry of Public Health.

Figure 5.25 Rates of reported AIDS cases by region, Thailand, 1984-2006

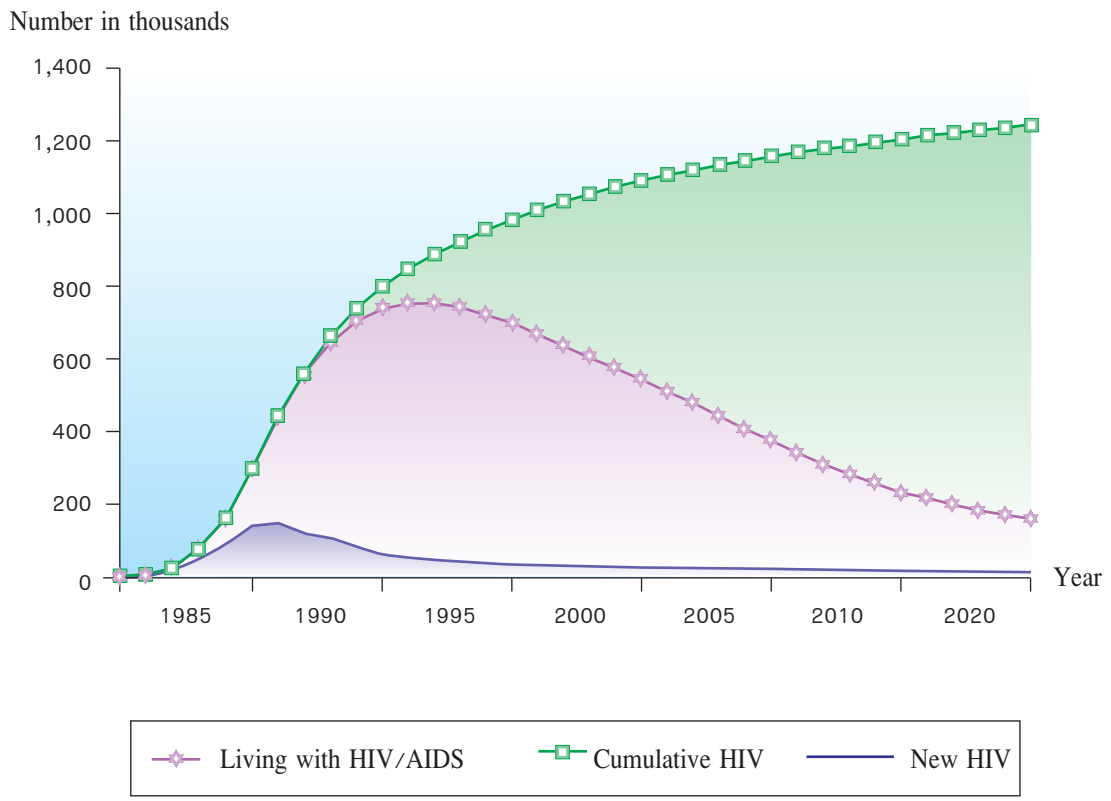


Region	1984	1986	1988	1990	1992	1994	1996	1998	2000	2002	2003	2004	2005	2006
North	-	-	0.04	0.61	7.76	55.08	76.66	71.17	62.86	45.73	54.26	57.15	41.31	15.7
Central	0.01	0.01	0.03	0.40	2.85	23.97	47.15	54.22	53.65	44.83	44.76	49.28	35.73	16.51
South	-	-	0.01	0.07	1.35	12.46	25.81	36.06	35.98	29.15	39.84	43.88	32.18	8.63
Northeast	-	-	0.01	0.11	1.14	8.82	20.15	23.27	21.74	18.16	27.12	29.66	18.15	5.06
Total	**-**	**-**	**0.02**	**0.30**	**3.06**	**23.49**	**40.89**	**44.66**	**42.06**	**33.71**	**40.85**	**43.32**	**30.29**	**11.36**

Source: Bureau of Epidemiology, Department of Disease Control.

Note: The number of reported cases is about 30-60% of actuality.

Figure 5.26 Projections of the number of persons living with HIV/AIDS each year, cumulative number of HIV-infected persons, and number of new infections, Thailand, 1985-2020



Source: Department of Disease Control, Ministry of Public Health.

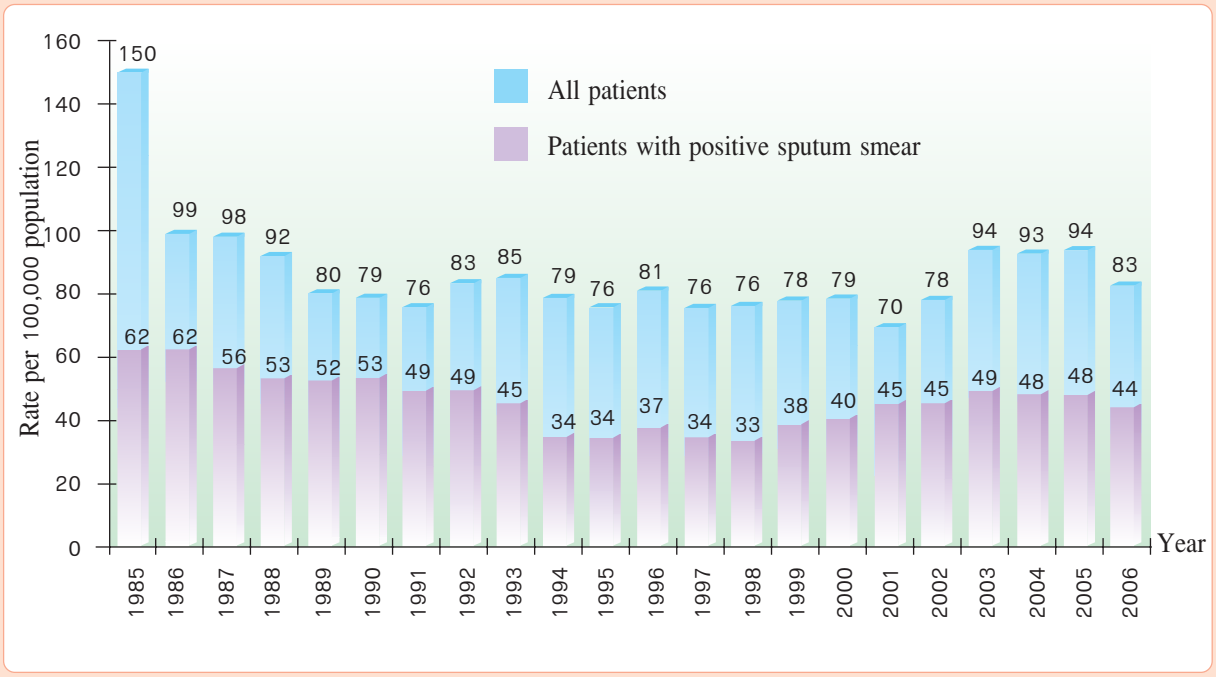
2) Tuberculosis

The tuberculosis prevalence (per 100,000 population) was actually declining between 1985 and 1989 from 150 to 80; but between 1990 and 2005 it did not decrease, rather it increased slightly (Figure 5.27).

Owing to the HIV/AIDS epidemic, tuberculosis is becoming a public health problem. In all upper northern provinces, the TB-HIV coinfection rate has risen from 4.1% in 1991 to 15.1% in 2005. Overall, for the entire country for over 10 years, the coinfection prevalence has increased from 14.5% in 1989 to 28.7% in 2005 (Figure 5.28).

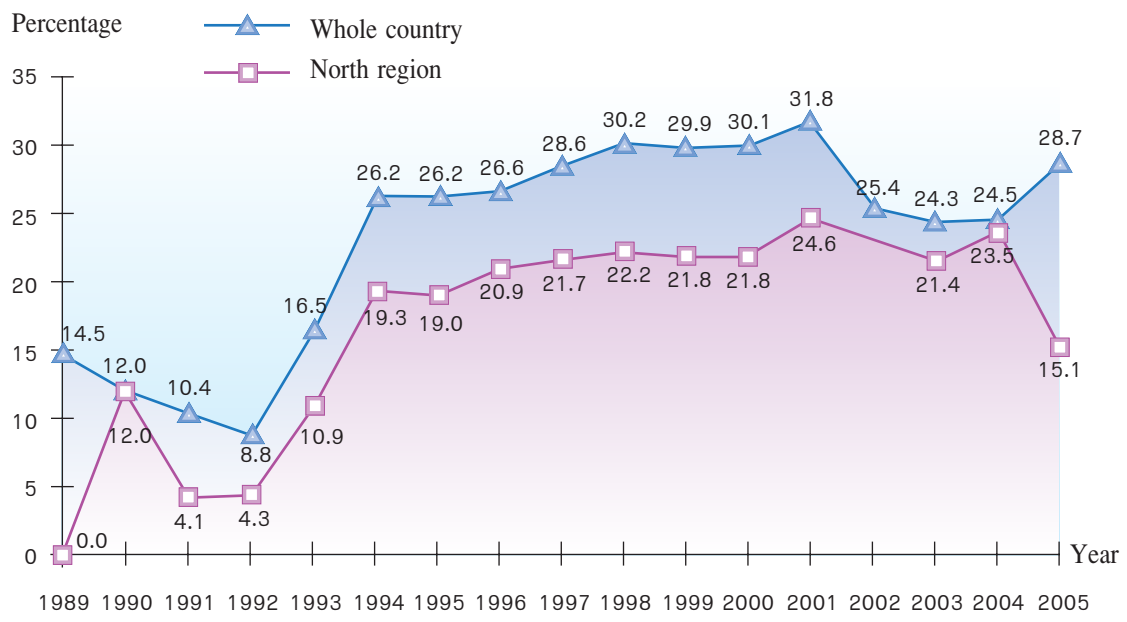
According to WHO's projections, HIV/AIDS has resulted in an annual increase of 4% of tuberculosis cases. In actuality, in Thailand the tuberculosis prevalence has risen by 2% each year during the past five years and there was no tendency to decline during the period 1995-2002. However, it has been reported that new cases of multidrug-resistant tuberculosis during 1997-1998 was 2.02% on average across the country. Despite a 6% prevalence in Chiang Rai (a high-prevalence area), the rate is rather low compared with those in other HIV/AIDS-affected countries whose rates are over 10% (Institute of Tuberculosis Research, Japan, quoted in the Division of Tuberculosis).

Figure 5.27 Rate of newly registered tuberculosis patients in Thailand, 1985-2006



Source: Department of Disease Control, Ministry of Public Health.

Figure 5.28 Percentage of tuberculosis infection in HIV/AIDS patients in Thailand, 1989-2005



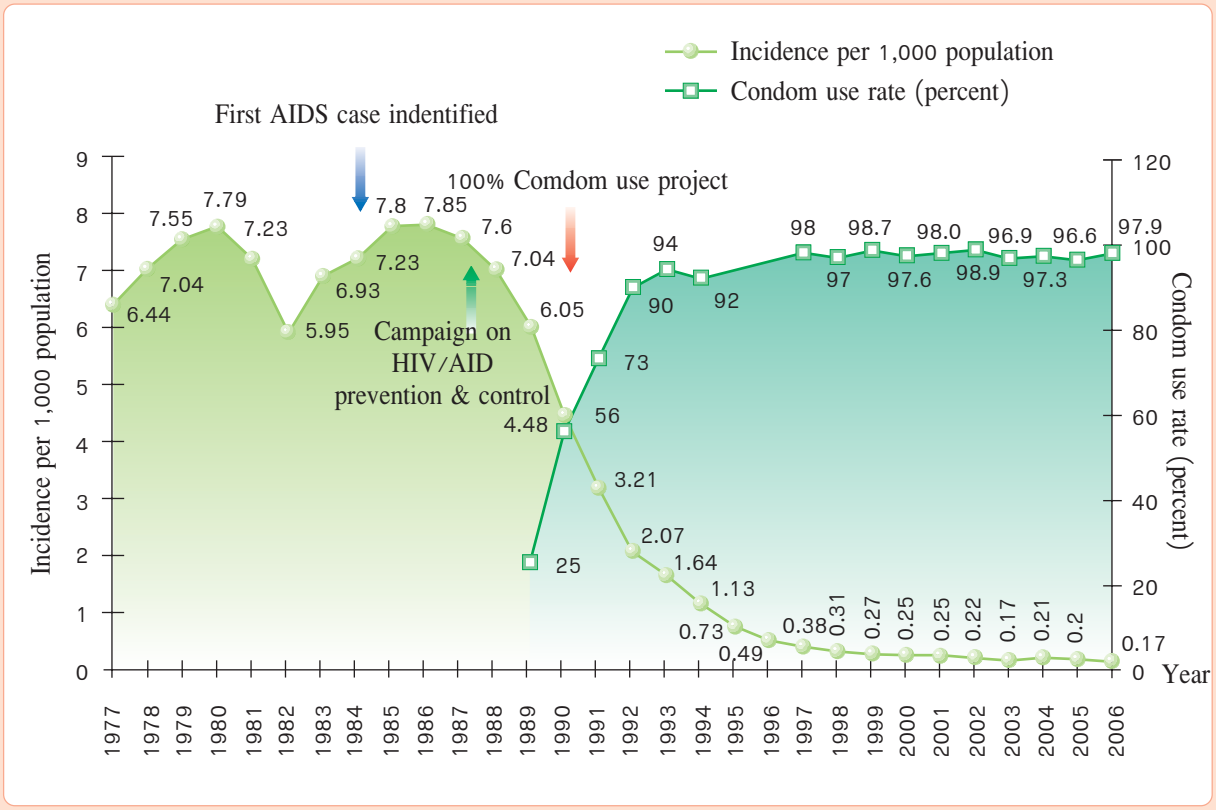
Source: Bureau of Epidemiology, Department of Disease Control.

Note: The Bureau of Epidemiology adjusted all the data for 1989-2003.

3) Sexually Transmitted Infections (STIs)

Overall, the trends in STI prevalence in Thailand between 1977 and 2005 have been improving. In particular, after 1986, the prevalence rate of STIs has fallen from 7.85 per 1,000 population in 1986 to 0.17 per 1,000 population in 2006 (Figure 5.29) as a result of the intensive campaigns on HIV/AIDS prevention and control.

Figure 5.29 Incidence of sexually transmitted infections and condom use rate among female commercial sex workers, Thailand, 1977-2006



Source: Bureau of Epidemiology and Cluster of STIs, Department of Disease Control.

Note: Sexually transmitted infections include syphilis, gonorrhoea, chancroid, lymphogranuloma venereum, granuloma inguinale, and pseudogonorhoea.

2.4 Problems of Emerging Diseases

2.4.1 Avian Influenza

According to the WHO report on avian influenza situation from 2003 to 23 September 2006 worldwide, there were 251 human causes and 148 deaths. For Thailand, cumulatively there were 25 confirmed cases and 17 deaths, a case-fatality rate of 68.0%; in 2006 (as of September) Thailand reported 3 confirmed cases and 3 deaths. At present, there has been no report of human-to-human transmission of the disease (Table 5.15).

Table 5.15 Avian influenza: numbers of confirmed cases and deaths in Thailand, 2003-2006

Case / death	No. of cases or deaths				
	2003	2004	2005	2006	Total
Confirmed cases	0	17	5	3	25
Deaths	0	12	2	3	17
Case-fatality rate (%)	0.0	70.6	40.0	100.0	68.0

Source: National Institute of Health, Department of Medical Sciences, MoPH.

2.4.2 SARS

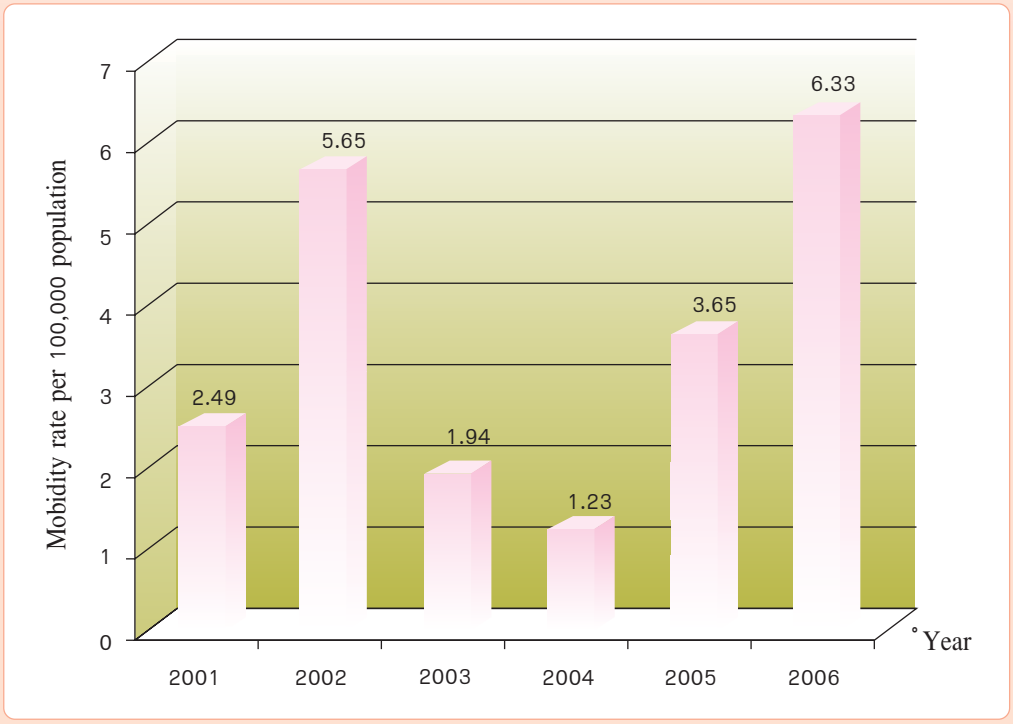
Severe acute respiratory syndrome (SARS) is an emerging disease. The SARS epidemic occurred in November 2002 in Quandong province in the southern region of the People's Republic of China. The outbreak could be controlled in June 2003 but had caused illness in 8,437 individuals and 813 deaths in 29 countries; a case-fatality rate of 9.64%. The areas with the widespread epidemic were China (Beijing and Quandong), Hong Kong, Taiwan, Singapore, Canada (Toronto) and Vietnam (Hanoi).

In Thailand, there were 9 probable cases (with pneumonia), 2 of whom had died, and 31 suspect cases (without pneumonia), and no deaths. All the patients contracted the disease from abroad. Thailand undertook strict measures for disease prevention and control and could successfully control the disease.

2.4.3 Hand-Foot-Mouth Disease

Hand-foot-mouth disease is another emerging disease; its outbreak was reported in 1997 in Malaysia. For Thailand, for the period 2000-2006, there were 3,961 reported cases and 7 deaths, a morbidity rate of 6.33 per 100,000 population (Figure 5.30).

Figure 5.30 Morbidity rate of hand-foot-mouth disease, 2001-2006



Source: Bureau of Epidemiology, Department of Disease Control.

Laboratory testing for enterovirus 71 conducted by the National Institute of Health of the Department of Medical Sciences in 2006 found that 13.5% of the samples (26 cases) were positive for the virus. (Table 5.16)

Table 5.16 Number of cases and laboratory testing results for hand-foot-month disease, 2001-2006 (Sept 2006)

Year	Surveillance situation		Lab testing results (No. of positive specimens)	
	Cases	Deaths	Enterovirus 71	Echovirus
2001	1,545	0	2	2
2002	3,533	2	3	0
2003	871	2	10	4
2004	474	0	51	0
2005	2,270	0	40	0
2006	3,961	7	26	0

Source: National Institute of Health, Department of Medical Sciences, Ministry of Public Health.

2.5 Non-communicable Diseases

2.5.1 Cancer

1) Cervical and Breast Cancers

Cervical and breast cancers are fatal diseases that affect Thai women resulting in their premature death; and the trend is rising each year (Table 5.17) especially in Bangkok Metropolis (Figure 5.31). According to the cancer registry in five member provinces, the highest rate of cervical cancer was recorded in Chiang Mai Province, while the highest rate of breast cancer was recorded in Bangkok (Table 5.18). Classified by age, females aged 35 and older have a greater incidence rate of cervical and breast cancers than those aged under 35. In comparison with those in the U.S., most American females (77%) had breast cancer when they were over 50 years of age, while it is only 40-45% among Thai females in the same age group (Tables 5.19 and 5.20). Besides, it was found that 80% of Thai female breast cancer patients were in the invasive stage.[10]

According to the 2004 health examination survey and the 2006 reproduction health survey among females aged 15-59 years across the country, it was found that 49% of respondents had ever undergone a cervical cancer screening test, the highest proportion was noted in the age group 30-44, and the lowest in the age group 15-29 (Table 5.21).

Regarding breast self-examination, it was found in 2004 that approximately 50% of respondents had ever done a breast self-examination, while the 2006 survey, revealed that only 25% had ever done so. concerning breast examination conducted by health personnel, in 2004 and 2006, about 23-24% of females had ever received such service, the highest proportion was noted among those aged 30 and over and lowest among the 15-29 age group (Table 5.21). However, only 4% of females aged 40-59 nationwide had ever taken a mammogram (Table 5.21).

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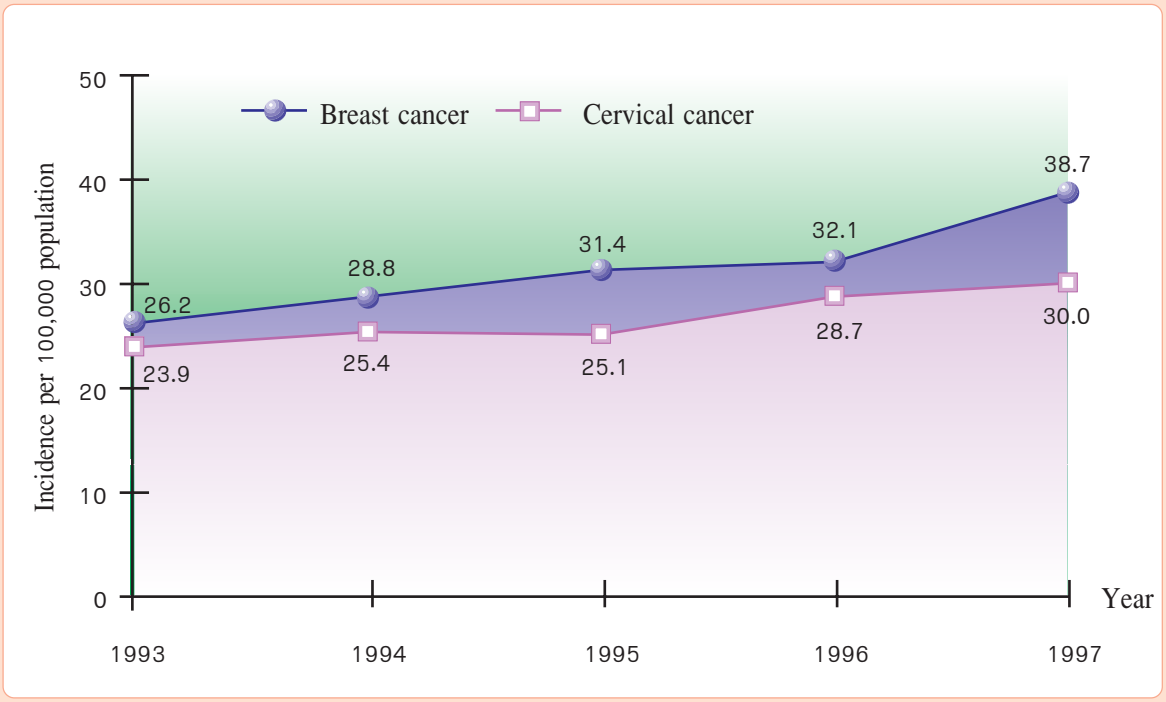
[10] Thammanit Angsusingh. Screening Mammography. Breast Cancer Treatment Centre, Siriraj Hospital.

Table 5.17 Incidence of cancers commonly found among Thai females, 1990, 1993, 1996, 1999 and 2000

Number	Type of cancer	Incidence rate per 100,000 population				
		1990	1993	1996	1999	2000
1	Cervical cancer	23.4	20.9	19.5	19.8	24.7
2	Breast cancer	13.5	16.3	17.2	19.9	20.5
3	Liver cancer	16.3	15.5	16.0	14.3	12.3
4	Lung cancer	12.1	11.1	10.0	9.9	9.3
5	Ovarian cancer	4.5	4.7	5.2	6.2	6.0

Source: National Cancer Institute, Ministry of Public Health.

Figure 5.31 Incidence of cervical and breast cancers among females in Bangkok, 1993-1997



Source: National Cancer Institute, Ministry of Public Health.

Table 5.18 Percentage of cancers of the reproductive organs recorded at provincial cancer registries, 1993, and 1995-1997 and 1998-2000

Province	Cervical cancer, %			Breast cancer, %			Ovarian cancer, %		
	1993	1995-1997	1998-2000	1993	1995-1997	1998-2000	1993	1995-1997	1998-2000
Chiang Mai	25.7	25.6	29.4	15.2	17.6	20.7	6.0	4.7	6.9
Lampang	23.1	23.6	22.3	15.0	16.4	20.8	4.4	3.7	4.6
Khon Kaen	18.0	15.0	15.9	8.6	11.6	13.7	4.5	5.6	6.2
Bangkok	18.5	20.7	19.3	20.6	25.4	24.3	4.2	5.9	6.1
Songkhla	15.8	16.1	20.6	11.5	12.1	17.2	3.1	4.6	5.7

Source: National Cancer Institute, Ministry of Public Health.

Table 5.19 Estimates of the number of breast cancer patients in American females by age group, 1997

Age (years)	Estimated number	Percent
< 30	600	0.3
30-39	8,600	4.8
40-49	32,600	18.1
50-59	33,000	18.3
60-69	36,600	20.3
70-79	43,500	24.2
80+	25,300	14.0
Total	**180,200**	**100.0**

Source: American Cancer Society. Surveillance Research. 1997.

Table 5.20 Ages of Thai women with breast cancer, 1983-2006

Siriraj Hospital's Surgery Department 1,353 cases (1983-1994)			Thanyarak Centre 5,994 cases (1995-2004)		Thanyarak Centre 219 cases (2005)		Thanyarak Centre 499 cases (2006)	
Age (yrs)	Case	percent	Case	percent	Case	percent	Case	percent
< 40	311	23.0	996	16.6	39	13.4	53	11.8
40-49	437	32.3	2,487	41.5	97	33.4	158	32.2
50-59	353	26.1	1,721	28.7	92	31.6	139	31.0
60-69	162	12.0	597	10.0	37	12.7	68	15.1
70 and over	90	6.6	193	3.2	26	8.9	31	6.9
Total	**1,353**	**100**	**5,994**	**100**	**291**	**100**	**449**	**100**

Source: Thammanit Angsusing. Screening Mammography, Thanyarak Breast Cancer Centre.

Table 5.21 Percentage of Thai women who have ever taken screening tests for cervical and breast cancer by age group, 2004 and 2006

Screening	Percentage by age group, 2004 (1)				2006 (2)
	15-29	30-44	45-59	Total	
- Pap smear for cervical cancer	29.0	62.2	55.0	48.5	49.8
- Breast self-examination	35.0	58.3	53.5	48.7	24.6
- Breast examination by health personnel	13.2	28.1	27.9	22.7	24.5
- Mammogram (40-59 yrs)	-	-	-	4.0	-

Source: 1. Report on Health Examination Survey, Third Round, 2003-2004. Health Systems Research Institute, MoPH.

2. Report in Reproduction Health Survey, 2006. National Statistical Office.

2) Liver Cancer

People's food consumption patterns have changed to eating out or eating readily-cooked food bought from restaurants or food stalls where the food might have been contaminated with pathogens or toxic substances due to unhygienic practices of the food handlers. Consumers, then, are likely to be vulnerable to food-borne diseases. Eating improperly heated food, especially fresh-water fish, might cause opisthorchiasis or liver fluke disease (Table 5.12) which is a major cause of liver cancer (Table 5.22). It has been noted that Thailand has the highest incidence of liver cancer in the world.[11]

Table 5.22 Incidence of liver cancer Thailand, 1993, 1996, 1999 and 2000

Year	Incidence per 100,000 population	
	Males	Females
1993	37.4	15.5
1996	40.5	16.0
1999	38.6	14.3
2000	31.2	11.5

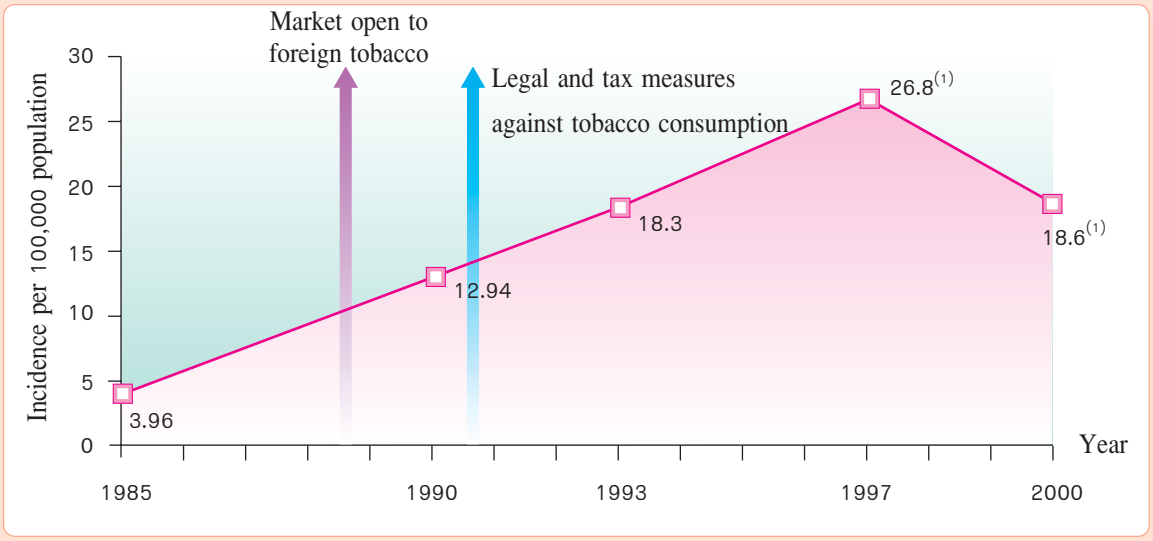
Source: Cancer in Thailand, 1995-2000.

3) Lung Cancer

The incidence of lung cancer increased sevenfold from 3.96 per 100,000 population in 1985 to 26.8 per 100,000 population in 1997, but dropped to 18.6 per 100,000 population in 2000, which was probably associated with tobacco consumption and air pollution (Figure 5.32).

[11] Vatanasapt, V., Sriamporn, S. (1999). Cancer in Thailand 1992-1994. (IARC Technical Report No. 34), Lyon, IARC.

Figure 5.32 Incidence of lung cancer in Thailand, 1985-2000

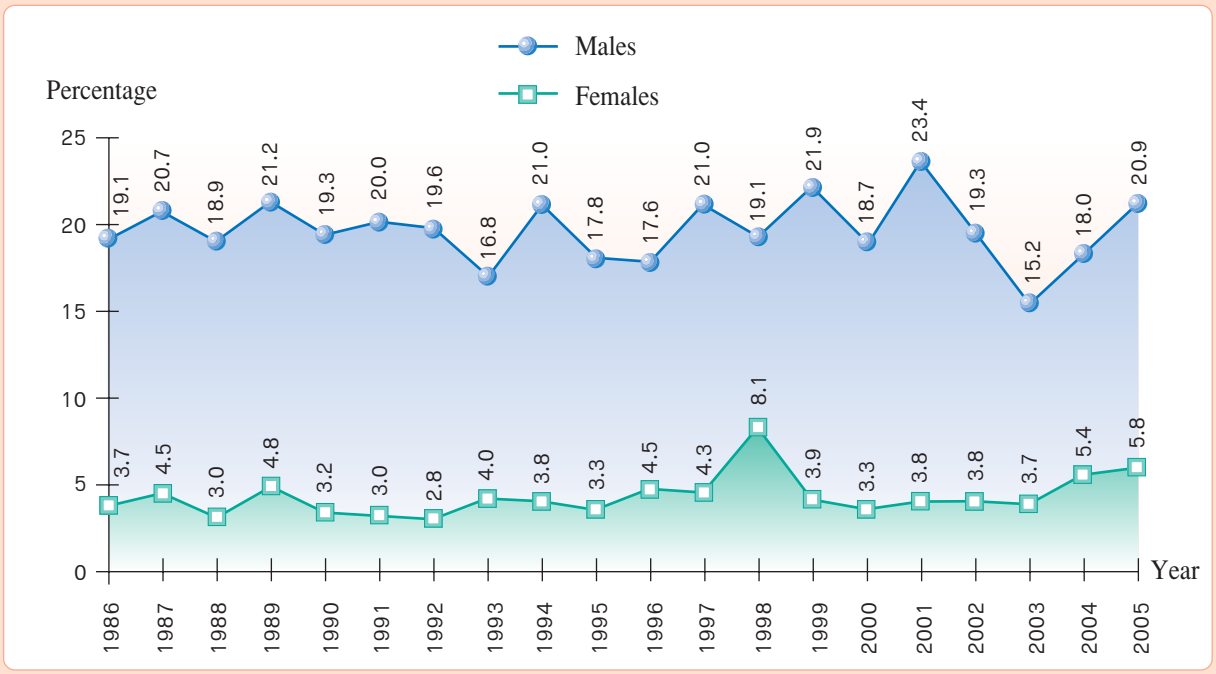


Source: National Cancer Institute, Department of Medical Services, MoPH.

Note: (1) Incidence of lung cancer in males.

Besides, according to the report on inpatient services at the National Cancer Institute between 1986 and 2005, 15% to 23% of inpatients were males, 3 to 8 times higher than in females (Figure 5.33).

Figure 5.33 Percentage of lung cancer patients registered for treatment at the National Cancer Institute, 1986-2005



Source: National Cancer Institute, Department of Medical Services.

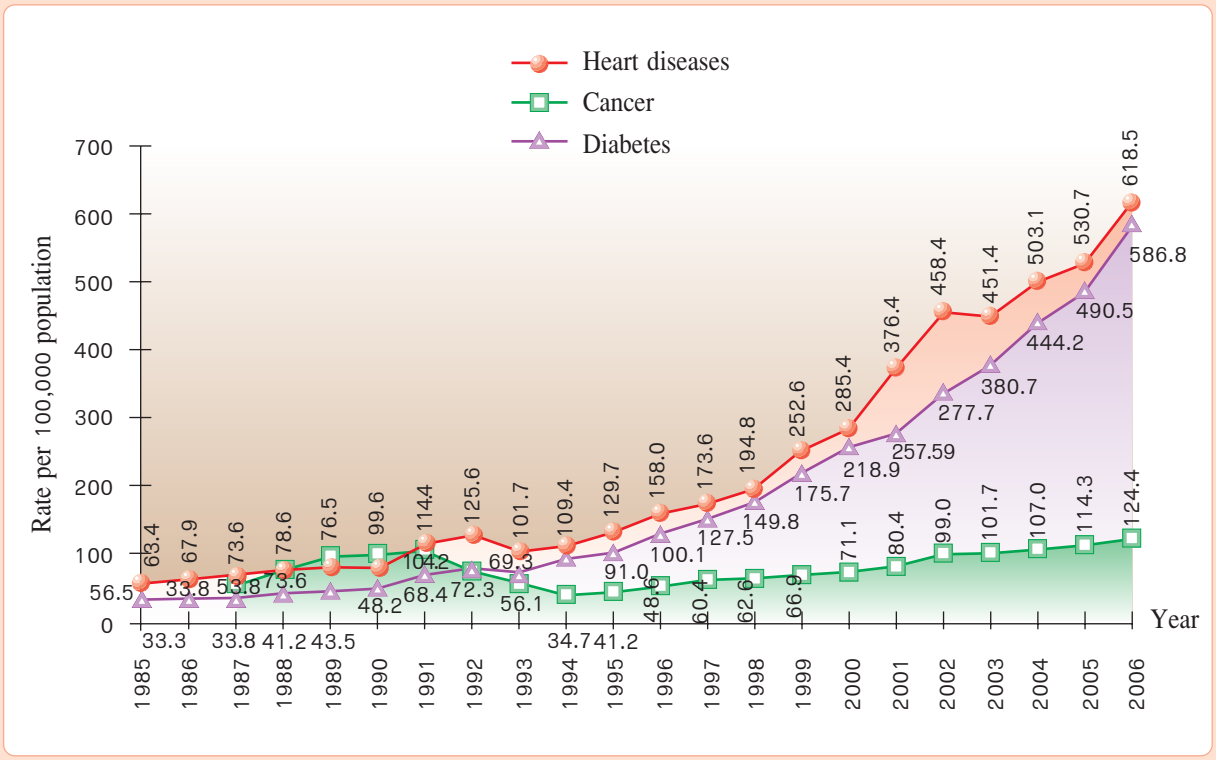
Note: As percentage of all cancer cases.

2.5.2 Heart Diseases, Diabetes and Hypertension

Currently, non-communicable diseases, such as heart diseases and cancer, have become the leading causes of morbidity and mortality among Thai people. Such an increasing trend results from unhealthy consumption behaviours and physical inactivity, as evidently demonstrated by the following hospital admission rates.

- Heart Diseases. The admission rate per 100,000 population has risen from 56.5 in 1985 to 109.4 in 1994 and to 618.5 in 2006.
- Cancer. The admission rate per 100,000 population has risen from 34.7 in 1994 to 124.4 in 2006.
- Diabetes. The admission rate has also risen from 33.3 per 100,000 population in 1985 to 91.0 in 1994 and 586.8 in 2006 (Figure 5.34).

Figure 5.34 Rate of hospitalizations of patients with heart diseases, cancers and diabetes, 1985-2006

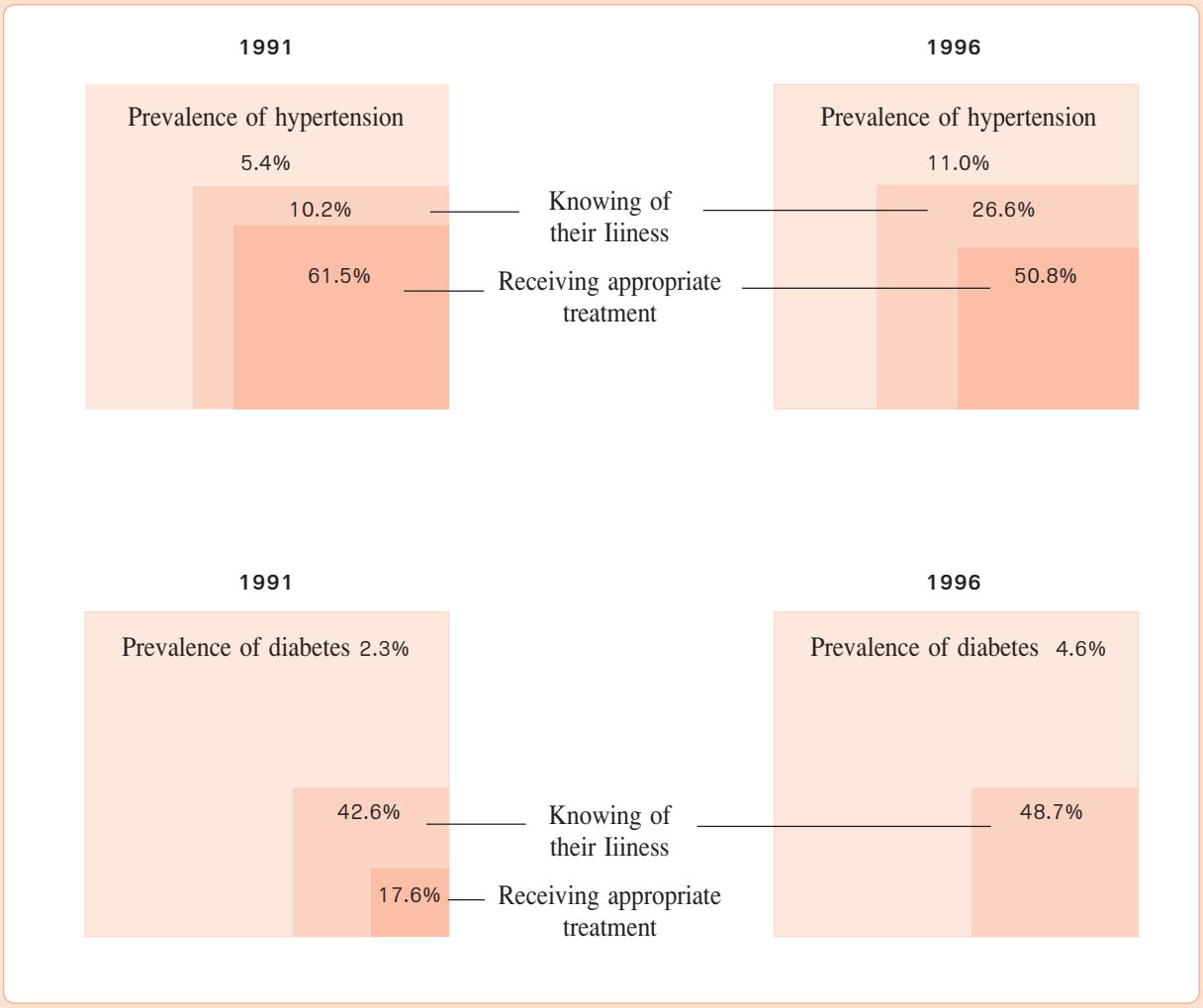


Source: Inpatients Report. Bureau of Policy and Strategy, Ministry of Public Health.

Note: The rate for cancers, since 1994, covers only liver, lung, cervical, and breast cancers.

Besides, the 2003-2004 health examination survey on Thai people revealed that the prevalence of hypertension had a tendency to rise from 5.4% in 1991 to 11.0% in 1996 and to 22% or 10.1 million individuals in 2004. Similarly, the diabetes prevalence had risen from 2.3% in 1991 to 4.6% in 1996 and 6.9% or 3.2 million individuals in 2004. This is evident that the prevalence of non-communicable diseases has a rising trend; and more importantly, the proportion of patients who has never had any diagnosis is also higher, resulting in a lower rate of patients receiving medical treatment. Thus, the people in this group do not have a chance to receive preventive care for their complications that might occur after getting ill with the disease (Figure 5.34 and Table 5.23).

Figure 5.35 Prevalence of diabetes and hypertension as well as appropriate treatment among Thai people, 1991-1996



Source: National Health Foundation, 1998.

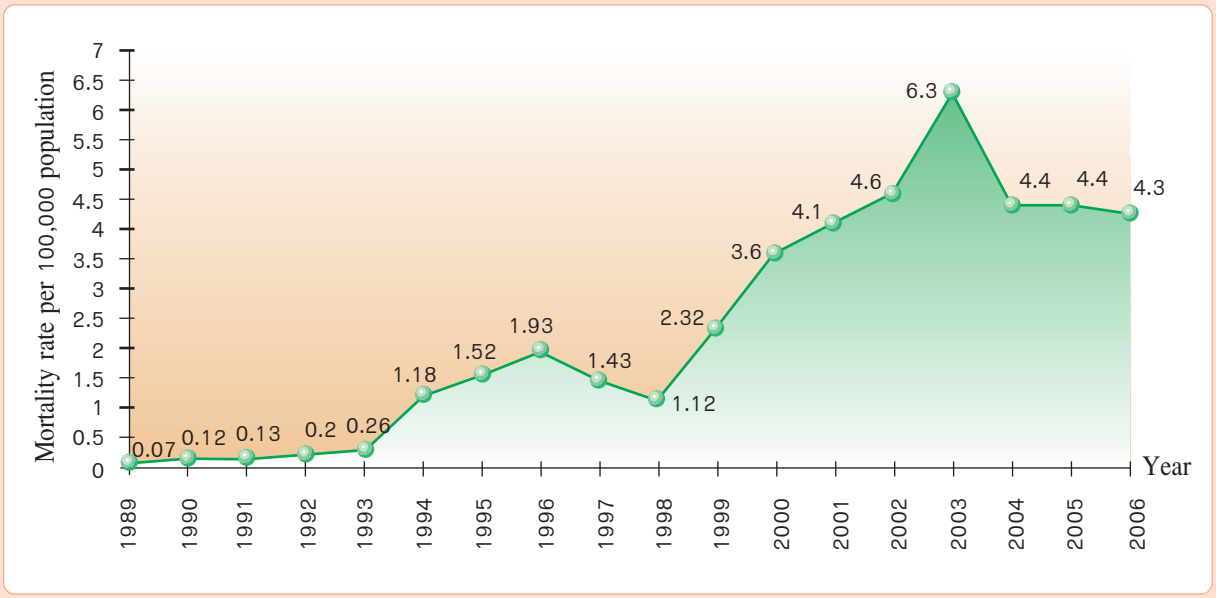
Table 5.23 Prevalence, diagnosis and treatment of chronic diseases among Thai people, 2004

Prevalence and care	Hypentension, %		Hyperlipidemia, %		Diabetes, %	
	Males	Females	Males	Females	Males	Females
Prevalence	**23.3**	**20.9**	**13.7**	**17.1**	**6.4**	**7.3**
- Never had diagnosis	78.6	63.8	87.6	86.8	65.5	49.2
- Diagnosed but not treated	4.5	5.4	3.1	4.1	1.9	1.7
- Treatment received but could not control	11.2	19.0	2.7	3.3	24.1	33.9
- Treatment received and symptoms controlled	5.7	11.7	6.7	5.9	8.5	15.2

Source: Report on Health Examination Survey, Third Round, 2003-2004. Health Systems Research Institute, MoPH.

2.5.3 Emphysema. The prevalence of emphysema has risen from 0.07% in 1989 to 4.3% in 2006 (Figure 5.36).

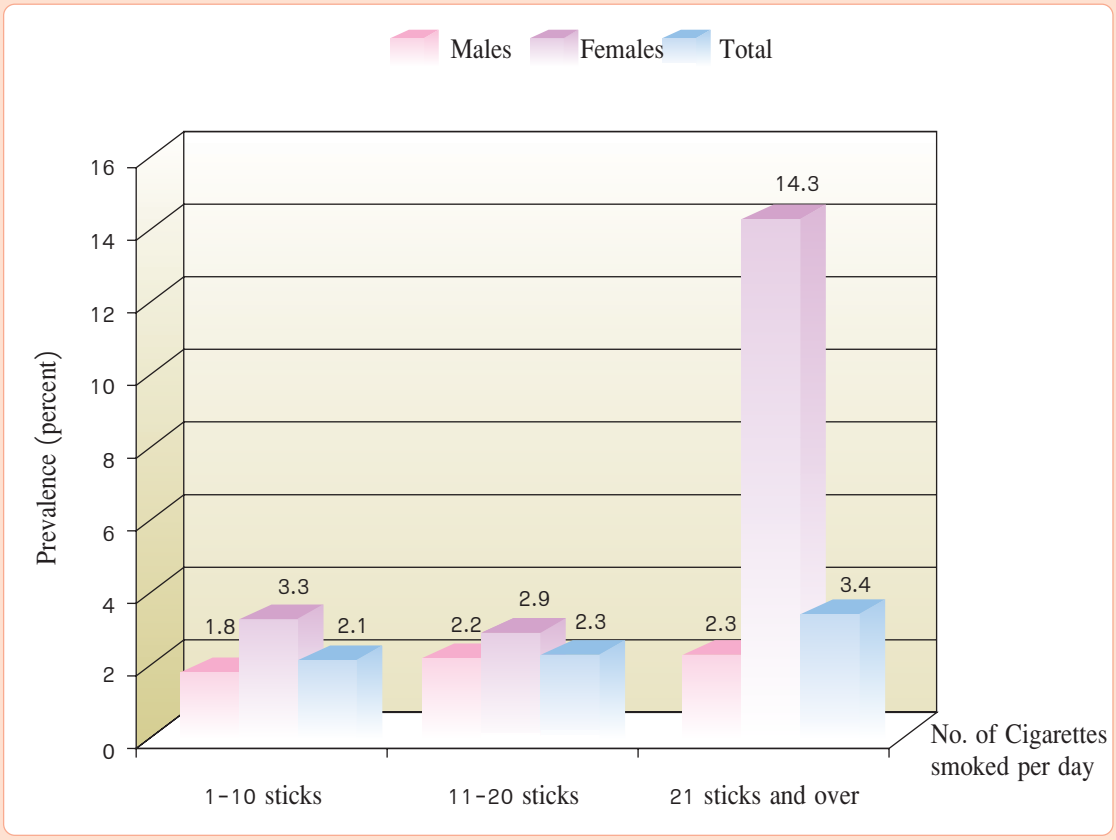
Figure 5.36 Mortality rate due to emphysema, 1989-2006



Source: Bureau of Policy and Strategy, Ministry of Public Health.

2.5.4 Chronic Obstructive Pulmonary Disease (COPD). A major cause of COPD is cigarette smoking for a long period of time. According to the 1991 Health Examination Survey, 1.5% of the people aged 15 had COPD, and that the more they smoked, the more they would come down with COPD (Figure 5.37). By 2010, it has been estimated that the prevalence of COPD would be 7,035 per 100,000 population[12] (Figure 5.38).

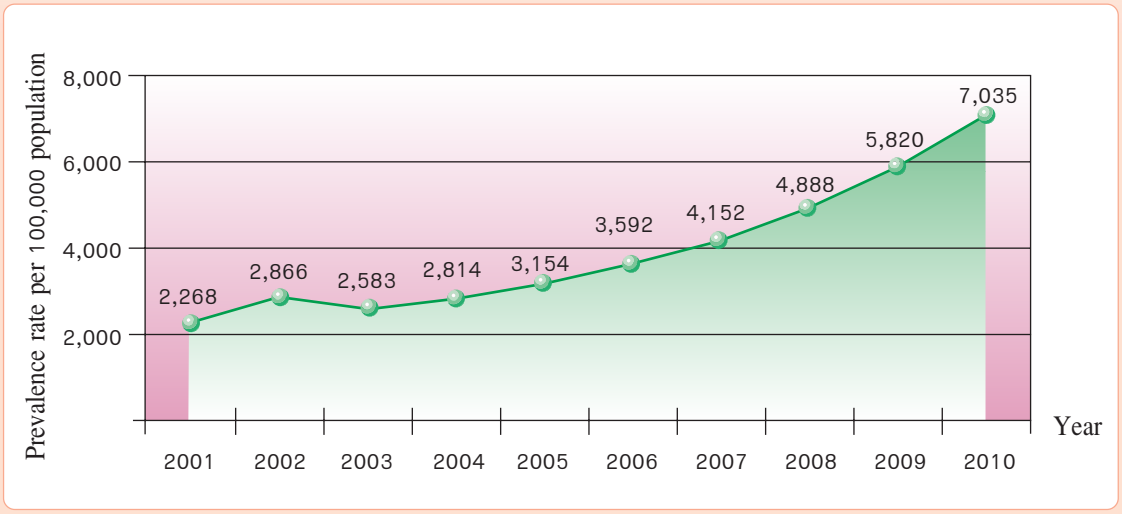
Figure 5.37 Prevalence rate of chronic obstructive pulmonary disease among Thai people aged 15 and over by the number of cigarettes smoked and sex



Source: Thai Health Research Institute and Health Systems Research Institute. Health Examination Surveys, 1st round in 1991, 1996.

[12] The projection was based on the assumption that in the next 10 years the smoking rate will decrease each year by 0.42% among males and 0.16% among females.

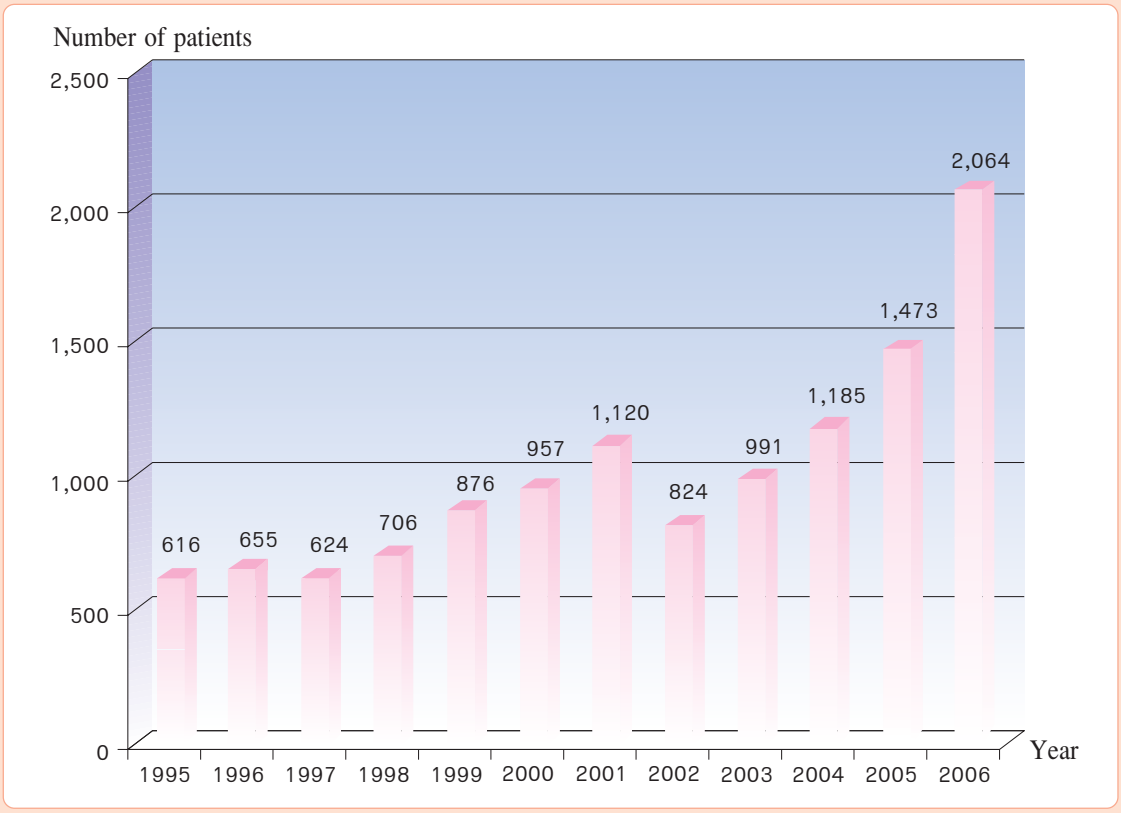
Figure 5.38 Projection of chronic obstructive pulmonary disease prevalence, Thailand, 2001-2010



Source: Sawang Saenghiranwattana. Chronic Obstructive Pulmonary Disease: Current Situation and Trends, 1999.

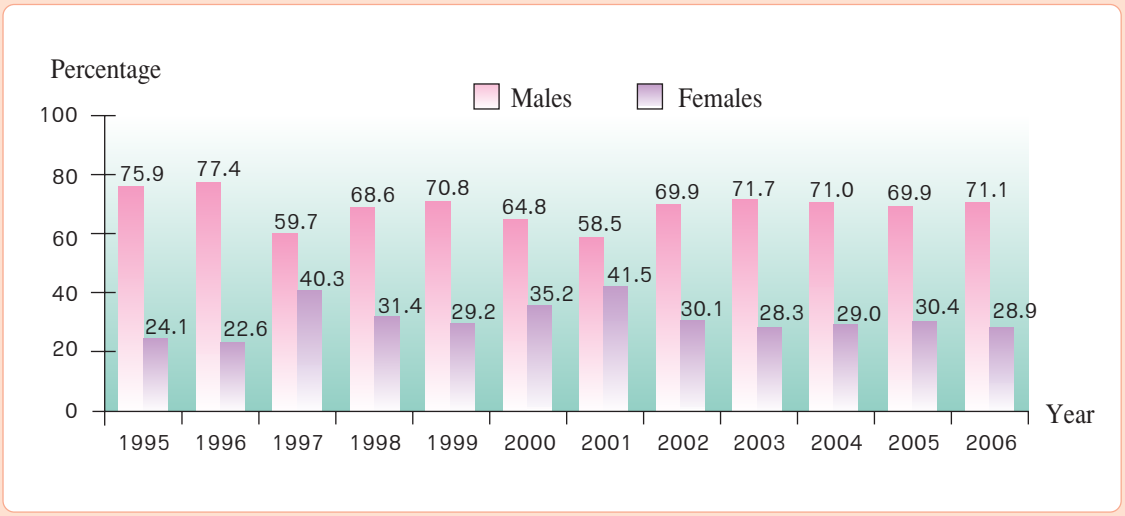
2.5.5 Coronary Atherosclerosis. This disease has a rising trend, especially among females (Figures 5.39 and 5.40), due to tobacco use, physical inactivity, hyperlipidaemia and overweight.

Figure 5.39 Number of patients with coronary atherosclerosis treated at the Cardiology Institute, 1995-2006



Source: Institute of Cardiology, Department of Medical Services, MoPH.

Figure 5.40 Proportion of patients with coronary atherosclerosis undergoing surgery at the Cardiology Institute by sex, 1995-2006

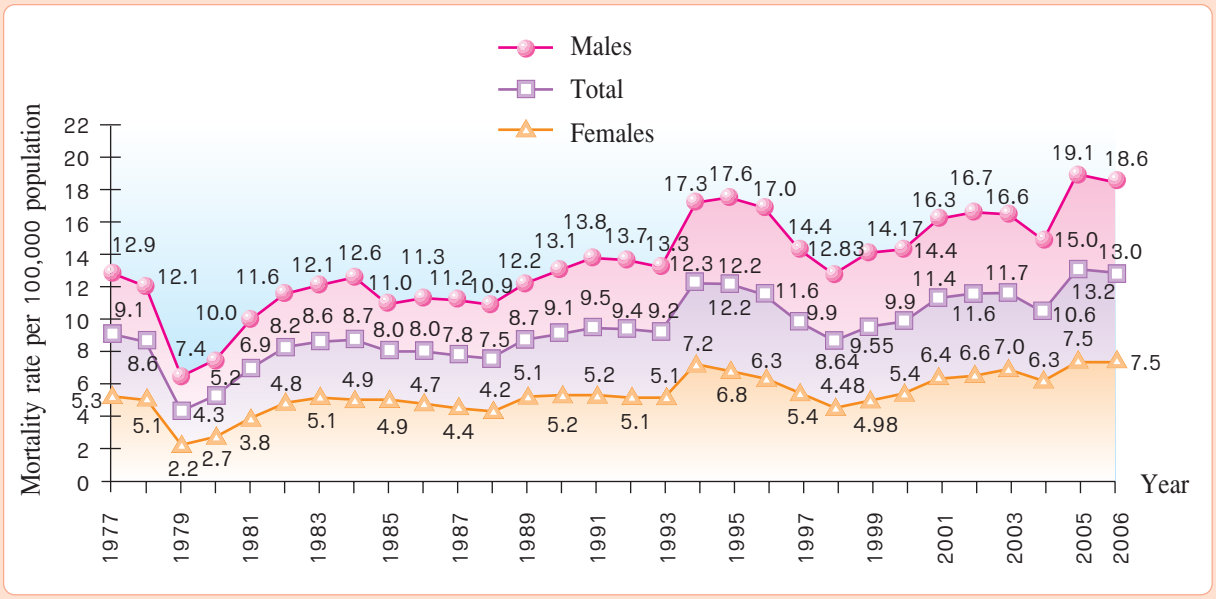


Source: Institute of Cardiology, Department of Medical Services, MoPH.

2.5.6 Cirrhosis

Consumption of alcohol for a long time negatively affects the liver as it has been found that, between 1977 and 2006, the mortality rates of liver disease and chronic cirrhosis were reported at 4.3-13.2 per 100,000 population, the rates being 6-19 in males and 2-7 in females, i.e. 2-4 times higher in males than in females (Figure 5.41). However, the trend in cirrhosis resulting from hepatitis B virus is declining.

Figure 5.41 Mortality rate of liver disease and cirrhosis, Thailand, 1977-2006



Source: Bureau of Policy and Strategy, Ministry of Public Health.

2.6 Injuries and Accidents

2.6.1 Road Traffic Accidents

The situation of road traffic accidents in Thailand can be categorized by the time period as follows:

The First Period, before 1986: Economic Recession. The number of accidents was not so high during this period. Each year, there were about 18,000-25,000 accidents with about 2,000-4,000 deaths or a mortality rate of 3.9-5.7 per 100,000 population. And there were approximately 8,000-9,000 injury cases each year, or an injury rate of 17.2 per 100,000 population.

The Second Period, 1987-1992: Economic Recovery. During this period there were annually about 40,000-60,000 accidents, nearly two times higher than during the previous period, with about 8,000-9,000 deaths or a mortality rate of 7.4-16.0 per 100,000 population. It was noteworthy that casualties had increased almost threefold. The number of injuries had increased to 20,000-25,000 each year or an injury rate of 24.0-43.9 per 100,000 population, a nearly twofold rise.

The Third Period, 1993-1996: Bubble Economy. Each year there were 80,000-100,000 accidents, a twofold increase, with about 14,000-16,000 deaths or a mortality rate of 16.3-28.2 per 100,000 population, a nearly twofold increase. And there were about 40,000-50,000 injuries each year or an injury rate of 43.4-85.6 per 100,000 population, a twofold increase.

The Fourth Period, 1997-2001: Economic Crisis. Each year there were 70,000-80,000 accidents with 12,000 deaths or a mortality rate of 20.0-22.7 per 100,000 population. And each year there were 48,000-52,000 injuries or an injury rate of 77.5-86.9 per 100,000 population. This was a declining trend compared with the previous period.

The Fifth Period, 2002 onward: Economic Recovery. Each year there were approximately 90,000-125,000 accidents with 13,000-14,000 deaths or a mortality rate of 21-22.26 per 100,000 population. And there were approximately 70,000-95,000 injuries a year or an injury rate of 110.8-151.72 per 100,000 population (Figure 5.42).

Primarily, traffic accidents are caused by humans (69.6) and a small proportion by the vehicles and environment (1.2% and 0.6%, respectively, Figure 5.44). By cause category of road traffic accidents, the most commonly found category is speeding (17.3%), followed by cutting across the path of another vehicle in short distance, illegal overtaking, violating traffic lights rules, and following another vehicle too closely (Figure 5.45).

It is noteworthy that the numbers of accidents, injuries, and deaths from accident are higher compared to those in the previous year probably as a result of economic expansion, grassroots-level economic stimulus measures with a low-interest monetary policy and tax measures enhancing the people's purchasing powers. With such higher purchasing powers, the volumes of auto sales have been rising after the economic crisis ended. Motor vehicles have become the fifth element of

livelihood. But the increase in the number of automobiles has resulted in more road traffic accidents as evidenced by a study on the relationship between the number of accidents and the auto sales records. It has been found that the increase or decrease in auto sales is positively associated with the number of road accidents (r = 0.818; Table 5.26).

Besides, a study of Yordphol Tanaboriboon and colleagues (2006) revealed that the number of deaths from road traffic accidents tends to be in accordance with the economic situation and the level of fuel used in the country[13] (Figure 5.46).

This kind of situation caused a direct loss of property worth 3,643.7 million baht in 2006 (Table 5.24). But actually there are other incalculable losses including life losses, medical expenses, disabilities, etc. According to the 2000-2002 study on economic losses from road traffic accidents, the economic loss is as high as 106,994 to 115,337 million baht or 2-2.3% of gross domestic product. [14,15]

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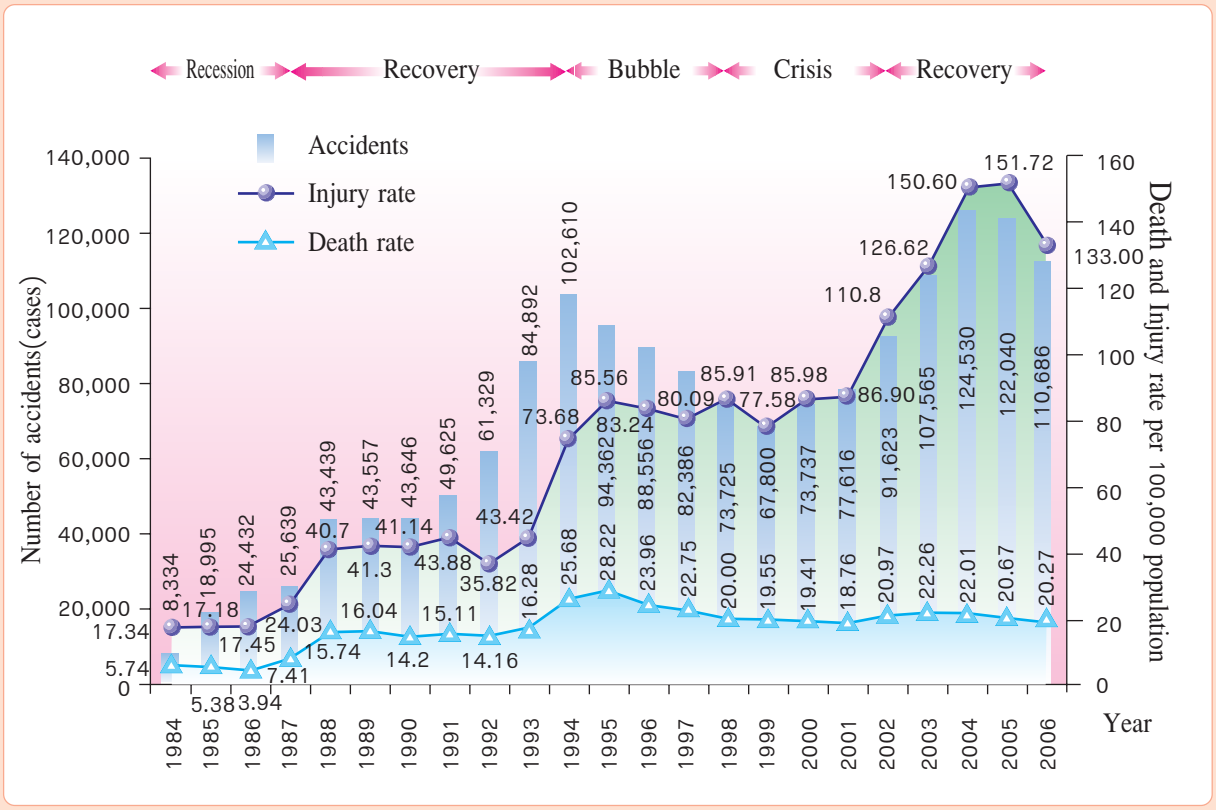
[13] Yordphol Tanaboriboon et al. Situation of Road Traffic Accidents in Thailand, 2006.

[14] Centre for Development Policy Studies, Faculty of Economics, Chulalongkorn University. Loss Due to Road Traffic Accidents in Thailand, 2005.

[15] Centre of Traffic and Transport Research and Development, King Mongkut's University of Technology at Thonburi. A Project on the Analysis of Causes of Road Traffic Accidents, 2002.

Figure 5.42 Death and injury rates from road traffic accidents, Thailand, 1984-2006



Source: Police Information System Centre, Royal Thai Police.

Table 5.24 Numbers and rates of accidental deaths and injuries and estimated damages, 1984-2006

Year	Population	No. of accidents (cases)	Deaths		Injuries		Property damages (baht)
			No. (persons)	Rate per 100,000 pop.	No. (persons)	Rate per 100,000 pop.	
1984	50,583,105	18,334	2,904	5.74	8,770	17.34	56,265,453
1985	51,795,651	18,955	2,788	5.38	8,901	17.18	60,645,504
1986	52,696,204	24,432	2,086	3.94	9,242	17.45	55,061,650
1987	53,873,172	25,639	3,991	7.41	12,947	24.03	129,539,616
1988	54,960,917	43,439	8,651	15.74	22,370	40.70	329,527,667
1989	55,888,393	43,557	8,967	16.04	23,083	41.30	439,028,000
1990	56,303,273	43,646	7,997	14.20	23,161	41.14	477,603,000
1991	56,961,030	49,625	8,608	15.11	24,995	43.88	639,616,000
1992	57,788,965	61,329	8,184	14.16	20,702	35.82	607,793,000
1993	58,336,072	84,892	9,496	16.28	25,330	43.42	1,021,464,000
1994	59,095,419	102,610	15,176	25.68	43,541	73.68	1,408,216,000
1995	59,277,900	94,362	16,727	28.22	50,718	85.56	1,631,117,000
1996	60,116,182	88,556	14,405	23.96	50,044	83.24	1,561,708,187
1997	60,816,227	82,386	13,836	22.75	48,711	80.09	1,571,786,469
1998	61,155,888	73,725	12,234	20.00	52,538	85.91	1,378,673,826
1999	61,577,827	67,800	12,040	19.55	47,770	77.58	1,345,985,811
2000	61,770,259	73,737	11,988	19.41	53,111	85.98	1,242,205,524
2001	62,093,855	77,616	11,652	18.76	53,960	86.90	1,240,801,187
2002	62,554,482	91,623	13,116	20.97	69,313	110.80	1,494,936,815
2003	62,939,819	107,565	14,012	22.26	79,692	126.62	1,750,964,040
2004	62,526,693	124,530	13,766	22.01	94,164	150.60	1,623,081,112
2005	62,195,839	122,040	12,858	20.67	94,364	151.72	3,238,226,110
2006	62,623,416	110,686	12,693	20.27	83,290	133.00	3,643,747,912

Source: Police Information System Centre, Royal Thai Police.

Table 5.25 Number and percentage of deaths from road traffic accidents by age group, 1996-2006

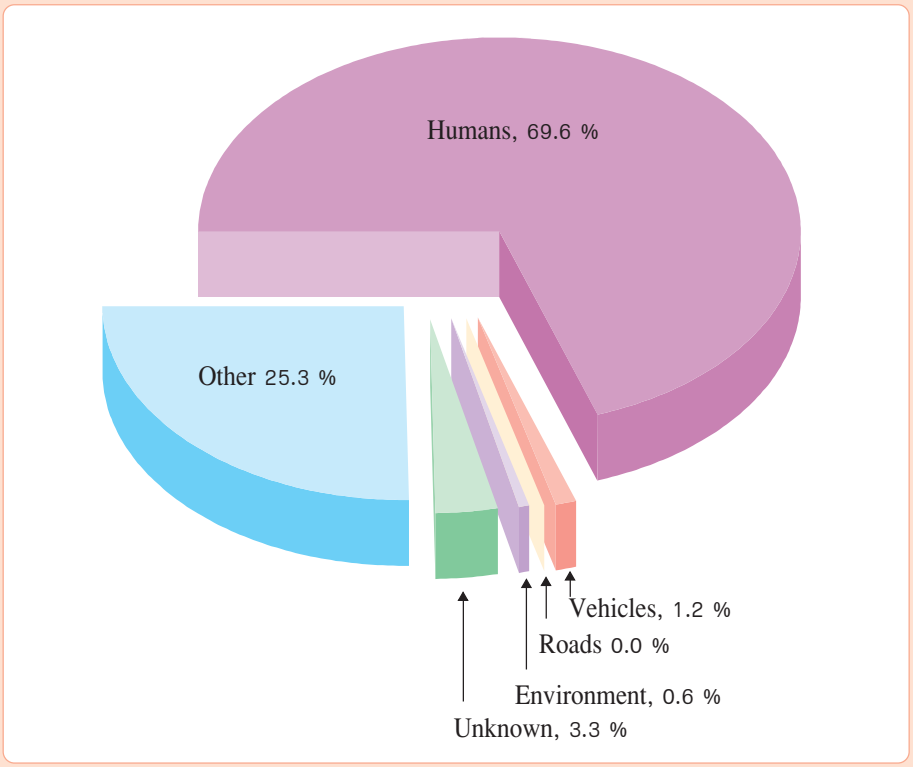
Age group (years)	1996		1997		1998		1999		2000		2001		2002		2003		2004		2005		2006	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
0 - 4	291	1.7	175	1.3	210	2.6	254	2.2	287	2.2	243	1.9	205	1.5	164	1.3	154	1.3	158	1.5	135	1.3
5 - 9	389	2.3	227	1.8	146	1.8	261	2.2	287	2.2	256	2.0	214	1.6	196	1.5	183	1.5	151	1.4	149	1.4
10 - 14	599	3.6	392	3.0	237	3.0	300	2.6	387	2.9	356	2.7	428	3.2	363	2.8	425	3.4	359	3.3	375	3.6
15 - 19	2,786	16.6	2,052	15.8	1,075	13.5	1,501	13.0	1,647	12.5	1,623	12.5	1,869	13.9	1,829	14.3	1,811	14.7	1,534	13.9	1,408	13.5
20 - 24	2,995	17.8	2,236	17.3	1,184	14.8	1,702	14.6	1,861	14.1	1,810	14.0	2,003	14.9	2,040	15.9	1,819	14.7	1,598	14.5	1,405	13.5
25 - 29	2,262	13.5	1,743	13.5	1,051	13.2	1,470	12.6	1,641	12.4	1,575	12.2	1,686	12.6	1,623	12.7	1,530	12.4	1,334	12.1	1,244	11.9
30 - 34	1,733	10.3	1,343	10.4	830	10.4	1,286	11.1	1,452	11.0	1,437	11.1	1,415	10.5	1,279	10.0	1,233	10.0	1,103	10.0	986	9.5
35 -39	1,410	8.4	1,177	9.1	742	9.3	1,113	9.6	1,221	9.3	1,306	10.1	1,225	9.1	1,198	9.4	1,094	8.9	1,016	9.2	956	9.2
40 - 44	1,017	6.1	904	7.0	665	8.3	914	7.9	1,092	8.3	1,063	8.2	1,086	8.1	1,030	8.0	950	7.7	891	8.1	886	8.5
45 - 49	870	5.2	750	5.8	488	6.1	785	6.8	884	6.7	912	7.0	903	6.7	847	6.6	832	6.8	759	6.9	745	7.2
50 - 54	594	3.6	484	3.7	329	4.1	561	4.8	638	4.8	650	5.0	697	5.2	651	5.1	654	5.3	614	5.6	648	6.2
55 - 59	546	3.3	468	3.6	320	4.0	444	3.8	507	3.8	463	3.6	488	3.6	493	3.8	510	4.1	449	4.0	421	4.0
60 - 64	421	2.5	371	2.9	287	3.6	392	3.4	448	3.4	450	3.5	408	3.0	371	2.9	422	3.4	395	3.5	352	3.4
65 - 69	304	1.8	209	1.6	205	2.6	283	2.4	352	2.7	341	2.6	355	2.7	316	2.5	295	2.4	272	2.4	277	2.7
70 - 74	162	1.0	157	1.2	115	1.5	168	1.4	241	1.8	204	1.6	222	1.7	225	1.8	232	1.9	201	1.8	233	2.2
75 - 79	112	0.6	67	0.5	66	0.8	83	0.7	135	1.0	124	1.0	139	1.0	116	0.9	126	1.0	123	1.1	125	1.2
80 - 84	39	0.2	37	0.3	22	0.3	56	0.5	59	0.5	65	0.5	56	0.4	43	0.3	43	0.3	52	0.5	45	0.4
85 and over	26	0.1	21	0.1	10	0.1	26	0.2	46	0.3	60	0.5	39	0.3	27	0.2	27	0.2	32	0.2	31	0.3

Source: Bureau of Policy and Stategy, Office of the Permanent Secretary, Ministry of Public Health.

Figure 5.43 Proportion of deaths from road traffic accidents by sex, 1996-2006

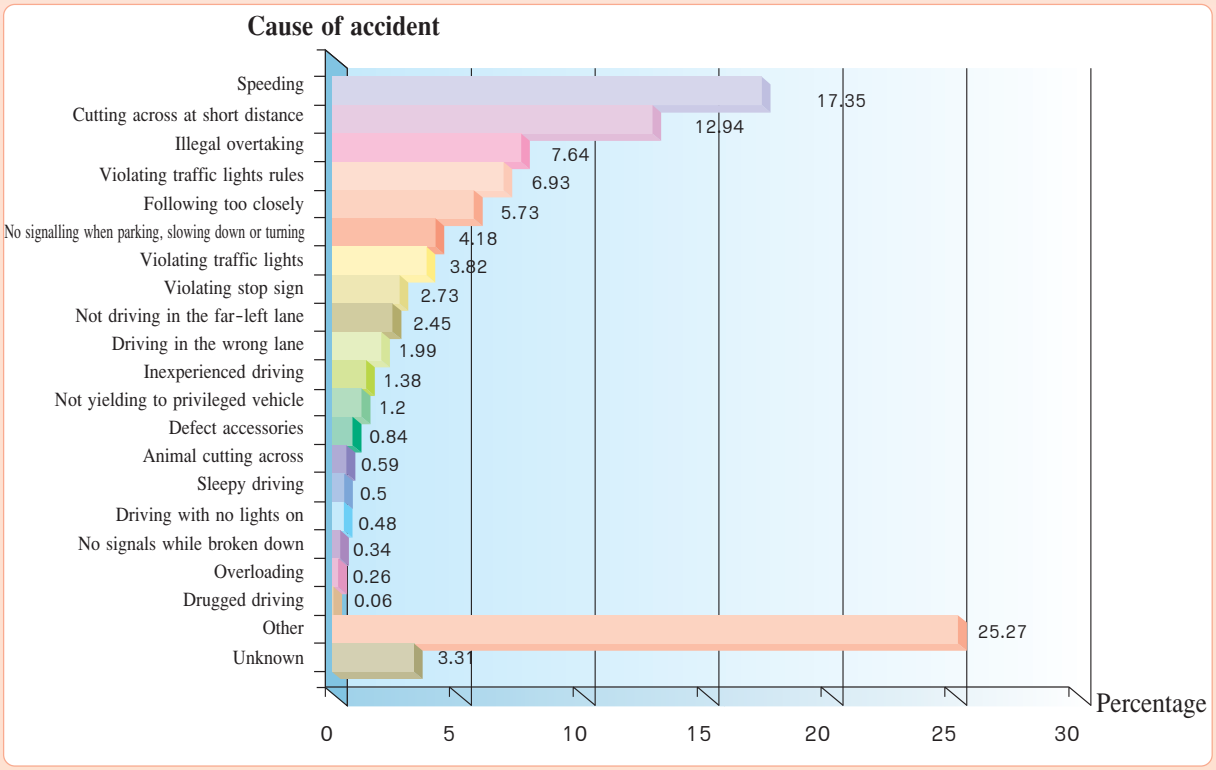
Source: Bureau of Policy and Strategy, Office of The Permanent Secretary, Ministry of Public Health.

Figure 5.44 Major causes of road traffic accident, 2006



Source: Royal Thai Police.

Figure 5.45 Causes of road traffic accidents by traffic-police charge, 2006



Source: Royal Thai Police.

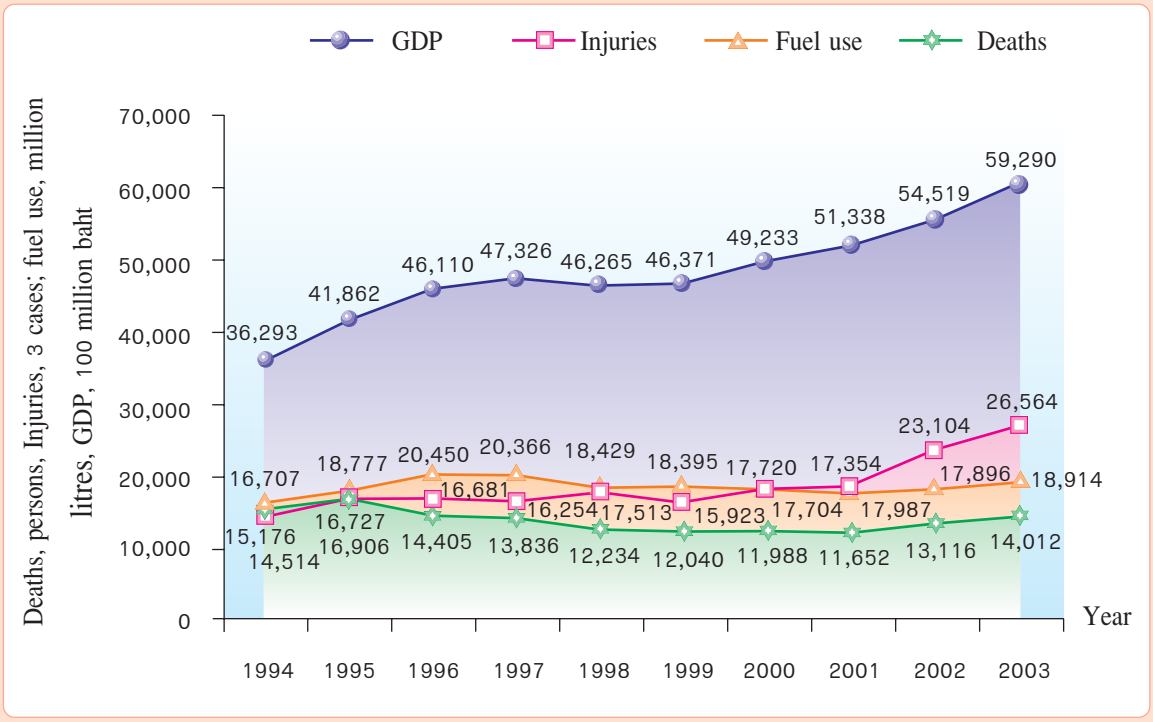
Table 5.26 Correlation between the number of accidents and overall automobile sales, 1990-2006

Year	Number of accidents[1] (cases)	Automobile sales	
		Number[2] (units)	Increase from previous year
1990	43,646	304,062	+46%
1991	48,625	268,560	-11.7%
1992	61,329	362,987	+35.2%
1993	84,892	456,461	+25.8%
1994	102,610	485,105	+6.4%
1995	94,362	571,580	+17.7%
1996	88,556	589,126	+3.1%
1997	82,386	363,156	-38.4%
1998	73,725	144,065	-60.3%
1999	67,800	218,330	+51.5%
2000	73,737	262,189	+20.1%
2001	77,616	289,000	+10.2%
2002	91,623	410,000	+41.9%
2003	107,565	533,176	+30.0%
2004	124,530	626,026	+17.4%
2005	122,040	703,432	+12.4%
2006	110,686	682,500	-3.1%
Correlation coefficient		=	**0.818**

Sources: [1] Royal Thai Police.

[2] Toyota Motors (Thailand) Co., Ltd.

Figure 5.46 Trends in GDP growth, fuel use for transportation, injuries and deaths from road traffic accidents, 1994-2003



Source: Yordphol Tanaboriboon el al. Situation of Road Traffic Accidents in Thailand, 2006.

Regarding the type of vehicles with accidents, it was found that motorcycles, pickup trucks, vans, private passenger cars, and bicycles/tricycles caused the highest number of injuries and deaths than other types of vehicles. But in terms of severity of accidents, the types of vehicles that caused the highest number of deaths during the three-year period (2001-2003) were private passenger cars, pickups/vans and motorcycles (Table 5.27).

Table 5.27 Injuries and deaths from road traffic accidents by type of vehicles, 1997-2003

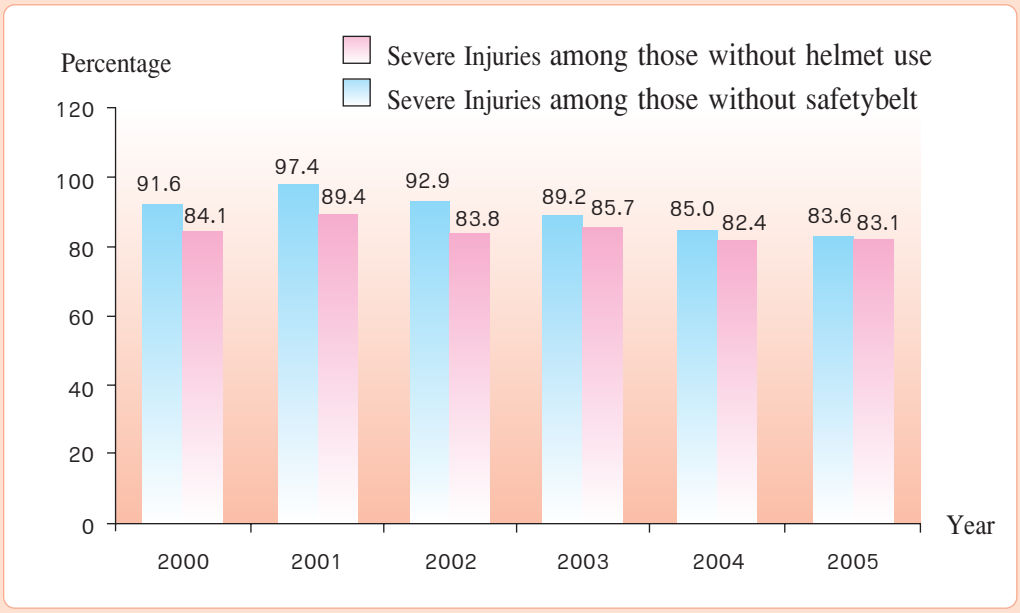
type of vehicles	1997			1998			1999			2000			2001			2002			2003		
	Injuries	Deaths	Death rate (%)	Injuries	Deaths	Death rate (%)	Injuries	Deaths	Death rate (%)	Injuries	Deaths	Death rate (%)	Injuries	Deaths	Death rate (%)	Injuries	Deaths	Death rate (%)	Injuries	Deaths	Death rate (%)
Bicycles and tricycles	1,817	45	2.5	1,888	43	2.3	2,183	45	2.1	14,450	118	0.8	2,037	124	6.1	2,296	127	5.5	1,812	108	6.0
Motorcycles	48,440	1,707	3.5	43,274	1,469	3.4	41,947	1,274	3.0	84,378	3,129	3.7	41,817	3,045	7.3	48,740	3,525	7.7	42,048	3,144	7.5
Three-wheel/motor vehicles	393	24	6.1	401	22	5.5	407	10	2.5	1,160	42	3.6	429	36	8.4	488	36	7.4	431	34	7.9
Private passenger cars	1,075	65	6.0	1,169	84	7.2	1,064	58	5.5	2,700	102	3.8	891	91	10.2	1,020	107	10.5	886	90	10.2
Pickups/vans	6,628	348	5.2	5,373	251	4.7	5,172	221	4.3	8,584	402	4.7	4,008	335	8.4	4,668	403	8.6	3,743	359	9.6
Trucks (6-wheel or more)	856	43	5.0	647	36	5.6	677	28	4.1	1,512	76	5.0	923	63	6.8	971	58	6.0	805	70	8.7
Trailers	140	2	1.4	137	3	2.2	172	5	2.9	215	9	4.2	70	6	8.6	83	5	6.0	72	7	9.7
Transport pickups	437	20	4.6	317	8	2.5	411	13	3.2	738	19	2.6	186	9	4.8	270	20	7.4	199	13	6.5
Buses	627	9	1.4	377	11	2.9	385	10	2.6	966	25	2.6	232	19	8.2	406	15	3.7	204	11	55.4
Agricultural trucks	147	13	8.8	139	3	2.2	173	10	5.8	413	22	5.3	367	19	5.2	428	20	4.7	390	20	5.1
Farm trucks (E-taen)	206	14	6.8	223	14	6.3	201	3	1.5	269	12	4.5	193	8	4.1	195	14	7.2	184	10	5.4
Total	**60,766**	**2,290**	**3.8**	**53,945**	**1,944**	**3.6**	**52,792**	**1,677**	**3.2**	**115,385**	**3,956**	**3.4**	**51,153**	**3,755**	**7.3**	**59,565**	**4,330**	**7.3**	**50,774**	**3,866**	**7.6**

Source: Report on Injury Surveillance in Thailand. Bureau of Epidemiology, Department of Disease Control.

Note: Data for 2001-2003 include only severely injured cases (injuries/deaths before reaching hospital, deaths in emergency rooms, and injured cases admitted/hospitalized for observation or as inpatients).

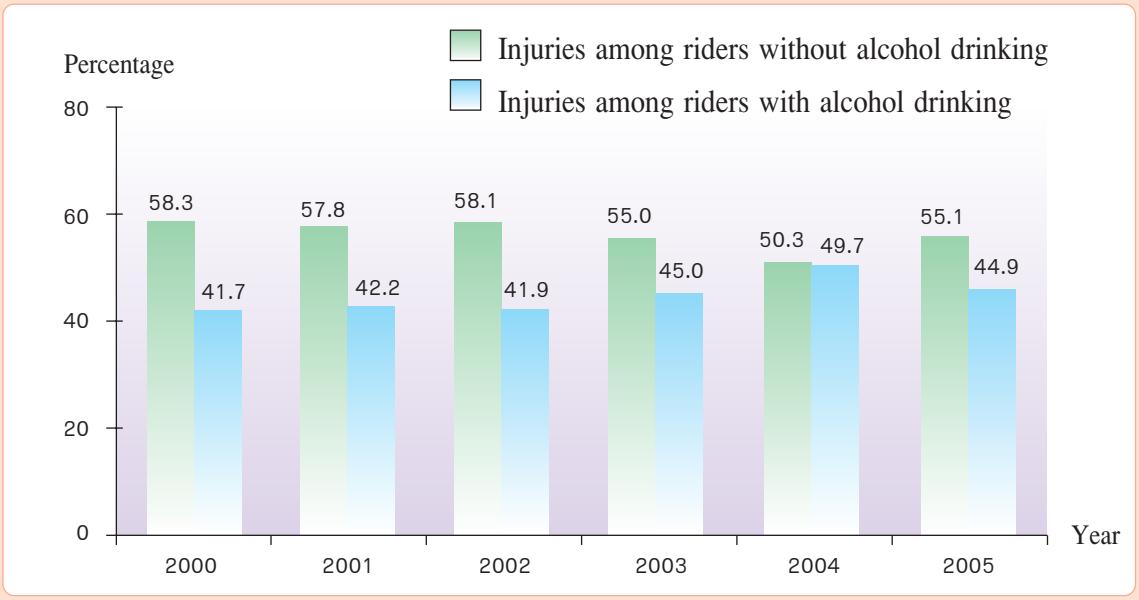
Even though the Royal Decree on Anti-crash Helmets has been enforced in all provinces throughout the country since 1 January 1996, the data from the injury surveillance system have shown that motorcycle riders/passengers who do not wear helmets as well as motor vehicle drivers/passengers who do not use safety belts are 80% more likely to have serious injuries from traffic accidents than those who do so (Figure 5.47); and nearly half of those motorcycle accident victims with severe injuries have drunk alcohol before riding (Figure 5.48).

Figure 5.47 Proportion of serious injuries from traffic accidents among riders/drivers and passengers with and without safetybelt/helmet use, 2000-2005



Source: Report on Injury Surveillance in Thailand. Bureau of Epidemiology, Department of Disease Control.

Figure 5.48 Proportion of severe injuries among motorcycle riders with and without alcohol drinking, 2000-2005



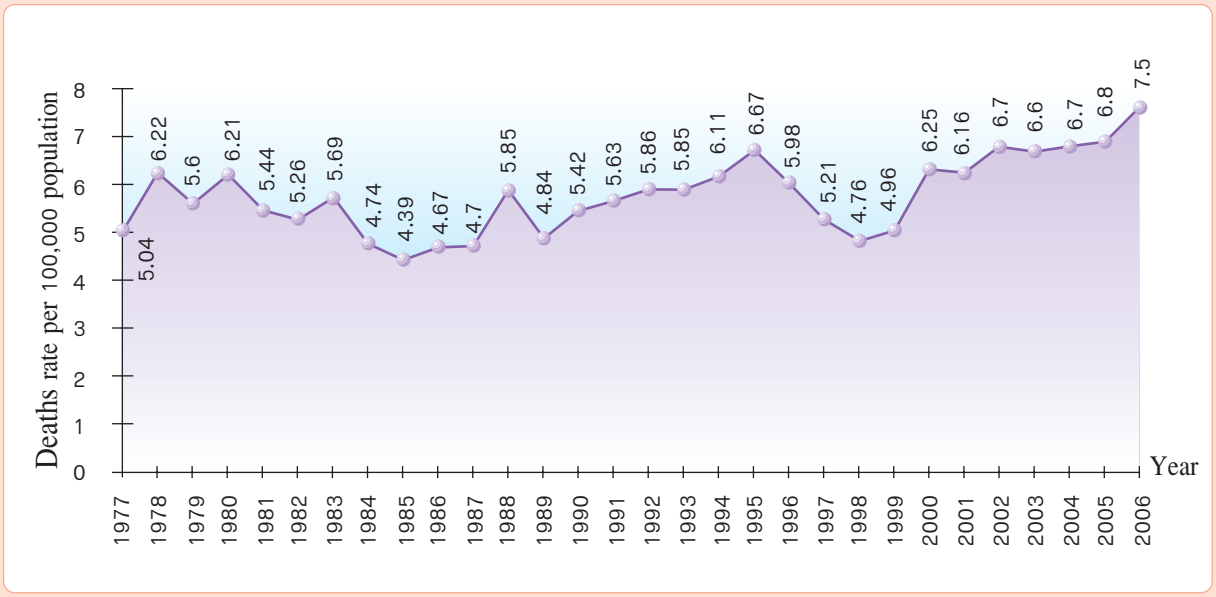
Source: Report on Injury Surveillance in Thailand. Bureau of Epidemiology, Department of Disease Control.

2.6.2 Water-Related Accidents: Drowning and Falling into the Water

Water-related accidents are an important problem that has not received adequate attention as expected, compared to the problem of road traffic accidents even through the drowning rate in Thai children is 5 to 15 times higher than that in developed countries.[16] During 1977-2006, the rate of deaths from drowning and falling into water was 4.4-7.5 cases per 100,000 population (Figure 5.49). An epidemiological analysis of water-related accidents in Thailand during the period 1996-2006 revealed that, among those who died from drowning, males were 3 times more likely than females to become the victims; **the highest number being among school-age children** (Figure 5.50). This might result from their lack of experience in playing safely in the water and thus being less capable of helping themselves.

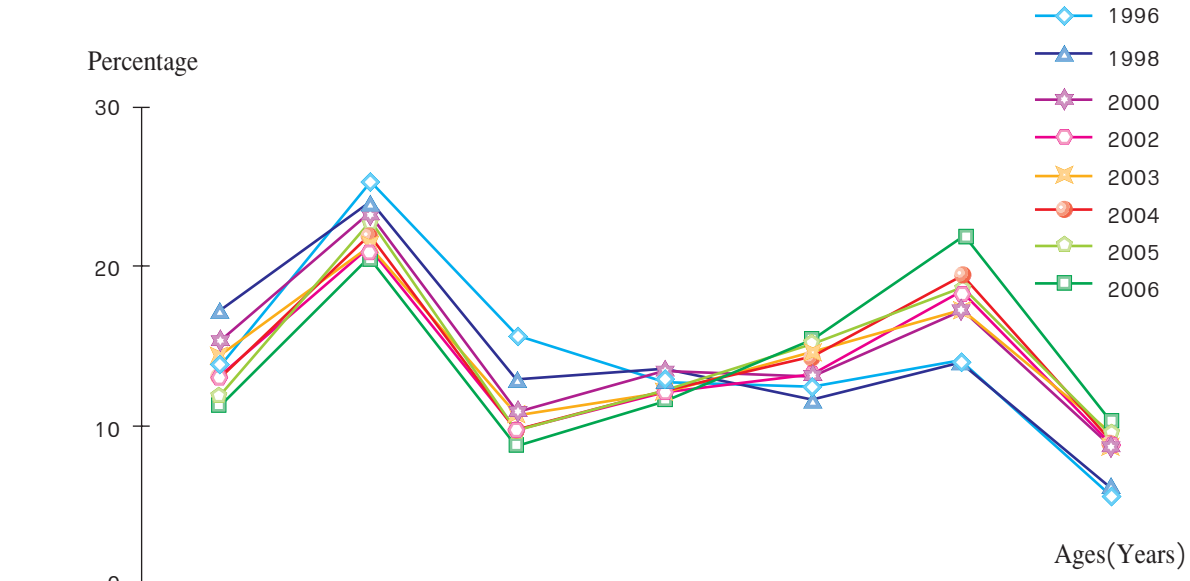
[16] Adisak Plitponkarnpim. Child Safety Promotion and Injury Prevention Research Centre of Ramathibodi Hospital, 2006.

Figure 5.49 Rate of deaths from accidental drowning in Thailand, 1977-2006

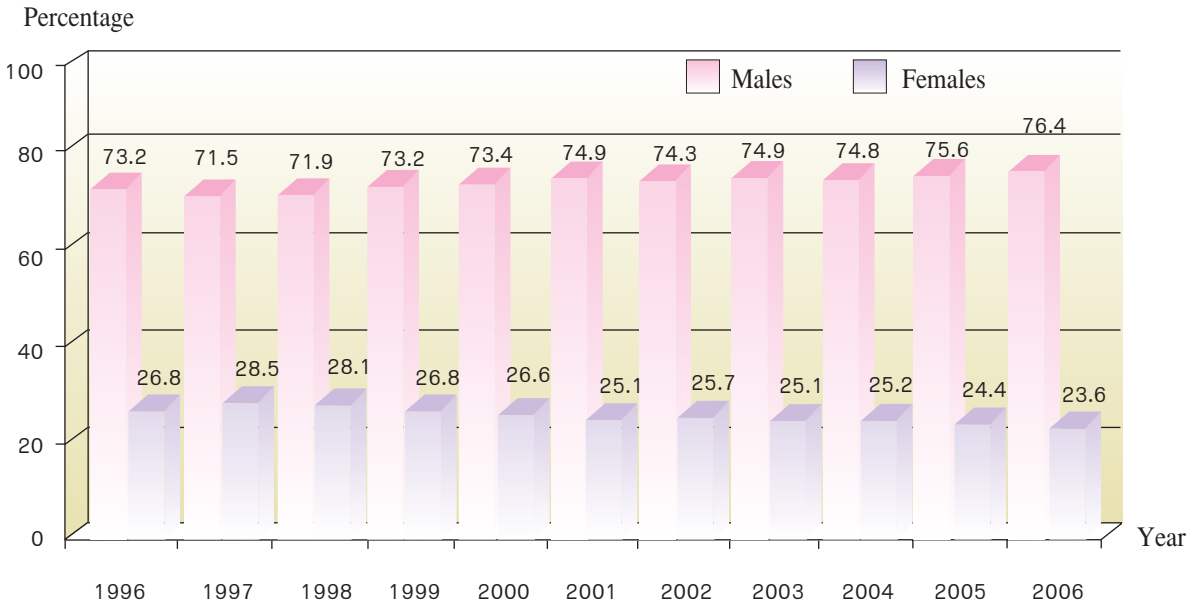


Source: Bureau of Policy and Strategy, Ministry of Public Health.

Figure 5.50 Percentage of reported deaths from accidental drowning by age and gender in Thailand, 1996-2006



	< 4	5-14	15-24	25-34	35-44	45-64	> 64
1996	13.8	25.3	15.7	12.7	12.5	14.2	5.7
1998	17.2	24.2	12.9	13.6	11.7	14.1	6.3
2000	15.2	21.3	10.8	13.4	13.1	17.3	8.9
2002	14.3	23.4	9.6	12.2	13.1	18.6	8.8
2003	14.3	21.3	10.7	11.9	14.7	17.2	9.8
2004	13.0	22.0	9.8	12.2	14.4	19.6	9.0
2005	11.8	22.9	9.7	12.1	15.2	18.8	9.5
2006	11.2	20.6	8.7	11.5	15.5	22.1	10.4



Source: Mortality Report. Bureau of Policy and Strategy, Ministry of Public Health.

2.7 Occupational and Environmental Diseases

According to the epidemiological surveillance of occupational diseases, significant situations can be summarized as follows:

2.7.1 Pesticide Poisoning

Based on the Department of Health's cholinesterase level examinations among farmers during 1992-2006, 13-31% of farmers had abnormal enzyme levels resulting from pesticide exposure. The trend is unlikely to decline and the rate of pesticide poisoning is between 2 and 6 cases per 100,000 population (Table 5.28).

Table 5.28 Cholinesterase test/results and morbidity/mortality due to pesticide poisoning among farmers, 1992-2006

Year	Cholinesterase test[1]			Pesticide poisoning [2]		
	Number (persons)	Tested abnormal (cases)	Percent	Illness (cases)	Deaths (cases)	Morbidity rate per 100,000 pop.
1992	42,471	8,669	20.41	3,599	31	6.23
1993	242,820	48,500	19.97	3,299	44	5.65
1994	411,998	72,590	17.62	3,143	41	5.32
1995	460,521	78,481	17.04	3,398	21	5.71
1996	156,315	40,520	25.92	3,196	31	5.32
1997	563,354	89,926	15.96	3,297	27	5.42
1998	369,573	77,789	21.05	4,398	15	7.16
1999	360,411	48,217	13.38	4,169	31	6.78
2000	278,612	52,604	18.88	3,109	21	5.03
2001	89,945	21,758	24.19	2,652	15	4.27
2002	115,105	33,858	29.4	2,571	14	4.11
2003	NA	NA	NA	2,342	9	3.72
2004	NA	NA	NA	1,864	9	2.98
2005	84,046	26,034	31.0	1,321	0	2.12
2006	133,255	36,776	27.6	1,183	0	1.90

Sources: [1] Department of Health, Ministry of Public Health.
[2] Bureau of Epidemiology, Department of Disease Control, MoPH.

2.7.2 Occupational Diseases in the Industrial Sector

In the industrial sector, an increasing number of workers encounter occupational diseases as evidenced by the rising percentage of disbursement rate under the Workers' Compensation Fund of the Social Security Office, i.e. from 1.2% in 1974 to 4.5% in 1996. The rate, however, has dropped to 2.4% in 2006 (Table 4.20). This is because of industrial expansion in manufacture and services with inappropriate use of new technologies, lack of training for personnel to have skills in using equipment or devices, and ineffective law enforcement measures.

Besides, there have been studies showing the importance of some specific occupational diseases as follows:

1) Silicosis (stone dust pulmonary disease). According to a report from the United States, prior to 1970, more than 1,000 people died from silicosis each year, and after 1996, the number has dropped to lower than 250. In Thailand, at present an estimated 211,796 workers in 7,845 worksites are at risk for silicosis.

Based on the silicosis surveillance in the relevant population groups according to their industrial categories, conducted by of the Department of Industrial Works and the Department of Mineral Resources during 1995-1998, the prevalence of silicosis per 1,000 population at risk increased from 16.9 in 1995 to 20.7 in 1998; and it was estimated that there were 4,393 cases of silicosis in 1998. To cope with the problem, in 2000 the Ministry of Public Health signed an agreement with the Department of Mineral Resources, Ministry of Industry, and the Department of Labour Protection and Welfare, Ministry of Labour and Social Welfare, to implement a 10-year Silicosis Prevention and Control Project (2001-2010). In 2002, physical check-ups were undertaken in 3,263 workers in industries across the country, and it was found that, based on X-ray examinations, 30 workers had silicosis, an **incidence of 9.19 per 1,000 at-risk population**.

2) Byssinosis (cotton dust disease). The then Division of Occupational Health, in collaboration with Dr. Praparn Yongchaiyudh and colleagues, in 1987, conducted a study on 229 thread-spinning workers in a textile industry in Samut Prakan Province. The study found a 19.7% byssinosis prevalence; a higher prevalence in workers with longer employment periods. Another study conducted by the Division of Occupational Health in 2002 in 43 textile industries revealed that four industries had a dust content in the air higher than the maximum permissible level. Besides, health examinations performed in 5,282 workers revealed that 86 of them had irregular symptoms; and it was found that only 21.6% (1,140) of all the workers wore a protective mask at all times while working. Another study on exposure to cotton dust in six textile industries of Malee Pongsophon and colleagues in 2002, by collecting air samples at the mixing, washing, spinning, reeling and weaving sections, revealed that all sections had cotton dust levels above the permissible level, especially in 28 (or 32.18%) out of 87 air samples.

3) Lead Poisoning. According to the 1993 study of the Department of Industrial Works, there were 558,839 workers in 14,440 workplaces nationwide that used lead in their production processes. The lead poisoning surveillance conducted in 16 industrial categories in 16 provincial areas, totally 56 workplaces, during 1990-1993 by the Division of Occupational Health demonstrated that the workplaces with a high risk of lead poisoning including those involved with battery manufacturing, ore smelting, lead mining, and lead foundries. Over 80% of the workers were found to have an elevated blood-lead level of over 40 micrograms per decilitre (mcg/dl); and over 20% of them had the lead level higher than 60 mcg/dl. Other industries with a lower risk of lead poisoning were printing press, vehicle-repairing garages, shipbuilding plants, and ornament-producing operations. Approximately 20-30% of the workers in such industrial categories had a blood-lead content of over 40 mcg/dl, and less than 5% had over 60 mcg/dl.

However, in 2002 the MoPH Division of Occupational Health conducted an occupational lead poisoning surveillance by testing for blood-lead contents in 3,876 workers. It was found that 257 workers (6.6%) had a lead content higher than 40 mcg/dl and 73 workers (1.9%) had higher than 60 mcg/dl.

4) Risks from Organic Solvents. According to a study of risks for chemical hazards by Dr. Nalinee Sripuang[17] in 1999 on workers in petrochemical, auto-making and electronics industries, the workers were found to be at high risk for exposure to solvents in the aromatic hydrocarbon group. And it was found that female workers had a higher urine metabolite concentration than male workers.

Another study on contacts with solvents (benzene, toluene, and xylene) in workers in three industries in the Map Taphut Industrial Estate, conducted by the Division of Occupational Health, MoPH, revealed unsafe conditions and risks of solvent poisoning among some groups of workers (of all the samples, 0.5% had a phenol content and 1.4% had a hippuric acid content higher than the maximum allowable levels).

In 2003, Dr. Nalinee Sripuang[18] conducted another study on impacts of occupational and environmental solvents on health in Thailand, collecting data on types of hazardous chemicals used and methods for management of chemical hazards in 62 provinces. It reveled that the major problems were found for four major groups of organic solvents resulting in three types of health problems, namely, (1) causing accidents, (2) causing illnesses, and (3) causing nuisances; and the industrial operations with a high risk for solvent exposure included washing operations, extracting operations, chemical production, fuel services, auto-repair operation, printing operation, paint production, and pesticide production, warehousing and sales.

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[17] Nalinee Sripuang. Risk Assessment of Chemical Hazards in Occupation Health Surveillance: A Case Study of Organic Solvents, 1999.

[18] Nalinee Sripuang et al. Impact of Occupational and Environmental Solvents on Health in Thailand, 2003.

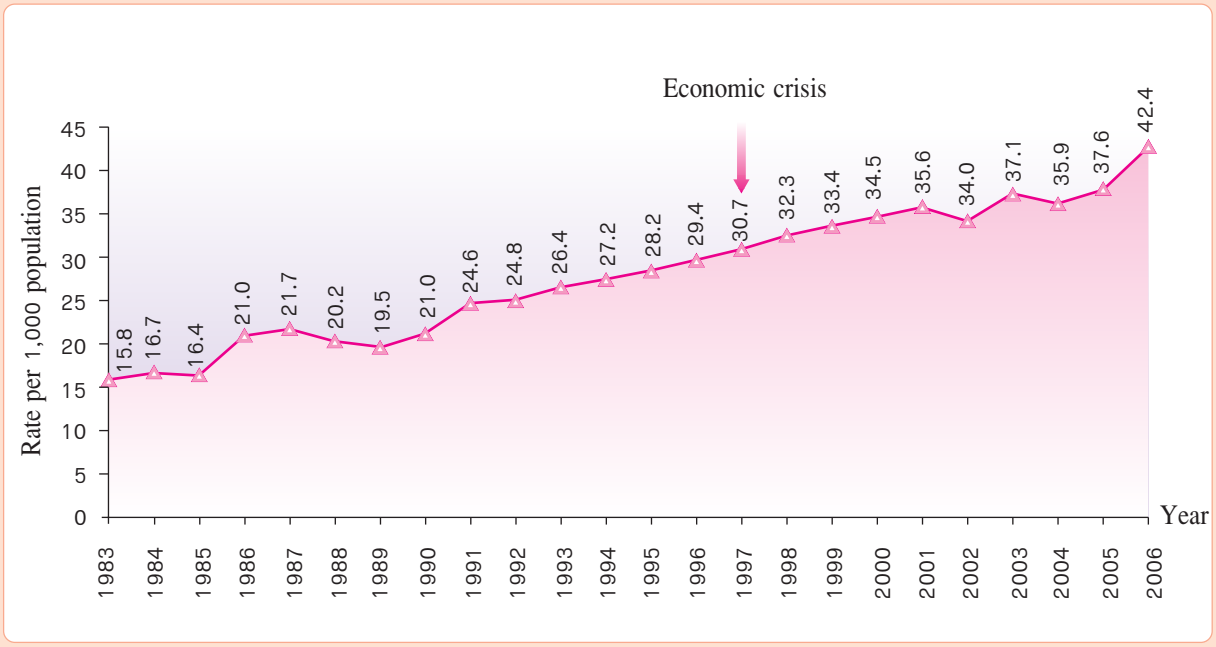
5) Hearing Loss. The Division of Occupational Health, MoPH, conducted a study in 1998[19] on hearing capacity of workers who encountered loud noise in industries. The study demonstrated that 69.3% of the workers had hearing impairment.

19 Vikrom Sengkisiri. Comparison of Effectiveness of Hearing Measurements between 16-hr Noise Exposure Cessation and 4-hr Ear Protective Device Usage in Industrial Plants in 1998, 1999.

2.8 Mental Health Problem

Mental health problems, based on the prevalence of mental disorders and suicide situation, tend to be worsening among the Thai people as the rate of outpatients attending mental health clinics has increased from 24.6 per 1,000 population in 1991 to 42.4 per 1,000 population in 2006 (Figure 5.51); and the numbers of patients with psychosis, depression and epilepsy are on the rise (Table 5.29). In addition, the rate of admissions of patients with psychosis and mental disorders has also risen from 90.74 per 100,000 population in 1981 to 227.2 per 100,000 population in 2006 (Figure 5.52).

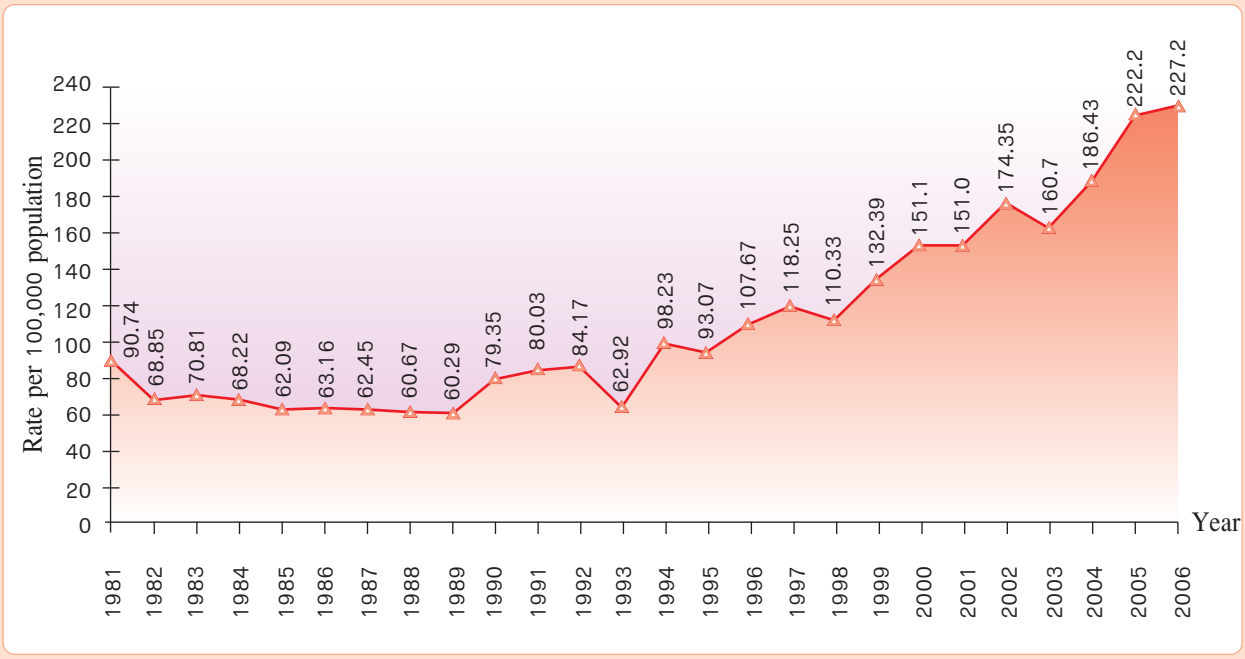
Figure 5.51 Rate of outpatient visits with mental and behavioural disorders, 1983-2006



Source: Outpatients Report. Bureau of Policy and Strategy, Office of the Permanent Secretary, Ministry of Public Health.

19 Vikrom Sengkisiri. Comparison of Effectiveness of Hearing Measurements between 16-hr Noise Exposure Cessation and 4-hr Ear Protective Device Usage in Industrial Plants in 1998, 1999.

Figure 5.52 Rate of admissions of patients with psychosis and mental disorders, Thailand, 1981-2006



Source: Inpatients Report. Bureau of Policy and Strategy, Office of the Permanent Secretary, Ministry of Public Health.

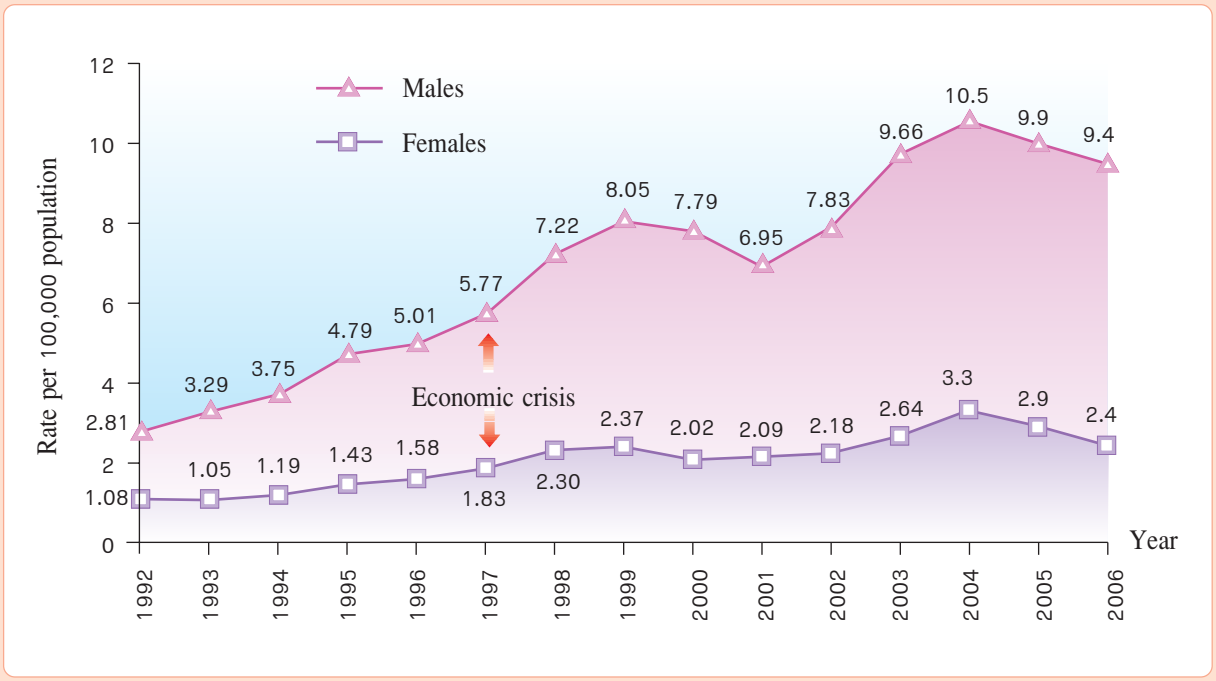
Table 5.29 Prevalence of mental disorders, 1997-2006

Mental disorder	Prevalence per 100,000 population									
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
- Psychosis	440.1	435.3	424.8	451.0	519.6	828.0	751.4	682.7	572.3	640.6
- Anxiety disorder	789.9	822.6	764.7	812.2	776.0	862.5	865.6	667.6	596.8	548.8
- Major depression	55.9	74.3	99.5	130.3	94.9	134.8	163.8	140.6	149.9	186.0
- Mental retardation	44.7	52.9	58.2	52.4	51.7	62.3	56.6	55.5	51.7	60.8
- Epilepsy	109.3	125.8	NA	149.8	182.5	200.3	193.5	180.5	195.2	172.1

Source: Department of Mental Health, Ministry of Public Health.

Suicide is one of the indicators reflecting serious mental conditions. According to a report of the Royal Thai Police, after the 1997 economic crisis the suicidal rate tends to be on the rise; the rate in males being almost four times greater than that in females (Figure 5.53).

Figure 5.53 Rate of suicides, 1992-2006



Sources: 1. Data for 1992-2003 were derived from the database of the Royal Thai Police.

2. Data for 2004-2006 were derived from the Bureau of Policy and Strategy, Office of the Permanent Secretary, MoPH.

2.9 Nutritional Diseases

2.9.1 Malnutrition

The nutritional status of preschool children has generally improved (Figure 5.54). However, with respect to geographical variation, preschool children in the Northeastern and Northern regions are more likely to be malnourished than those in other regions. In particular, the malnutrition rate among preschool children on the highlands (hilltribes) are almost eight times greater than that for Bangkok (Tables 5.30 and 5.31).

According to the World Health Report,[20] it was estimated that in 2000 approximately 27% of children under 5 years of age worldwide (168 million) were malnourished (weigh-for-age scale), making them more vulnerable to death due to diarrhoea and pneumonia.

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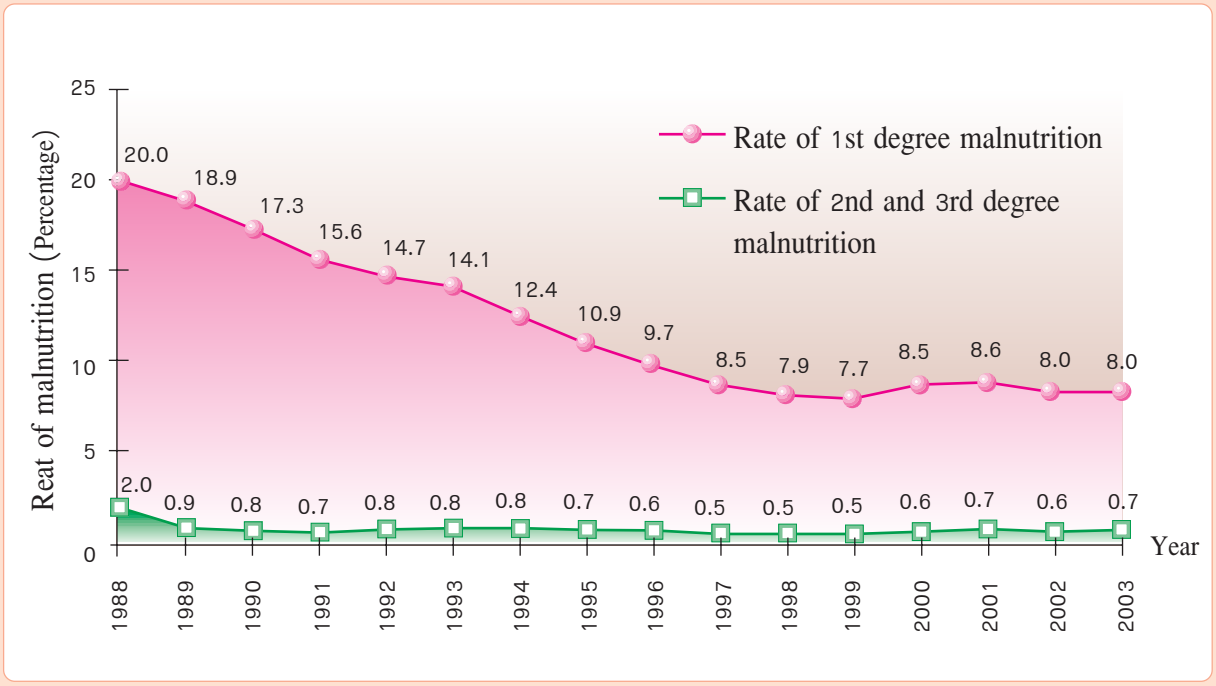
[20] Pathom Sawanpanyalert (editor). World Health Report 2002: Reducing Risks and Promoting Health. 2003 (in Thai).

Figure 5.54 Situation of protein and energy malnutrition among children aged 0-5 years, Thailand, 1988-2003



Source: Department of Health, Ministry of Public Health.

Table 5.30 Rate (percentage) of malnutrition among children aged 0-5 years by region, 1989-2003

Year	Bangkok		Central		Northeast		North		South		Hilltribes	
	1st degree	2nd & 3rd degree	1st degree	2nd & 3rd degree	1st degree	2nd & 3rd degree	1st degree	2nd & 3rd degree	1st degree	2nd & 3rd degree	1st degree	2nd & 3rd degree
1989	13.08	1.25	9.45	0.28	24.91	1.67	18.76	1.33	16.38	1.37	-	-
1990	5.65	0.43	8.19	0.18	23.46	1.12	17.50	0.96	14.80	0.58	-	-
1991	5.10	0.37	7.30	0.34	21.52	0.89	16.78	0.97	12.56	0.56	-	-
1992	4.33	0.19	6.82	0.18	20.88	0.96	15.87	1.07	11.87	0.54	-	-
1993	3.56	0.19	6.11	0.18	19.51	0.94	15.28	1.12	11.29	0.62	-	-
1994	3.66	0.31	5.56	0.18	17.55	0.99	14.77	0.92	10.47	0.68	-	-
1995	3.76	0.33	4.62	0.17	14.48	0.87	13.56	1.14	9.25	0.62	-	-
1996	2.89	0.23	4.35	0.15	12.56	0.71	10.67	0.83	8.21	0.52	-	-
1997	4.50	0.45	4.04	0.14	10.82	0.65	10.05	0.81	7.27	0.44	30.3	10.6
1998	4.01	0.38	3.86	0.12	10.26	0.65	9.52	0.78	6.55	0.44	18.92	2.84
1999	4.01	0.38	3.79	0.16	10.20	0.65	9.33	0.63	6.61	0.44	23.2	2.48
2000	4.66	0.31	4.19	0.16	10.61	0.85	8.95	0.73	7.35	0.59	17.24	2.55
2001	4.54	0.39	4.94	0.29	10.53	0.92	7.81	0.42	6.09	0.53	14.00	3.02
2002	-	-	3.89	0.24	9.93	0.83	8.52	0.69	7.06	0.56	-	-
2003	-	-	3.62	0.21	9.82	0.95	8.49	0.73	7.28	0.71	-	-
Ratio compared with Bangkok in 2001	1	1	1.1	0.7	2.3	2.4	1.7	1.1	1.3	1.4	3.1	7.7

Sources: (1) Department of Health, Ministry of Public Health.

(2) Bureau of Policy and Strategy, Ministry of Public Health.

Notes: For 1989-1996 and 2002-2003, there was no survey on the hilltribes.

For 2002-2003, there was no survey in Bangkok.

Table 5.31 Nutritional status (weight-for-age, percentage) of children aged 0-6 years by region, 2004-2006

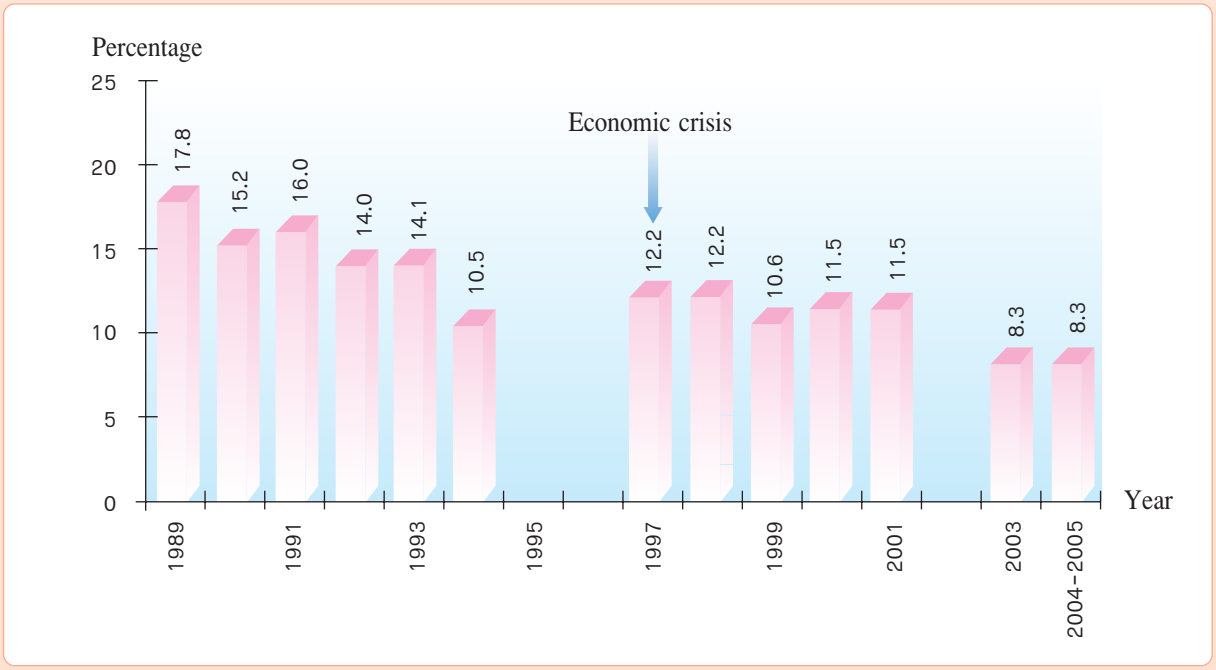
Year	Central		Northeast		North		South		Total	
	Rather low	Lower than standard	Rather low	Lower than standard	Rather low	Lower than standard	Rather low	Lower than standard	Rather low	Lower than standard
2004	2.68	1.35	8.02	3.03	7.56	2.67	5.24	2.81	6.23	2.53
2005	3.01	1.91	6.58	3.23	5.98	3.39	4.99	2.68	5.30	2.83
2006	2.90	2.81	6.44	2.98	4.74	2.72	4.36	3.27	5.19	2.94

Sources: Department of Health, Ministry of Public Health.

Note: Since 2004, the Department of Health has charged the criteria for assessing nutritional status of children.

The rate of underweight primary schoolchildren dropped steadily from 17.8% in 1989 to 10.5% in 1994. Nonetheless, during the economic crisis, such a rate increased slightly (Figure 5.55).

Figure 5.55 Proportion of underweight primary schoolchildren, 1989-2005



Source: Department of Health, Ministry of Public Health.

Note: For 1995, 1996, and 2002 there were no surveys on malnutrition among primary schoolchildren.

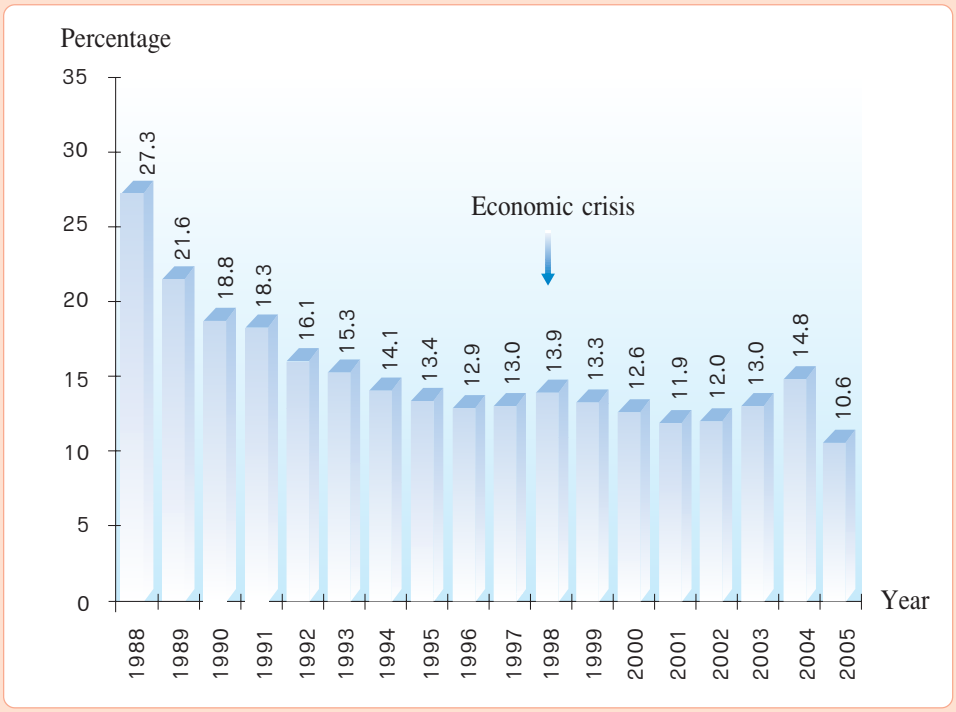
For 2003, data were derived from Thailand Diet and Nutrition Survey, Fifth Round, Department of Health, MoPH.

For 2005, data were derived from Child and Youth Survey, 2004-2005. Thai Health Promotion Foundation, 2006.

2.9.2 Anemia among Pregnant Women

The rate of anemia among pregnant women had a declining trend, i.e. dropping from 27.3% in 1988 to 12.9% in 1996, but it rose slightly during the economic crisis. However, the rate dropped again to 10.6% in 2005 (Figure 5.56).

Figure 5.56 Proportion of anaemic pregnant women (Hct <33%), 1988-2005

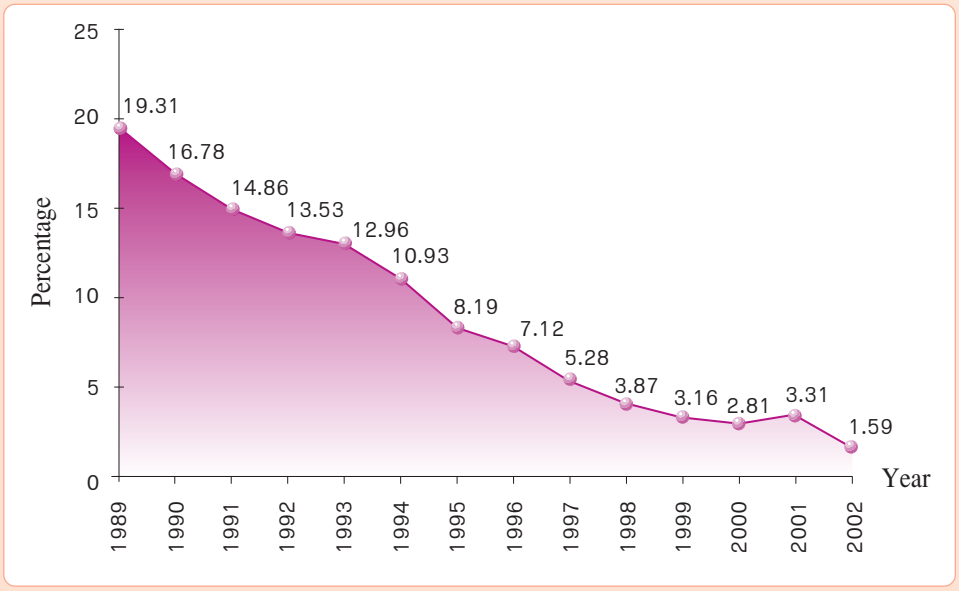


Source: Department of Health, Ministry of Public Health.

2.9.3 Iodine Deficiency Disorders

As a result of strong efforts on the elimination of iodine deficiency disorders (IDD), the prevalence of IDD in primary schoolchildren in 15 provinces with high rates of severe goitre dropped from 19.31% in 1989 to 1.59% in 2002 (Figure 5.57); and the national average of goitre prevalence rate also dropped to 1.3% in 2003. But the IDD surveillance programme for preventing intellectual problems among newborn babies revealed that the trend in iodine deficiency among pregnant women is rising (Figure 5.58).

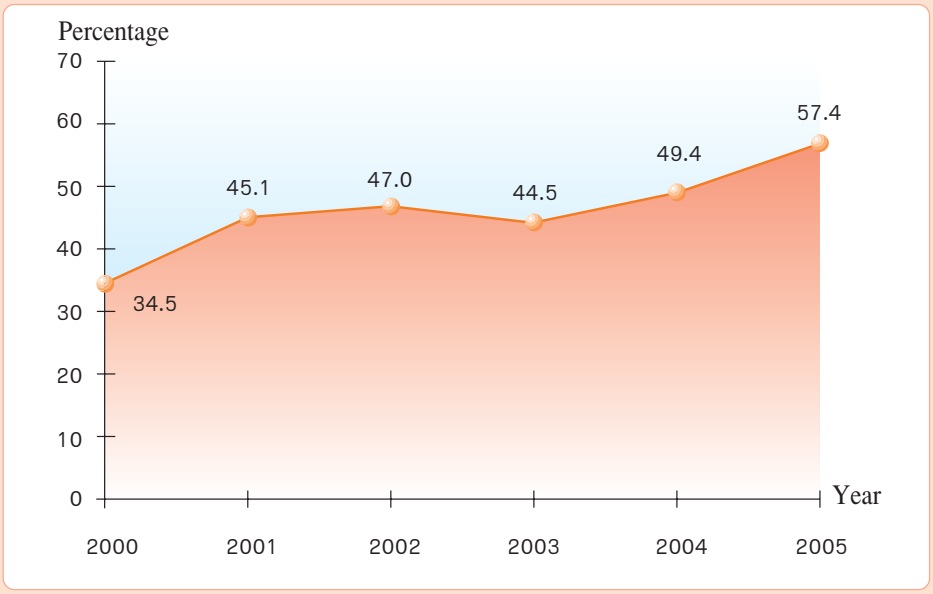
Figure 5.57 Situation of iodine deficiency disorders among primary schoolchildren, 1989-2002



Source: Department of Health, Ministry of Public Health.

Note: Data were collected only from 15 provinces with a severe goitre problem.

Figure 5.58 Percentage of pregnant women with iodine deficiency (<10 μg/dl), 2000-2005

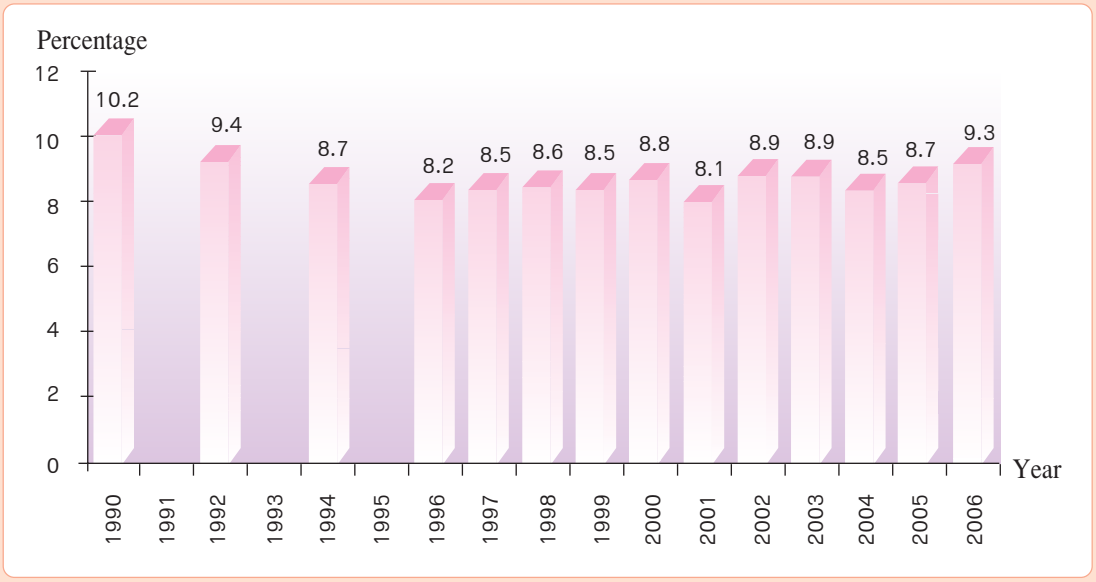


Source: Department of Health, Ministry of Public Health.

2.9.4 Neonates with Birth Weight under 2,500 Grams

Even though the rate of low birth weight (below 2,500 grams) in general has declined from 10.2% in 1990 to 9.3% in 2006 (Figure 5.59), after the economic crisis the rate of low birth weight in Thailand has been on a rising trend, particularly among the poor and unemployed population groups whose rates are higher than that among the non-poor; and the rates are highest in the South and the Northeast.

Figure 5.59 Percentage of newborns with low birth weight (under 2,500 grams), 1990-2006



Source: 1. Department of Health, MoPH.

2. For 2006, data were derived from the Child Situation Survey in Thailand, Dec 2005 - Feb 2006, National Statistical Office.

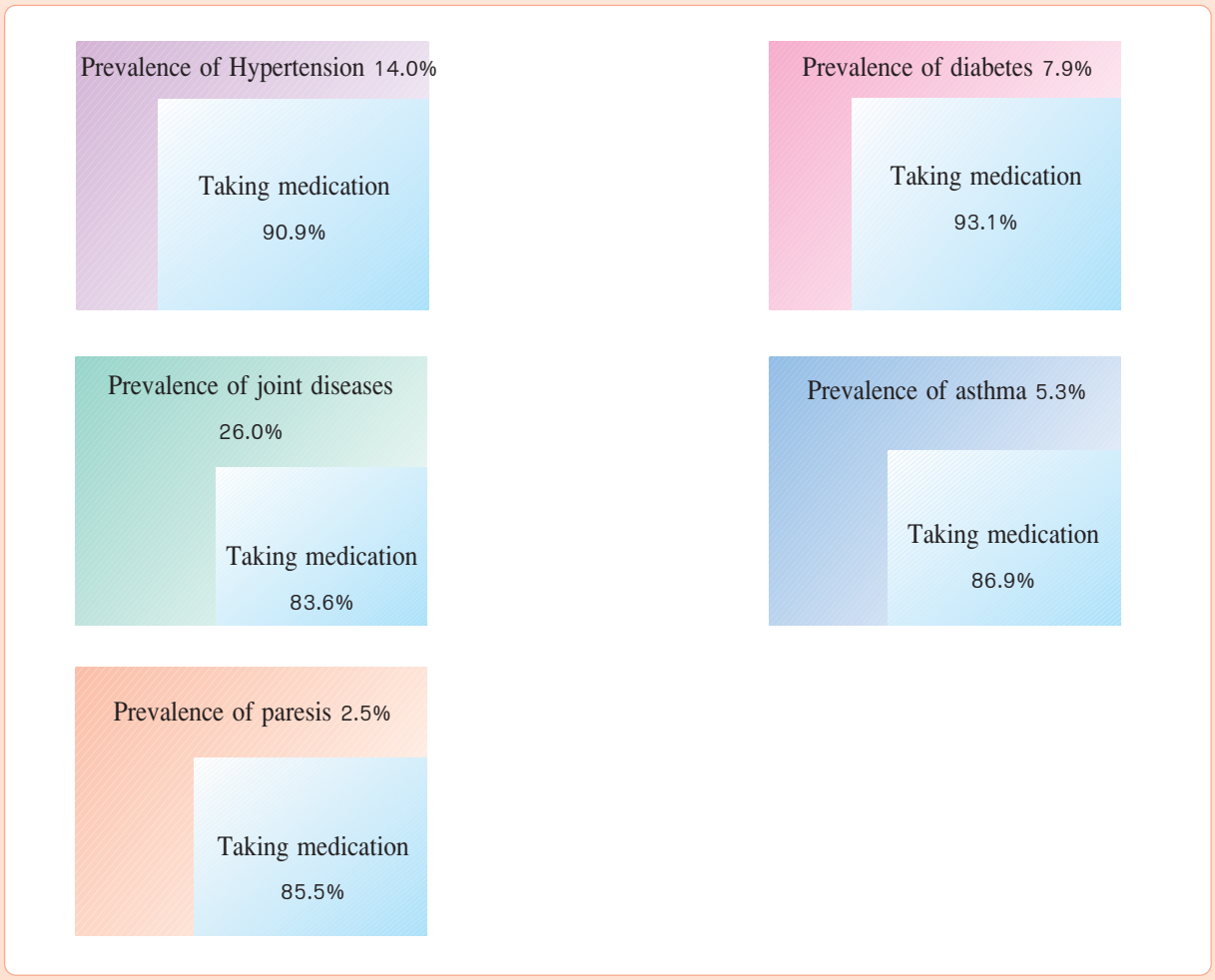
2.10 Health Problems of the Elderly

2.10.1 Diseases and Deficiencies in the Elderly

According to the 2001 survey on quality of life of Thai people aged 60 years and over, the most common illnesses among the elderly are hypertension, diabetes, joint diseases, asthma, and paresis (Figure 5.60).

Another survey conducted by the National Statistical Office in 2002 revealed that the first 5 illnesses that elderly people had are body ache (including backache and joint pain), insomnia, vertigo, eye diseases, dementia and hypertension. These illnesses are more prevalent with age (Table 5.32), and the prevalence is higher in females than in males (Table 5.33). The 2006 survey on risks of Thai elders, conducted by the Ministry of Social Development and Human Security, revealed that three-fourths of all elders had commonly found illnesses, i.e. hypertension, bone/joint diseases, diabetes, eye diseases and cardiovascular disease.

Figure 5.60 Prevalence of illnesses among Thai elderly people, 2001



Source: Institute of Geriatric Medicine. A Survey on Quality of Life of Thai Elderly People, 2001.

Table 5.32 Proportion (percentage) of Thai elders with most common diseases/symptoms by age group, 1994 and 2002

Disease/Symptom	1994					2002				
	Total	60-64 yrs	65-69 yrs	70-74 yrs	75 yrs and over	Total	60-64 yrs	65-69 yrs	70-74 yrs	75 yrs and over
- Body ache, backache	-	-	-	-	-	75.1	72.7	74.7	77.8	77.3
- Joint pain (degenerative)	72.4	68.5	73.7	73.8	76.9	47.5	42.8	46.7	49.8	54.9
- Insomnia	44.7	40.2	44.8	46.6	52.0	38.7	34.1	38.1	42.0	44.9
- Vertigo	49.2	46.8	45.7	51.6	56.9	36.8	34.4	35.6	38.7	41.2
- Eye diseases	43.0	35.6	40.6	48.5	56.0	33.2	27.5	31.1	37.3	42.8
- Dementia	27.2	21.7	22.9	32.1	40.2	29.8	22.3	26.5	33.2	45.2
- Hyper/hypotension	25.0	22.3	25.7	27.4	26.8	20.0	17.7	20.3	21.9	21.6

Source: Surveys on Elderly People in Thailand, 1994 and 2002, National Statistical Office.

Table 5.33 Proportion (percentage) of Thai elders with most common diseases/symptoms by sex, 1994 and 2002

Disease/Symptom	1994			2002		
	Total	Male	Female	Total	Male	Female
- Body ache, backache	-	-	-	75.1	73.0	76.8
- Joint pain (degenerative)	72.4	67.3	76.5	47.5	43.5	50.8
- Insomnia	44.7	36.5	51.4	38.7	33.7	42.9
- Vertigo	49.2	38.9	57.6	36.8	27.8	44.4
- Eye diseases	43.0	39.1	46.1	33.2	30.6	35.3
- Dementia	27.2	23.8	30.0	29.8	26.6	32.5
- Hyper/hypotension	25.0	22.1	27.3	20.0	17.6	22.0

Source: Surveys on Elderly People in Thailand, 1994 and 2002, National Statistical Office.

2.10.2 Rising Trends in Health Problems of the Elderly

The diseases that are health problems with rising trends are the following:

(1) Hypertension is a major health problem of the elderly that has a rising trend (Table 5.34) and is correlated with the economic and social development of society. Urban residents are more likely to have hypertension than rural residents. Besides, according to the World Health Report, it was estimated that in 2000 hypertension was the cause of 7.1 million deaths or approximately 13% of all deaths worldwide and it was also the cause of loss in non-fatal health status or loss of healthy life years.

Table 5.34 Trends and prevalence of hypertension among Thai elders in urban and rural areas, 1985-1998

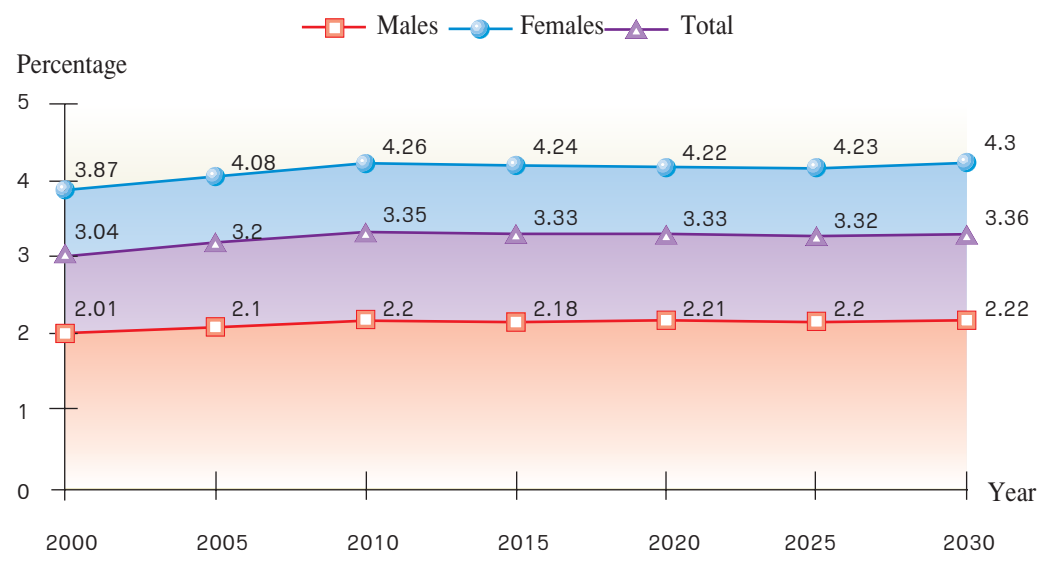
Residence	Prevalence, percent								
	1985	1986	1988	1989	1991	1992	1995	1996	1998
Urban	28		26		15.8[+#]		26[**#]	44.4[#]	36.5
Rural		23.3		18[*]	11.1[+#]	8.8[*]	15.3[**#]	23.6[#]	

Source: Sutthichai Jitapunkul. The Spread of Chronic Diseases and Disabilities in Thailand: A Hypothesis Based on the Data from Studies on the Elderly, 2000.

Notes: * Criteria used only for hypertension
** Criteria used only for history taking
+ Age 65[+] yrs
# National survey

(2) **Dementia** is increasingly an important problem affecting the quality of life of the patients, caregivers, and society. A study on the prevalence of dementia among Thai elders reveals that at present the prevalence is 3.04% and is projected to be 3.4% in 2030 (the female to male ratio being 2:1) (Figure 5.61). Besides, the prevalence of dementia is rising with age. A screening test of elders' brains reveals a rising proportion of both male and female elders with brain defects which might be dementia, more prevalent in females than in males (Table 5.35). However, the prevalence of this disease in Thai elders is lower than that in American elders, but when considering the prevalence in each age group, their rates of increase are comparable (Table 5.36).

Figure 5.61 Projection of dementia prevalence in the elderly, 2000-2030



Source: Thai Health Research Institute, National Health Foundation, and Bureau of Health Policy and Planning, MoPH. Report on a Study of Health Problems among Thai Elders, 1998.

Table 5.35 Results of brain screening examinations of the elderly by sex and age

Sex	Age (years)	Dementia (%)
Male	60-69	16.3
	70-79	27.0
	80+	47.2
	Total	**23.8**
Female	60-69	22.1
	70-79	38.6
	80+	70.3
	Total	**35.2**

Source: Report on Health Examination Survey, Thailand, Third Round, 2003-2004. Health Systems Research Institute.

Table 5.36 Comparison of dementia prevalence among Thai and American elders

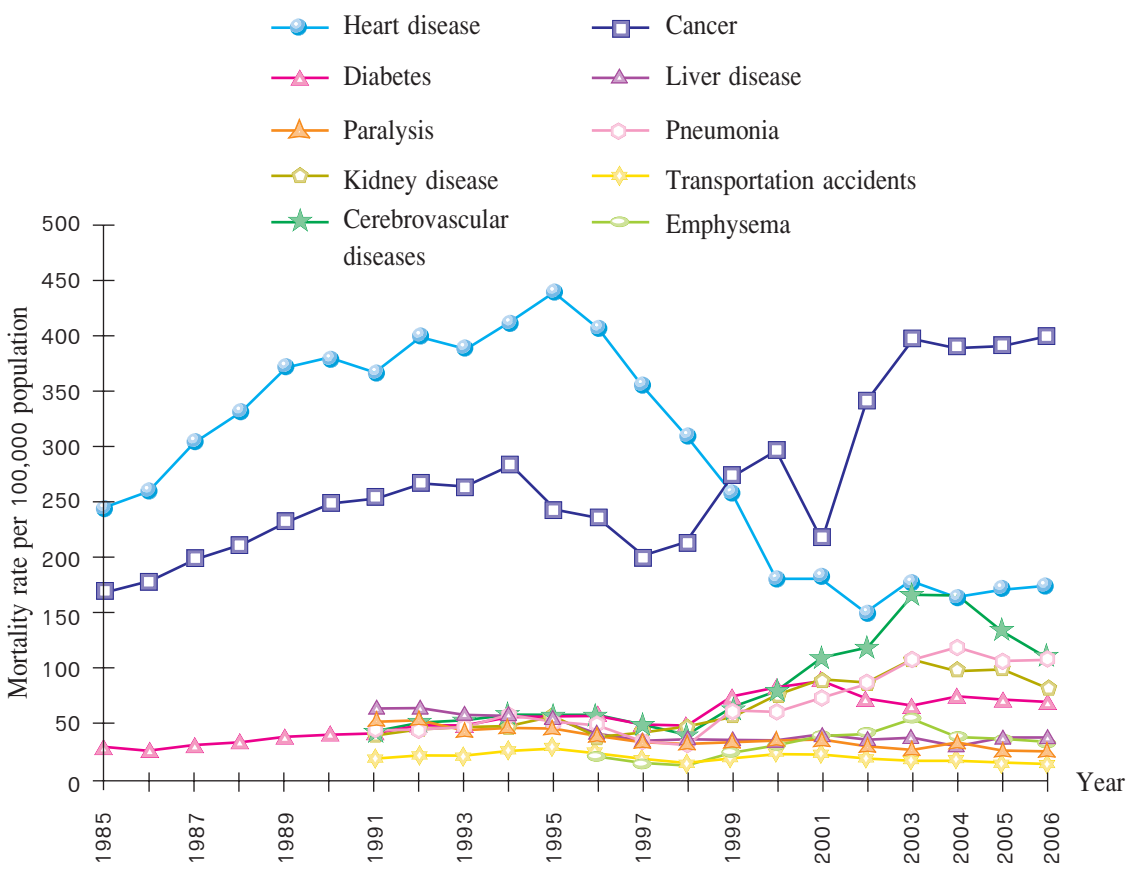
Age (years)	Prevalence	
	Thai elders	American elders
60 - 64	1%	-
65 - 69	2%	2.5%
70 - 74	3%	5%
75 - 79	5%	10%
80 - 84	7.5%	15%
85 - 89	12.5%	30%
90+	30%	-

Source: Sutthichai Jitapunkul, Napaporn Chayovan and Jiraporn Kespichaywattana. "National Policies on Ageing and Long-term Care Provision for Older Persons in Thailand" in David R. Phillips and Alfred C.M. Chan (eds). Ageing and Long-term Care: National Policies in the Asia-Pacific. Bestprint Printing Co., Singapore, 2002.

(3) Major Causes of Death in the Elderly

Among the elderly, the most common causes of death are, in order of magnitude, cancer, heart disease, cerebrovascular disease, pneumonia, kidney disease and diabetes. It has been found that the mortality rate per 100,000 population from cancer has risen from 169.1 in 1985 to 402.5 in 2006. The rate of mortality due to cerebrovascular disease (per 100,000 population) has also risen from 54.9 in 1996 to 110.9 in 2006. The rates of mortality have also risen for diabetes from 28.8 to 71.3 for the same period and for pneumonia from 42.0 in 1991 to 110.3 in 2006 (Figure 5.62 and Table 5.37).

Figure 5.62 Mortality rates of major causes of death in the elderly, 1985-2006



Source: Bureau of Policy and Strategy, Ministry of Public Health.

Table 5.37 Mortality rates of diabetes, heart disease, cancer, paralysis, liver diseases, kidney diseases, pneumonia, transportation accidents, cerebrovascular disease, and emphysema among the elderly, 1985-2006

Year	Mortality rate per 100,000 population among the elderly									
	Diabetes	Heart diseases	Cancer	Liver diseases	Kidney diseases	Paralysis	Pneumonia	Transportation accidents	Cerebrovascular diseases	Emphysema
1985	28.8	245.0	169.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1986	24.9	259.3	177.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1987	30.3	304.3	199.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1988	32.4	331.1	209.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1989	37.2	372.3	231.9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1990	39.4	379.2	248.8	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1991	39.9	386.7	253.9	62.6	38.3	49.5	42.0	16.9	n.a.	n.a.
1992	49.5	400.3	266.8	63.4	48.0	51.5	42.3	20.1	n.a.	n.a.
1993	50.8	389.7	262.9	57.1	45.9	42.4	45.3	19.5	n.a.	n.a.
1994	57.2	412.2	283.9	56.3	47.5	44.9	56.0	24.1	n.a.	n.a.
1995	56.2	440.7	242.1	52.2	55.3	45.5	51.0	26.3	n.a.	n.a.
1996	57.4	407.5	236.2	41.4	38.2	37.4	46.8	22.4	54.9	18.4
1997	48.5	356.1	199.4	33.1	40.5	32.0	33.7	17.1	49.1	13.3
1998	47.7	310.0	213.0	34.4	46.7	31.3	28.9	13.3	38.0	11.0
1999	74.8	257.7	273.7	34.0	56.1	32.3	61.1	18.5	63.8	23.0
2000	82.1	179.9	297.6	34.0	75.5	33.9	59.9	22.6	79.7	29.5
2001	88.4	182.2	218.2	40.6	89.6	34.8	73.0	21.5	110.1	38.8
2002	72.1	149.4	342.6	35.5	87.2	29.2	85.5	18.9	118.7	40.2
2003	66.7	177.1	399.5	38.3	108.0	26.8	107.4	16.7	166.8	54.9
2004	75.8	163.8	393.1	30.7	98.9	32.8	119.2	17.3	166.3	37.7
2005	73.0	172.3	393.6	39.5	100.3	26.6	107.8	16.2	134.3	37.4
2006	71.3	175.3	402.5	39.2	83.0	25.9	110.3	15.2	110.9	35.1

Source: Bureau of Policy and Strategy, Ministry of Public Health.

Note: n.a. = Data not available

Table 5.37 Mortality rates of diabetes, heart disease, cancer, paralysis, liver diseases, kidney diseases, pneumonia, transportation accidents, cerebrovascular disease, and emphysema among the elderly, 1985-2006

Year	Mortality rate per 100,000 population among the elderly									
	Diabetes	Heart diseases	Cancer	Liver diseases	Kidney diseases	Paralysis	Pneumonia	Transportation accidents	Cerebrovascular diseases	Emphysema
1985	28.8	245.0	169.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1986	24.9	259.3	177.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1987	30.3	304.3	199.1	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1988	32.4	331.1	209.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1989	37.2	372.3	231.9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1990	39.4	379.2	248.8	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
1991	39.9	386.7	253.9	62.6	38.3	49.5	42.0	16.9	n.a.	n.a.
1992	49.5	400.3	266.8	63.4	48.0	51.5	42.3	20.1	n.a.	n.a.
1993	50.8	389.7	262.9	57.1	45.9	42.4	45.3	19.5	n.a.	n.a.
1994	57.2	412.2	283.9	56.3	47.5	44.9	56.0	24.1	n.a.	n.a.
1995	56.2	440.7	242.1	52.2	55.3	45.5	51.0	26.3	n.a.	n.a.
1996	57.4	407.5	236.2	41.4	38.2	37.4	46.8	22.4	54.9	18.4
1997	48.5	356.1	199.4	33.1	40.5	32.0	33.7	17.1	49.1	13.3
1998	47.7	310.0	213.0	34.4	46.7	31.3	28.9	13.3	38.0	11.0
1999	74.8	257.7	273.7	34.0	56.1	32.3	61.1	18.5	63.8	23.0
2000	82.1	179.9	297.6	34.0	75.5	33.9	59.9	22.6	79.7	29.5
2001	88.4	182.2	218.2	40.6	89.6	34.8	73.0	21.5	110.1	38.8
2002	72.1	149.4	342.6	35.5	87.2	29.2	85.5	18.9	118.7	40.2
2003	66.7	177.1	399.5	38.3	108.0	26.8	107.4	16.7	166.8	54.9
2004	75.8	163.8	393.1	30.7	98.9	32.8	119.2	17.3	166.3	37.7
2005	73.0	172.3	393.6	39.5	100.3	26.6	107.8	16.2	134.3	37.4
2006	71.3	175.3	402.5	39.2	83.0	25.9	110.3	15.2	110.9	35.1

Source: Bureau of Policy and Strategy, Ministry of Public Health.

Note: n.a. = Data not available

3. Conclusions

3.1 Equity in Health Status

3.1.1 Health Status According to Socioeconomic Factors at Individual Level

Social and economic factors at the individual or family level has some influence on health as they affect people's accessibility to factors required for livelihood and to services, particulary essential health care.

The 1996 health examination survey revealed a comparison of equalities in health status of the elderly with different economic status backgrounds, classified by family's financial conditions: unneedy, occasionally needy, somewhat needy, and very needy. It was found that the financially needy condition was significantly associated with disability; 22% of unneedy elders were disabled, and as high as 35% of very needy elders were disabled compared to the unneedy (Table 5.38).

Table 5.38 Disabilities of elders by level of financial neediness

Financial status	Long-term disability		total disability	
	Percent	Odds ratio	Percent	Odds ratio
Very needy (n =188)	25.5	1.63-3.4	34.6	1.59-3.09
Somewhat needy (n =591)	20.8	1.12-1.83	28.9	1.22-1.88
Occasionally needy (n =1,056)	19.6	1.08-1.61	27.0	1.15-1.65
Unneedy (n =2,213)	17.7	1.0	22.2	1.0

Source: Sutthichai Jitapunkul et al. 1999.

According to the 2004 Health and Welfare Survey, examining the proportion of sick people with and without hospitalized care and their income level, the lowest-income group had the highest proportion of illness (26%) while the highest-income group had an illness proportion of only 15% (Table 5.39). If the illness proportion was equal for all five income groups, the proportion should be 20%.

Table 5.39 Proportion (percentage) of people with illness (as outpatients and inpatients) by income level

Income level	Proportion of people with illness	
	Requiring non-hospitalization care (outpatient)	Requiring hospitalization care (inpatient)
Lowest	26.4	25.6
Low	21.0	21.1
Medium	20.4	19.3
High	17.2	19.0
Highest	15.0	15.0
Total	**100**	**100**

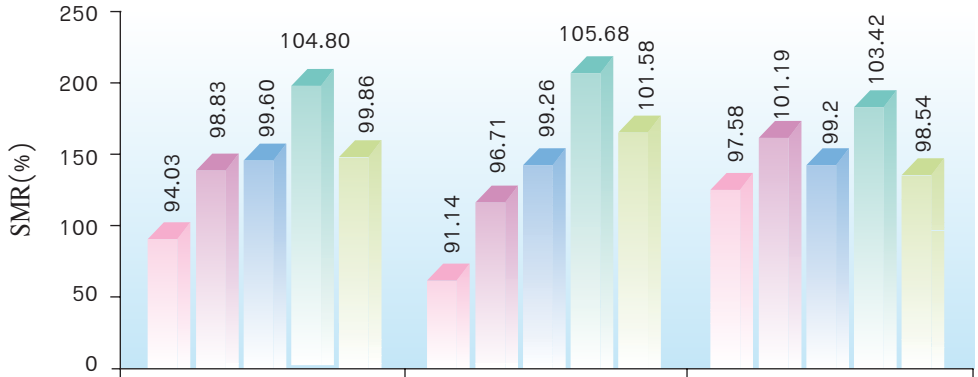
Source: Suphon Limwattananon et al. 2005.

So it can be said that the socioeconomic status of individuals or families mostly tends to be associated with illness conditions which are self-reported, including disabilities resulting from a lack of suitable care.

3.1.2 Health Status According to Socioeconomic Status at the Locality Level

An analysis of the relationship between the socioeconomic status of locality and mortality in 926 districts across the country (including Bangkok), categorized into five quintiles using socioeconomic indicators of districts derived from five socioeconomic variables from the population and housing census data, comparing standardized mortality ratio (SMR) in groups of districts, reveals that SMRs are different among groups of districts. The differences are found in the aspects of overall mortality, mortality by sex, and mortality by disease. For overall mortality in males, accidents and suicide are the top leading causes of death in the district groups with medium and high socioeconomic levels (quintile 4); a lower proportion is noted in poorer districts with regard to deaths due to liver cancer, the highest death proportion is found in poor district groups (quintiles 1 and 2) as they are located in the Northeast with a higher prevalence of bile duct cancer, compared with other regions. As for lung cancer, diabetes, ischemic heart disease and cerebrovascular disease, the highest death proportions are found in the rich group of districts (quintile 5), while the death proportions of leukemia and accidental drowning have no difference among district groups (Figures 5.63-5.66).

Figure 5.63 Standardized mortality ratios (overall and by sex) in groups of districts with various socioeconomic levels

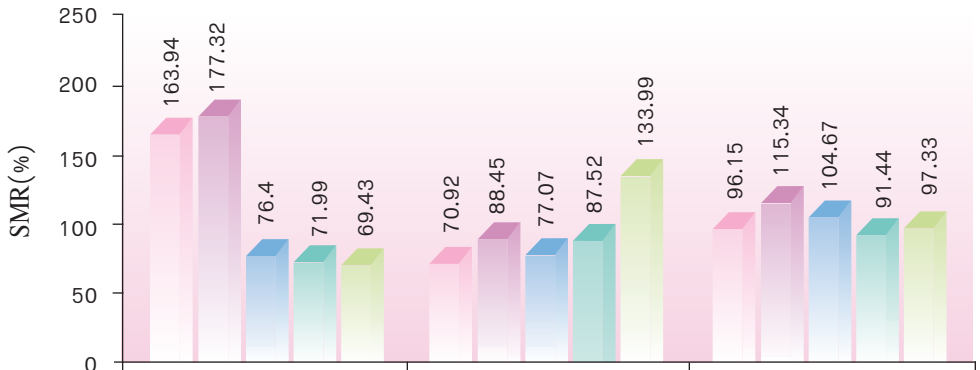


	SMR, Overall	SMR, Males	SMR, Females
Quintile 1	94.03	91.14	97.58
Quintile 2	98.83	96.71	101.19
Quintile 3	99.60	99.26	99.2
Quintile 4	104.80	105.68	103.42
Quintile 5	99.86	101.58	98.54

Quintile 1 = Poorest Quintile 5 = Richest

Source: Pinij Faramnuayphon and Pattama Wapattanawong, 2005.

Figure 5.64 Standardized mortality ratios of three cancers in groups of districts with various socioeconomic levels

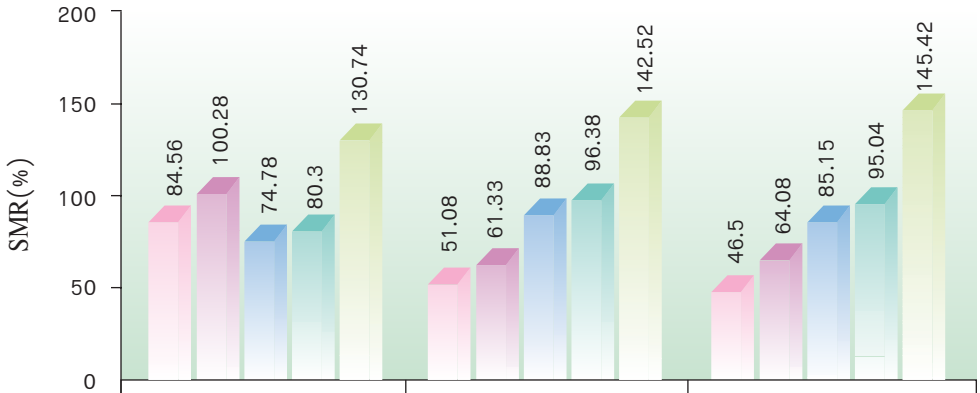


	Liver cancer	Lung Cancer	Leukemia
Quintile 1	163.94	70.92	96.15
Quintile 2	177.32	88.45	115.34
Quintile 3	76.4	77.07	104.67
Quintile 4	71.99	87.52	91.44
Quintile 5	69.43	133.99	97.33

Quintile 1 = Poorest Quintile 5 = Richest

Source: Pinij Faramnuayphon and Pattama Wapattanawong, 2005.

Figure 5.65 Standardized mortality ratios of three chronic diseases in groups of districts with various Socioeconomic Levels

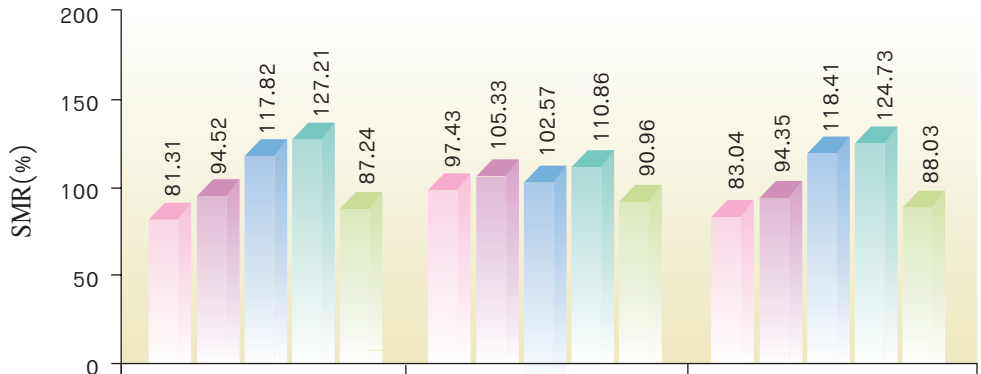


	Diabetes	Ischemic heart disease	Cerebrovascular disease
Quintile 1	84.56	51.08	46.5
Quintile 2	100.28	61.33	64.08
Quintile 3	74.78	88.83	85.15
Quintile 4	80.3	96.38	95.04
Quintile 5	130.74	142.52	145.42

Quintile 1 = Poorest Quintile 5 = Richest

Source: Pinij Faramnuayphon and Pattama Wapattanawong, 2005.

Figure 5.66 Standardized mortality ratios of accidents and suicide in groups of districts with various socioeconomic levels



	Traffic accident	Drowning	Suicide
Quintile 1	81.31	97.43	83.04
Quintile 2	94.52	105.33	94.35
Quintile 3	117.82	102.57	118.41
Quintile 4	127.21	110.86	124.73
Quintile 5	87.24	90.96	88.03

Quintile 1 = Poorest Quintile 5 = Richest

Source: Pinij Faramnuayphon and Pattama Wapattanawong, 2005.

Another explanation of the differences in morbidity and mortality rates in districts with different socioeconomic status is that they have different risk factors. For example, in municipal and non-municipal areas, according to the 1996-1997 and national health examination survey, the proportion municipal residents with a high cholesterol level (>200 mg/dl%) is 18% higher than that for non-municipal residents (Table 5.40).

Table 5.40 Percentage of people with high blood cholesterol by region and residence

Residential area	Population with cholesterol >200 mg/dl%					
	Bangkok	Central	North	Northeast	South	Total
Cholesterol >200 mg/dl%	56.1	48.4	36.1	15.7	41.7	35.8
Municipal areas		43.2	43.3	42.6	50.4	51.5
Non-municipal areas		49.3	35.5	13.9	40.3	33.9

Source: Second National Health Examination Survey.

The 1996-97 survey also shows that municipal residents are 1.2 times more likely to have hypertension than non-municipal people. Besides, differences are noted for risks for such illnesses as heart diseases, cerebrovacular diseases, etc, which are major causes of morbidity and mortality.

Moreover, the infant mortality rate is an indicator of health status disparities in various population groups. In non-municipal areas, the infant mortality rate is 1.56 times higher than that in municipal areas. Even though it has declined significantly during the part 30 years, the disparities between municipal and non-municipal areas are steadily on the rise (Table 5.41).

Table 5.41 Infant morbidity rates in municipal and non-municipal areas, 1964-2006

Survey	IMR (per 1,000 live births)			
	Total	Municipal areas	Non municipal areas	NM to M rates
SPC 1 (1964-1965)	84.3	67.6	85.5	1.26
SPC 2 (1974-1976)	51.8	39.6	58.7	1.48
SPC 3 (1985-1986)	40.7	27.6	42.6	1.54
SPC 4 (1989)	38.8	23.6	41.4	1.75
SPC 5 (1991)	34.5	21.0	37.0	1.76
SPC 6 (1995-1996)	26.05	15.24	28.23	1.85
SPC 7 (2005-2006)	11.26	7.92	12.39	1.56

Source: National Statistical Office.

Note: SPC = Survey of Population Changes.

3.2 Relationship Between Risk Factors and Health Problems

An analysis of the relationship between risk factors and health problems reveals that smoking and alcohol drinking as are significant co-risk factors for major disease burden in males. Alcohol abuse is the major cause of road traffic accidents, alcoholic dependence, liver cancer, depression and cirrhosis, while smoking is the major risk factor for cerebrovascular disease, liver cancer, ischaemic heart disease, and chronic obstructive pulmonary disease for instance (Figure 5.67).

Among females, the risk factors for major disease burdens are, for example, overweight being a co-risk factor for cerebrovascular disease, depression, ischaemic heart disease, and knee-joint degeneration (Figure 5.68).

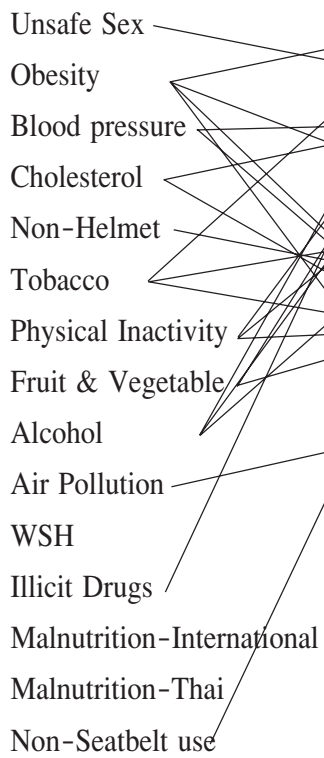
Figure 5.67 Diseases and risk factors among Thai males, 2004

Rank	Risk factors
1	Alcohol
2	Unsafe Sex
3	Tobacco
4	Non-Helmet
5	Blood pressure
6	Obesity
7	Cholesterol
8	Fruit & Vegetable
9	Illicit Drugs
10	Air Pollution
11	Physical Inactivity
12	WSH
13	Non-Seatbelt use
14	Malnutrition-International
15	Malnutrition-Thai

Rank	Males	DALYs (x 100,000)	DALYs %
1	HIV/AIDS	6.5	12
2	Traffic accidents	6.0	11
3	Alcohol dependence/harmful use	3.3	6
4	Stroke	3.1	6
5	Liver and bile duct cancer	2.9	5
6	Depression	2.6	5
7	Ischaemic heart disease	1.8	3
8	COPD	1.8	3
9	Diabetes	1.7	3
10	Cirrhosis	1.3	2

Source: Working Group on Burden of Disease and Risk Factors in Thailand, International Health Policy Programme, 2006.

Figure 5.68 Diseases and risk factors among Thai females, 2006



Rank	Risk factors
1	Unsafe Sex
2	Obesity
3	Blood pressure
4	Cholesterol
5	Non-Helmet
6	Tobacco
7	Physical Inactivity
8	Fruit & Vegetable
9	Alcohol
10	Air Pollution
11	WSH
12	Illicit Drugs
13	Malnutrition-International
14	Malnutrition-Thai
15	Non-Seatbelt use

Rank	Females	DALYs (x 100,000)	DALYs %
1	Stroke	3.1	8
2	HIV/AIDS	2.9	7
3	Diabetes	2.9	7
4	Depression	1.9	5
5	Liver and bile duct cancer	1.4	4
6	Traffic accidents	1.4	3
7	Ischaemic heart disease	1.2	3
8	Osteoarthritis	1.2	3
9	COPD	1.1	3
10	Cirrhosis	1.1	3

Source: Working Group in Burden of Disease and Risk Factors in Thailand, International Health Policy Programme, 2006.

3.3 Risk Factors and Disease Occurrence

In addition to risk factors that are behaviour related, factors at the individual level tend to result in getting chronic or non-communicable diseases such as obesity, hereditary diseases (family history), and high blood-chemical contents (such as cholesterol and sugar levels).

A cohort study on employees of the Electricity Generating Authority of Thailand (EGAT, 1985-1997) reveals that there are several factors that determine the chances of developing an illness such as age, sex, body mass index, waistline, hypertension, family history with diabetes, impaired glucose tolerance, triglyceride level, and HDL-cholesterol level. The study also indicates that a BMI level between 23 and 27.5 increases the chance of having diabetes 1.7 times, and a BMI of 27.5 or over increases such a chance 2.9 times, compared with a BMI under 23. The waistline greater than the maximum allowable limit (90 cm in males and 80 cm in females) increases the chance of developing diabetes 1.7 times; hypertension increases such a chance 1.7 times, and a family history increases it 2.7 times (Table 5.42). It is noteworthy that such risk factors clearly determine the chance of developing illnesses in the future; some of the risk factors can be controlled or modified.

Table 5.42 Odds ratios of various variables contributable to the occurrence of diabetes

Variable	Odds ratio (95% CI)
Age 35-39	1
40-44	0.86 (0.60, 1.25)
45-49	1.06 (0.72, 1.57)
≥ 50	1.43 (0.81, 2.49)
Sex (male =1, female = 0)	1.64 (1.09, 2.47)
BMI (kg/m^2) 23 - ≤ 27.5	1.73 (1.26, 2.47)
≥ 27.5	2.93 (1.59, 5.54)
Waistline: ≥90 cm in males, ≥ 80 cm in females	1.69 (1.12, 2.57)
Hypertension	1.67 (1.18, 2.35)
Diabetic history: father or mother or brother/sister	2.72 (2.03, 3.66)
Impaired Glucose tolerance	4.10 (2.97, 5.64)
Triglyceride ≥ 200	1.57 (1.11, 2.23)
HDL-C <40 in males, < 50 in females	1.30 (0.85, 1.98)

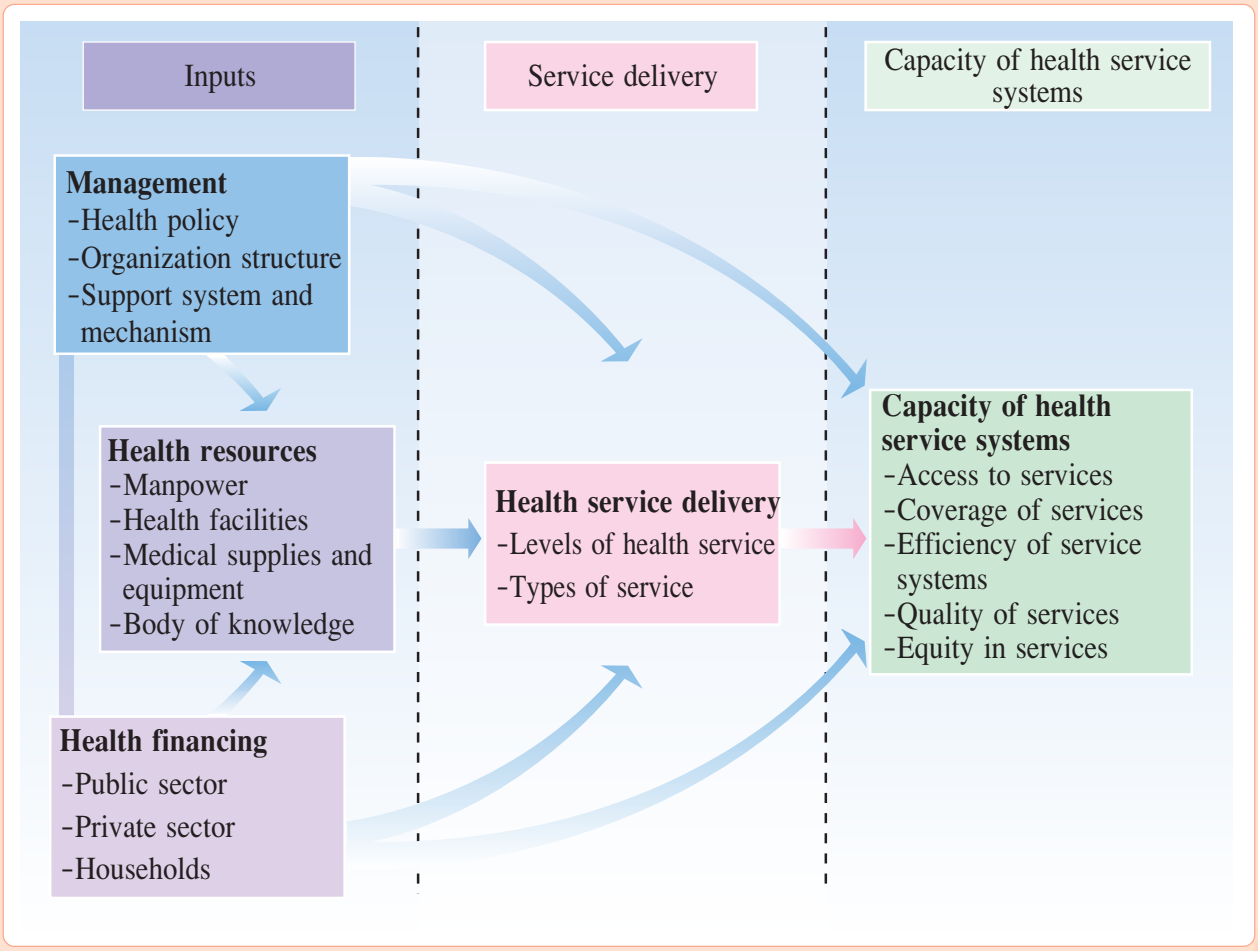
Source: Wichai Ekpalakorn, 2005.

CHAPTER 6

HEALTH SERVICE SYSTEMS IN THAILAND

The health service systems in Thailand have continuously developed in terms of capacity building for health services, particularly the increases in health resources, including human resources for health, expansion of healthcare facilities, medical technology and equipment, and health financing. There are three major components of health service systems, namely: (1) inputs of health service systems, (2) health services delivery and (3) capacity of health service systems, which are the outputs of health service systems. The inputs include management mechanism, health resources, and health financing, which affect health service delivery and capacity of health service systems as shown in Figure 6.1

Figure 6.1 Relationships of inputs, health service delivery and capacity of health service systems



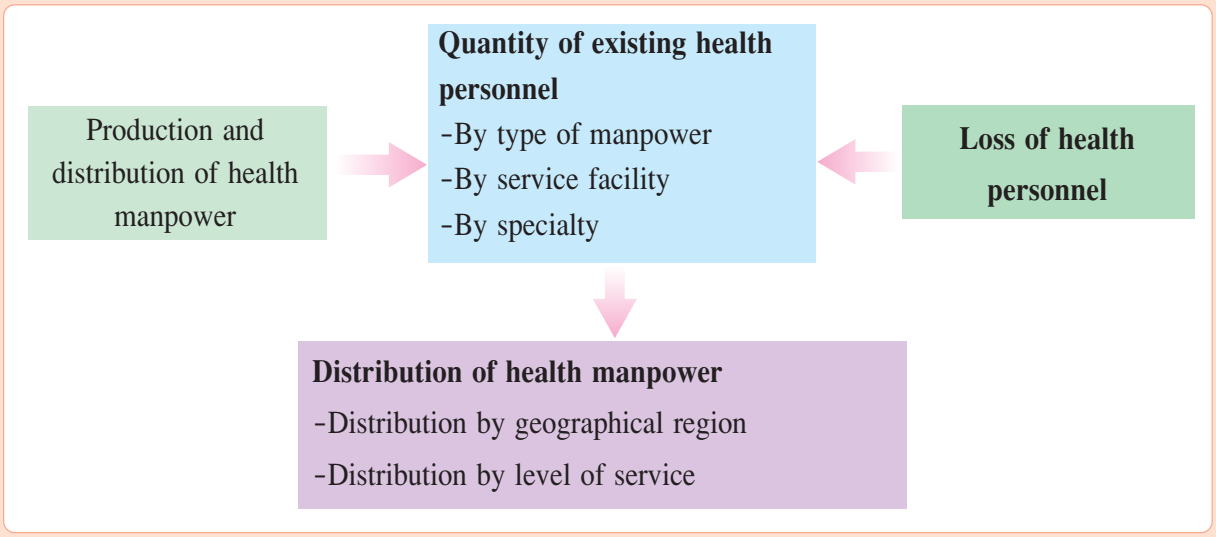
Chapter 6 deals with the information about health resources, health financing and capacity of health service systems in seven parts, i.e. (1) health manpower, (2) health facilities, (3) health technology, (4) health expenditure, (5) accessibility to health services, (6) efficiency and quality of health services delivery, and (7) equity in health services, as detailed below:

1. Health Manpower

Health manpower is an input that is extremely important for health service systems. The production of health personnel has been undertaken continuously, resulting in an increase in the number of health personnel and their distribution to various health facilities within and outside the MoPH. However, there are some problems in this regard, particularly the inadequacy of health personnel, compared with the suitable standard, the problem of distribution to cover all geographical areas, and the quality of personnel, which might be associated with personnel's workloads.

In analyzing the manpower situation, the following aspects are taken into consideration: quantity of existing personnel, production situation, loss situation and distribution situation, as shown in Figure 6.2.

Figure 6.2 Aspects in the analysis of health manpower situation



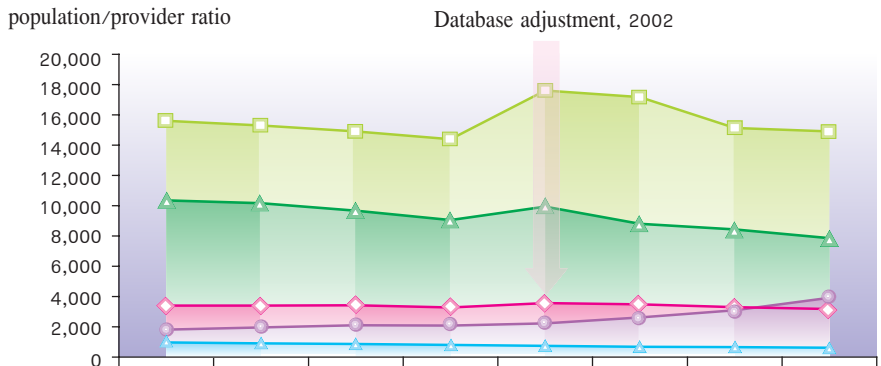
1.1 Situation and Trends in Quantity of Health Manpower

1.1.1 Trends in Ratio of Population to Health Manpower by Type of Personnel

The overall situation of health manpower during the past period, using the ratio of population to healthcare provider (manpower), it was found that the trends in quantities had been improving steadily. But if considered for a short period of time from 1998 to 2005, not much change did occur (Figure 6.3).

The ratio of population to professional nurse declined while the ratio of population to technical nurse increased, partly due to changes in their status from technical nurses to professional nurses. However, some change in such tends occurred in 2002 when the population/provider ratio increased as a result of the MoPH database adjustment.

Figure 6.3 Ratios of population to healthcare provider, 1998-2005

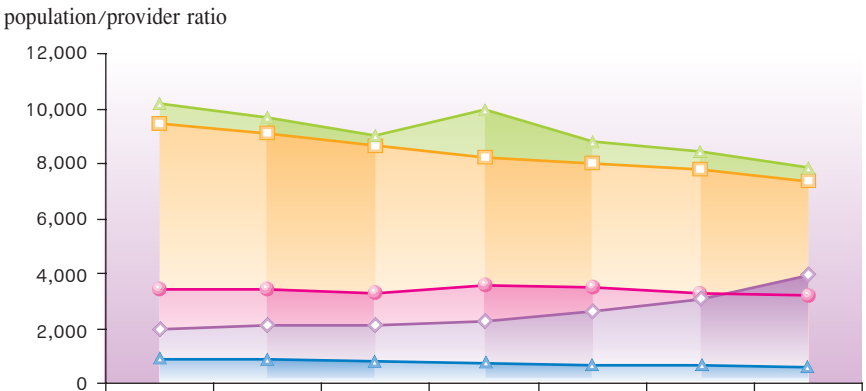


	1998	1999	2000	2001	2002	2003	2004	2005
Pop./Doctors	3,406	3,395	3,427	3,277	3,569	3,476	3,305	3,182
Pop./Dentist	15,613	15,295	14,917	14,384	17,606	17,182	15,143	14,901
Pop./Pharmacist	10,346	10,158	9,676	9,054	9,948	8,807	8,432	7,847
Pop./Profes. Nurse	960	905	870	796	739	687	652	613
Pop./Technical Nurse	1,806	1,952	2,096	2,080	2,233	2,625	3,085	3,910

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Data from the MoPH health resources survey might be inaccurate due to incompleteness of data obtained, especially for dentists. According to the report on dental health personnel of the Department of Health, the population/dentist ratio was close to the population/pharmacist ratio, which tends be improving steadily (Figure 6.4).

Figure 6.4 Ratios of population to health manpower, 1999-2005



	1999	2000	2001	2002	2003	2004	2005
Pop./Doctors	3,395	3,427	3,277	3,569	3,476	3,305	3,182
Pop./Dentist	9,436	9,074	8,624	8,252	8,022	7,811	7,340
Pop./Pharmacist	10,158	9,676	9,054	9,948	8,807	8,432	7,847
Pop./Profes.Nurse	905	870	796	739	687	652	613
Pop./Technical Nurse	1,952	2,096	2,080	2,233	2,625	3,085	3,910

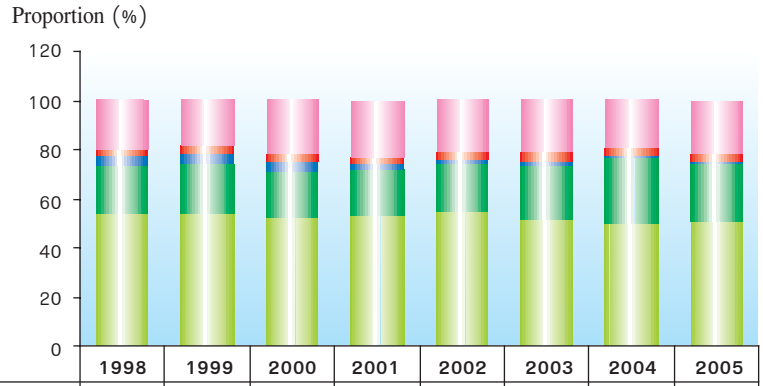
Sources: - Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.
- Report on Dental Health Personnel, 1999-2005, Department of Health, MoPH.

1.1.2 Health Manpower by Agency

1) Doctors

During the 1998-2005 period, the proportion of doctors by agency had a tendency to change slightly, particularly that for the MoPH which was declining, but that in other ministries was rising, and that in the private sector rose slightly (Figure 6.5). Most of the doctors in Bangkok are in the MoPH followed by the private sector, while in other regions they are mostly under the MoPH (Figure 6.6).

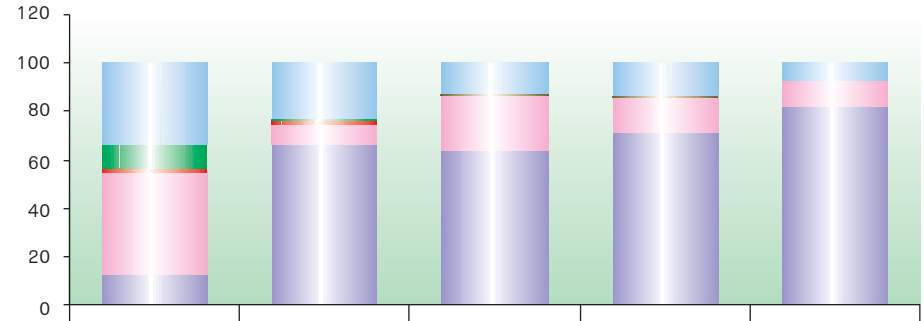
Figure 6.5 Proportions of doctor by agency, 1998-2005



	1998	1999	2000	2001	2002	2003	2004	2005
Private sector	19.8	18.7	21.7	23.1	21.0	21.1	18.9	21.6
Local agencies	2.8	3.0	3.2	2.9	3.0	4.0	3.3	3.4
State enterprises	4.0	4.0	4.3	2.0	2.0	1.4	0.7	0.6
Other ministries	19.7	20.3	18.9	18.8	19.0	22.1	27.5	23.5
MoPH	53.7	54.0	51.9	53.1	55.0	51.5	49.6	50.8

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Figure 6.6 Proportions of doctors by region, 2005



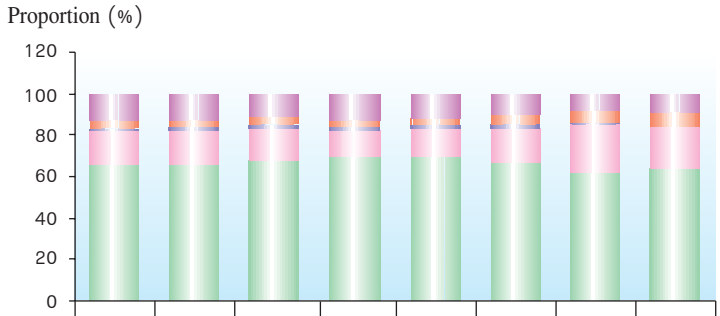
	Bangkok	Central	North	South	Northeast
Private sector	33.8	23.4	12.9	13.9	7.0
Local agencies	9.9	0.1	0.3	0.2	0.1
State enterprises	1.5	1.5	0.3	0.0	0.03
Other ministries	42.5	8.9	22.5	14.5	10.9
MoPH	12.4	65.9	64.0	71.4	81.9

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

2) Dentists

During the 1998-2005 period, the proportion of dentists by agency also had a tendency to change slightly. The dentist proportion in the MoPH did not change much while those in other ministries had a rising trend and that in the private sector declined (Figure 6.7). However, during the last eight years, the dentist proportion by agency had an unstable change. In Bangkok, most of the dentists are in other ministries, followed by local administrative agency (Bangkok Metropolitan Administration) and the private sector; in other regions, most of them are under the MoPH (Figure 6.8).

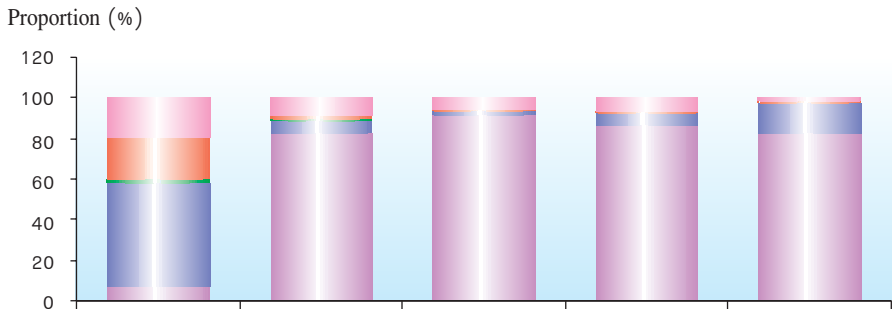
Figure 6.7 Proportions of dentists by agency, 1998-2005



	1998	1999	2000	2001	2002	2003	2004	2005
Private sector	13.0	12.6	11.1	13.1	11.6	10.5	8.3	9.4
Local adm. agencies	3.4	3.5	3.9	3.1	3.6	4.3	5.9	6.3
State enterprises	1.5	1.6	1.8	2.0	1.9	2.1	0.6	0.6
Other ministries	16.6	16.2	15.0	12.0	12.9	16.6	23.8	19.6
MOPH	65.5	66.1	68.1	69.8	70.0	66.6	61.5	64.2

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Figure 6.8 Proportions of dentists by region, 2005

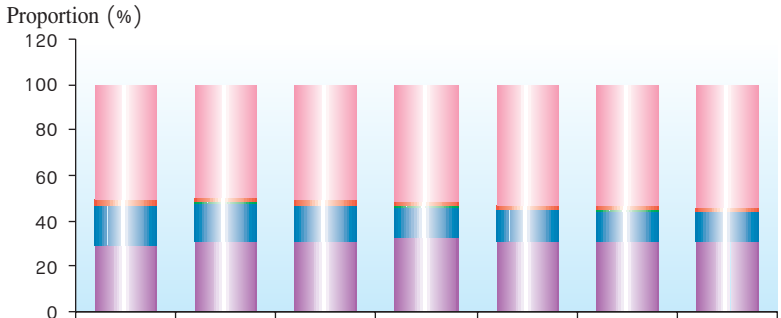


	Bangkok	Central	North	South	Northeast
Private sector	19.6	8.8	5.5	6.3	2.0
Local agencies	20.6	1.3	0.6	1.6	0.9
State enterprises	1.8	1.3	0.5	0.0	0.0
Other ministries	51.2	5.9	2.4	5.5	14.5
MoPH	6.8	82.7	91.0	86.5	82.7

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

However, according to other data sources, such as that for dental health personnel of the Department of Health, most of dentists are in the private sector, while only 30.7% are under the MoPH, in which the dentist proportion by agency does not change much (Figure 6.9).

Figure 6.9 Proportions of dentists by agency, 1999-2005 (according to DoH database)



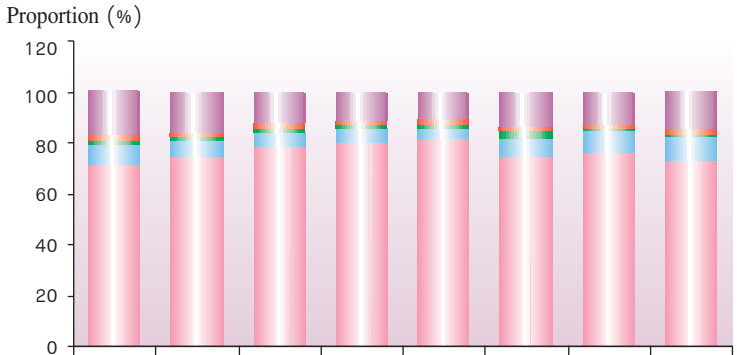
	1999	2000	2001	2002	2003	2004	2005
Private sector	51.0	49.8	51.0	51.4	53.2	53.4	53.9
Local adm. agencies	1.9	2.0	1.8	1.7	1.6	1.7	1.6
State enterprises	0.7	0.7	0.7	0.7	0.6	0.6	0.5
Other ministries	17.1	16.7	15.2	13.8	13.3	13.5	13.2
MOPH	29.3	30.8	31.3	32.4	31.3	30.8	30.7

Source: Report on Dental Health Personnel, 1999-2005. Department of Health, MoPH.

3) Pharmacists

There is a small increase in the proportion of pharmacists in the MoPH, with a declining trend in the private sector. Since 2002, however, the pharmacist proportion in the private sector has been rising (Figure 6.10). In Bangkok, most pharmacists are in the private sector in the proportion close to that in other ministries; in other regions, they are mostly under the MoPH (Figure 6.11).

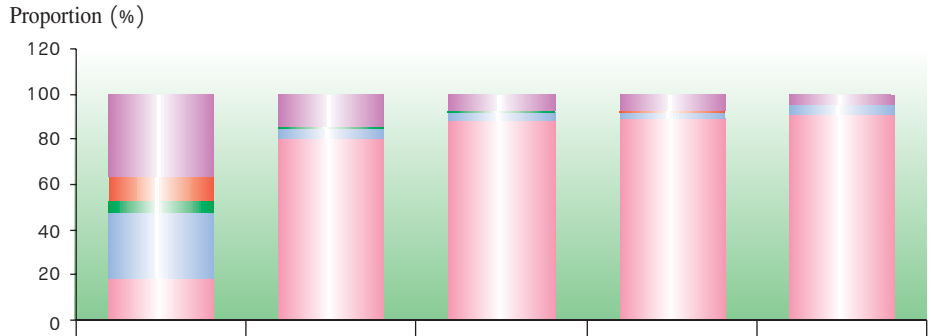
Figure 6.10 Proportions of pharmacists by agency, 1998-2005



	1998	1999	2000	2001	2002	2003	2004	2005
Private sector	17.2	15.7	12.2	11.4	10.8	13.7	12.7	14.6
Local agencies	2.0	2.0	2.0	1.7	1.8	1.9	2.1	2.3
State enterprises	1.7	1.7	1.7	1.6	1.7	3.0	0.8	0.7
Other ministries	7.4	5.8	5.6	5.6	3.9	6.8	8.6	9.7
MoPH	71.7	74.8	78.5	79.7	81.8	74.6	75.8	72.8

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Figure 6.11 Proportions of pharmacists by region, 2005



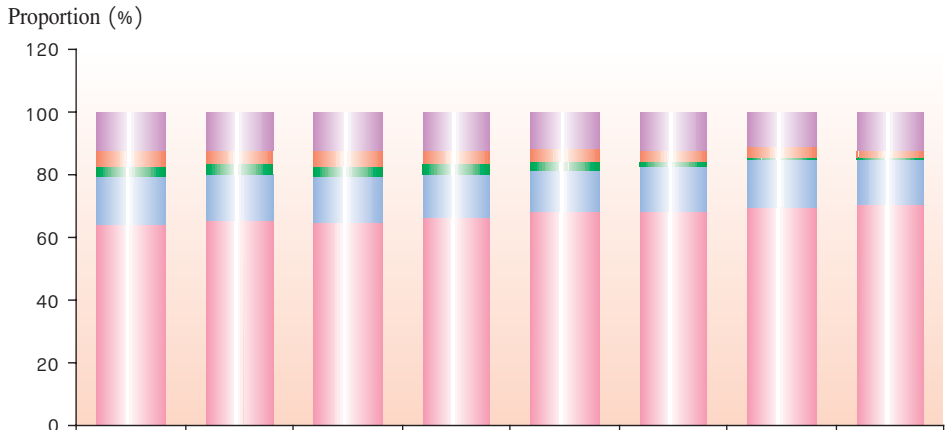
	Bangkok	Central	North	South	Northeast
Private sector	36.4	14.3	7.4	7.4	4.6
Local agencies	10.2	0.2	0.4	0.4	0.3
State enterprises	5.8	0.9	0.1	0.0	0.0
Other ministries	29.2	4.1	4.0	3.0	4.0
MoPH	18.4	80.5	88.2	89.2	91.1

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

4) Professional Nurses

There has been a rising trend in the proportion of professional nurses in the MoPH, while that in other ministries declines slightly. Similarly, in the private sector, the changes have been in a narrow range (Figure 6.12). In Bangkok, most of the professional nurses are in other ministries, followed by in the private sector; while in other regions, most of them are under the MoPH (Figure 6.13).

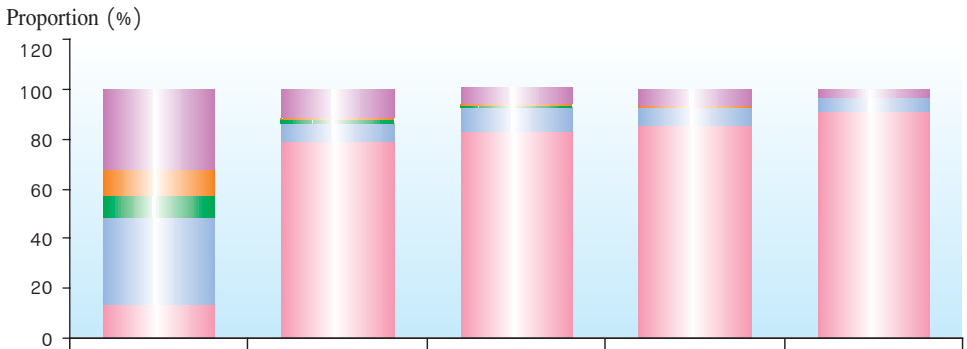
Figure 6.12 Proportions of professional nurses by agency, 1998-2005



	1998	1999	2000	2001	2002	2003	2004	2005
Private sector	12.6	12.1	12.6	12.6	11.7	12.2	10.9	12.2
Local agencies	4.4	4.2	4.4	3.7	4.0	3.7	3.7	2.6
State enterprises	3.7	3.5	3.7	3.3	3.0	1.1	0.7	0.7
Other ministries	15.2	15.0	14.4	14.4	12.9	14.5	15.0	14.1
MoPH	64.1	65.2	64.9	65.9	68.3	68.5	69.8	70.4

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Figure 6.13 Proportions of professional nurses by region, 2005

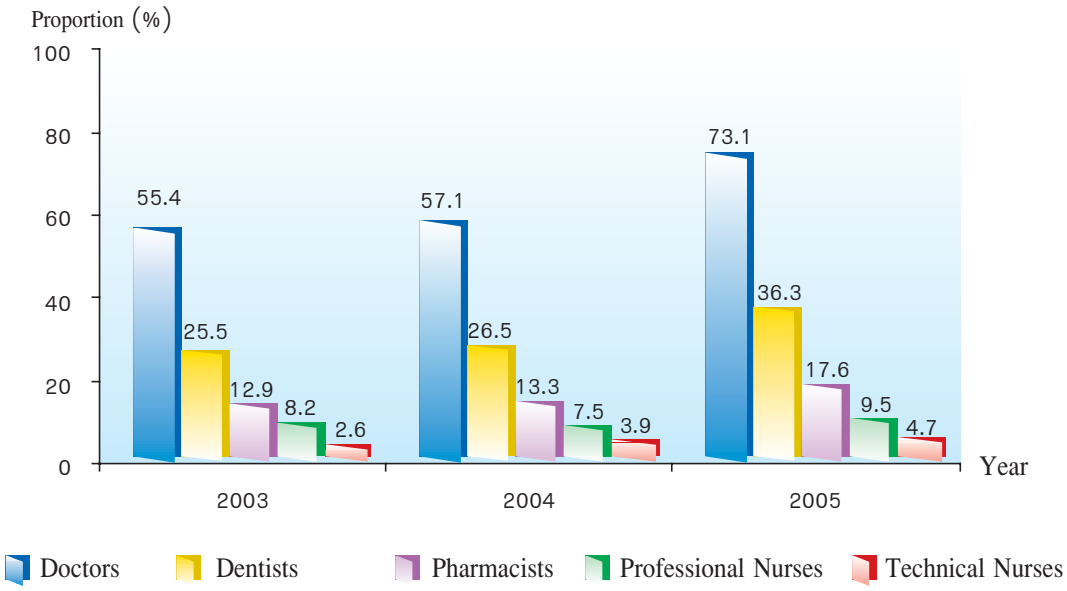


	Bangkok	Central	North	South	Northeast
Private sector	32.4	11.4	6.8	6.2	3.3
Local agencies	10.7	0.9	0.5	1.0	0.3
State enterprises	8.6	1.5	1.0	0.1	0.1
Other ministries	34.2	7.4	9.8	7.5	5.1
MoPH	14.0	78.7	82.8	85.2	91.2

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Another important aspect in the management of health manpower is their part-time work in the private sector while working in the public sector. The proportion of part-time doctors mostly in the private sector was as high as 55.4% in 2003 and rose to 73.1% in 2005, while the proportions for part-time dentists, pharmacists, professional nurses and technical nurses were lower proportionately, but with a rising trend (Figure 6.14).

Figure 6.14 Proportions of part-time healthcare providers in the private sector, 2003-2005

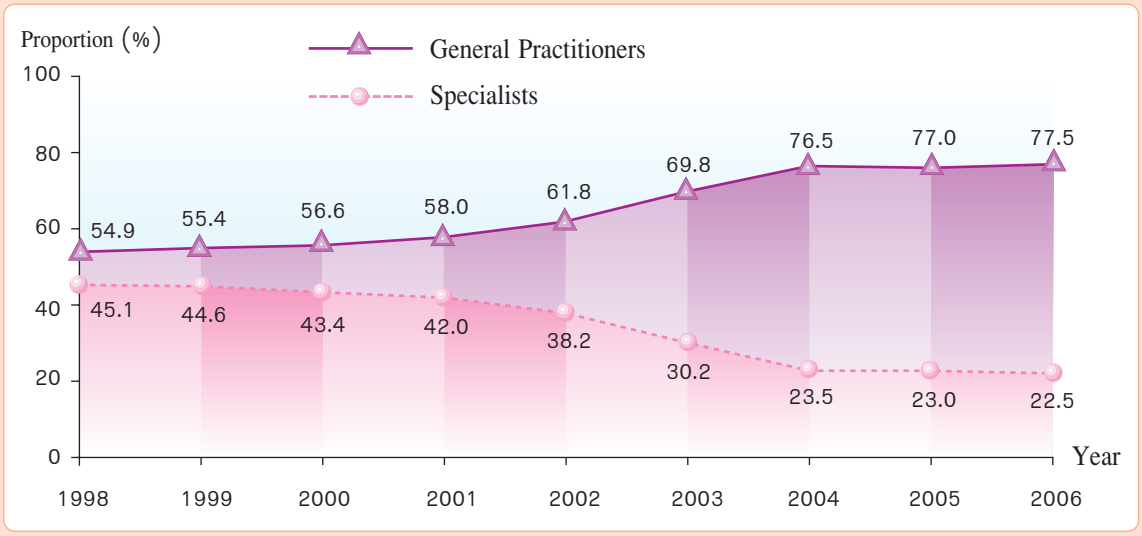


Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

1.1.3 Specialties of Health Manpower

Specialties of healthcare providers reflect the direction towards specialized care rather than integrated services. There has been a rising trend for doctors in Thailand to undertake specialty training. In 2006, the proportion of doctors with specialty certification was as high as 77.5% of all medical doctors (Figure 6.15).

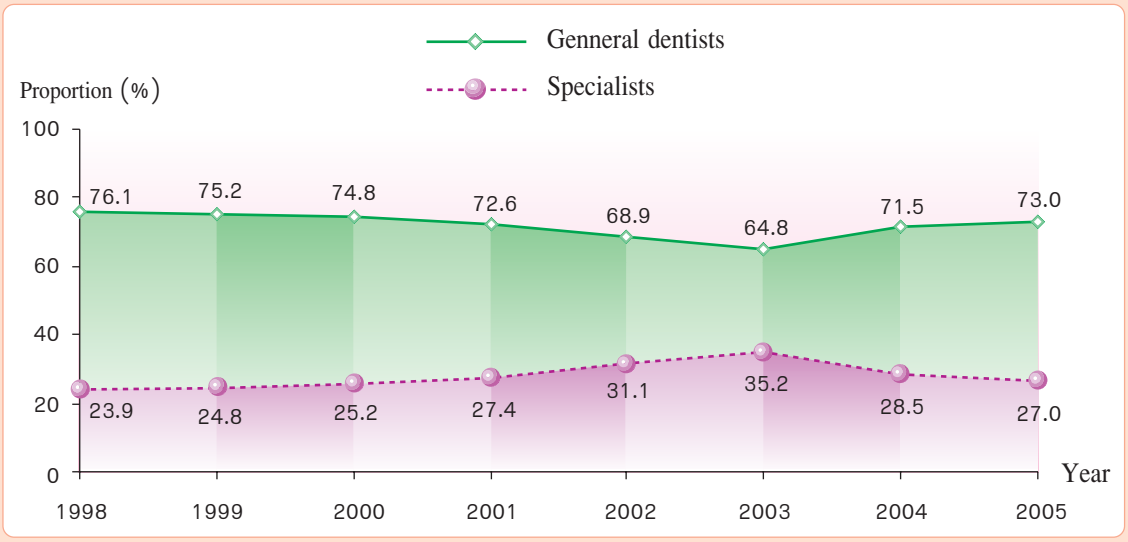
Figure 6.15 Proportions of medical general practitioners and specialists, 1998-2006



Source: Office of the Secretary-General, Medical Council of Thailand.

Similarly, for dentists in Thailand, there has been a rising trend for them to undertake specialty training. In 2005, the proportion of dentists with specialty certification was as high as 27.0% of all dentists (Figure 6.16).

Figure 6.16 Proportions of general and specialized dentists, 1998-2005



Source: Dental Health Division, Department of Health, MoPH, September 2006.

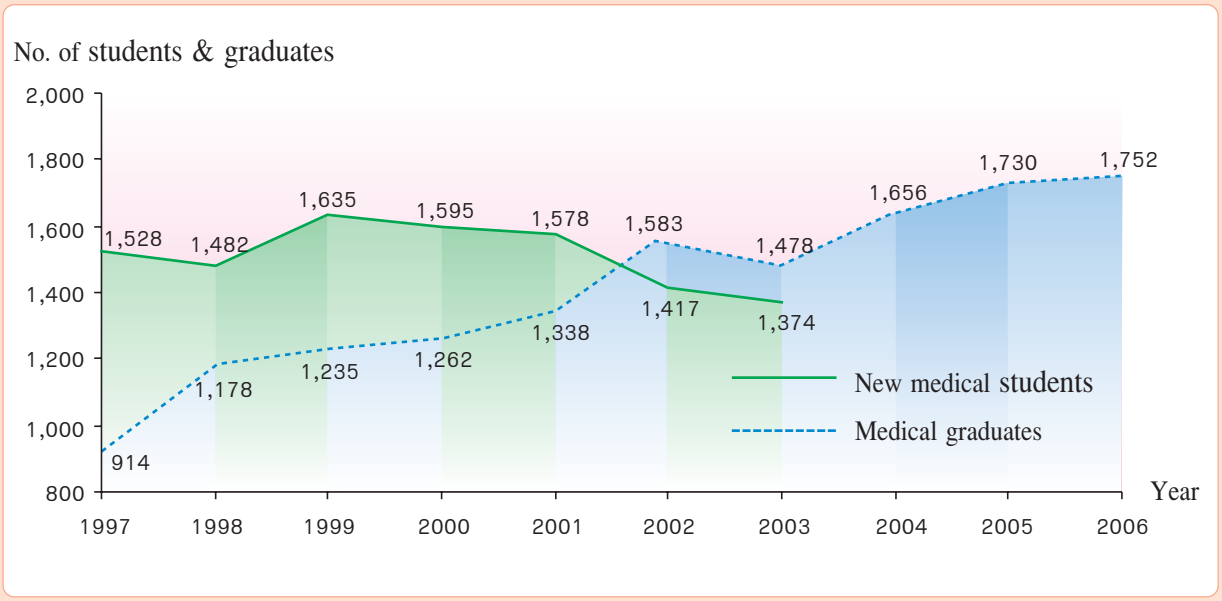
1.2 Production and Distribution of Health Manpower

1.2.1 Production of Doctors

At present, there are 14 medical schools in Thailand: 13 public and 1 private. Beginning in 2007, there will be another four state-run universities that will be producing medical graduates: Burapha, Princess of Naradhiwas, Walailak and Kasetsart universities.

Regarding the admission of medical students and the number of newly graduated doctors each year, there has been a rising trend. Between 1999 and 2001, there was a significant increase in the number of medical student admissions, as a result of the Project on Increased Production of Medical Doctors for Rural People, to approximately 1,600 students each year. And the number of newly graduated doctors has risen since 2002 to more than 1,500 each year. However, recently the number of student admissions has a declining tend to only around 1,400 each year (Figure 6.17).

Figure 6.17 Numbers of medical student admissions and newly graduated doctors, 1997-2006



Sources: Student admissions data, from the Bureau of Policy and Planing, Office of the Higher Education Commission (HEC).

Notes: Number of medical students actually admitted.

Medical graduates data, from the Medical Council of Thailand and the Project on Increased Production of Medical Doctors for Rural People, MoPH.

Notes: Number of medical graduates registered with the Medical Council of Thailand.

When considering by the medical training institution, it was noted that the number of student admissions under the Office of Higher Education Commission tended to decline in 2002 and 2003, while the trend under other agencies seemed to be steady. In connection with the number of medical graduates, there was a rising trend before 2002 in all institutions, but since then it seems to be steady (Tables 6.1 and 6.2).

Table 6.1 Number of medical students admitted in Thailand, academic years 1997-2003

Institution	No. of new students							
	1997	1998	1999	2000	2001	2002	2003	Total
1. Public sector	**1,426**	**1,382**	**1,539**	**1,498**	**1,501**	**1,315**	**1,274**	**9,935**
1.1 HEC	1,152	1,147	1,169	1,132	1,130	959	911	7,600
1.2 MoPH & HEC	150	143	277	272	276	293	301	1,712
1.3 Other agencies	124	92	93	94	95	63	62	623
2. Private sector	**102**	**100**	**96**	**97**	**77**	**102**	**100**	**674**
Total	**1,528**	**1,482**	**1,635**	**1,595**	**1,578**	**1,417**	**1,374**	**10,609**

Source: Bureau of Policy and Planning, Office of the Higher Education Commission.

Notes: 1. Number of medical students actually admitted.

2. Other agencies include the Phramongkutklao College of Medicine, and the BMA Medical College at Vajira Hospital.

Table 6.2 Number of medical graduates, academic years 1997-2006

Production agency	No. of graduates										
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
1. Public sector	**877**	**1,148**	**1,177**	**1,222**	**1,272**	**1,504**	**1,422**	**1,575**	**1,659**	**1,677**	**13,533**
1.1 HEC	852	1,073	1,089	1,124	1,140	1,250	1,206	1,231	1,296	1,291	11,552
1.2 MoPH & HEC	-	-	-	8	31	134	137	249	255	292	1,106
1.3 Other agencies	25	75	88	90	101	120	79	95	108	94	875
2. Private sector	**37**	**30**	**58**	**40**	**66**	**79**	**56**	**81**	**71**	**75**	**593**
Total	**914**	**1,178**	**1,235**	**1,262**	**1,338**	**1,583**	**1,478**	**1,656**	**1,730**	**1,752**	**14,126**

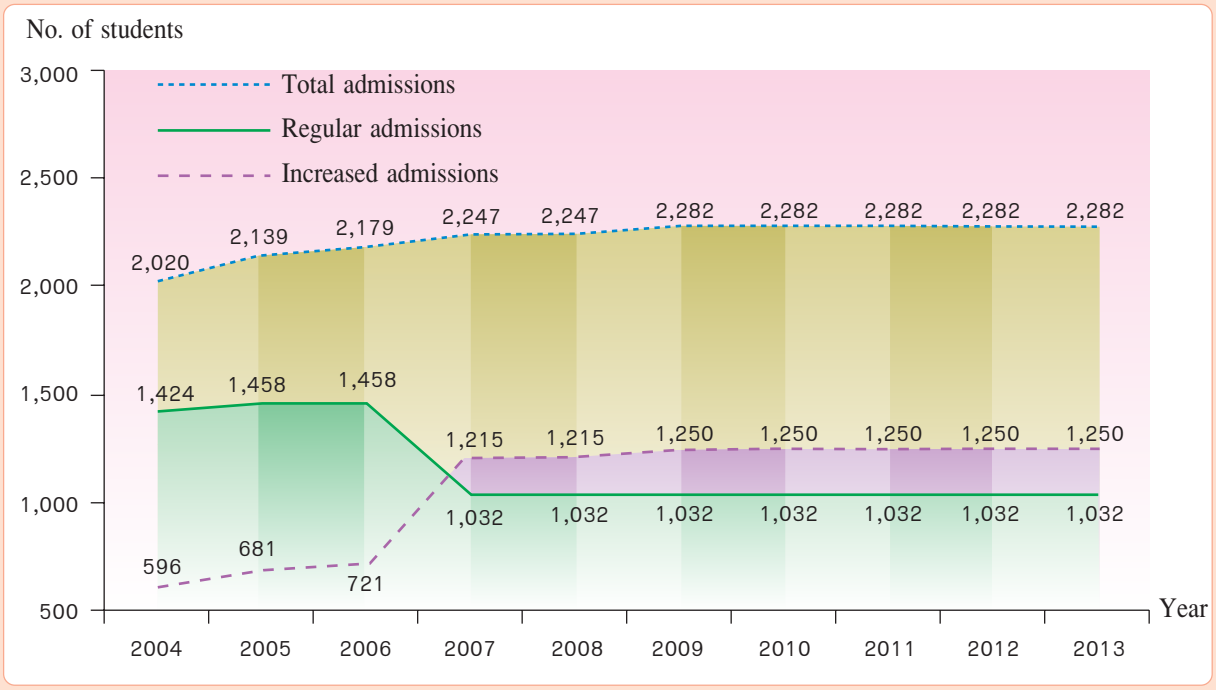
Source: Medical Council of Thailand and the Project on Increased Production of Medical Doctors for Rural People, MoPH.

Notes: 1. For academic years 1997-2006, numbers of graduates registered with the Medical Council of Thailand.

2. Other agencies include the Phramongkutklao College of Medicine, the BMA Medical College at Vajira Hospital, and foreign institutions.

Between 1997 and 2003, Thailand could produce 1,300-1,500 medical graduates each year. It is expected that during the ten-year period of 2004-2013 the production of doctors will be accelerated to meet the needs of the country; each year there will be 1,000-1,400 students admitted under the regular programme and an additional 600 students under the accelerated production programme (Figure 6.18).

Figure 6.18 Planned admissions of medical students in Thailand, 2004-2013



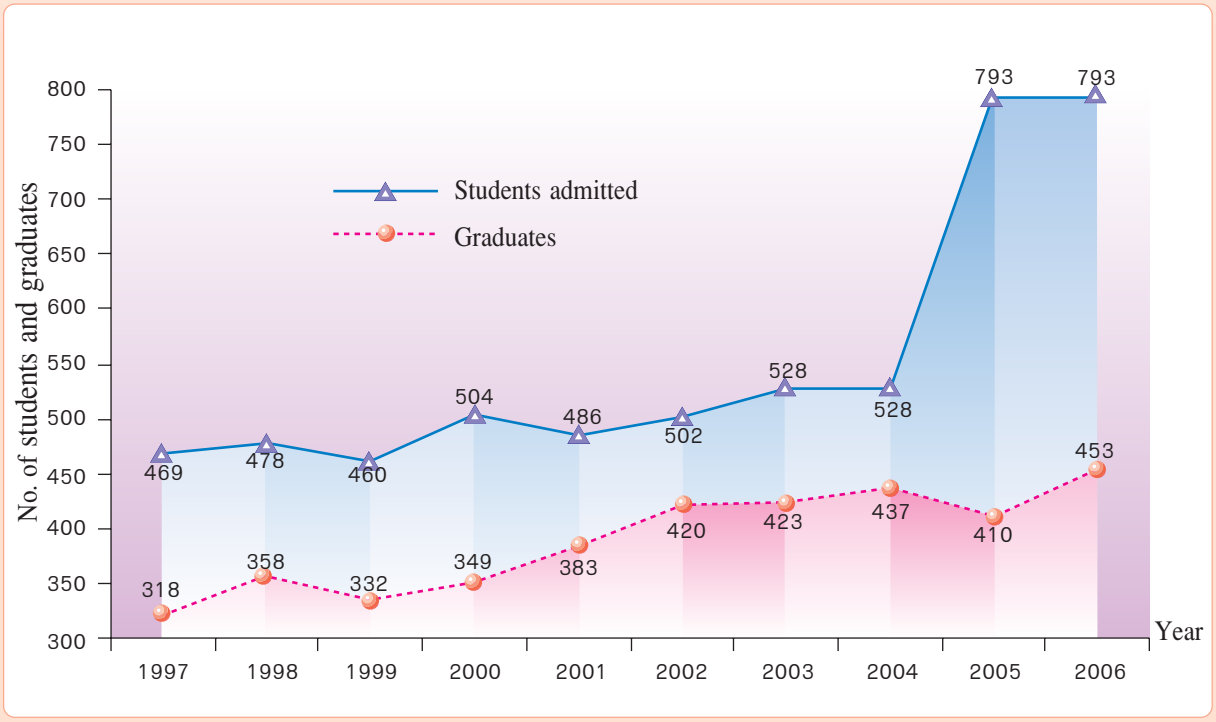
Source: Bureau of Policy and Planning, Office of the Higher Education Commission.

1.2.2 Production of Dentists

At present, the production of dentists in Thailand is undertaken by ten public and private institutions (nine public and one private); the private one is Rangsit University, starting the production in 2005.

The production output in 2005 was approximately 500; since 2005 the annual student intake has been increased by 200. The only private institution has enrolled another 80 dentists annually. The numbers of dental students admitted and dental graduates are shown in Figure 6.19.

Figure 6.19 Numbers of dental students admitted and dental graduates, 1997-2006



Sources: **Student admissions data**, from the Bureau of Policy and Planning, Office of the Higher Education Commission.

Note: Number of dental students actually admitted.

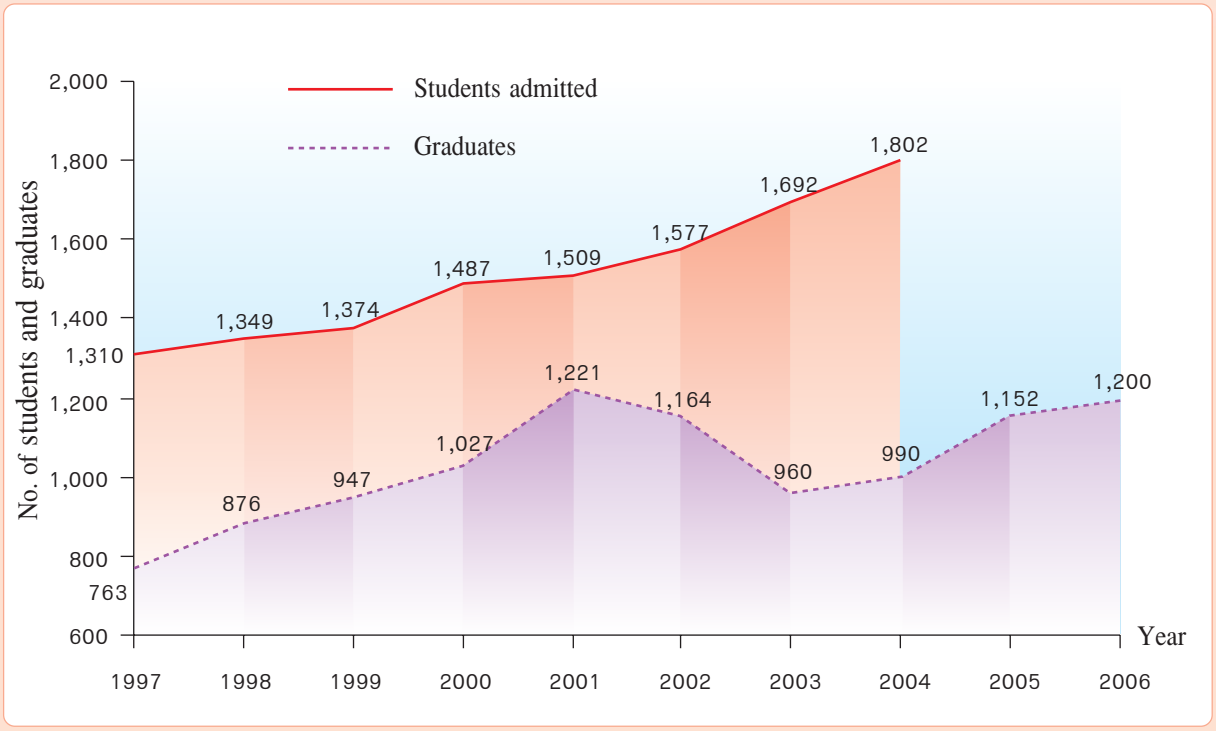
Dental graduate data, from the Dental Council of Thailand.

Note: Number of new dental graduates registered with the Dental Council of Thailand.

1.2.3 Production of Pharmacists

At present, Thailand has 13 schools of pharmacy: 11 public and 3 private. Between 1997 and 2006, the production capacity in the public sector increased slightly, but tended to decrease in the private sector, from 2003 onward from 300 graduates to 220 graduates annually. The numbers of pharmacy students admitted and graduates are shown in Figure 6.20.

Figure 6.20 Numbers of pharmacy students admitted and graduates, 1997-2006



Sources: **Student admissions data**, from the Bureau of Policy and Planning, Office of the Higher Education Commission.

Note: 1. For academic years 1997-2002, number of students actually admitted.

2. For academic years 2003-2006, data were derived from the pharmacy student admission plan.

Data on graduate, from the Pharmacy Council of Thailand.

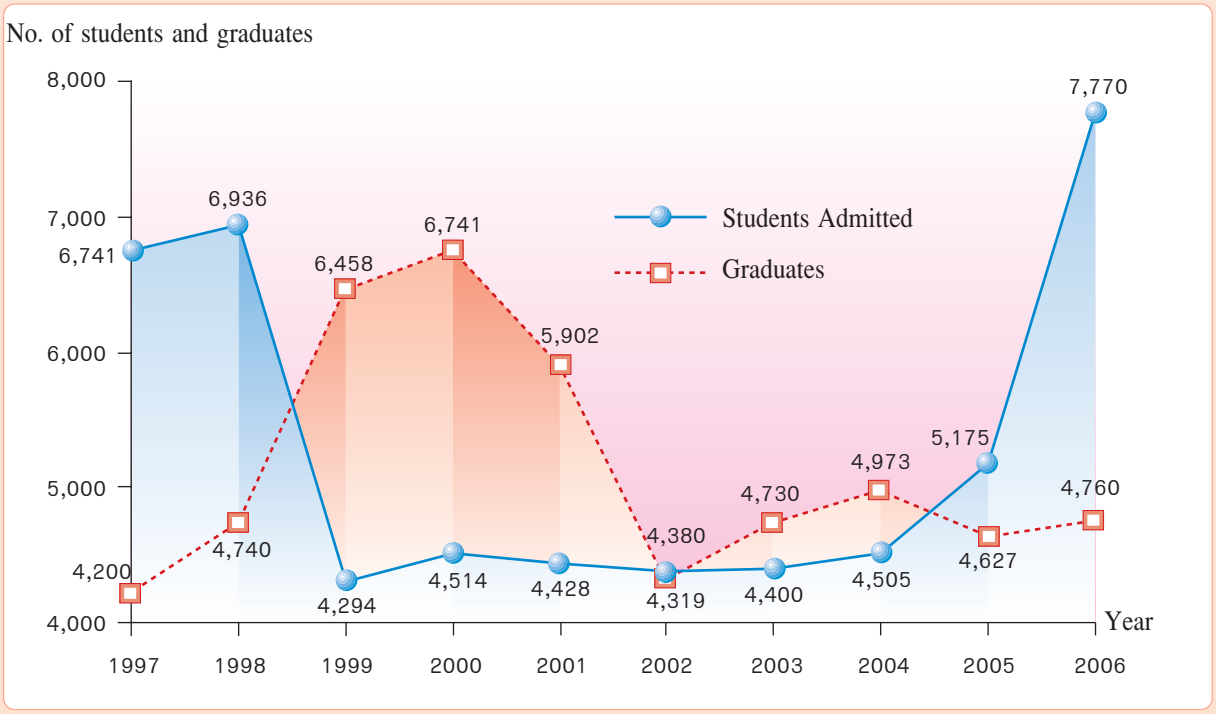
Note: For academic years 1997-2006, number of pharmacy graduates registered with the Pharmacy Council of Thailand.

1.2.4 Professional Nurses

At present, Thailand has 74 nursing colleges/institutions: 64 public and 10 private. Since 2004, another two public institutions (Kasetsart and Suranaree Technology Universities) have offered their nursing training programmes.

In the production of professional nurses, since 2005, the public sector, especially the MoPH, has had a tendency to increase its production capacity by 1,000 nurses from 1,500 nurses each year as the previously planned number did not meet the rising requirements. The numbers of nursing students admitted and graduates are as shown in Figure 6.21.

Figure 6.21 Numbers of nursing students admitted and graduates, 1997-2006



Sources: **Student admissions data**, from the Bureau of Policy and Planning, Office of the Higher Education Commission.

Data on graduates, from the Nursing Council of Thailand and Praboromrajchanok Institute, MoPH.

Note: For academic years 1997-2006, number of nursing graduates registered with the Nursing Council of Thailand.

1.3 Losses of Health Manpower

This section mainly focuses on the issue of resignation from civil service which reflects the change in the type of agency for which healthcare providers work, especially shifting from the public sector to the private sector or to other occupations. Even though shifting to the private sector does not mean a loss in the entire system, the impact is not minimal as most rural residents rely on public services. In the MoPH, the significant problem is the resignation of medical doctors; the net loss is on the rising trend, the peak being during the economic booming period (1996, before the economic crisis). During that time period, as many as 21 community hospitals had no doctors at all (Table 6.3).

After the 1997 economic crisis, the situation improved considerably, possibly due to the downturn in the private sector. Until the economic recovery period of 2001-2003, the resignation of doctors from the MoPH became a serious issue again (Figure 6.22). However, the loss declined in 2004, but rose again in 2005 and 2006, most likely due to the recovery in the private sector.

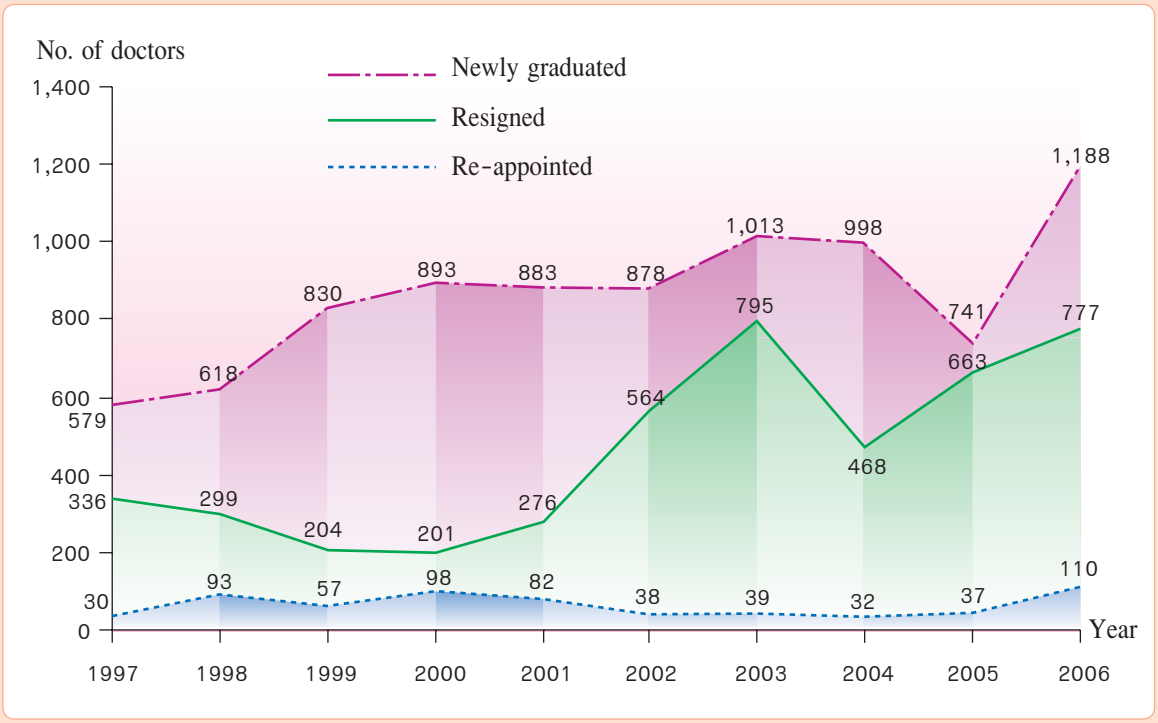
Table 6.3 Number and proportion of doctors loss in relation to newly appointed doctors, Office of the Permanent Secretary for Public Health, 1994-2006

Fiscal year	No. of doctors						Net loss No. (percent)
	Increase			Decrease (resigned)			
	Newly Graduated	Re-appointed	Total	Civil servants	State employees	Total	
1994	526	-	526	42	-	42	42 / 8.0
1995	576	-	576	260	-	260	260 / 45.1
1996	568	-	568	344	-	344	344 / 60.6
1997	579	30	609	336	-	336	306 / 52.8
1998	618	93	711	299	-	299	206 / 33.3
1999	830	57	887	204	-	204	147 / 17.7
2000	893	98	991	201	-	201	103 / 11.5
2001	883	82	952	193	83	276	194 / 22.0
2002	878	38	916	401	163	564	526 / 59.9
2003	1,013	39	1,052	287	508	795	756 / 74.6
2004	998	32	1,030	468	-	468	436 / 43.7
2005	741	37	778	663	-	663	626 / 84.5
2006	1,188	110	1,298	777	-	777	667 /56.1

Source: Bureau of Central Administration, Office of the Permanent Secretary for Public Health.

Notes:
1. Parent agencies adjusted their own data for fiscal years 1995-2003.
2. According to the cabinet resolution, since 1999 MoPH has been required to accept the graduates who have been awarded scholarships as state employees under the MoPH, rather than as civil servants.
3. In 2004, MoPH appointed all state employees as civil servants.

Figure 6.22 Numbers of doctors who were newly graduated, re-appointed as civil servants and resigned, 1997-2006



Source: Bureau of Central Administration, Office of the Permanent Secretary for Public Health.

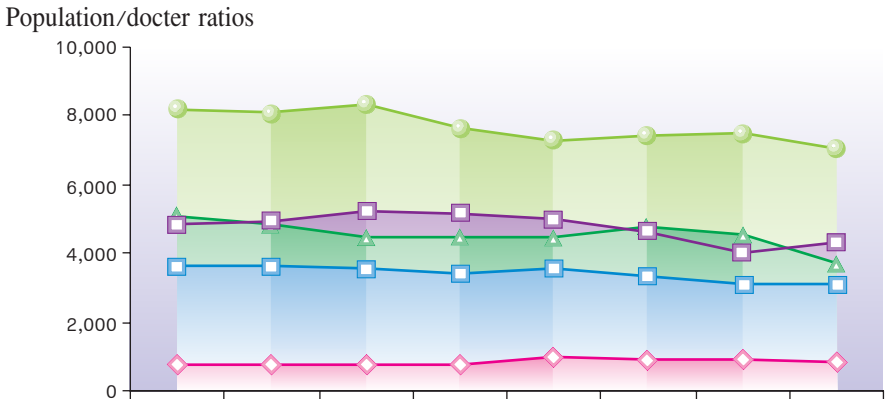
1.4 Distribution of Health Manpower

1.4.1 Distribution of Health Manpower by Geographical Region

1) Ratio of Population to Healthcare Provider by Region

Between 1998 and 2005, a regional comparison of the ratio of population to doctor (population per doctor ratio) revealed that the ratio for the Northeast has steadily declined, but still higher than those in other regions; the North, South and Central having a comparable ratio (Figure 6.23).

Figure 6.23 Population/doctor ratios by region, 1998-2005

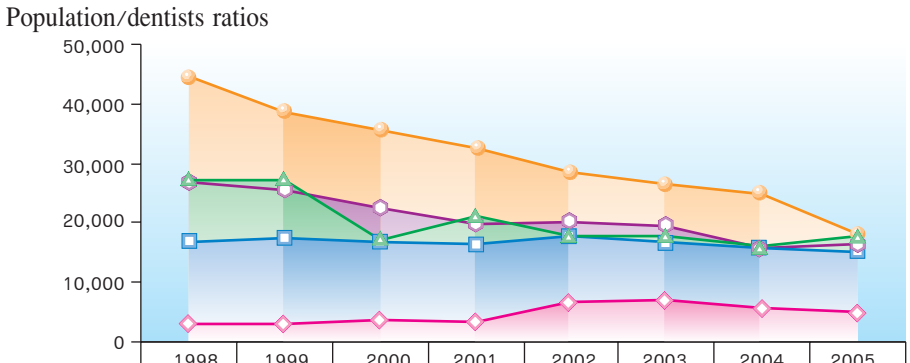


	1998	1999	2000	2001	2002	2003	2004	2005
Bangkok	762	760	793	760	952	924	879	867
Central	3,614	3,653	3,576	3,375	3,566	3,301	3,134	3,124
North	5,050	4,869	4,501	4,488	4,499	4,766	4,534	3,724
South	4,814	4,888	5,194	5,127	4,984	4,609	3,982	4,306
Northeast	8,218	8,116	8,311	7,614	7,251	7,409	7,466	7,015

Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

Similarly, the population/dentist ratio in the Northeast has steadily declined, until 2005 it became close to those for the North, South and Central (Figure 6.24).

Figure 6.24 Population/dentist ratios by region, 1998-2005

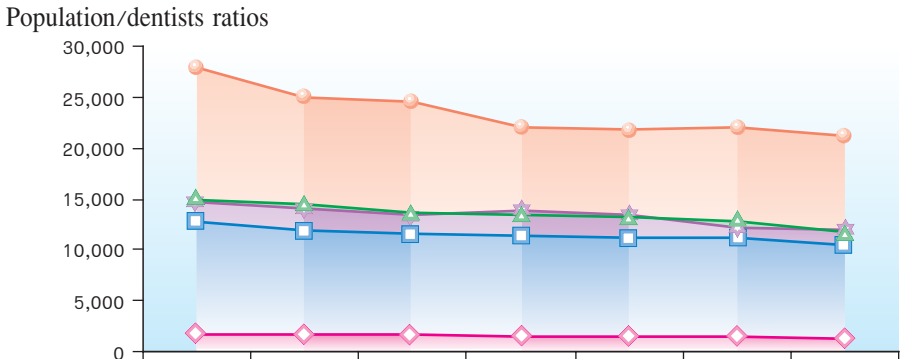


	1998	1999	2000	2001	2002	2003	2004	2005
Bangkok	3,033	2,991	3,529	3,190	6,614	6,920	5,583	5,064
Central	16,800	17,494	16,813	16,588	17,810	16,851	15,775	15,176
North	27,310	27,225	17,037	20,993	17,824	17,694	16,039	17,897
South	26,954	25,663	22,549	19,963	20,105	19,578	15,620	16,595
Northeast	44,484	38,487	35,476	32,499	28,432	26,351	24,699	18,157

Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

However, according to other data sources especially the report on dental health personnel of the Department of Health, the population/dentist ratios are lower (larger number of dentists). The ratio for the Northeast was higher than those for other regions in 2005 (Figure 6.25).

Figure 6.25 Population/dentist ratios by region, 1999-2005

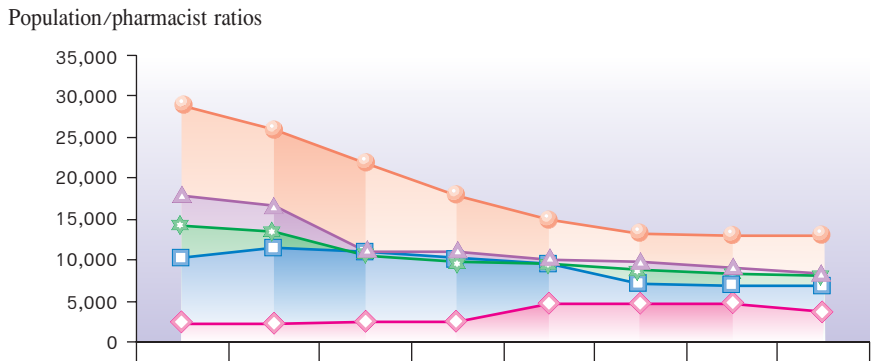


	1999	2000	2001	2002	2003	2004	2005
Bangkok	1,722	1,690	1,605	1,506	1,458	1,422	1,305
Central	12,864	12,042	11,524	11,474	11,259	11,235	10,494
North	14,956	14,468	13,566	13,471	13,137	12,752	11,830
South	14,640	14,032	13,383	13,852	13,443	12,160	11,877
Northeast	28,005	25,034	24,462	22,112	21,739	21,967	21,120

Source: Report on Dental Health Personnel, 1999-2005, Department of Health, MoPH.

Regarding pharmacists, the Northeast has a steady decline in the population/pharmacist ratio; and the ratios are comparable for the North, South and Central (Figure 6.26).

Figure 6.26 Population/pharmacist ratios by region, 1998-2005

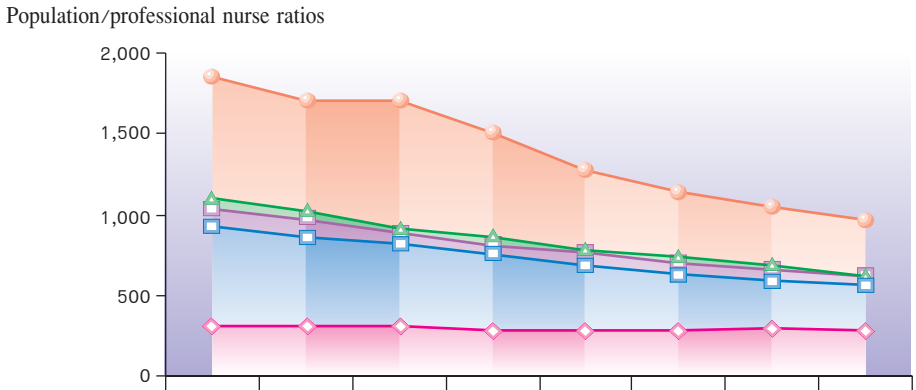


	1998	1999	2000	2001	2002	2003	2004	2005
Bangkok	2,221	2,132	2,551	2,485	4,667	4,765	4,632	3,562
Central	10,346	11,458	11,058	10,213	9,557	7,169	6,819	6,852
North	17,780	16,610	11,012	11,082	10,115	9,743	9,037	8,273
South	14,094	13,382	10,575	9,712	9,569	8,801	8,292	8,125
Northeast	28,988	25,954	21,740	17,979	14,987	13,183	13,032	12,869

Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

The population/professional nurse ratio has also been declining; the Northeast has the ratio closer to those for other regions (Figure 6.27).

Figure 6.27 Population/professional nurse ratios by region, 1998-2005

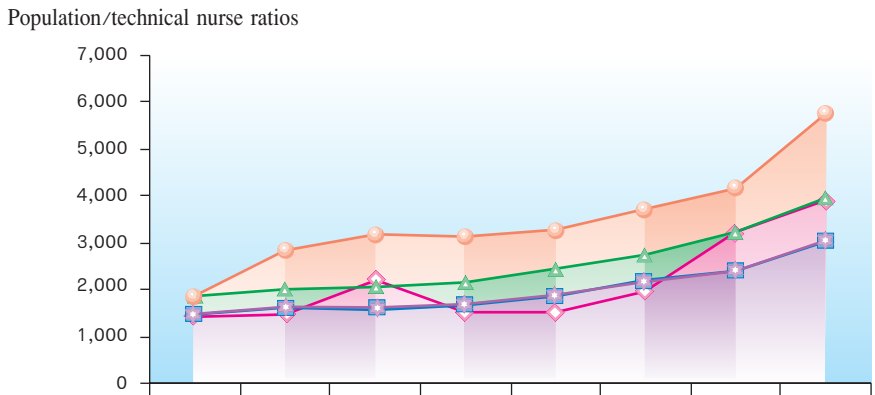


	1998	1999	2000	2001	2002	2003	2004	2005
Bangkok	311	305	309	287	279	285	289	285
Central	922	855	825	749	684	631	593	562
North	1,100	1,022	908	856	785	734	684	621
South	1,037	973	884	807	765	692	659	622
Northeast	1,849	1,707	1,702	1,498	1,278	1,145	1,045	968

Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

In connection with population/technical nurse ratio, the trend is rising in all regions due to the change in their status to professional nurses. The Northeast has the highest ratio, while the Central and South have the lowest (Figure 6.28).

Figure 6.28 Population/technical nurse ratios by region, 1998-2005

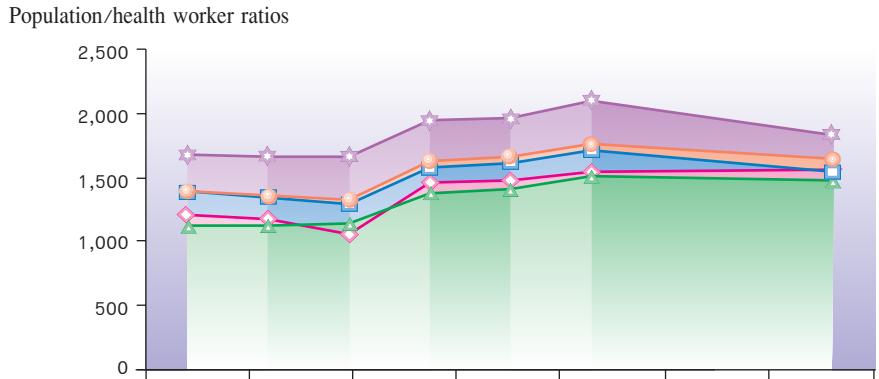


	1998	1999	2000	2001	2002	2003	2004	2005
Bangkok	1,425	1,477	2,208	1,535	1,511	1,960	3,250	3,900
Central	1,466	1,597	1,555	1,686	1,848	2,187	2,402	3,047
North	1,849	1,994	2,078	2,160	2,449	2,737	3,228	3,944
South	1,466	1,609	1,612	1,639	1,791	2,137	2,481	3,042
Northeast	1,857	2,821	3,183	3,130	3,257	3,730	4,141	5,761

Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

For health personnel at subdistrict health centres, the overall population/ health worker ratio had a declining tend in 2006. The highest ratio is noted for the Northeast and lowest for the South (Figure 6.29). Overall, the regional disparities have also declined.

Figure 6.29 Population/health worker ratios (at subdistrict health centres) by region, 1998-2006



	1998	1999	2000	2001	2002	2003	2006
Central	1,207	1,180	1,059	1,453	1,470	1,552	1,562
North	1,389	1,349	1,292	1,572	1,603	1,713	1,547
South	1,129	1,127	1,141	1,378	1,416	1,511	1,484
Northeast	1,681	1,655	1,666	1,938	1,971	2,097	1,832
Total	1,390	1,366	1,324	1,628	1,657	1,762	1,637

Source: Table 6.4.

Table 6.4 Health personnel at subdistrict health centres by regions, 1987-2003 and 2006

Region	No. of health workers									
	1987	1996	1997	1998	1999	2000	2001	2002	2003	2006
Central	4,217	7,724	7,917	8,928	9,017	8,769	8,150	8,027	7,604	8,502
North	3,233	5,734	6,826	6,970	7,167	7,068	6,558	6,456	6,043	6,823
South	2,318	4,628	5,038	5,152	5,264	5,146	4,843	4,761	4,463	4,837
Northeast	4,573	9,114	10,430	10,236	10,569	10,248	9,693	9,591	9,015	10,279
Disparity between population/worker ratios of the Central and Northeast	1:1.73	1:1.59	1:1.43	1:1.39	1:1.40	1:1.57	1:1.3	1:1.3	1:1.4	1: 1.2
Total	**14,341**	**27,200**	**30,211**	**31,286**	**32,017**	**31,231**	**29,244**	**28,835**	**27,125**	**30,441**

Sources: 1. For 1987-2000, data were derived from the Bureau of Health Service System Development, Department of Health Service Support, MoPH.

2. For 2001-2003 and 2006, data were derived from the Bureau of Central Administration, Office of the Permanent Secretary, MoPH.

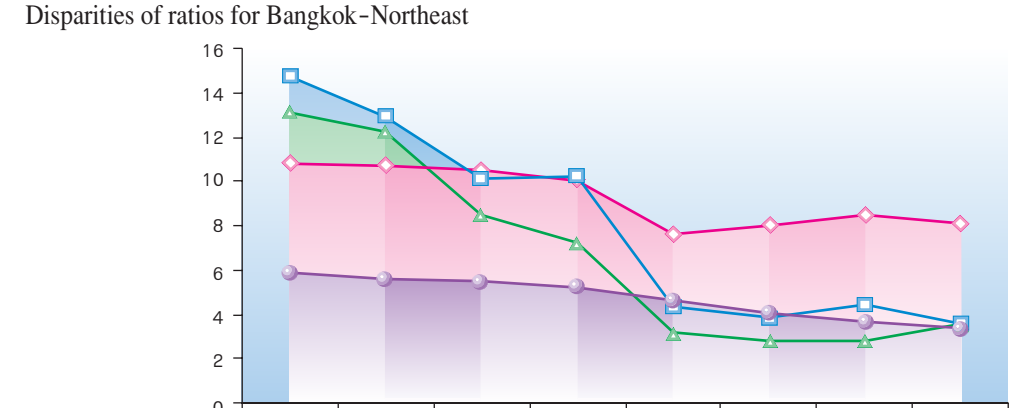
Notes: 1. The figure in ( ) is the ratio of health personnel to population outside municipal areas and Sanitary districts.

2. From FY 1999 onwards, data were derived from the payrolls (Jor 18) of health centre personnel of the Central Administration Bureau, Office of the Permanents Secretary, MoPH.

3. Data on population outside municipal areas for 2001 are as of 31 Dec 2001; and for 2002-2003, are as of 1 Jan 2003; for 2006, as of 31 Dec 2006 from the Registration Administration, analyzed by Rujira Taverat of the Bureau of Policy and Strategy, MoPH.

A comparison of population/healthcare provider ratios for Bangkok and the Northeast reveals that the disparities have declined steadily, especially for dentists and pharmacists for whom the disparities dropped from 13- to 14-fold in 1998 to 3.5-fold in 2005. However, the disparities were about 8-fold for doctors and 3.4-fold for professional nurses in 2005 (Figure 6.30). But with another source of data for dentists, from the Department of Health, the disparity was 15-fold for 2005 (Figure 6.31).

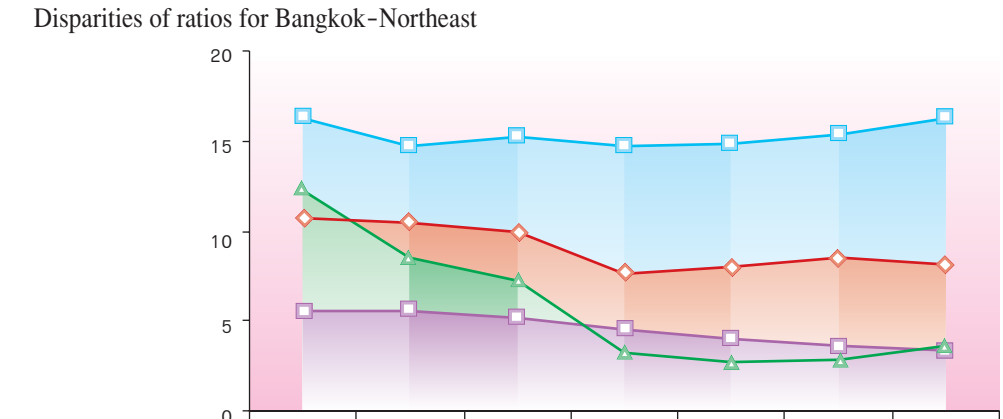
Figure 6.30 Disparities of population/healthcare provider ratios for Bangkok and the Northeast



	1998	1999	2000	2001	2002	2003	2004	2005
Doctors	10.8	10.7	10.5	10.0	7.6	8.0	8.5	8.1
Dentists	14.7	12.9	10.1	10.2	4.3	3.8	4.4	3.6
Pharmacist	13.1	12.2	8.5	7.2	3.2	2.8	2.8	3.6
Professional Nurses	5.9	5.6	5.5	5.2	4.6	4.0	3.6	3.4

Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

Figure 6.31 Disparities of population/healthcare provider ratios for Bangkok and the Northeast (Database of the Department of Health)



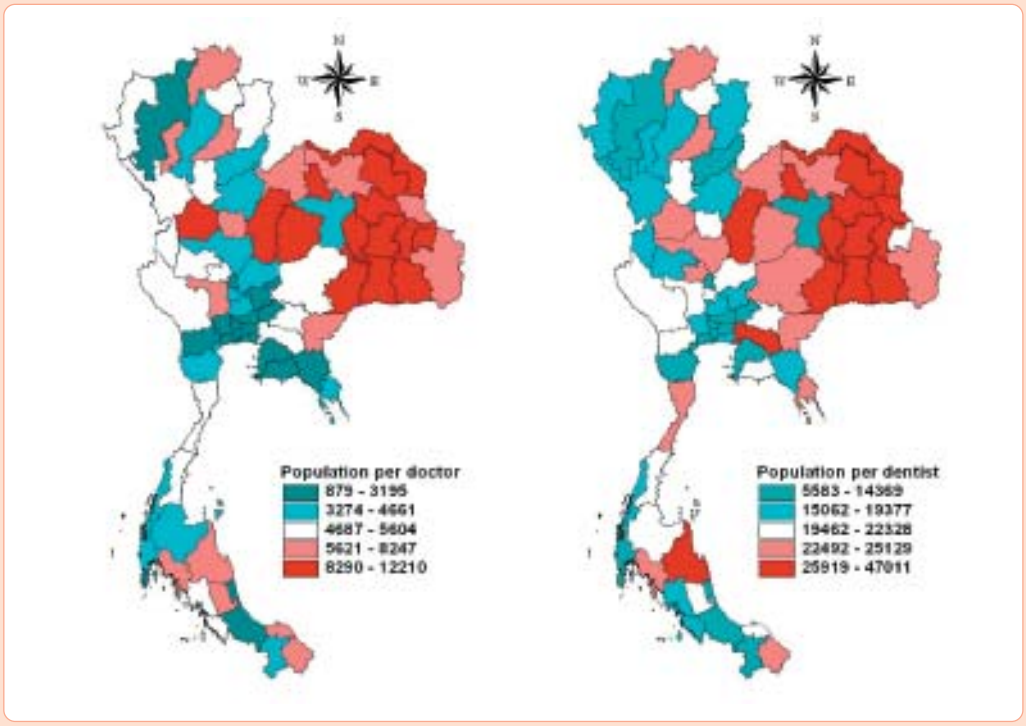
	1999	2000	2001	2002	2003	2004	2005
Doctors	10.7	10.5	10.0	7.6	8.0	8.5	8.1
Dentists	16.3	14.7	15.2	14.7	14.9	15.4	16.2
Pharmacist	12.2	8.5	7.2	3.2	2.8	2.8	3.6
Professional Nurses	5.6	5.5	5.2	4.6	4.0	3.6	3.4

Sources: Report on Health Resources, Bureau of Policy and Strategy, MoPH.
Report on Dental Health Personnel, 1999-2005. Department of Health, MoPH.

2) Ratios of Population to Healthcare Provider by Province

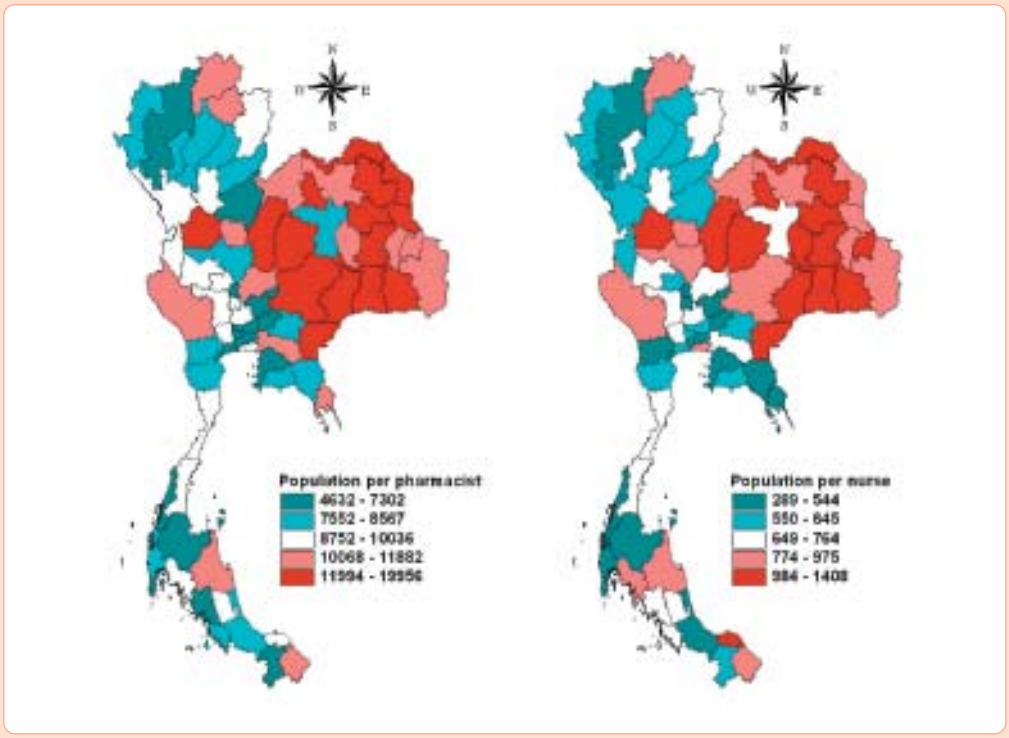
A comparison of population/healthcare provider ratios for all 76 provinces grouped in five quintiles and shown in different colours for each quintile on a shaded area map (Figures 6.32 and 6.33) reveals that most provinces in the Northeast have a higher ratio, compared with those in other regions, except for provinces with a university hospital. The provinces near Bangkok and in the East as well as those in the upper South, such as Phuket, have more health personnel than other provinces.

Figure 6.32 Geographical distribution of doctors and dentists: population/doctor and population/dentist ratios, 2004



Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

Figure 6.33 Geographical distribution of pharmacists and professional nurses: population/pharmacist and population/nurse ratios, 2004



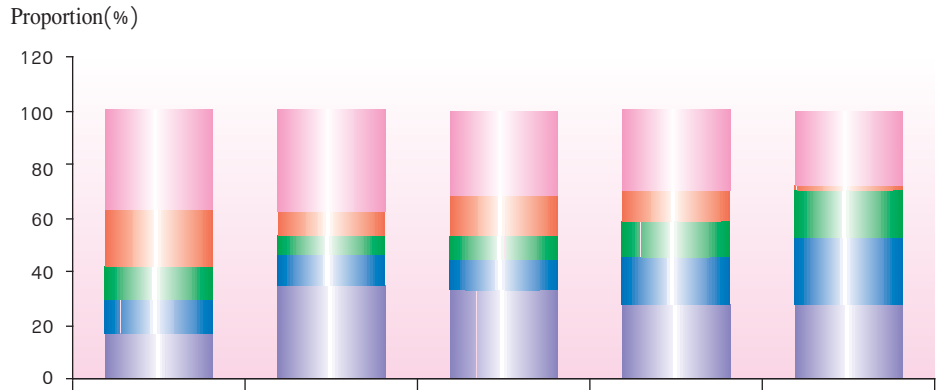
Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

1.4.2 Distribution of Health Manpower by Level of Services and Workload

1) Proportion of Health Manpower by Level of Services

Based on the level and type of health facilities, the proportion of doctors working in private hospitals is higher than those of other professionals, and the proportion in community hospitals is lower than other professionals. But for dentists, pharmacists, professional nurses and technical nurses, most of them work in community hospitals (Figure 6.34).

Figure 6.34 Proportion of health manpower by type of hospitals, 2005



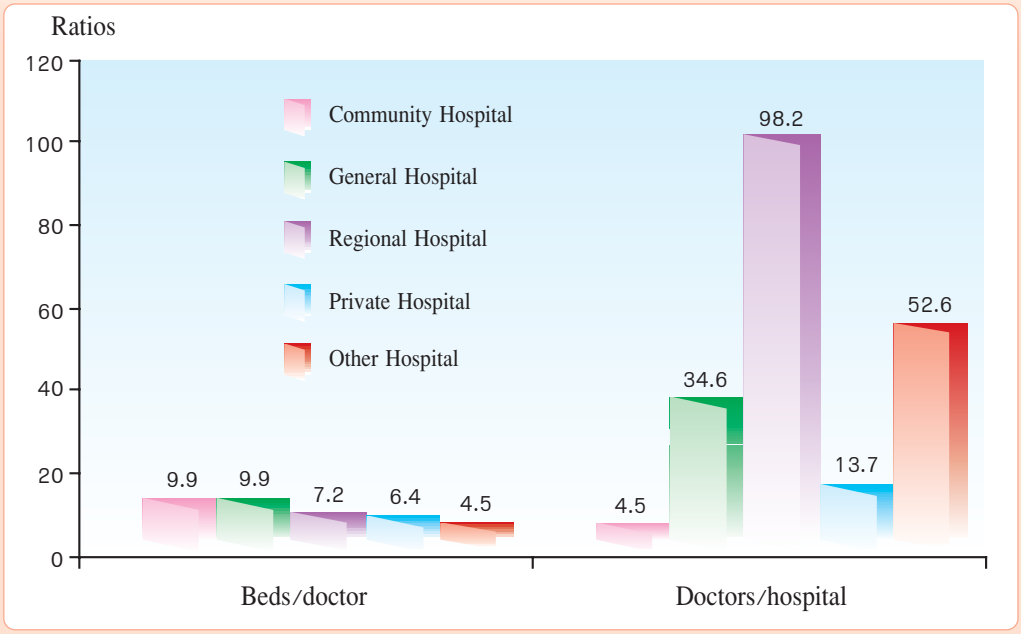
	Doctors	Dentists	Pharmacists	Professional Nurses	Technical Nurses
Others	36.9	37.7	31.9	29.5	27.9
Private Hospitals	21.6	9.4	14.6	12.2	1.9
Regional Hospitals	12.6	6.6	8.8	12.7	17.6
General Hospitals	12.4	11.4	12.1	17.7	25.2
Community Hospitals	16.5	34.9	32.6	28.0	27.4

Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

An analysis of beds-to-doctor ratio and the average number of doctors per hospital will reflect the existence of doctors in comparison with the size of hospital. In 2005, it was found that community hospitals had the highest beds/doctor ratio, close to that for general hospitals, followed by regional hospitals and private hospitals. For the doctors per hospital comparison, on average, a hospital will have 4.5 doctors; a general hospital, 35 doctors; a regional hospital, 98 doctors; and a private hospital, 14 doctors (Figure 6.35).

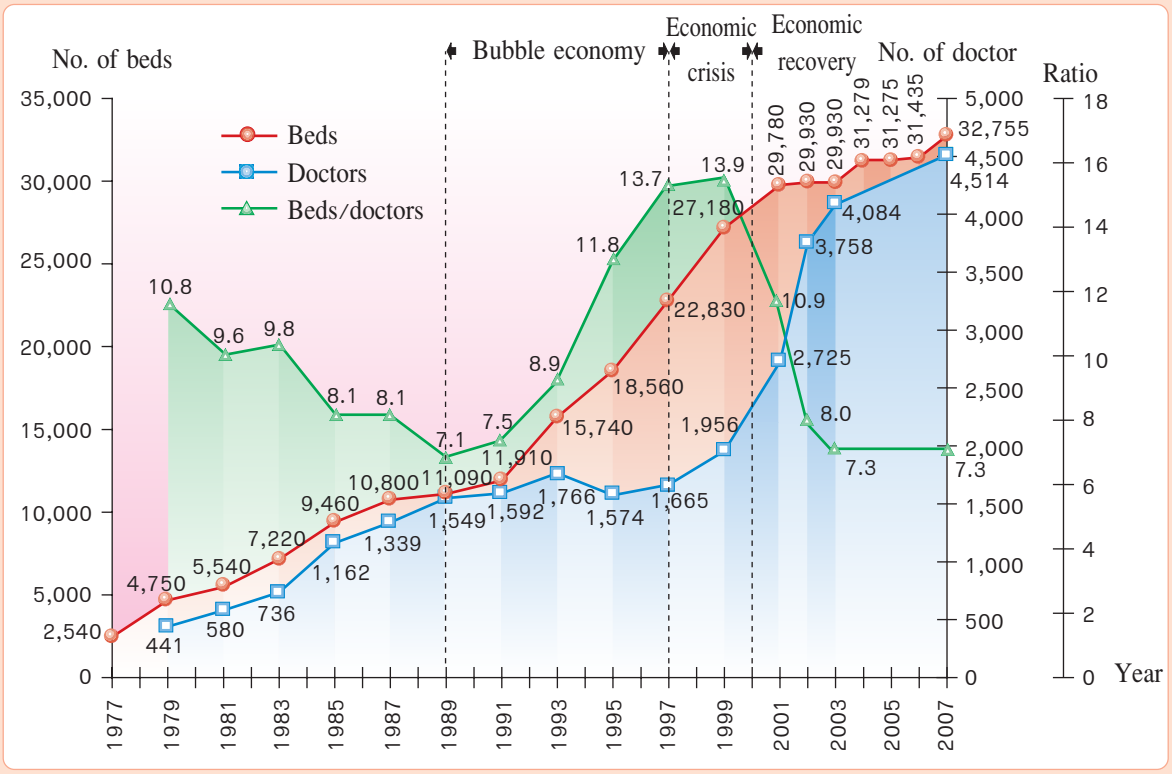
However, when considering the trends in beds-to-doctor ratios of community hospitals, using data from the Department of Health Service Support, before the economic crisis the ratio for private hospitals increased markedly, reflecting the shortages of doctors during that period. But after the crisis, the ratio began to decline due to increasing numbers of doctors (Figure 6.36).

Figure 6.35 Beds/doctor ratios and average number of doctors per hospital by type of hospital, 2005



Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

Figure 6.36 Numbers of beds and doctors, beds-to-doctor ratios at community hospitals, 1977-2007

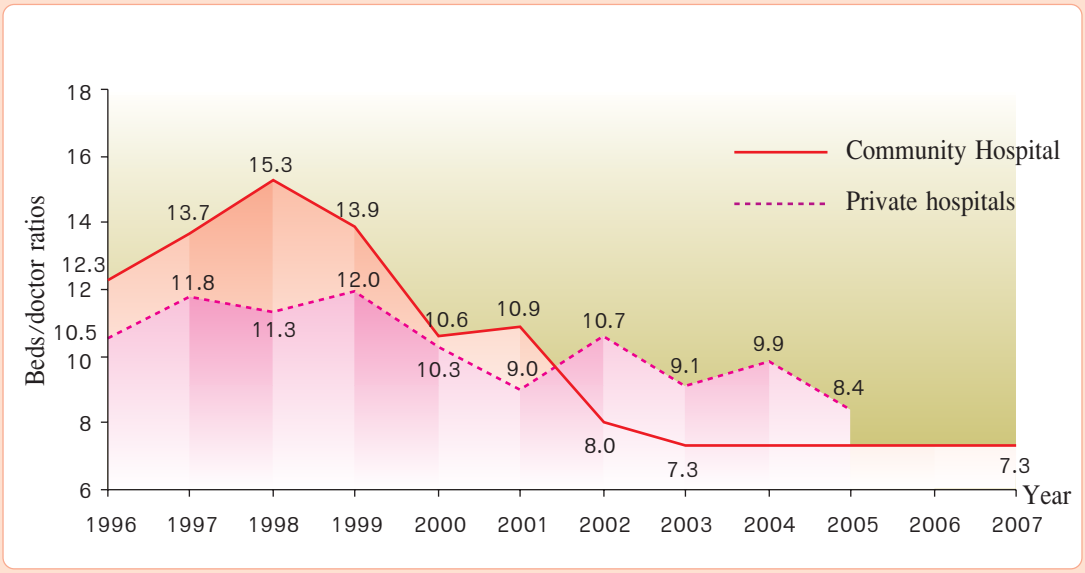


Sources: Bureau of Health Service System Development, Department of Health Service Support, MoPH. Bureau of Central Administration, Office of the Permanent Secretary, MoPH (for doctors at community hospitals in 2001 onwards).

Note: For 2001-2007. There was no survey on doctors actually working at community hospitals; so data from official payrolls (Jor 18) were used; such limitation resulted in the numbers being higher than actuality.

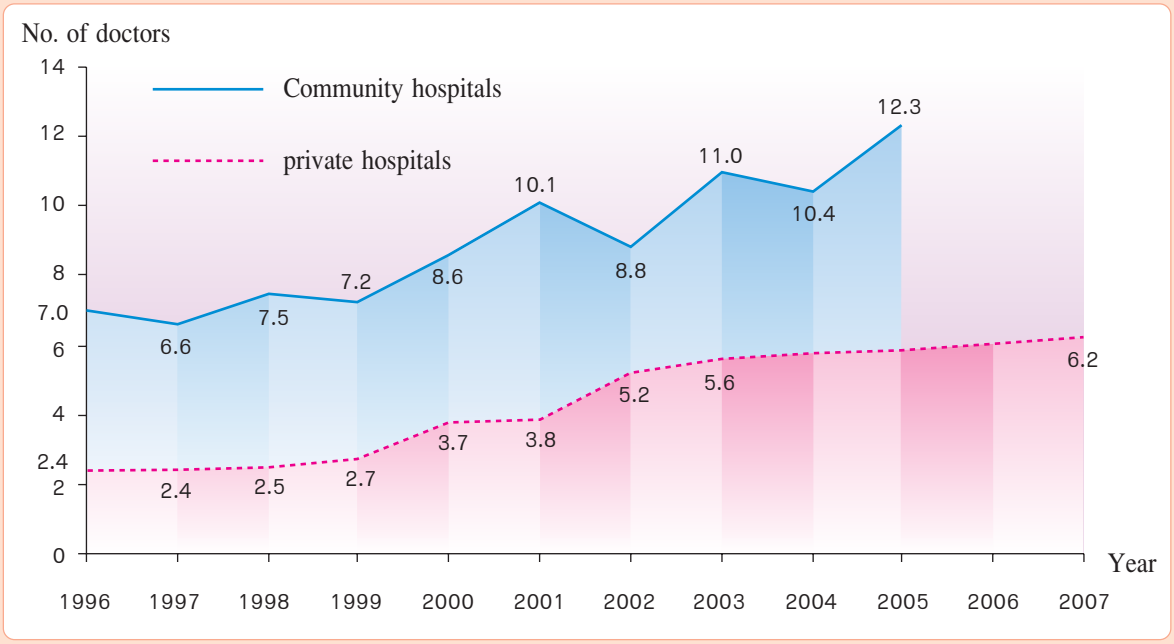
A comparison between community and private hospitals revealed that, between 1996 and 2001, the beds/doctor ratio for community hospitals was higher than that for private hospitals; but after that the ratio for community hospitals was lower (Figure 6.37). The average number of doctors per hospital for private hospitals was higher than that for community hospitals (Figure 6.38).

Figure 6.37 Beds/doctor ratios in community and private hospitals, 1996-2007



Sources: Bureau of Health Service System Development, Department of Health Service Support.
Bureau of Central Administration, Office of the Permanent Secretary for Public Health.
Medical Registration Division, Department of Health Service Support.

Figure 6.38 Average numbers of doctors per hospital in community and private hospitals, 1996-2007



Sources: - Bureau of Health Service System Development, Department of Health Service Support, MoPH.

- Bureau of Central Administration, Office of the Permanent Secretary, MoPH.
- Medical Registration Division, Department of Health Service Support, MoPH.
- Bureau of Policy and Strategy, Office of the Permanent Secretary, MoPH.

Notes

1. Data on doctors in community hospitals in 1977-2001 were derived from a survey conducted by the Bureau of Health Service System Development, Department of Health Service Support, MoPH.
2. Data on doctors in community hospitals from 2002 onwards were derived from the Bureau of Central Administration, Office of the Permanent Secretary, MoPH, based on the numbers of civil servants and state employees in the payrolls (Jor 18), which had some limitation, resulting in the numbers being higher than reality.
3. The number of beds in private hospitals was based on their permit records; in actuality, the number would be lower; and the bed-occupancy rate was less than 50%.
4. For 2002, data were obtained from a survey on 77.3% of private hospitals.

2) Workload of Health Manpower by Level of Services

An analysis of doctors' workloads in various levels of health facilities reflects the workloads of doctors in hospitals at each level. However, the computation of the workload might not be so accurate due to the complexity of patients which could be different at each level. A patient with a complex illness might cause a greater burden to the doctor than other patients in general.

The 2005 health resources survey revealed that doctors at community hospitals had the highest workload, followed by those at general hospitals, while those at university hospitals had the lowest; and doctors at private hospitals had a workload close to that for doctors at regional hospitals; based on the assumption that the multiplier for inpatients in the case of general, regional and university hospitals being equal, for community and private hospitals being equal, and for outpatients at all levels of hospitals being equal (Table 6.5).

Table 6.5 Workloads of doctors, 2005

Health facility	Outpatients (visits) (1)	Inpatients (cases) (2)	Inpatients, adjusted* (3)	Total workloads (1) + (3)	Doctors (cases) (4)	Workloads per doctor (1)+(3)/(4)	Com-parison index
Community hospitals	54,005,596	3,061,014	42,854,196	96,859,792	3,229	29,997	1.9
General hospitals	15,623,960	1,552,186	27,939,348	43,563,308	2,422	17,987	1.14
Regional hospitals	10,954,499	1,171,450	21,086,100	32,040,599	2,456	13,046	0.83
University hospitals	6,396,731	317,878	5,721,804	12,118,535	3,179	3,812	0.24
Private hospitals	35,299,555	1,790,142	25,061,988	60,361,543	4,229	14,273	0.9
Total	**122,280,341**	**7,892,670**	**122,663,436**	**244,943,777**	**15,515**	**15,788**	**1**

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Notes: * In order that the inpatient workloads for each type of hospitals is in the same output, the number of inpatients is adjusted as follows:

1. For community and private hospitals = no. of inpatients X 14
2. For regional/general, university and BMA hospitals = no. of inpatients X 18

2. Health Facilities

2.1 Situation and Trends of Health Facilities

Health facilities, both public and private, have the following trends:

2.1.1 Health Facilities in the Public Sector

Public sector health facilities play a crucial role in the health service system as they provide health services to the people in all localities with good accessibility and coverage, particularly in remote areas. State services include those provided by the MoPH at specialized hospitals, regional hospitals, general hospitals, community hospitals, and subdistrict health centres, and by other ministries such as the Ministry of Education (medical schools), the Ministry of Defence, the Ministry of Interior, state enterprises, local administrative organizations (including Bangkok Metropolitan Administration), and community primary health care centres, which can be divided according to the administrative level as follows (Table 6.6).

In Bangkok Metropolis, there are five medical school hospitals, 26 general hospitals, 14 specialized hospitals/institutions, and 68 public health centres (with 77 branches) in all BMA districts.

Region level. There are six medical school hospitals, 25 regional hospitals, and 47 specialized hospitals.

Provincial level. There are 70 general hospitals covering all provincial areas (previously there were 67 general hospitals; and now Hua Hin Community Hospital has been upgraded as a general hospital, two other hospitals have been transferred to MoPH. i.e. Chonprathan Hospital of the Agriculture Ministry and the Northeastern Region Infectious Disease Hospital of the MoPH Disease Control Department) and 59 hospitals under various military bases and combat units of the Ministry of Defence.

District level. There are 730 community hospitals, covering 91.7% of all districts, one extended OPD or branch hospital, and 214 municipal health centres.

Tambon (subdistrict) level. There are 9,762 health centres, covering all Tambons; several Tambons have more than one health centre.

Village level. There are 311 community health posts, 66,223 rural community primary health care centres, and 3,108 urban community primary health care centres.

Table 6.6 Health facilities in the public sector, 2007

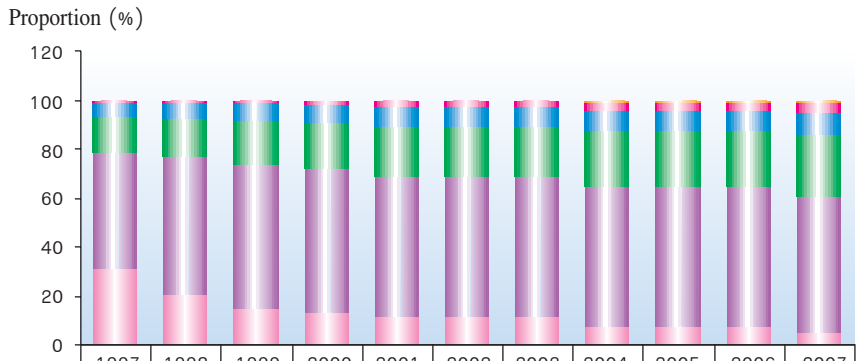
Administrative level	Health facility	Number	Coverage
Bangkok Metropolis	Medical school hospitals	5	
	General hospitals	26	
	MoPH	4	
	Royal Thai Police	1	
	Ministry of Justice	4	
	Ministry of Defence	5	
	BMA	8	
	State enterprises	4	
	Specialized hospitals/institutions	14	
	Public health centres/branches	68/77	All districts under BMA
Regional level and branches	Medical school hospitals	6	
	Regional hospitals	25	
	Specialized hospitals:	47	
	Health promotion hospitals	12	
	Psychiatric hospitals	13	
	Neurological hospital	1	
	Rajprachasamasai Institute	1	
	Bamrasnaradura Institute	1	
	Chest Disease Institute	1	
	Cancer prevention & control centres	6	
	Drug dependence treatment centres	5	
	Metta Pracharak Hospital	1	
	Centre for elderly care	1	
	Dernatology Centre	1	
	Dental Institute	1	
	Sirindhorn National Medical Rehabilitation Centre	1	
	Thanyarak Institute	1	
	Maha Vajiralongkorn Centre at Thanyaburi	1	
Provincial level (75 provinces)	General hospitals, under MoPH	70	100%
	Military hospitals under the Ministry of Defence	59	
	Hospital under the Royal Thai Police	1	
796 districts	Community hospitals (Mar, 2007)	730	91.7%

Administrative level	Health facility	Number	Coverage
81 minor districts	Branch hospital	1	
	Municipal health centres (Oct, 2003)	214	
7,255 subdistricts	Health centres (2006)	9,762	100%
74,435 villages	Community health posts	311	
	Community PHC centres (2003)		
	Rural	66,223	89.0%
	Urban	3,108	

Sources: 1. Bureau of Policy and Strategy, MoPH.
2. Bureau of Health Service System Development, Department of Health Service Support, MoPH.
3. Primary Health Care Division, Department of Health Service Support, MoPH.
4. Department of Provincial Administration, Ministry of Interior.
5. Department of Health, Bangkok Metropolitan Administration (BMA).

District-level hospitals are community hospitals, each with 10 to 150 beds, and located in all district towns across the country. For the past several years, community hospitals have been expanded steadily, particularly from 10 beds to 30 beds. In 2007, there are only 34 10-bed hospitals while there are as many as 408 30-bed hospitals among 730 community hospitals. The proportion of 10-bed hospitals is only 4.7% in 2007, while that for 30-bed hospitals has increased to 55.9% and the proportions of 60-bed, 90-bed, 120-bed, and 150-bed hospitals have also risen (Figure 6.39).

Figure 6.39 Proportions of community hospitals by size, 1997-2007



	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
150 bed	0.0	0.0	0.0	0.0	0.3	0.3	0.3	1.1	1.1	1.1	1.4
120 bed	1.3	1.3	1.5	1.7	2.5	2.5	2.5	3.3	3.3	3.3	3.7
90 bed	5.3	6.5	7.3	7.3	8.2	8.1	8.1	8.3	8.3	8.4	8.9
60 bed	14.6	15.9	17.5	19.0	20.5	20.4	20.4	22.7	22.7	22.8	25.5
30 bed	47.6	56.2	59.3	58.5	56.9	57.2	57.2	57.4	57.4	57.4	55.9
10 bed	31.1	20.1	14.3	13.4	11.5	11.4	11.4	7.2	7.2	7.0	4.7

Source: Bureau of Health Service System Development, Department of Health Service Support, MoPH.

2.1.2 Health Facilities in the Private Sector

Private health facilities play a significant role in providing health services in urban areas, especially those with a good economic status. With people's high purchasing power, there are investments in providing health services to the people in the locality. However, private health facilities are not only located in Bangkok, but they are also located in provincial areas, both in Mueang and nearby districts, particularly drugstores and private clinics (health facilities with no inpatient beds). In 2006, private health facilities are divided into three categories (Table 6.7). as follows:

(1) Pharmacies or drugstores: 8,801 modern pharmacies, 4,528 pharmacies selling only packaged drugs, and 2,096 traditional medicine drugstores.

(2) Clinics: 16,800 clinics without inpatient beds.

(3) Hospitals: 344 private hospitals with inpatient beds.

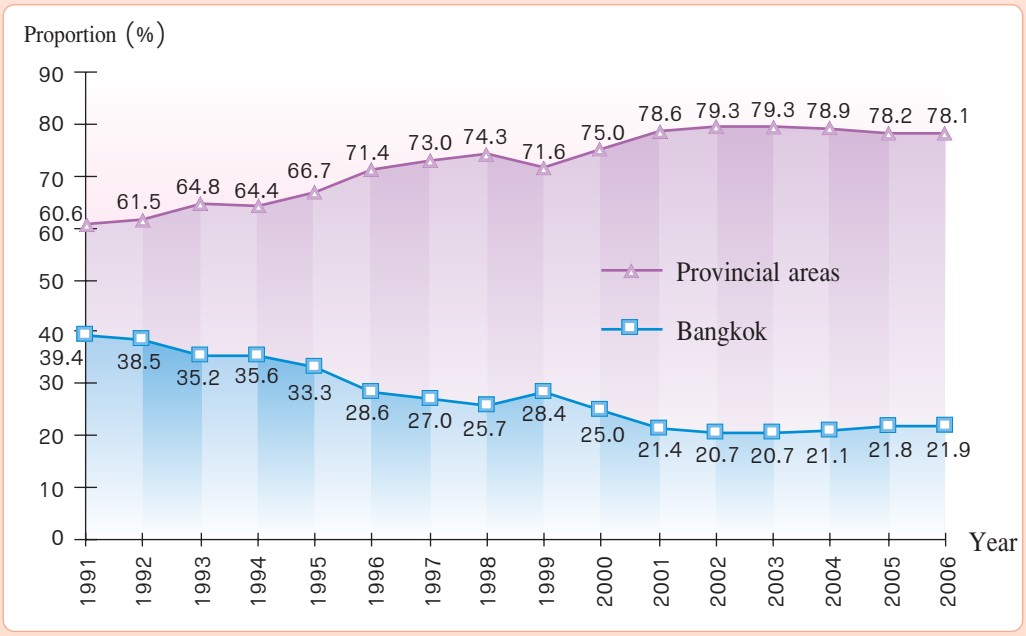
Table 6.7 Private health facilities, 2006

Health facility	Bangkok		Provincial areas		Total
	No.	Percent	No.	Percent	
1. Pharmacies					
1.1 Modern pharmacies	3,615	41.1	5,186	58.9	8,801
1.2 Modern pharmacies selling only packaged drugs	497	11.0	4,031	89.0	4,528
1.3 Traditional medicine drugstores	400	19.1	1,696	80.9	2,096
Total	4,512	29.2	10,913	70.8	15,425
2. Medical premises without inpatient beds (clinics)	3,687	21.9	13,113	78.1	16,800
3. Medical premises with inpatient beds (private hospitals)	3,603	21.8	12,944	78.2	16,547
- No. of hospitals	102	29.7	242	70.3	344
- No. of beds	15,500	43.3	20,306	56.7	35,806

Sources: 1. Drug Control Division, Food and Drug Administration, MoPH.
2. Medical Registration Division, Department of Health Service Support, MoPH.

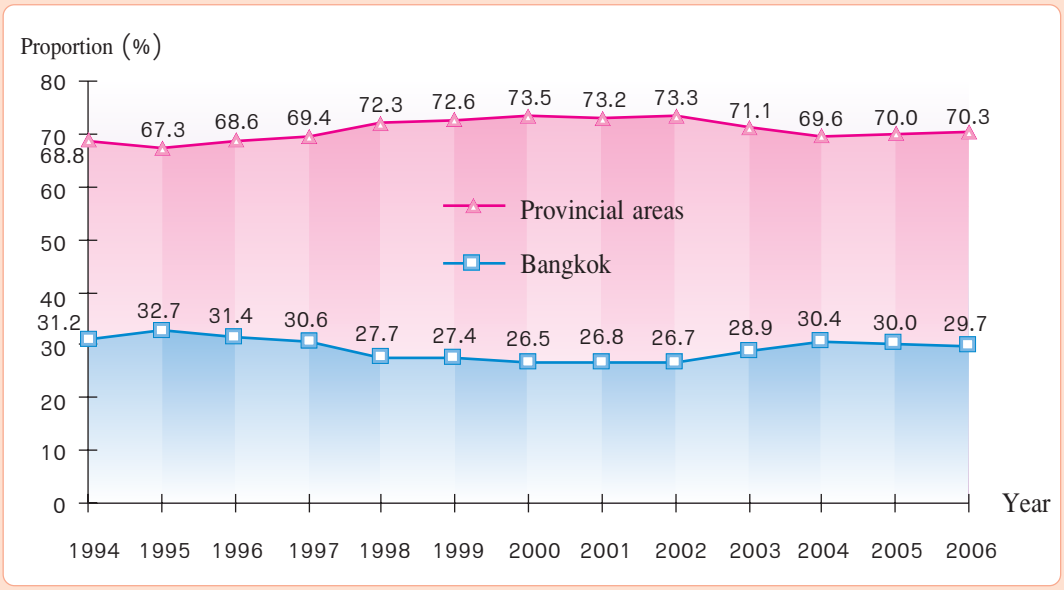
In analyzing the proportions of private clinics in Bangkok and provincial areas, it is noted that most clinics (78%) are located in provincial areas and only 22% in Bangkok (Figure 6.40). Similarly, most private hospitals (70%) are located in provincial areas and the rest (30%) in Bangkok (Figure 6.41).

Figure 6.40 Proportions of clinics in Bangkok and provincial areas, 1991-2006



Source: Medical Registration Division, Department of Health Service Support, MoPH.

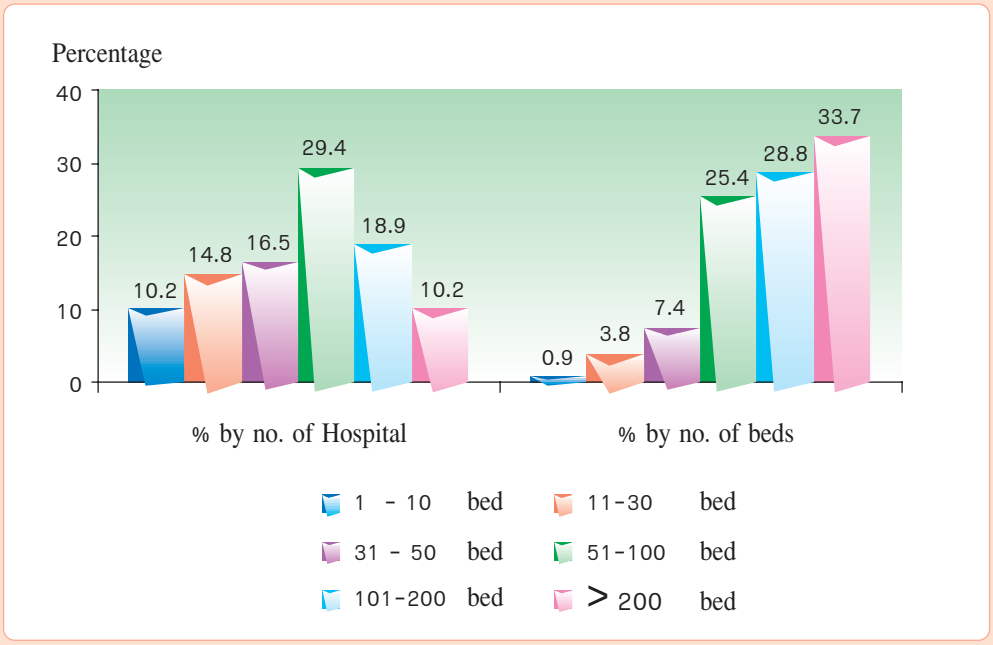
Figure 6.41 Proportions of private hospitals in Bangkok and provincial areas, 1994-2006



Source: Medical Registration Division, Department of Health Service Support, MoPH.

For private hospitals, in 2006 most of them were medium-sized hospitals with 51-100 beds, but if the number of all beds was considered, most of the beds were in large hospitals (each with more than 200 beds), see Figure 6.42.

Figure 6.42 Proportion of private hospitals by size, 2006



Source: Medical Registration Division, Department of Health Service Support, MoPH.

If the numbers of hospitals and beds were classified by hospital size and by region, it was noted that in 2006, most of large hospitals with over 200 beds were located in Bangkok (25 out of 35) (Table 6.8).

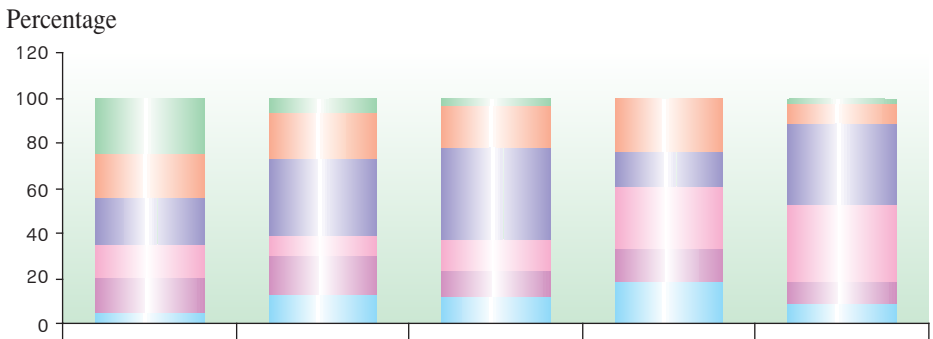
Table 6.8 Number of private hospitals by number of beds and region, 2006

Region	1-10 beds		11-30 beds		31- 50 beds		51-100 beds		101-200 beds		>200 beds		Total	
	Hos-pitals	Beds	Hos-pitals	Beds	Hos-pitals	Beds	Hos-pitals	Beds	Hos-pitals	Beds	Hos-pitals	Beds	Hos-pitals	Beds
Bangkok	5	57	16	412	15	673	21	1,912	20	3,318	25	9,128	102	15,500
Central	14	136	20	516	11	488	38	3,499	24	3,910	7	2,108	114	10,657
Northeast	4	39	4	112	15	716	16	1,440	4	560	1	214	44	3,081
North	6	60	6	168	7	336	21	1,798	9	1,224	2	620	51	4,206
South	6	47	5	136	9	432	5	448	8	1,299	-	-	33	2,362
Total	35	339	51	1,344	57	2,645	101	9,097	65	10,311	35	12,070	344	35,806

Source: Medical Registration Division, Department of Health Service Support, MoPH.

If the proportion of hospitals was computed according to hospital size for each region, it was found that one-fourth of private hospitals in Bangkok had more than 200 beds each, only 5% of them had 10 beds or less. In the central region, one-third of private hospitals had 51-100 beds each, while 41% in the North had 51-100 beds each. For the South, most of them had 31-50 beds each, followed by those with 101-200 beds, whereas in the Northeast only 11% had 101 beds or more (Figure 6.43).

Figure 6.43 Proportions of private hospitals by number of beds and by region, 2006

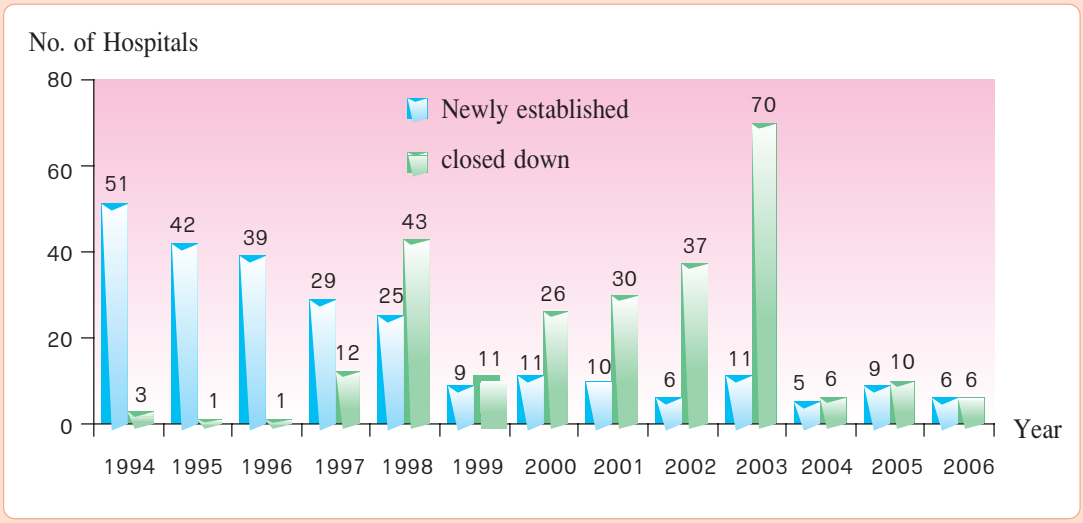


	Bangkok	Central	North	South	Northeast
> 200 beds	24.5	6.1	3.9	0.0	2.3
101 -200beds	19.6	21.1	17.6	24.1	9.1
51 - 100 beds	20.6	33.3	41.2	15.2	36.3
31 - 50 beds	14.7	9.7	13.7	27.3	34.1
11 - 30 beds	15.7	17.5	11.8	15.2	9.1
1 - 10 beds	4.9	12.3	11.8	18.2	9.1

Source: Medical Registration Division, Department of Health Service Support, MoPH.

Regarding the expansion and closure of private health facilities which are also important issues, based on the data on applications for establishing new facilities (medical premises with inpatient beds), it was found that the trends were declining while the number of closures were rising during the period 1998-2003, when as many as 70 hospitals were shut down in one year. After that period, the number of hospitals closing down was declining to about the same level as that applying for setting up new ones (Figure 6.44), reflecting the economic recovery to the balanced condition.

Figure 6.44 Numbers of private hospitals newly established and closed down, 1994-2006

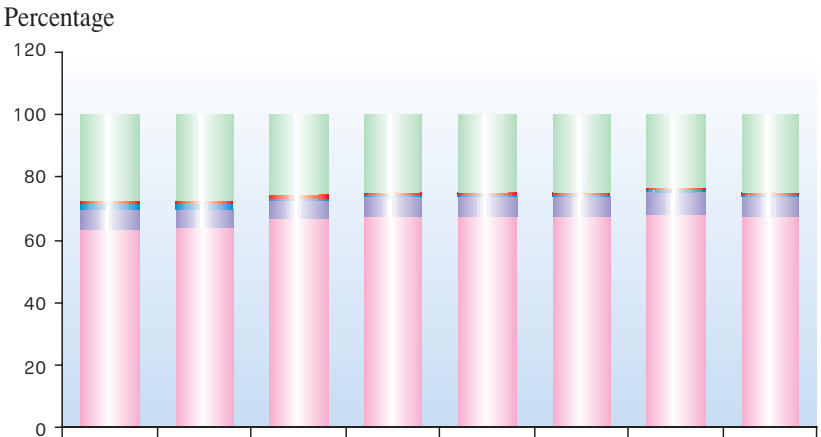


Source: Medical Registration Division, Department of Health Service Support, MoPH.

3) Proportions of Health Facilities by Agency

There was a rising trend for hospitals under the MoPH, while that for private hospitals was falling; the same was true for the proportions of hospital beds (Figures 6.45 and 6.46).

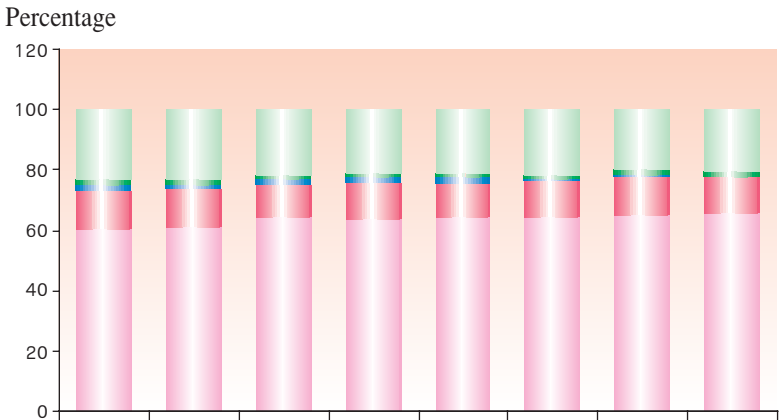
Figure 6.45 Proportions of hospitals by agency, 1998-2005



	1998	1999	2000	2001	2002	2003	2004	2005
Private sector	27.9	27.8	25.6	24.9	24.6	24.9	23.3	24.4
Local administration	0.7	0.8	1.1	0.8	0.9	0.8	1.0	0.8
State enterprises	1.6	1.6	0.7	0.8	0.8	0.8	0.6	0.6
Other ministries	6.3	6.2	5.5	6.1	6.0	6.2	6.6	6.5
MoPH	63.5	63.6	67.1	67.4	67.8	67.3	68.5	67.7

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Figure 6.46 Proportions of hospital beds by agency, 1998-2005

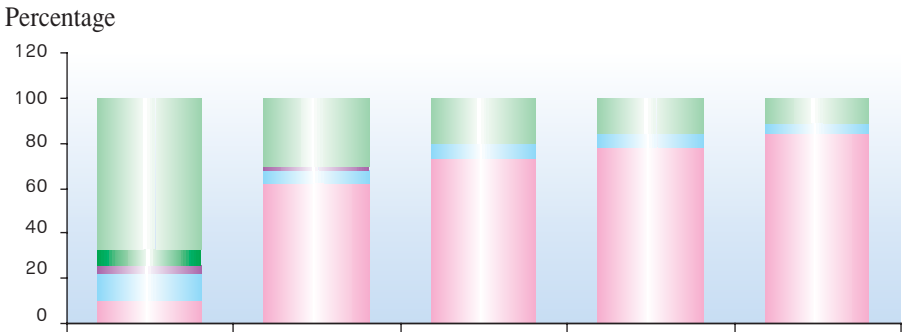


	1998	1999	2000	2001	2002	2003	2004	2005
Private sector	23.2	23.1	21.6	21.0	21.0	21.5	19.8	20.2
Local administration	1.7	1.7	1.6	1.6	1.7	1.7	1.8	1.9
State enterprises	1.9	1.9	1.8	1.8	1.9	0.7	0.6	0.5
Other ministries	12.8	12.6	10.6	11.8	11.3	12.0	12.9	11.8
MoPH	60.4	60.7	64.4	63.7	64.1	64.1	65.0	65.6

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

A regional comparison revealed that most hospitals in Bangkok are private hospitals, followed by those under other ministries, where as in provincial areas, most of them are under the MoPH (Figure 6.47). Regarding the proportions of hospital beds by region, they were actually similar to those for hospitals, but hospitals under other ministries have the highest proportion of hospital beds close to that for private hospitals (Figure 6.48), reflecting the fact that hospital under other ministries are large hospitals.

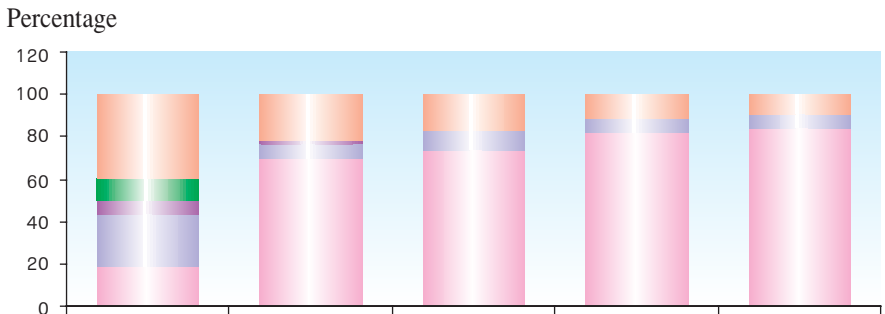
Figure 6.47 Proportions of hospitals by agency and region, 2005



	Bangkok	Central	North	South	Northeast
Private sector	66.9	30.1	20.2	15.4	11.4
Local administration	7.3	0.0	0.4	0.0	0.0
State enterprises	4.0	1.7	0.0	0.5	0.0
Other ministries	12.1	6.2	6.0	6.1	4.1
MoPH	9.7	62.0	73.4	78.0	84.5

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Figure 6.48 Proportions of hospital beds by agency and region, 2005

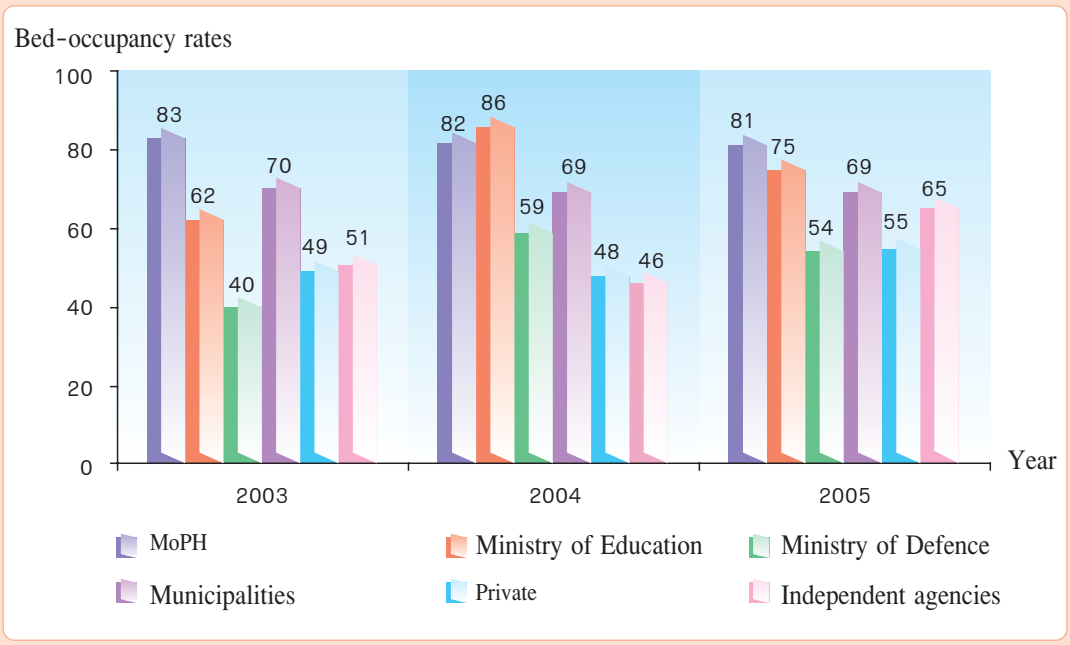


	Bangkok	Central	North	South	Northeast
Private	39.8	21.7	16.5	11.1	9.3
Local administration	9.8	0.0	0.1	0.0	0.0
State enterprises	7.1	1.6	0.0	0.1	0.0
Other ministries	24.5	7.0	9.3	6.7	6.3
MoPH	18.9	69.7	74.0	82.2	84.4

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

An analysis of bed-occupancy rates will reflect the efficiency in the use of existing beds and the burden the hospital has to take when admitting inpatients. Based on the 2005 data, MoPH hospitals had the highest bed-occupancy rate, followed by those under the Ministry of Education; while private hospitals and those under the Ministry of Defence had the lowest rates (Figure 6.49).

Figure 6.49 Bed-occupancy rates by agency, 2003-2005



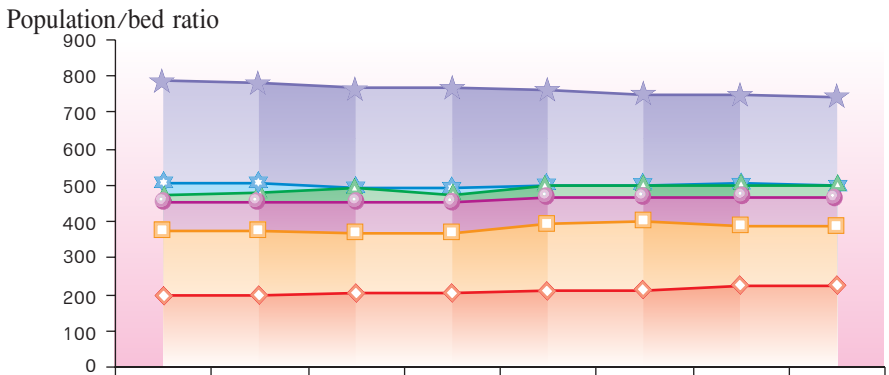
Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

2.2 Distribution of Health Facilities

2.2.1 Geographical Distribution of Hospitals

Trends in population to hospital bed ratio during the 1998-2005 period fell slightly in the Northeast (with more beds), while those for other regions including Bangkok seemed to be stable or rising slightly (Figure 6.50).

Figure 6.50 Population/bed ratios by region, 1998-2005

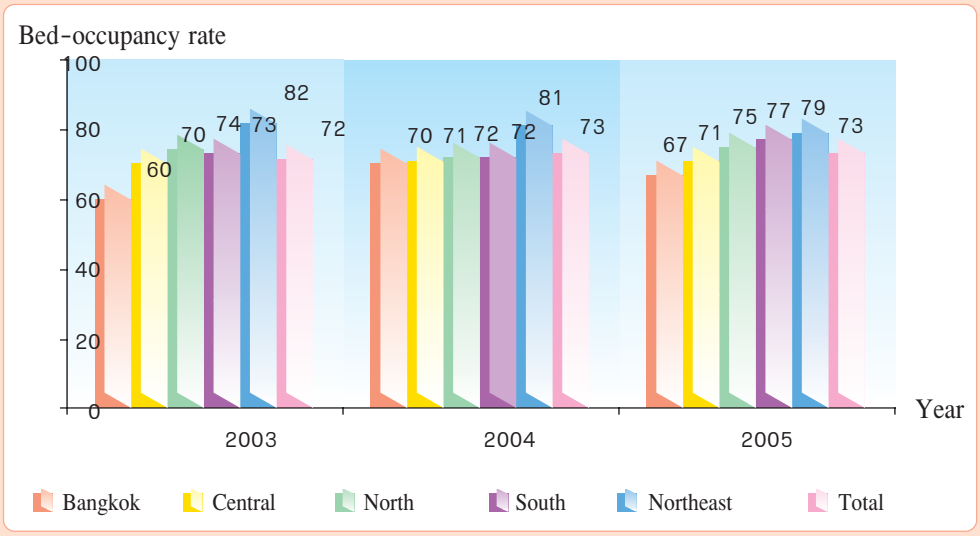


	1998	1999	2000	2001	2002	2003	2004	2005
Bangkok	199	199	202	205	213	210	224	223
Central	377	376	369	368	391	401	390	388
North	475	478	493	474	496	501	503	498
South	507	509	494	492	496	499	501	498
Northeast	790	780	766	771	759	752	747	740
Total	**456**	**455**	**454**	**451**	**465**	**467**	**469**	**468**

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

In addition, the Northeast had the highest bed occupancy rate (Figure 6.51), reflecting a higher burden of the hospitals in that region, compared with other regions.

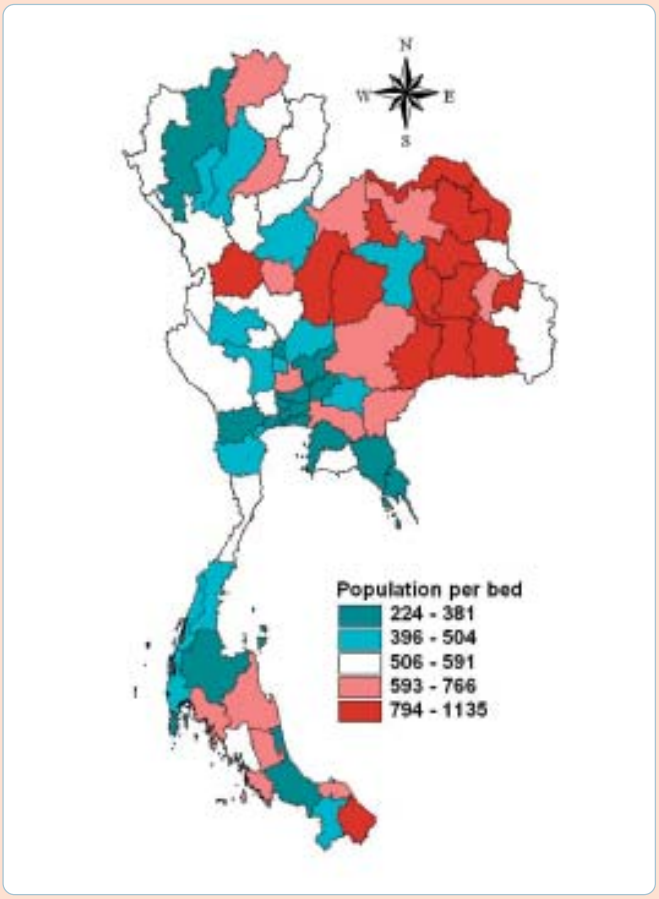
Figure 6.51 Bed-occupancy rates by region, 2003-2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

An analysis of bed distribution by province revealed that most provinces in the Northeast had a higher population/bed ratio, compared with that in other provinces in other regions the distribution of beds was similar to that for healthcare providers (Figure 6.52).

Figure 6.52 Geographical distribution of population/bed ratios by province, 2004



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

2.2.2 Geographical Distribution of Health Centres

Health centres have been built and distributed to cover all subdistricts (tambons) across the country since the last decade. In 2006, there were 9,762 health centres nationwide.

The health centre to population ratio rising in the last decade had a rising trend in all regions of the country, from 1:10,064 in 1979 to 1:5,106 in 2006. Although health centres are mostly clustered in the Central Region, the regional disparities have actually decreased as shown in Table 6.9 and Figure 6.53.

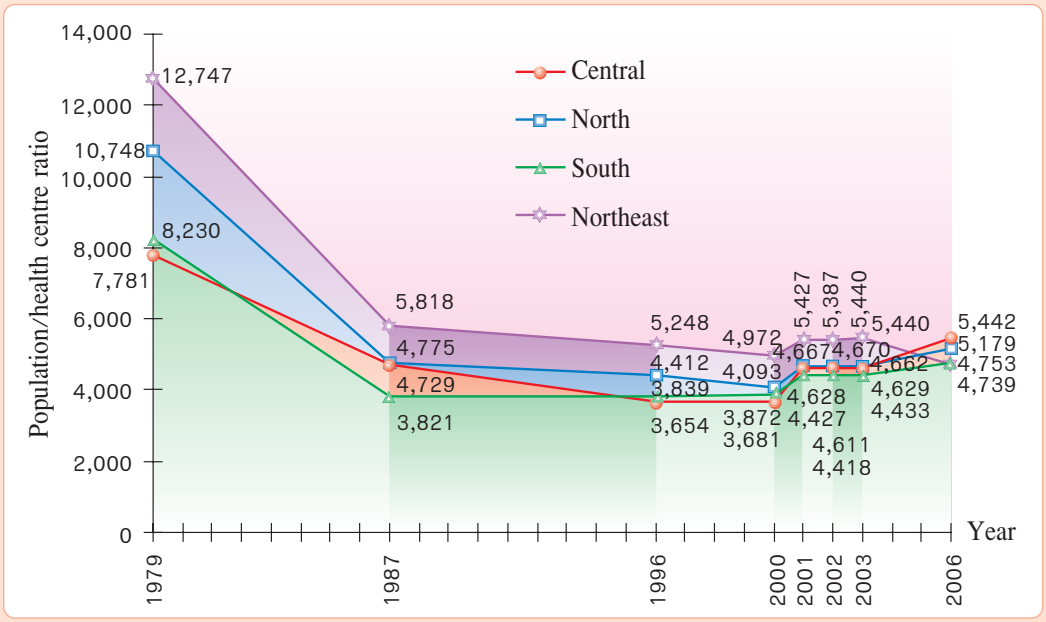
Table 6.9 Distribution of health centres by region in 1979, 1987, 1996-2003, and 2006

Region	No. of health centres and health centre/population ratio										
	1979	1987	1996	1997	1998	1999	2000	2001	2002	2003	2006
Central	1,219	1,635	2,377	2,471	2,508	2,523	2,524	2,559	2,559	2,549	2,564
	(1:7,781)	(1:4,729)	(1:3,654)	(1:3,554)	(1:4,298)	(1:4,219)	(1:3,681)	(1:4,628)	(1:4,611)	(1:4,629)	(1:5,179)
North	914	1,616	1,965	2,151	2,203	2,225	2,231	2,210	2,216	2,220	2,227
	(1:10,748)	(1:4,775)	(1:4,412)	(1:4,103)	(1:4,393)	(1:4,345)	(1:4,093)	(1:4,667)	(1:4,670)	(1:4,662)	(1:4,739)
South	688	1,252	1,400	1,488	1,505	1,513	1,516	1,507	1,526	1,521	1,510
	(1:8,230)	(1:3,821)	(1:3,839)	(1:3,653)	(1:3,864)	(1:3,922)	(1:3,872)	(1:4,427)	(1:4,418)	(1:4,433)	(1:4,753)
Northeast	1,277	2,489	3,100	3,367	3,398	3,428	3,433	3,462	3,509	3,475	3,461
	(1:12,747)	(1:5,818)	(1:5,248)	(1:4,900)	(1:5,063)	(1:5,102)	(1:4,972)	(1:5,427)	(1:5,387)	(1:5,440)	(1:5,442)
Disparity between Central's and Northeast's ratios	1:1.64	1:1.23	1:1.44	1:1.38	1:1.18	1:1.21	1:1.21	1:1.17	1:1.17	1:1.18	1:1.05
Total	4,088	6,992	8,842	9,477	9,614	9,689	9,704	9,738	9,810	9,765	9,762
	(1:10,064)	(1:4,964)	(1:4,411)	(1:4,173)	(1:4,522)	(1:4,514)	(1:4,262)	(1:4,890)	(1:4,872)	(1:4,895)	(1:5,106)

Source: The Bureau of Central Administration, Office of the Permanent Secretary, MoPH, recalculated by Rujira Taverat, Bureau of Policy and Strategy, MoPH.

Notes:
1. The figure in ( ) is the ratio of health centre to population outside municipal areas and sanitary districts.
2. Data on population outside municipal areas for 2001, 2002 and 2006 were derived from the Bureau of Registration Administration, Department of Provincial Administration, Ministry of Interior, and recalculated by Rujira Taverat, Bureau of Policy and Strategy, MoPH.
3. For 2003, data on population in 2002 outside municipal areas were derived from the Bureau of Registration Administration, Department of Provincial Administration.

Figure 6.53 Population to health centre ratios by region, 1979-2006



Sources: - Bureau of Health Service System Development, Department of Health Service Support, MoPH.

- Bureau of Central Administration, Office of the Permanent Secretary, MoPH.

2.2.3 Geographical Distribution of Pharmacies

The ratio of pharmacy to population has an improved trend for the past decade, from 1: 4,931 in 1996 to 1: 4,032 in 2005. Most pharmacies or drugstores are located in Bangkok and the Central Region (Table 6.10).

Table 6.10 Distribution of drugstores by region, 1996-2005

Region	No. of drugstores and drugstore/population ratio									
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Central	6,644	6,690	6,904	7,465	7,534	7,826	7,895	8,821	8,696	8,960
	(1:2,908)	(1:2,925)	(1:2,869)	(1:2,675)	(1:2,665)	(1:2,590)	(1:2,547)	(1:2,350)	(1:2,373)	(1:2,295)
North	1,989	1,958	2,029	2,029	2,045	1,982	1,964	2,087	2,103	2,179
	(1:6,004)	(1:6,149)	(1:5,976)	(1:5,984)	(1:5,923)	(1:6,111)	(1:6,180)	(1:5,808)	(1:5,690)	(1:5,444)
South	1,189	1,152	1,237	1,243	1,273	1,354	1,398	1,510	1,507	1,535
	(1:6,534)	(1:6,837)	(1:6,472)	(1:6,524)	(1:6,430)	(1:6,104)	(1:5,983)	(1:5,601)	(1:5,618)	(1:5,521)
Northeast	2,303	2,396	2,378	2,536	2,253	2,148	2,166	2,566	2,574	2,751
	(1:9,019)	(1:8,759)	(1:8,923)	(1:8,423)	(1:9,445)	(1:9,986)	(1:9,950)	(1:8,431)	(1:8,339)	(1:7,742)
Total	12,125	12,196	12,548	13,273	13,105	13,310	13,423	14,984	14,880	15,425
	(1:4,931)	(1:4,958)	(1:4,874)	(1:4,639)	(1:4,713)	(1:4,665)	(1:4,660)	(1:4,200)	(1:4,202)	(1:4,032)

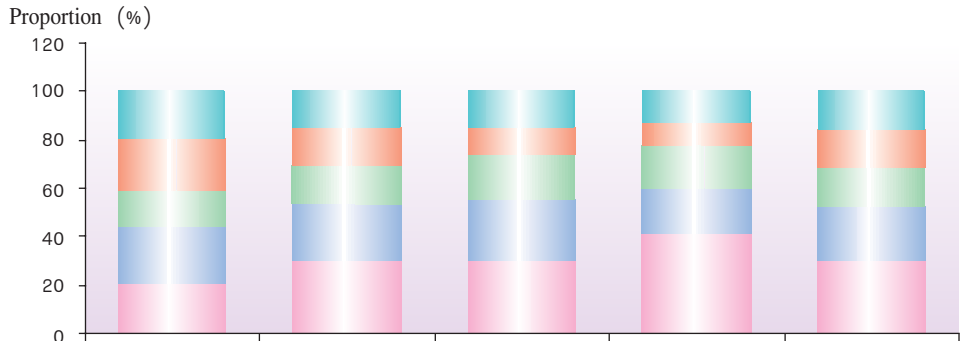
Source: Food and Drug Administration, MoPH.

Note:
1. Figures in ( ) are drugstore/population ratios.
2. A drugstore means a modern drugstore, a modern drugstore selling only packaged medicines, or a traditional medicine drugstore.
3. The Central Region includes Bangkok.

2.3 Distribution of Hospitals by Level of Hospitals

An analysis of hospital bed proportions by the level of hospitals will help reflect the distribution of hospitals by their capacity. It was found that the Northeast had the highest proportion of beds in community hospitals, while the proportion of beds among private hospitals was highest in the Central Region (Figure 6.54). For private hospitals, the bed proportions by province in the Central region, large provinces in the North as well as some provinces in the East and South were higher than those in other provinces (Figure 6.55).

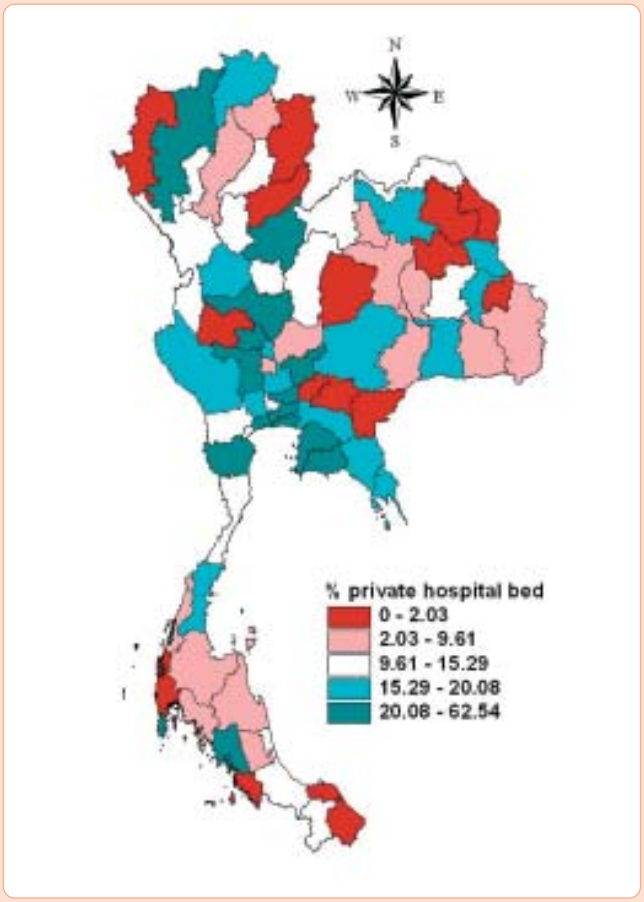
Figure 6.54 Bed proportions by level of hospitals and region, 2005



	Central	North	South	Northeast	Total
Community hospitals	19.2	14.4	14.8	13.2	15.8
General hospitals	21.8	16.6	11.1	9.3	15.6
Regional hospitals	15.0	15.7	18.9	17.3	16.4
Private hospitals	23.1	23.1	24.9	19.1	22.3
Others	20.9	30.2	30.2	41.2	29.9

Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Figure 6.55 Geographical distribution of bed proportions in private hospitals in relation to all beds by province, 2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

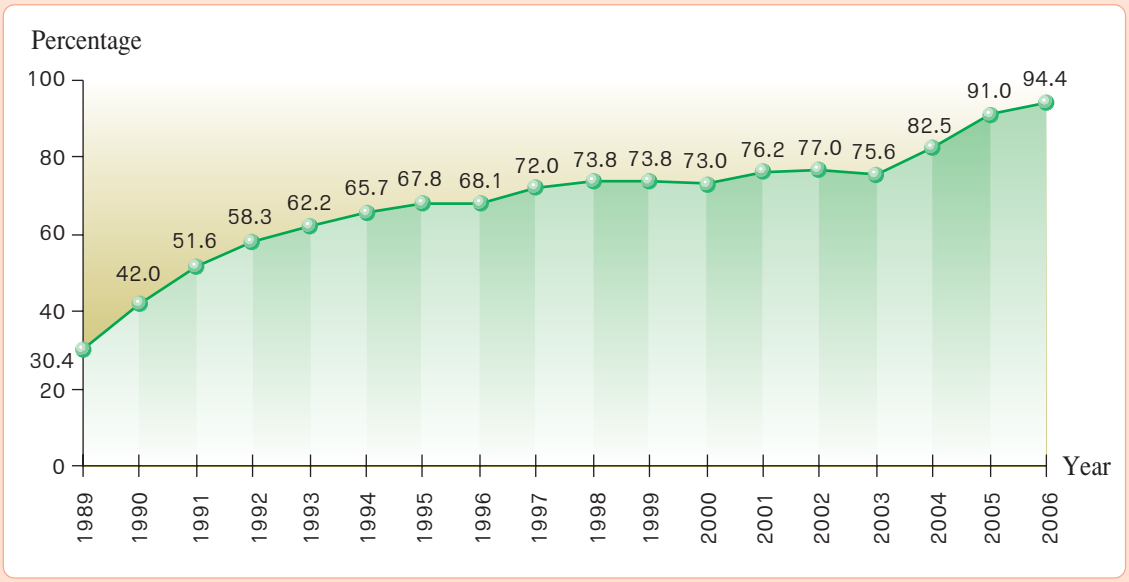
3. Health Technologies

Major health technologies are drugs and medical supplies as well as medical and health technologies for use in the treatment of illnesses.

3.1 Drug and Medical Supplies

The quality of domestically produced drugs has much improved as a result, in part, of the promotion of Good Manufacturing Practices (GMP). In 2003, the MoPH issued a rule requiring that all pharmaceutical manufacturers have a GMP certification. In 2006, 94.4% of the manufacturers were GMP-certified.

Figure 6.56 Percentage of GMP-certified drug manufacturers, 1989-2006



Source: Drug Control Division, Food and Drug Administration, MoPH.

During the economic booming period 1988-1996, with the monopolies of new drugs, the proportion of imported drugs had a rising trend. Even after the economic crisis, since 2002, the import trend had been rising steadily, up to 56.3% in 2005 (Table 6.11 and Figure 6.57).

When considering the values of local production and drug imports, the trends rose steadily, except for a slightly downward trend for production in 2005, while the import values rose and surpassed the production values for the same year, the difference being approximately nine billion baht (Figure 6.58).

In addition to production and dispensing of drugs for domestic consumption, some drugs are exported to other countries, the export values rising from 480.8 million baht in 1989 to 6,958.3 million baht in 2006 (Figure 6.59).

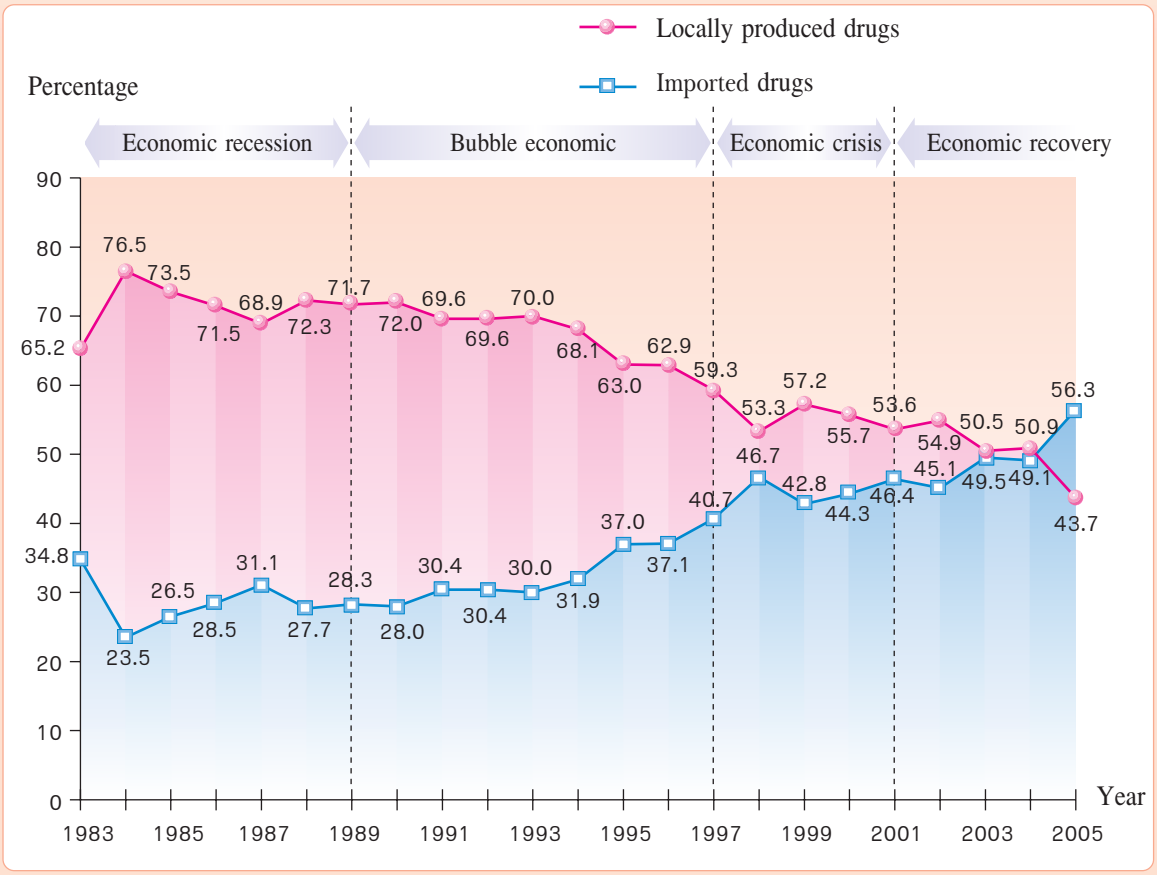
Table 6.11 Values of locally produced and imported drugs (for human use) 1983-2005

Year	Wholesale values as reported(current prices)								Estimates of retail prices Country x 1.8	Estimates consumption values 2005		Change (%)		Total retail prices value as a percentage of health expenditure
	Values	Percent	Values	Percent	Total (million baht)	Values of exports (million baht)	Values of domestic consumption[1] (million baht)	Estimates values of domestic consumption[2] X 1.675		Wholesale prices	Retail prices	Current prices	Constant prices	
1983	3,777.9	65.2	2,012.0	34.8	5,789.9	255.6	5,534.3	9,270.0	16,686.0	20,131.02	36,236.01	-	-	40.52
1984	5,453.0	76.5	1,673.0	23.5	7,126.0	284.0	6,842.0	11,460.4	20,628.7	24,703.42	44,466.31	+23.6	+22.7	39.49
1985	6,651.2	73.5	2,393.1	26.5	9,044.3	315.5	8,728.8	14,620.7	26,317.3	30,741.58	55,334.85	+27.6	+24.4	44.41
1986	4,678.0	71.5	1,864.5	28.5	6,542.5	350.5	6,192.0	10,371.6	18,668.9	21,405.22	38,529.39	-29.1	-30.4	28.26
1987	5,145.8	68.9	2,325.4	31.1	7,471.2	389.4	7,081.8	11,862.0	21,351.6	23,904.75	43,028.56	+14.4	+11.7	28.73
1988	6,708.8	72.3	2,571.0	27.7	9,279.8	432.7	8,847.1	14,818.9	26,674.0	28,748.65	51,747.57	+24.9	+20.3	29.65
1989	8,372.9	71.7	3,307.6	28.3	11,680.5	480.8	11,199.7	18,759.5	33,763.1	34,550.72	62,191.30	+26.6	+20.2	32.13
1990	8,886.0	72.0	3,449.1	28.0	12,335.1	604.1	11,731.0	19,649.4	35,368.9	34,157.60	61,483.68	+4.8	-1.1	28.23
1991	9,657.6	69.6	4,216.4	30.4	13,874.0	784.8	13,089.2	21,924.4	39,463.9	36,045.22	64,881.39	+11.6	+5.5	28.43
1992	10,696.6	69.6	4,682.6	30.4	15,379.2	1,193.5	14,185.7	23,761.0	42,769.8	37,537.81	67,568.06	+8.4	+4.1	27.08
1993	11,831.0	70.0	5,075.3	30.0	16,906.3	2,855.3	14,051.0	23,535.4	42,363.7	35,970.63	64,747.14	-0.9	-4.2	23.02
1994	12,969.7	68.1	6,086.6	31.9	19,056.3	1,536.2	17,520.1	29,346.2	52,823.2	42,698.67	76,857.61	+24.7	+18.7	26.41
1995	15,820.9	63.0	9,276.4	37.0	25,097.3	2,398.5	22,698.8	38,020.5	68,436.9	52,287.16	94,116.88	+29.6	+22.5	30.08
1996	18,120.4	62.9	10,676.0	37.1	28,796.4	1,784.9	27,011.5	45,244.3	81,439.7	58,777.14	105,798.86	+19.0	+12.4	31.63
1997	19,608.0	59.3	13,467.1	40.7	33,075.1	2,319.7	30,755.4	51,515.3	92,727.5	63,413.50	114,144.30	+13.9	+7.9	32.88
1998	16,127.7	53.3	14,146.5	46.7	30,274.2	2,782.3	27,491.9	46,048.9	82,888.1	52,426.60	94,367.88	-10.6	-17.3	30.02
1999	19,033.9	57.2	14,232.3	42.8	33,266.2	3,014.9	30,251.3	50,670.9	91,207.7	57,508.74	103,515.72	+10.0	+9.7	32.09
2000	20,995.9	55.7	16,700.4	44.3	37,696.3	3,732.7	33,963.6	56,889.0	102,400.2	63,574.15	114,433.40	+12.3	+10.5	34.16
2001	23,087.9	53.6	19,967.6	46.4	43,055.5	4,326.9	38,728.6	64,870.4	116,766.7	71,342.74	128,416.89	+14.0	+12.2	36.35
2002	24,144.6	54.9	19,867.9	45.1	44,012.5	4,115.5	39,897.0	66,827.5	120,289.5	72,998.48	131,397.31	+3.0	+2.3	36.04
2003	26,586.1	50.5	26,024.9	49.5	52,611.0	4,821.5	47,789.5	80,047.4	144,085.3	85,891.53	154,604.75	+19.8	+17.7	38.92
2004	31,707.6	50.9	30,545.5	49.1	62,253.1	4,961.6	57,291.5	95,963.3	172,734.0	100,234.49	180,422.08	+19.9	+16.7	43.97
2005	29,704.8	43.7	38,293.4	56.3	67,998.2	6,196.9	61,801.3	103,517.4	186,330.8	103,517.13	186,330.83	+7.9	+3.3	42.84
											Avg 18 yrs	12.8	8.5	-

Source: Drug Control Division, Food and Drug Administration, MoPH.

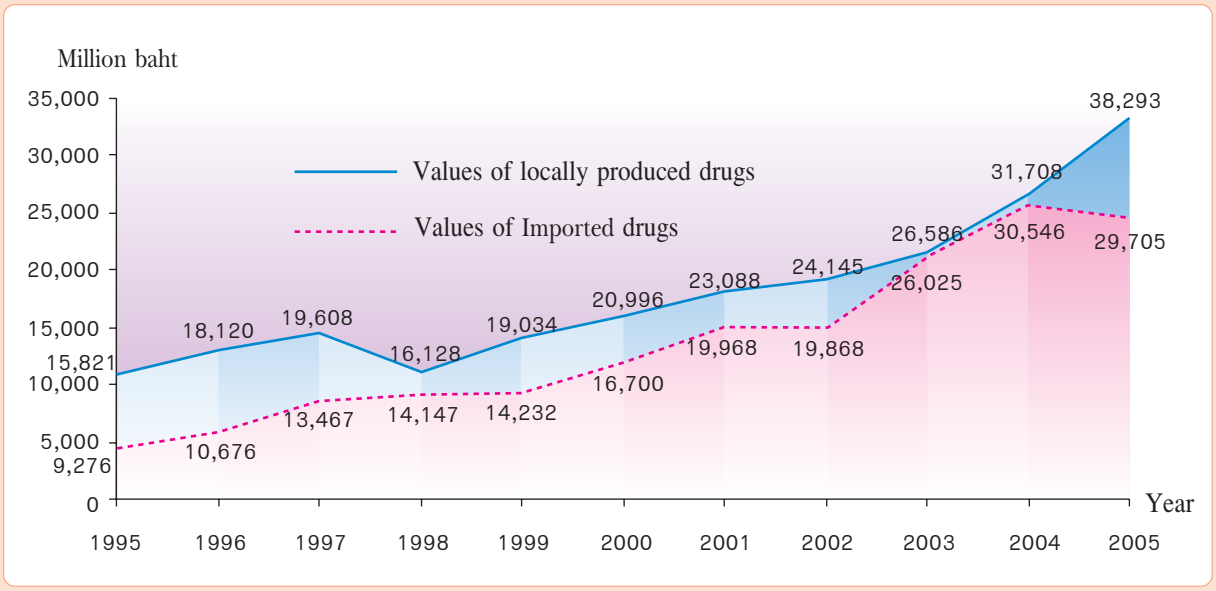
1. The estimates are to be deducted by export values
2. The reported figures are about 67.5% lower than actuality(48% underreported; and the reports do not include drugs from GPO, narcotics and psychoactive drugs)
3. Retail prices are about 1.8 times of wholesale prices.

Figure 6.57 Percentage of locally produced and imported drugs(for human use) 1983-2005



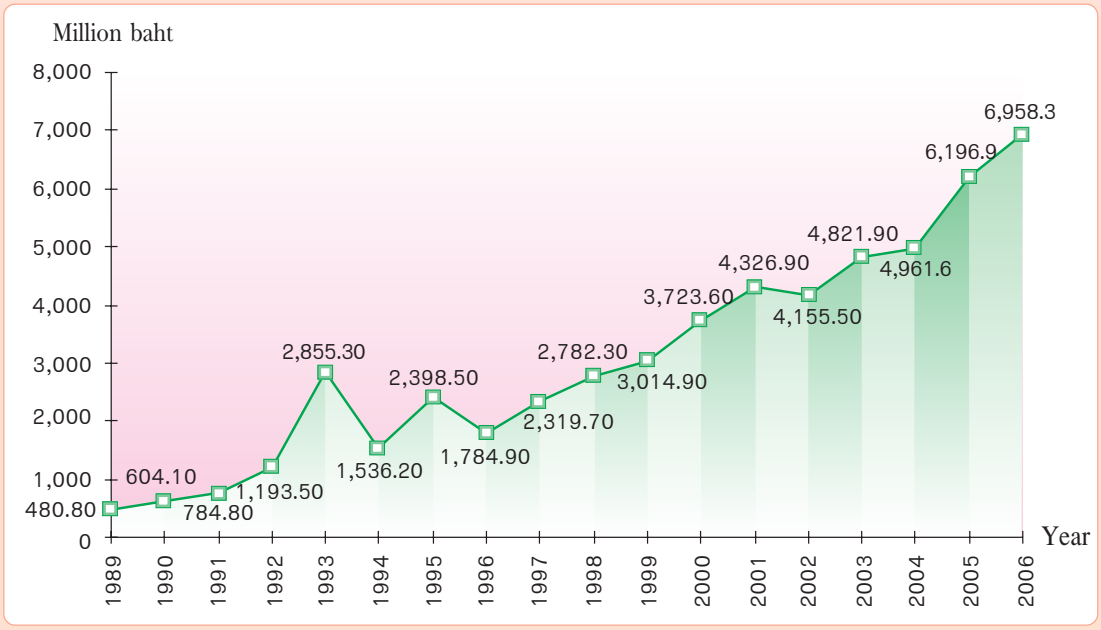
Source: Drug Control Division, Food and Drug Administration, MoPH.

Figure 6.58 Values of locally produced and imported drugs, 1995-2005



Source: Drug Control Division, Food and Drug Administration, MoPH.

Figure 6.59 Values of drugs exported from Thailand (current prices), 1989-2006



Source: Food and Drug Administration, MoPH.

Note: Data for 1989-2006 were derived from the Customs Department, Ministry of Finance.

3.2 Medical and Health Technologies

High-technology medical devices are on a rising trend, but mostly clustered in large cities and in the private sector rather than the public sector, except that extracorporeal shortwave lithotripters (ESWL) and ultrasound devices are more abundant in the public sector than in the private sector (Table 6.12).

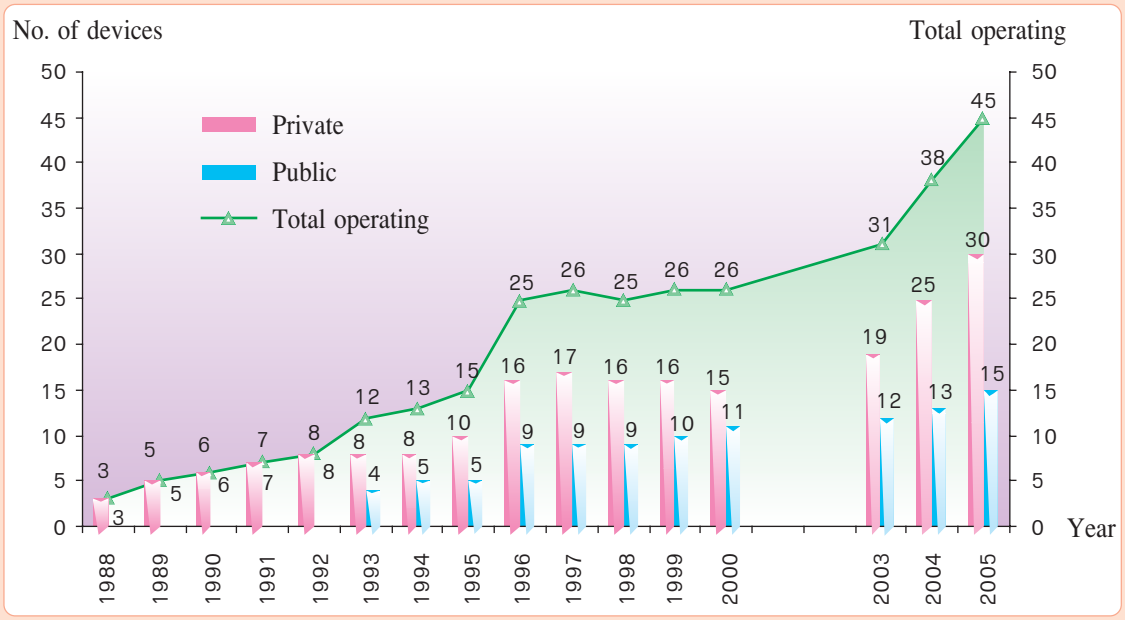
Table 6.12 Number and distribution of important medical devices

Device	No. of devices			Total by sector		Remarks
	Total	In Bangkok: No. (%)	In provinces: No. (%)	Public	Private	
1. CT scanners[1]	343	115 (33.5)	228 (66.5)	61 (17.8)	282 (82.2)	2006
2. Magnetic resonance imaging (MRI) [1]	45	30 (64.5)	15 (35.5)	15 (33.3)	30 (66.7)	2005
3. Lithotripters[2]	76	22 (29.3)	54 (70.7)	55 (72.4)	21 (27.6)	2005
4. Mammogram [1]	152	80 (54.9)	72 (45.1)	46 (30.3)	106 (69.7)	2006
5. Ultrasound [2]	1,987	399 (16.4)	1,588 (83.6)	1,501 (75.5)	486 (24.5)	2005

Sources: [1] Division of Radiology and Medical Devices, Department of Medical Services, 2006.
[2] Report on Health Resources. Bureau of Policy and Strategy, MoPH, 2007.

Note: Figures in ( ) are percentages.

Figure 6.60 Number of MRI devices in the private and public sectors in Thailand

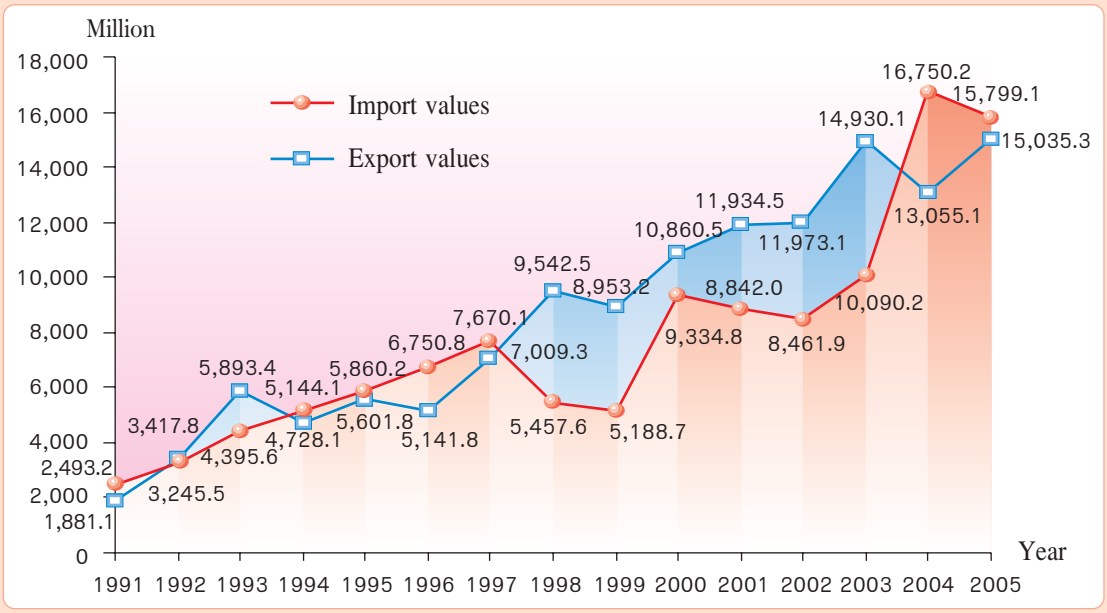


Sources: Data for 1988-1999 were derived from Piya Hanvoravongchai, 1999.
Data for 2003-2005 were derived from the Radiology and Medical Devices Division, Department of Medical Sciences, MoPH, 2006.

Note: The number for each year is as recorded at the end of the year, except for 2000.

The values of imported medical equipment rose 14.1% annually between 1991 and 2005. At the beginning of the economic crisis, the import values were decreasing, but increased by as much as 66.0% in 2004 whereas the values of exports have been rising since 1997, except for 2004 which had a small decrease (Figure 6.61).

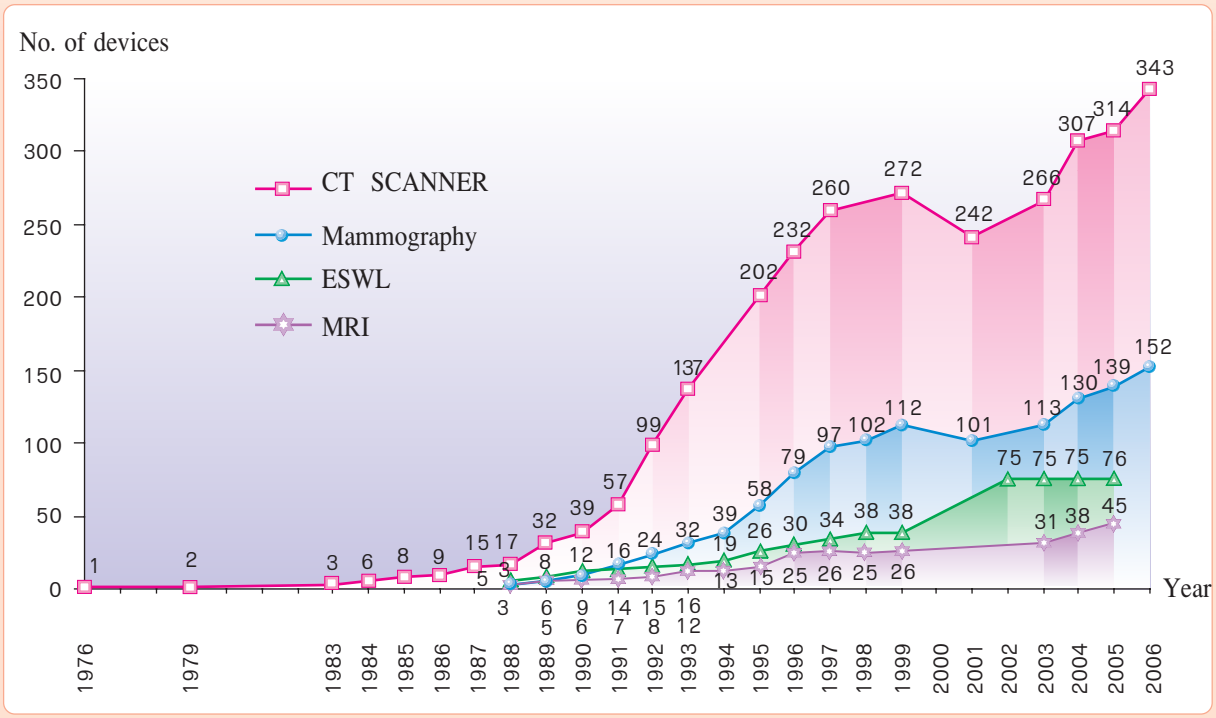
Figure 6.61 Values of imported and exported medical devices, Thailand, 1991-2005



Source: Department of Customs, Ministry of Finance.

The increase in values of technology imports was partly due to rising prices of high-cost equipment, particularly CT scanners, MRI devices, lithotripters and mammogram devices (Figure 6.62).

Figure 6.62 Numbers of high-cost medical technologies, Thailand, 1976-2006



Sources: - Wongduern Jindawatthana et al. High-cost Medical Devices in Thailand: Distribution, Utilization and Accessibility, 1999.

- For 2002-2006, data were derived from reports on health resources of the Bureau of Policy and Strategy, Office of the Permanent Secretary, and the Division of Radiology and Medical Devices, Department of Medical Sciences, MoPH.

The problem of inequalities in high-technology diffusion, especially CT scanner, MRI, ESWL and mammography, can be considered based on the device to population ratios (number of devices per 1 million population). For Bangkok, the ratios are highest for CT scanners, MRI, ESWL and mammography devices. But when using the discrepancy index, for Bangkok, the indices for all 4 types of devices ranged from 3.2 to 7.7 (compared with the national average), and for provincial areas the indices ranged from 0.4 to 1.3 (Table 6.13). For CT scanners, the discrepancy index dropped in 1999 but rose in 2006 (Table 6.14), the Bangkok/Northeast discrepancy declining from 12-fold in 1994 to 7.2-fold in 1999 and rose to 9.3-fold in 2006. This has shown that, even though the economic crisis is over, inequalities in medical device diffusion have increased.

Table 6.13 Ratio of high-cost medical technologies to population and discrepancy index by region, 2006

Region	Ratio of medical devices per 1 million population				Discrepancy index			
	ESWL (2005)	CT	MRI (2005)	Mammogram	ESWL (2005)	CT	MRI (2005)	Mammogram
Bangkok Metropolis	3.9	20.5	5.4	14.3	3.2	3.7	7.7	6.0
Provincial areas	1.0	4.0	0.3	1.3	0.8	0.7	0.4	0.5
Central	1.0	7.4	0.2	2.4	0.8	1.3	0.3	1.0
North	0.9	4.0	0.3	0.9	0.8	0.7	0.4	0.4
Northeast	0.8	2.2	0.2	0.7	0.7	0.4	0.3	0.3
South	1.2	2.9	0.5	1.3	1.0	0.5	0.7	0.5
Nationwide	**1.2**	**5.5**	**0.7**	**2.4**	**1.0**	**1.0**	**1.0**	**1.0**

Sources: - Report on Health Resources. Bureau of Policy and Strategy, MoPH (ESWL data for 2005).
- Division of Radiology and Medical Devices, Department of Medical Sciences (MRI, 2005; CT and mammography devices, 2006).

Table 6.14 Ratio of CT scanner to population and discrepancy index by region, 1994 and 1998-2006

Region	No. of CT scanners					Ratio of CT scanners per 1 million population					Discrepancy index				
	1994	1998	1999	2003	2006	1994	1998	1999	2003	2006	1994	1998	1999	2003	2006
Bangkok Metropolis	88	83	89	89	115	15.7	14.8	15.9	13.3	20.5	12.1	8.6	7.2	7.8	9.3
Provincial areas	117	156	183	177	228	2.2	2.8	3.3	3.1	4.0	1.7	1.6	1.5	1.8	1.8
Central	45	66	74	80	110	3.3	4.6	5.2	5.3	7.4	2.7	2.7	2.4	3.1	3.4
North	31	37	41	37	48	2.6	3.1	3.4	3.2	4.0	2.0	1.8	1.5	1.9	1.8
Northeast	26	36	46	38	46	1.3	1.8	2.2	1.7	2.2	1.0	1.0	1.0	1.0	1.0
South	15	17	22	22	24	2.0	2.1	2.8	2.5	2.9	1.5	1.2	1.3	1.5	1.3
Nationwide	205	239	272	266	343	3.5	3.9	4.5	4.2	5.5	2.7	2.3	2.0	2.5	2.5

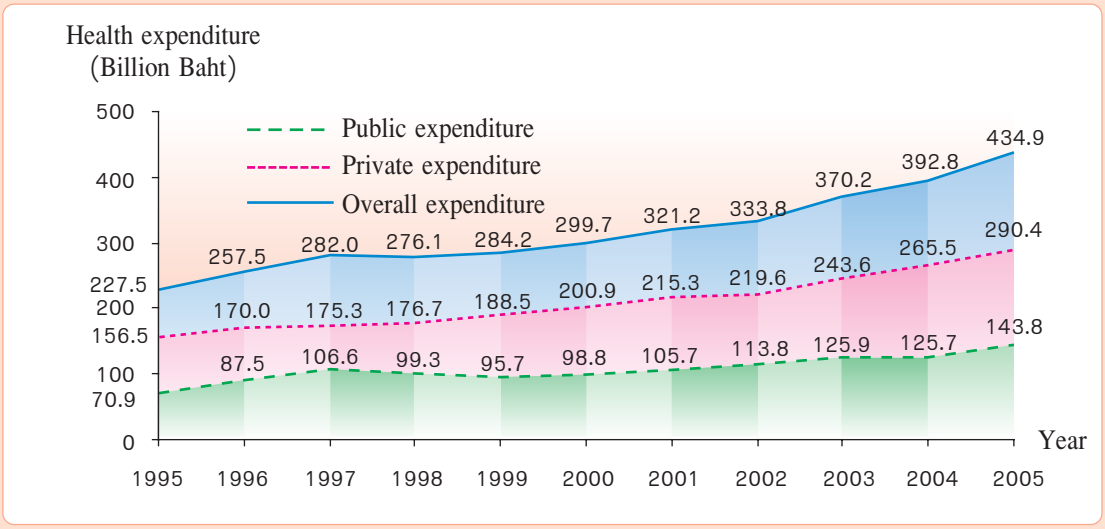
Sources: For 1994, data were derived from Viroj Tangcharoensathien et al. Diffusion of Medical Equipment in Thailand, 1995.
For 1998 and 2003-2006, data were derived from the Division of Radiology and Medical Devices, Department of Medical Sciences.
For 1999, data were derived from Wongduern Jindawatthana et al. High-cost Medical Devices in Thailand: Distribution, Utilization and Accessibility, 1999.

4. Health Expenditures

4.1 Trends in Overall Health Expenditure

During the past decades, health expenditures in Thailand were on a rapid upward trend, rising from 25,315 million baht in 1980 to 434,974 million baht in 2005(Table 6.15 and Figure 6.63), a 17.2-fold increase. Per-capita health spending rose from 545 baht in 1980 to 6,994 baht in 2005 (Figure 6.64), a 12.8-fold increase in current prices.

Figure 6.63 Overall, public and private health expenditures, 1995-2005

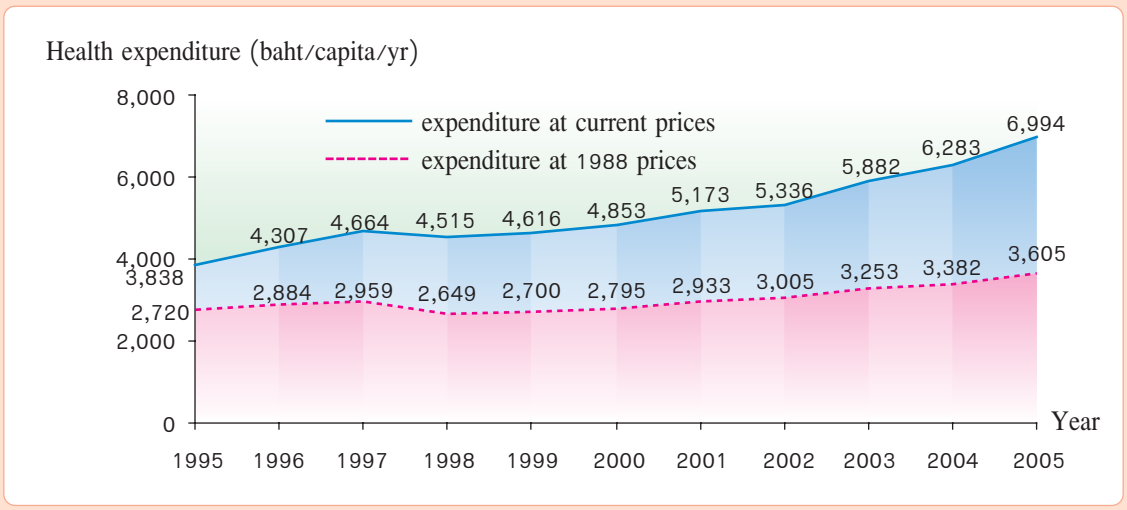


Sources: 1. Office of the National Economic and Social Development Board. National Income, Thailand, 1951-2005.

2. Viroj Tangcharoensathien. Sufferings and Causes in Health Systems, 1996.

3. Charles Myers. Financing Health Services and Medical Care in Thailand, 1985.

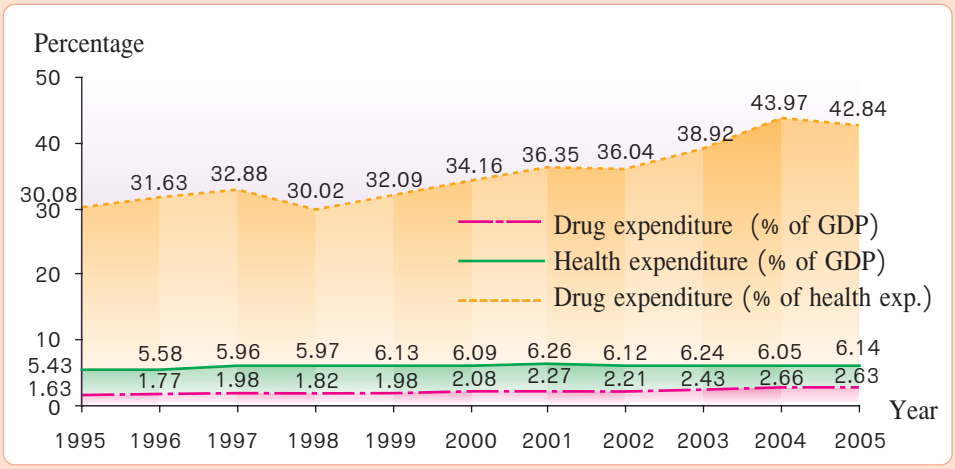
Figure 6.64 Overall health expenditure per capita at current prices and at 1988 prices, 1995-2005



Sources: Tables 6.15 and 6.17.

As a percentage of GDP, the national health expenditure rose from 3.8% in 1980 to 6.1% in 2005 (Figure 6.65), the growth rising at the rate faster than that for GDP, i.e. an average at 7.7% in real terms while the average GDP growth was only 5.7% annually (Table 6.16). Most of health spending was on curative care as evidenced by the fact that the proportion of pharmaceutical spending rose to 42.8% of overall health spending in 2005 (Table 6.16 and Figure 6.65).

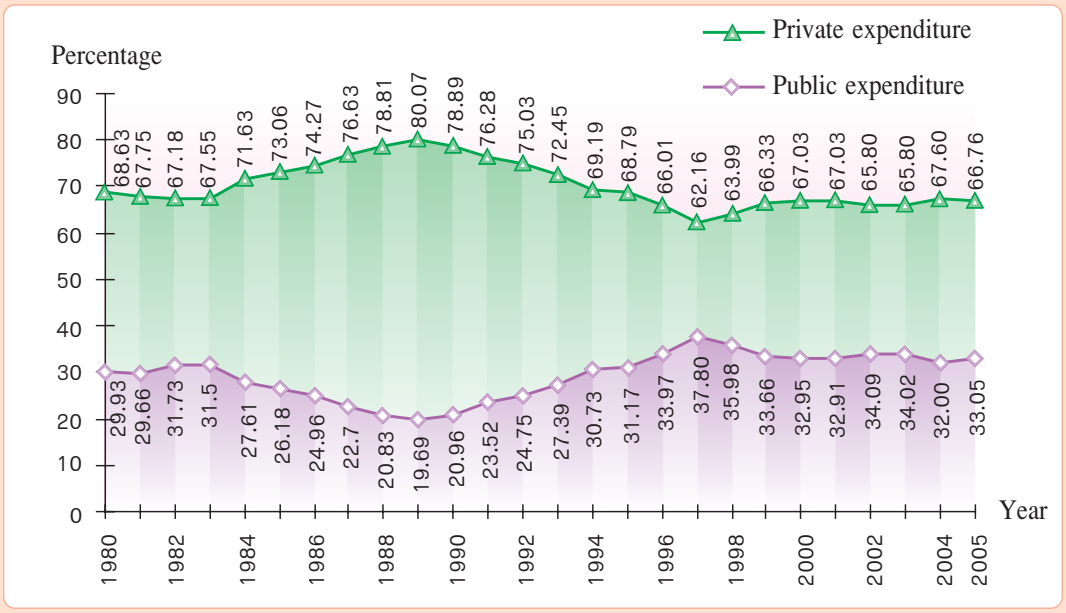
Figure 6.65 Overall health and drug expenditures in relation to GDP and proportion of drug expenditure to health expenditure, 1995-2005



Source: Table 6.16.

Regarding sources of health expenditure, a higher proportion was from the private including household sector (66.8% of overall health expenditure in 2005), whereas an overall proportion (33%) was from the public sector (Figure 6.66).

Figure 6.66 Proportions of public and private health expenditures, 1980-2005



Source: Table 6.17.

Table 6.15 Health expenditure at current prices, 1980-2005 (million baht)

Year	Public sector								Private sector				International financial aid		Total health expenditure		
	MoPH	Other ministries	Civil servant benefit scheme	State enterprise benefit scheme	Works' compen-sation fund	Social security	Total	Percent	Private health insurance	House-holds & employers	Total	Percent	Total	Percent	Amount	Per capita	As percentage of GDP
1980	4,495	2,210	660	111	100	-	7,576	29.93	224	17,150	17,374	68.68	365	1.44	25,315	544.94	3.82
1981	5,572	2,535	995	167	149	-	9,418	29.66	284	21,229	21,513	67.75	824	2.59	31,755	668.70	4.18
1982	6,652	2,838	1,219	204	153	-	11,066	31.73	318	23,109	23,427	67.18	380	1.09	34,873	719.16	4.14
1983	7,902	3,134	1,482	248	205	-	12,971	31.50	350	27,469	27,819	67.55	391	0.95	41,181	832.63	4.47
1984	8,618	3,467	1,791	300	250	-	14,426	27.61	469	36,951	37,420	71.63	395	0.76	52,241	1,036.61	5.29
1985	9,044	3,716	2,157	362	236	-	15,515	26.18	547	42,751	43,298	73.06	452	0.76	59,265	1,146.75	5.61
1986	9,275	3,965	2,594	435	221	-	16,490	24.96	630	48,432	49,062	74.27	508	0.77	66,060	1,254.78	5.83
1987	9,525	4,082	2,828	474	274	-	17,183	22.70	756	57,258	58,014	76.63	507	0.67	75,704	1,439.10	5.82
1988	10,373	4,338	3,156	529	347	-	18,743	20.83	951	69,955	70,906	78.81	319	0.35	89,968	1,649.70	5.77
1989	11,733	4,448	3,521	590	397	-	20,689	19.69	1,162	82,988	84,150	80.07	252	0.24	105,091	1,895.31	5.66
1990	16,225	4,558	4,316	723	443	-	26,265	20.96	1,403	97,450	98,853	78.89	184	0.15	125,302	2,224.04	5.74
1991	20,569	4,699	5,127	859	624	778	32,656	23.52	1,544	104,348	105,892	76.28	270	0.19	138,818	2,449.93	5.54
1992	24,604	4,840	5,854	981	753	2,057	39,089	24.75	1,775	116,745	118,520	75.03	356	0.23	157,965	2,753.20	5.58
1993	32,898	4,928	7,906	1,291	927	2,473	50,423	27.39	2,061	131,297	133,358	72.45	281	0.15	184,062	3,141.85	5.81
1994	39,319	5,558	9,954	1,668	1,169	3,773	61,441	30.73	2,307	136,047	138,354	69.19	154	0.08	199,949	3,405.40	5.51
1995	45,833	6,677	11,156	1,869	1,370	3,991	70,896	31.17	4,984	151,508	156,492	68.79	89	0.04	227,477	3,837.50	5.43
1996	55,861	7,768	13,587	2,418	1,610	6,239	87,483	33.97	6,296	163,693	169,989	66.01	35	0.01	257,507	4,307.00	5.58
1997	68,934	7,182	15,503	2,756	1,987	10,245	106,607	37.80	7,518	167,780	175,298	62.16	96	0.03	282,001	4,663.80	5.96
1998	65,065	5,740	16,440	2,817	1,630	7,637	99,329	35.98	7,803	168,876	176,679	63.99	82	0.03	276,090	4,514.50	5.97
1999	62,787	6,087	15,174	2,539	1,404	7,676	95,667	33.66	8,171	180,356	188,527	66.33	41	0.01	284,235	4,615.90	6.13
2000	63,001	6,195	17,062	1,622	1,257	9,623	98,760	32.95	7,291	193,634	200,925	67.03	72	0.02	299,757	4,852.80	6.09
2001	61,563	7,134	19,180	3,013	1,277	13,543	105,710	32.91	8,400	206,942	215,342	67.03	187	0.06	321,239	5,173.40	6.26
2002	70,923	6,884	20,475	3,081	1,220	11,223	113,806	34.09	9,734	209,886	219,620	65.80	372	0.11	333,798	5,336.10	6.12
2003	74,134	8,579	22,679	3,971	1,480	15,113	125,956	34.02	11,128	232,457	243,585	65.80	665	0.18	370,206	5,881.90	6.24
2004	77,721	7,056	19,798	4,101	1,490	15,553	125,719	32.00	12,581	252,956	265,537	67.60	1,573	0.40	392,829	6,282.60	6.05
2005	85,914	6,070	28,951	3,741	1,507	17,592	143,775	33.05	13,861	276,547	290,408	66.76	791	0.18	434,974	6,993.60	6.14

Notes:
1. NESDB, Thailand's National Income, 1951-2005
2. Viroj Tangcharoensathien. Sufferings and Causes in Health System, 1996.
3. Chares Myers. Financing Health services and Medical Care in Thailand, 1985

Notes: Methods for estimating health expenditure:

1. MoPH – real figures from the Bureau of Policy and Strategy, Office of the Permanent Secretary.
2. Workers' Compensation Fund and Social Security – real figures from the Social Security Office.
3. Civil servants welfare – real figures form the Comptroller – General's Department, Ministry of Finance.
4. Health spending of households and employers – figures were derived from NESDB's National Income Reports; since 1994, such figures have been adjusted to include only fees for curative care, medication, and medical supplies/equipment; while the spending on emergency care has been shifted to "other service item", resulting in a drop in this category.
5. Other ministries
   - 5.1 1980-1983 – from Financing Health Services and Medical Care in Thailand, Charles Myers, 1985.
   - 5.2 1984-1992 (even number years) – from the Viroj's Sufferings and Causes Study.
   - 5.3 1984-1992 (odd number years) – by averaging the figures in the previous and following years.
   - 5.4 1994-2000 – from the Bureau of the Budget.
   - 5.5 2001-2005 – figures were derived from actual expenditure or spending as reported by the Comptroller-General's Department, Ministry of Finance, computed by NESDB.
6. State enterprise welfare
   - Estimates based on a constant proportion in relation to the civil servants welfare, i.e. = civil servants welfare x $\frac{1,668}{9,954}$ (based on national health account figures for 1994)
   - 1996-2005 – real numbers from the State Enterprise Office, Bureau of the Budget.
7. Private health insurance

   Data for 1980-1986, derived by Charles Myers from the Insurance Department.

   Data for 1994, from Viroj Tangcharoensathien.
   - 7.1 1980-1983 – from Charles Myer's report.
   - 7.2 1984-1994 – using the ratio of private insurance to total private health expenditure, i.e. ~1.26 for 1983 and ~1.62 for 1994, and average increasing ratios during the period.
   - 7.3 1995-2005 – real numbers from the Insurance Department, Ministry of Commerce.
8. Foreign aid
   - 8.1 1980-1983 – from Charles Myer's report.
   - 8.2 1984-1992 (even number years) – from Viroj's Sufferings and Causes Study.
   - 8.3 1984-1993 (odd number years) – by averaging the figures in the previous and following years.
   - 8.4 1994-2001 – data were derived from Viroj Tangcharoensathien et al. Report on National Health Accounts, 1994-2001.
   - 8.5 2002-2005, data were derived from the World Health Organization, the Department of Technical and Economic Cooperation, and all MoPH's departments.

Table 6.16 Health and drug expenditures in relation to GDP, 1980-2005 (million baht)

Year	GDP			health expenditure				drug expenditure				
	Actual values	Values in 1988 prices	Increase (percent)	Actual values	Values in 1988 prices	Increase (percent)	Percentage of GDP	Actual values	Values in 1988 prices	Increase (percent)	As percentage of GDP	As percentage of health expenditure
1980	662,482	913,733	4.61	25,315	34,916	-	3.82	-	-	-	-	-
1981	760,356	967,706	5.91	31,755	40,415	15.75	4.18	-	-	-	-	-
1982	841,569	1,019,501	5.35	34,873	42,246	4.53	4.14	-	-	-	-	-
1983	920,989	1,076,432	5.58	41,181	48,131	13.93	4.47	16,686	19,502	-	1.81	40.52
1984	988,070	1,138,353	5.75	52,241	60,187	25.05	5.29	20,629	23,767	21.87	2.09	39.49
1985	1,056,496	1,191,255	4.65	59,265	66,824	11.03	5.61	26,317	29,674	24.85	2.49	44.41
1986	1,133,397	1,257,177	5.53	66,060	73,275	9.65	5.83	18,669	20,708	-30.21	1.65	28.26
1987	1,299,913	1,376,847	9.52	75,704	80,184	9.43	5.82	21,352	22,616	9.21	1.67	28.73
1988	1,559,804	1,559,804	13.29	89,968	89,968	12.20	5.77	26,674	26,674	17.94	1.71	29.65
1989	1,856,992	1,749,952	12.19	105,091	99,033	10.08	5.66	33,763	31,817	19.28	1.82	32.13
1990	2,183,545	1,945,372	11.23	125,302	111,635	12.72	5.74	35,369	31,511	-0.96	1.62	28.23
1991	2,506,635	2,111,862	8.56	138,818	116,955	4.77	5.54	39,464	33,249	5.51	1.57	28.43
1992	2,830,914	2,282,572	8.08	157,965	127,368	8.90	5.58	42,770	34,486	3.72	1.51	27.08
1993	3,170,258	2,473,937	8.38	184,062	143,634	12.77	5.81	42,364	33,059	-4.14	1.34	23.02
1994	3,629,341	2,722,006	10.03	199,949	149,962	4.41	5.51	52,823	39,617	19.83	1.45	26.41
1995	4,186,212	2,967,542	9.02	227,477	161,255	7.53	5.43	68,437	48,514	22.46	1.63	30.08
1996	4,611,041	3,087,751	4.05	257,507	172,438	6.93	5.58	81,440	54,536	12.41	1.77	31.63
1997	4,732,610	3,002,925	-2.75	282,001	178,935	3.77	5.96	92,728	58,838	7.89	1.98	32.88
1998	4,626,447	2,715,051	-9.59	276,090	162,025	-9.45	5.97	82,888	48,643	-17.33	1.82	30.02
1999	4,637,079	2,712,800	-0.08	284,235	166,284	2.63	6.13	91,208	53,359	9.70	1.98	32.09
2000	4,923,263	2,835,981	4.54	299,757	172,671	3.84	6.09	102,400	58,986	10.55	2.08	34.16
2001	5,133,836	2,910,338	2.62	321,239	182,108	5.47	6.26	116,767	66,194	12.22	2.27	36.35
2002	5,451,854	3,069,738	5.48	333,798	187,949	3.21	6.12	120,290	67,731	2.32	2.21	36.04
2003	5,917,368	3,272,881	6.62	370,206	204,760	8.94	6.24	144,085	79,693	17.66	2.43	38.92
2004	6,489,847	3,494,175	6.76	392,829	211,502	3.29	6.05	172,734	93,001	16.70	2.66	43.97
2005	7,087,660	3,653,433	4.56	434,974	224,213	6.01	6.14	186,331	96,047	3.28	2.63	42.84
		Average	5.70			7.72				7.52		

Source : Tables 6.15 and 6.17

Note : Since 1994, NESDB has adjusted the GDP figures.

Table 6.17 Proportions of sources of health expenditures in Thailand, 1980-2005(1988 prices)

Source of spending	1980	1982	1984	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
1. Public sector																							
Ministry of Public Health	17.76	19.07	16.50	14.04	12.58	11.53	11.16	12.95	14.82	15.58	17.87	19.67	20.15	21.69	24.44	23.57	22.10	21.02	19.16	21.25	20.03	19.78	19.75
Other ministries	8.73	8.14	6.64	6.00	5.39	4.82	4.23	3.64	3.39	3.06	2.68	2.78	2.94	3.02	2.55	2.08	2.14	2.07	2.22	2.06	2.32	1.80	1.40
Civil servants benefit sehme	2.61	3.50	3.43	3.93	3.74	3.51	3.35	3.44	3.69	3.71	4.30	4.98	4.91	5.28	5.50	5.95	5.34	5.69	5.97	6.13	6.13	5.04	6.66
State enterprise benefit sehme	0.44	0.58	0.57	0.66	0.63	0.59	0.56	0.58	0.62	0.62	0.70	0.83	0.82	0.94	0.98	1.02	0.89	0.54	0.94	0.92	1.07	1.04	0.86
Workers' compensation fund	0.40	0.44	0.48	0.33	0.36	0.39	0.38	0.35	0.45	0.48	0.50	0.58	0.60	0.62	0.70	0.59	0.49	0.42	0.40	0.37	0.40	0.38	0.35
Social security	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	1.30	1.34	1.89	1.75	2.42	3.63	2.77	2.70	3.21	4.22	3.36	4.08	3.96	4.04
Total	29.93	31.73	27.61	24.96	22.70	20.83	19.69	20.96	23.52	24.75	27.39	30.73	31.17	33.97	37.80	35.98	33.66	32.95	32.91	34.09	34.02	32.00	33.05
2. Private sector																							
Private health insurance	0.88	0.91	0.90	0.95	1.00	1.06	1.11	1.12	1.11	1.12	1.12	1.15	2.19	2.44	2.66	2.82	2.88	2.43	2.61	2.92	3.01	3.20	3.19
Households and emplyers	67.75	66.27	70.73	73.32	75.63	77.76	78.97	77.77	75.17	73.91	71.33	68.04	66.6	63.57	59.5	61.17	63.45	64.6	64.42	62.88	62.79	64.39	63.57
Total	68.63	67.18	71.63	74.27	76.63	78.81	80.07	78.89	76.28	75.03	72.45	69.19	68.79	66.01	62.16	63.99	66.33	67.03	67.03	65.80	65.80	67.60	66.76
3. Other																							
International financial aid	1.44	1.09	0.76	0.77	0.67	0.35	0.24	0.15	0.19	0.23	0.15	0.08	0.04	0.01	0.03	0.03	0.01	0.02	0.06	0.11	0.18	0.40	0.18
Total (%)	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Overall health expenditure (million baht)	34,916	42,246	60,187	73,275	80,184	89,968	99,033	111,635	116,955	127,368	143,634	149,962	161,255	172,438	178,935	162,025	166,284	172,671	182,108	187,949	204,760	211,502	224,213
Increase rate(%)	-	4.53	25.05	9.65	9.43	12.20	10.08	12.72	4.77	8.90	12.77	4.41	7.53	6.93	3.77	-9.45	2.63	3.84	5.47	3.21	8.94	3.29	6.02
As percentage of GDP	3.82	4.14	5.29	5.83	5.82	5.77	5.66	5.74	5.54	5.58	5.81	5.51	5.43	5.58	5.96	5.97	6.13	6.09	6.26	6.12	6.24	6.05	6.14
Population (million)	46.45	48.49	50.40	52.65	52.61	54.54	55.45	56.34	56.66	57.37	58.58	58.72	59.28	59.79	60.46	61.15	61.58	61.77	62.09	62.55	62.94	62.53	62.20
Per capita expenditure(baht)	752	871	1,194	1,392	1,524	1,650	1,786	1,981	2,064	2,220	2,452	2,554	2,720	2,884	2,959	2,649	2,700	2,795	2,933	3,005	3,253	3,382	3,605
Increase (%)	-	15.82	37.08	16.58	9.51	8.23	8.27	10.94	4.17	7.56	10.44	4.16	6.50	6.03	2.60	-10.48	1.93	3.52	4.94	2.45	8.27	3.97	6.57

Source: Table 6.16

In comparison with other Asian countries (Table 6.18), although Thailand's per capita health expenditure is not so high, its spending as a percentage of GDP is higher than those for other countries; and its proportion of public health spending is lower than that of private health spending, the people bearing a greater share of healthcare spending for themselves.

Table 6.18 Comparison of health expenditures among some Asian countries

Country	Health expenditure		
	Per capita (USD)	As percentage of GDP	Proportion, Govt.: household
Indonesia	113	3.1	35.9 : 64.1
The Philippines	174	3.2	43.7 : 56.3
Sri Lanka	121	3.5	45.0 : 55.0
Malaysia	374	3.8	58.2 : 41.8
Thailand (2004)	145	6.1	32.0 : 67.6
Singapore	1,156	4.5	36.1 : 63.9
South Korea	1,074	5.6	49.4 : 50.6

Source: The World Health Report, 2006 (data for 2003).

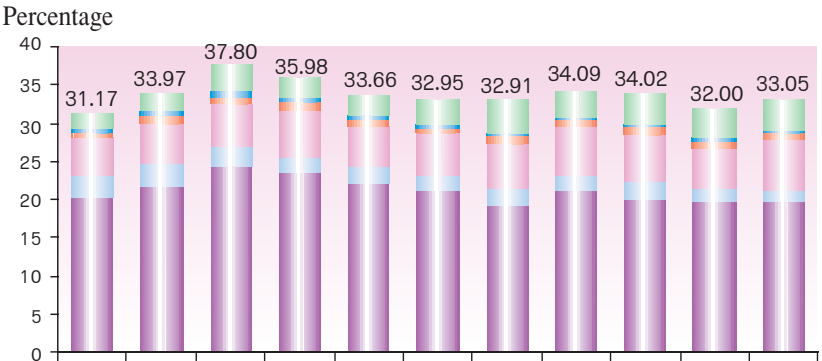
Note: For 2004, the exchange rate of 40 baht to a US dollar is used.

4.2 Public Health Expenditure

The major source of public expenditure on health is the government budget, especially the MoPH which is a central administration agency. During the 1980-1989 decade, the proportion of public spending on health dropped from 29.9% to 19.7%. But after 1989, the public spending proportion had a rising trend to 37.8% in 1997, during the period of rapid economic recovery and continuous growth. After the economic crisis the government had to adjust the national budget downwards, resulting in a drop to 32.9% in 2001, but increased again in 2002 to 34.1%, probably due to the launch of the universal health care policy.

An analysis of the sources of public spending on health revealed that the proportion from the MoPH had a falling trend from 24.4% in 1997 to 19.7% in 2005, while the proportion of health expenditure under the civil servants medical benefits scheme rose from 5.5% in 1997 to 6.7% in 2005; similarly, the proportion of health expenditure under the social security scheme also rose from 2.4% in 1996 to 4% in 2005 (Figure 6.67).

Figure 6.67 Proportion of public health expenditure, 1995-2005

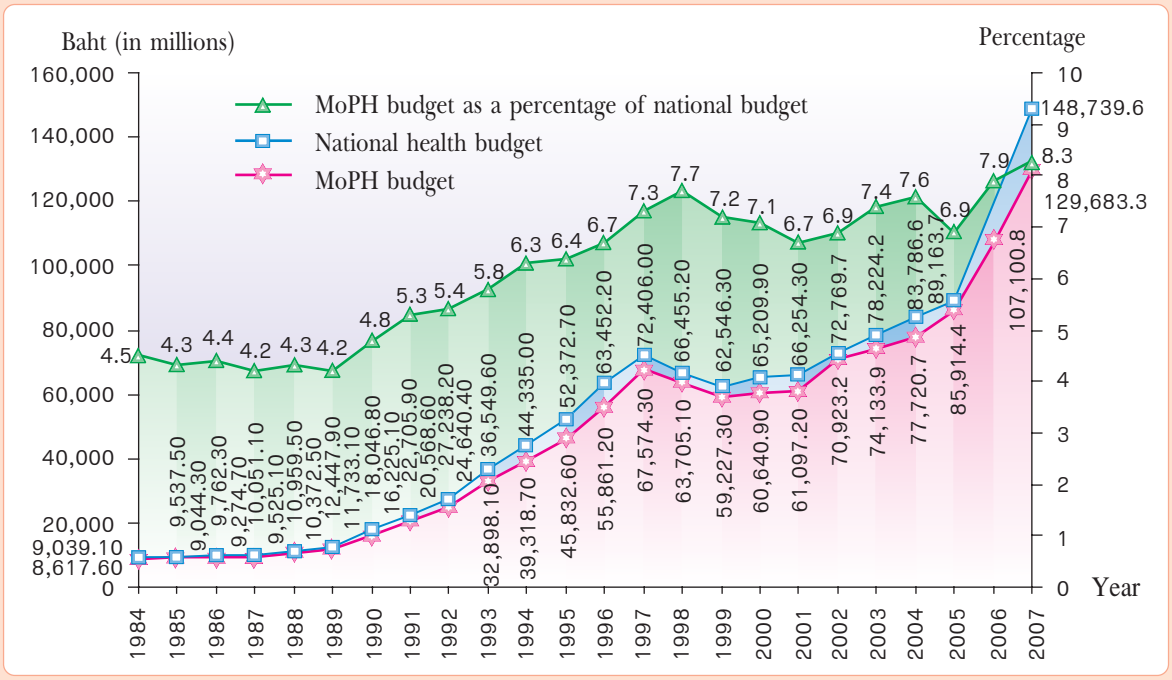


	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Social security	1.75	2.42	3.63	2.77	2.70	3.21	4.22	3.36	4.08	3.96	4.04
Workers' compensation	0.60	0.62	0.70	0.59	0.49	0.42	0.40	0.37	0.40	0.38	0.35
Stae enterprise	0.82	0.94	0.98	1.02	0.89	0.54	0.94	0.92	1.07	1.04	0.86
Civil servants welfare	4.91	5.28	5.50	5.95	5.34	5.69	5.97	6.13	6.13	5.04	6.66
Other ministries	2.94	3.02	2.55	2.08	2.14	2.07	2.22	2.06	2.32	1.80	1.40
MoPH	20.15	21.69	24.44	23.57	22.10	21.02	19.16	21.25	20.03	19.78	19.75

Source: Table 6.17.

Regarding the budget of the MoPH, the proportion in relation to the national budget rose from 6.7% in 2001 to 7.6% and 8.3% in 2004 and 2007, respectively (Figure 6.68), reflecting the continuous importance accorded by the government to the health service system.

Figure 6.68 The National health budget and the MoPH budget, 1984-2007



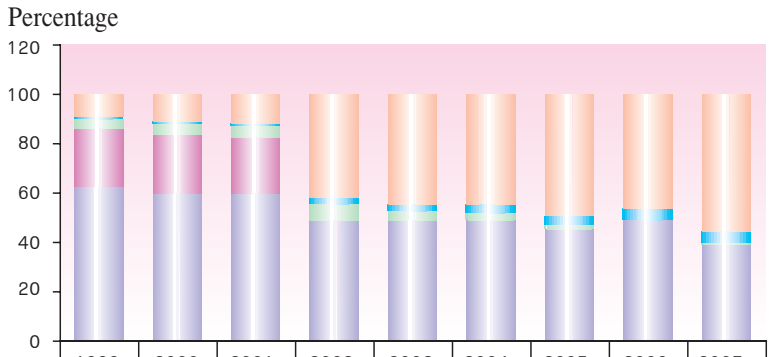
Source: Bureau of the Budget.

Note: For 1995-2007, the MoPH budget includes the health insurance revolving funds (previously known as health card revolving funds).

In connection with the allocation of government health budget, importance has been accorded to curative care, as evidenced by the 60% to 66% of budget allocated hospital-based services, while only 20% to 24% of health budget is allocated for health services at subdistrict health centres focusing on health promotion and disease prevention (Figure 6.69). Since 2002, the budget system has been restructured, according to the Universal Coverage of Health Care Scheme, and the investment budget decreased, resulting in a drop in the proportion of budget for hospitals. However, the budget increase is noted for the universal healthcare fund (other health programmes) including the budget for health centres as well as health promotion and disease prevention

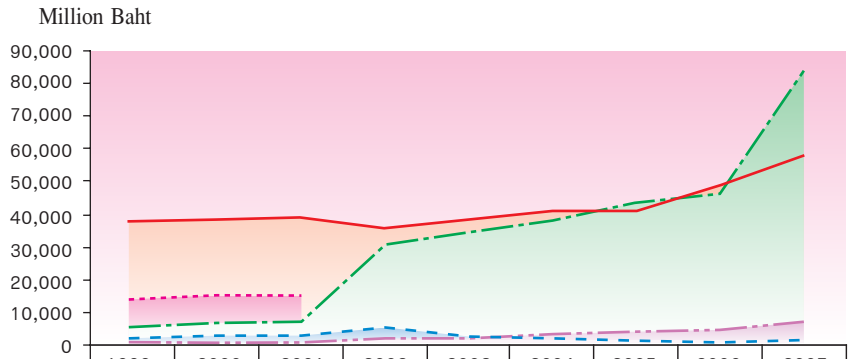
When considering the amount of budget, it was found that the trends in hospital budget were on the rise as the MoPH budget, especially the budget for other health activities which include the universal healthcare fund, rose considerably from 30,113 million baht in 2002 to 82,741 million baht in 2007 (Figure 6.70).

Figure 6.69 Proportion of health budget by category, 1999-2007



	1999	2000	2001	2002	2003	2004	2005	2006	2007
Other health activities	9.0	10.7	11.6	41.4	44.3	44.7	48.7	46.2	55.6
Health research	1.3	1.4	1.1	2.8	2.7	3.8	4.3	4.3	4.4
Health services	3.6	3.9	4.3	7.0	3.7	2.3	1.2	0.8	1.0
Outpatient services (Health centers)	23.3	23.8	23.0	NA	NA	NA	NA	NA	NA
Hospital	62.8	60.2	60.0	48.8	49.3	49.2	45.8	48.7	39.0

Figure 6.70 Health budget by category, 1999-2007



	1999	2000	2001	2002	2003	2004	2005	2006	2007
Hospital	37,795	38,230	38,949	35,547	38,554	41,253	40,819	49,222	57,994
Outpatient services (Health centre)	14,045	15,122	14,943	NA	NA	NA	NA	NA	NA
Health services	2,187	2,495	2,766	5,073	2,876	1,949	1,051	823	1,534
Health research	809	858	719	2,037	2,113	3,172	3,859	4,374	6,472
Other health activities	5,344	6,796	7,551	30,113	34,681	37,413	43,434	46,621	82,741

Source: Bureau of the Budget.

Note: Since 2002, the Bureau of the Budget has included the outpatient service budget (at health centres) in the "other health activities" category.

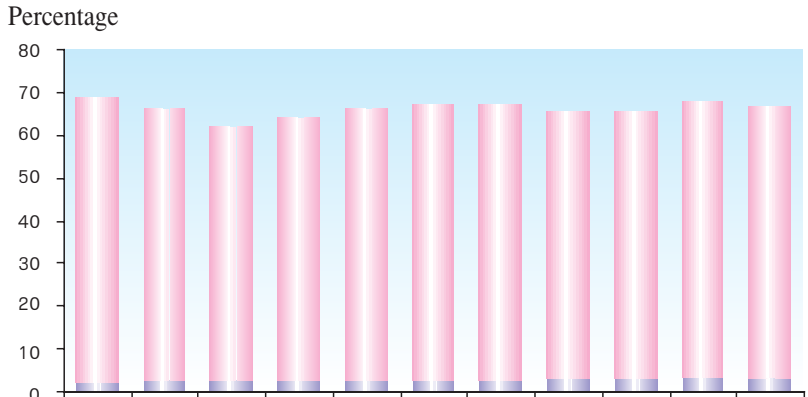
4.3 Private and Household Health Expenditure

The private sector has households as the largest source of funds for health care since the people sometimes have to make an out-of-pocket payment for the services, according to their behaviour of buying drugs for self-medication, or whenever they are not entitled to such services at a private clinic or private hospital, or when they do not follow the steps or procedures of the state healthcare scheme, in the designated area, or at the healthcare facility. Therefore, the household financing plays a very significant role in healthcare delivery.

The proportion of household spending has always been more than 60% (Table 6.17 and Figure 6.71). In 1980, such a proportion was as high as 68.6% and rose to 80.1% in 1989 due to the decrease in government budget, resulting in the households bearing a greater share of healthcare costs. After 1989 until 1997 with the economic crisis, the household spending proportion steadily dropped to 62.2%, but rose again to 67.03% in 2000; with a decreased state budget in 2005, the proportion slightly dropped to 66.77% despite the government policy on universal health care. This situation has shown that using the services that are not covered by the universal health care scheme is still high, particularly drug purchasing for self-care, attending a private clinic, and bypassing the steps required when using state health services, attending a health facility in another area, and the people have to pay for their own services when doing so.

In analyzing the sources of private health expenditure, it was found that the major source is the households and employers rather than private health insurance. The proportion of private health insurance slightly increased from 2.2% in 1995 to 3.2% in 2005 which was very little compared with that from the households and employers (Figure 6.72).

Figure 6.71 Proportion of private health expenditure, 1995-2005



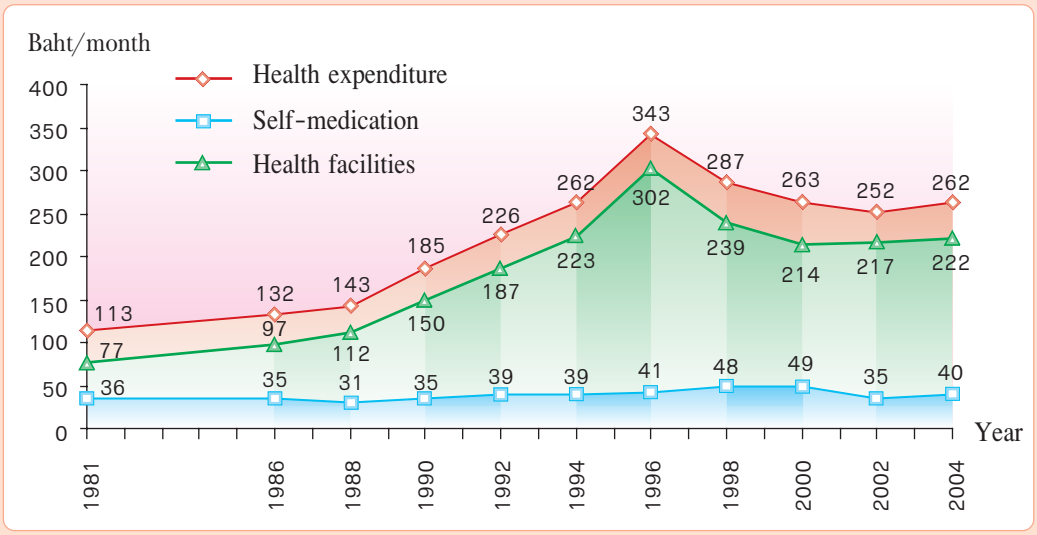
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Hoseholds & employers	66.60	63.57	59.50	61.17	63.45	64.60	64.42	62.88	62.79	64.39	63.57
Private health insurance	2.19	2.44	2.66	2.82	2.88	2.43	2.61	2.92	3.01	3.20	3.19

Source: Table 6.17.

The pattern of household health expenditure was derived from the household income and expenditure survey conducted every five years by the National Statistical Office in 1976, 1981, 1986 and every two years from 1988 to 2004. As shown in Table 6.19, household expenditure for the period 1981-1996 was rather stable at 3.6% to 3.9% of spending on household consumption each month and tended to decline to 3.2% during the economic crisis period, and further dropped to 2.4% in 2004. Significant observations are as follows:

1) **Household health expenditure for self-medication** had a declining trend from 31.9% in 1981 to 11.9% in 1996. On the contrary, the proportion of service purchases at health facilities (including drug consumption and services at private clinics, and state and private hospital) had a rising trend from 68.1% to 88.0% for the same period. There was a change in the trend when the economic crisis occurred in 1997, more people turned to purchasing drugs for self-medication, the proportion of self-care rising to 18.6% in 2000, with a declining trend in attending health care facilities. When the economy recovered in 2002, the proportion of self-medication dropped to 15.3% and the proportion of health spending at health facilities, especially private hospitals, had a rising trend (Figure 6.72 and Table 6.19).

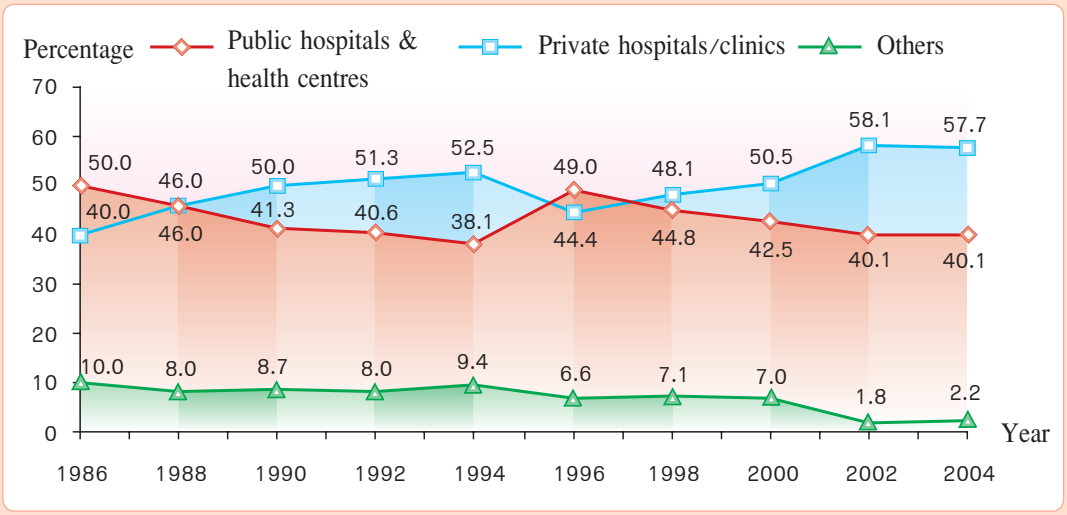
Figure 6.72 Household health expenditure, 1981-2004



Source: Report on Household Socio-Economic Survey. National Statistical Office.

2) **Health expenditure** when attending health facilities had a rising proportion for private facilities, but declining for state facilities. As shown in Figure 6.73, household spending at private health facilities (clinics and hospitals) had a rising trend from 40% in 1986 to 52.5% in 1994. On the contrary, household spending at public hospitals and health centres declined from 50% to 38.1% for the same period. At the beginning of the economic crisis period, more people turned to attend public hospitals and health centres and fewer people went to private hospitals and clinics. For other services, such as dental care and opticians' services, the spending proportion was 8% to 10%. It is noteworthy that since 2002, the beginning of economic recovery, the household spending on healthcare at private hospitals/clinics had increased to 57.7% by 2004.

Figure 6.73 Proportion of household health spending, 1986-2004



Source: Report on Household Socio-Economic Survey. National Statistical Office.

Table 6.19 Household health spending pattern (baht/month), 1981-2004.

Pattern of expenditure	1981		1986		1988		1990		1992		1994		1996		1998		2000		2001		2002		2004	
	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%
Family size (Person)	4.5	-	4.3	-	4.0	-	4.1	-	3.9	-	3.8	-	3.7	-	3.7	-	3.6	-	3.6	-	3.5	-	3.4	-
Total expenditure per month	3,374	-	3,783	-	4,161	-	5,437	-	6,529	-	7,567	-	9,190	-	10,389	-	9,848	-	10,025	-	10,889	-	12,297	-
Consumption expenditure per month	3,151	-	3,486	-	3,804	-	4,942	-	5,892	-	6,787	-	8,072	-	8,966	-	8,558	-	8,758	-	9,601	-	10,885	-
Health expenditure per month	113	3.6	132	3.8	143	3.9	185	3.7	226	3.8	262	3.9	343	4.2	287	3.2	263	3.1	264	3.0	252	2.6	262	2.4
Self-medication expenditure	36	31.9	35	26.5	31	21.7	35	18.9	39	17.3	39	14.9	41	11.9	48	16.7	49	18.6	46	17.4	35	13.9	40	15.3
Spending at health facilities	77	68.1	97	73.5	112	78.3	150	81.1	187	82.7	223	85.1	302	88.0	239	83.3	214	81.4	218	82.6	217	86.1	222	84.7
- Public hospital & health centres	-	-	48	50	52	46	62	41.3	76	40.6	85	38.1	148	49.0	107	44.8	91	42.5	98	45.0	87	40.1	89	40.1
- Private hospitals/clinics	-	-	39	40	51	46	75	50.0	96	51.3	117	52.5	134	44.4	115	48.1	108	50.5	110	50.4	126	58.1	128	57.7
- Others	-	-	10	10	9	8	13	8.7	15	8.0	21	9.4	20	6.6	17	7.1	15	7.0	10	4.6	4	1.8	5	2.2

Source: Report on Household Socio-Economic Survey. National Statistical Office.

5. Accessibility to Health Services

5.1 Coverage of Health security

Thailand has a tendency to expand health security or insurance to cover all the people under major schemes: civil servants medical benefits (also for state enterprise employees), social security, medical services for the poor and society-supported groups, voluntary health insurance project, private health insurance, and vehicle accident victims protection. In 2001, all the schemes could cover 71.0% of the population. Since 2001, under the universal health care policy, the coverage of health security had risen to 96.0% by 2006 (74.3% under the universal coverage of health care schemes), leaving 4.0% without any health insurance coverage (Table 6.20).

Table 6.20 Percentage of Thai people with health security, 1991, 1996, 2001and 2003-2006

Health insurance scheme	Before the launch of the UC healthcare scheme			After the launch of the UC healthcare scheme			
	1991	1996	2001	2003	2004	2005	2006
1. Universal coverage healthcare	-	-	**0.9**	**74.7**	**73.5**	**72.2**	**74.3**
- Gold card with Tor (not paying 30 baht/visit)	-	-	-	74.7	30.6	28.1	28.6
- Gold card without Tor (paying 30 baht/visit)	-	-	0.9		42.9	44.1	45.7
2. Medical welfare for the poor (Sor Por Ror)	12.7	12.6	31.5	-	-	-	-
3. Medical benefits for civil servants and state enterprise employees	**15.3**	**10.2**	**8.5**	**8.9**	**9.4**	**9.8**	**8.9**
- Civil servants	13.2	9.0	7.5	8.9	9.4	9.8	8.9
- State enterprise employees	2.1	1.2	1.0				
4. Social security and workers' compensation fund	-	**5.6**	**7.2**	**9.6**	**10.7**	**11.0**	**11.4**
5. Voluntary health insurance	**4.5**	**16.1**	**22.1**	**1.7**	**0.8**	**1.0**	**0.7**
- Health card, MoPH	1.4	15.3	20.8	-	-	-	-
- Private insurance	3.1	0.8	1.3	1.7	0.8	1.0	0.7
6. Others	0.9	1.0	0.8	-	-	1.1	0.7
Population with health insurance	33.5	45.5	71.0	94.9	94.3	95.1	96.0
Population without health insurance	66.5	54.5	29.0	5.1	5.7	4.9	4.0

Sources: 1. Reports on Health and Welfare Surveys, 1991, 1996, and 2001. National Statistical Office.
2. Viroj Tangcharoensathien, et al. An analysis of data from the Reports on Health and Welfare Surveys, 2003-2006. National Statistical Office.

Note: The number of insured persons with private health insurance companies in 2004 was 2.88 million, or 4.4% of total population, but some of them had coverage from more than one scheme.

In addition, it was found that, in 2006, the proportion of rural residents with universal healthcare cards was higher than that for urban residents. But more urban residents had healthcare coverage under the social security scheme and the medical benefits scheme for civil servants than did rural residents (Table 6.21).

Table 6.21 Percentage of people with health insurance coverage in municipal and non-municipal areas, 1991, 1996, 2001, 2003, 2004, and 2006

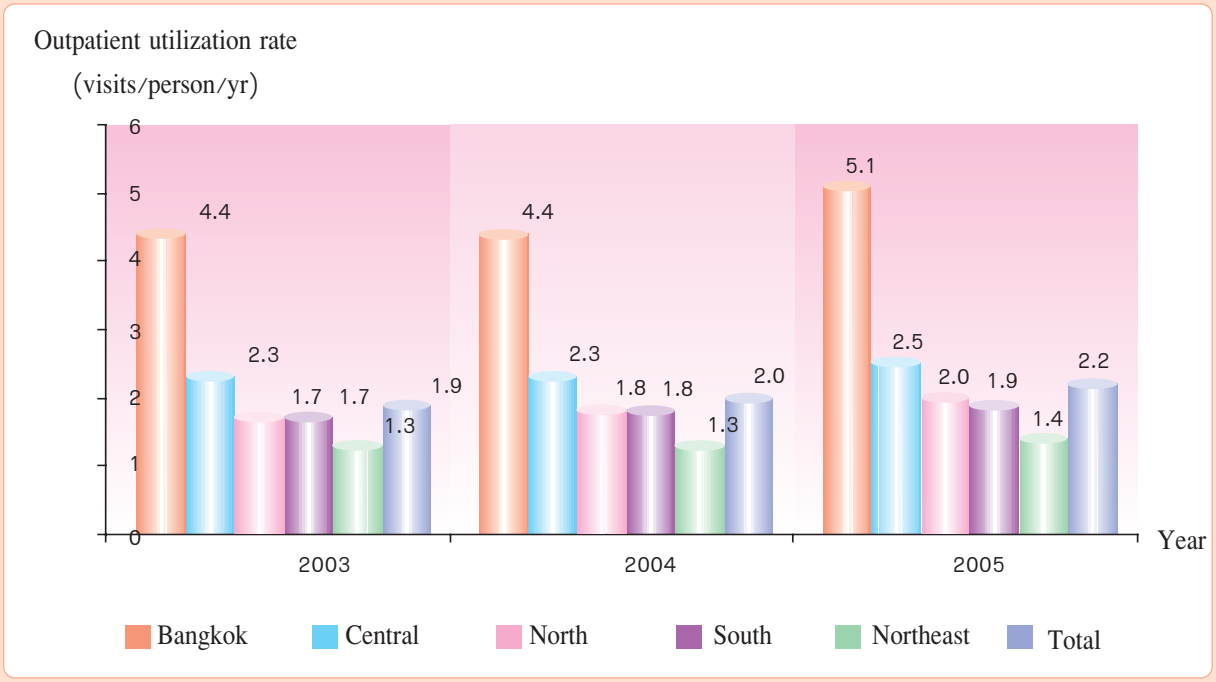
Health insurance coverage	Municipal areas						Non-municipal areas					
	1991	1996	2001	2003	2004	2006	1991	1996	2001	2003	2004	2006
No insurance	65	58	42	9	10.1	7.7	68	52	22	3	3.5	2.5
Civil servants and state	22	17	16	15	15.3	14.1	6	7	9	6	6.5	6.6
enterprise officials	-	-	-	56	54.6	56.3	-	-	-	84	82.8	82.1
Universal coverage healthcare	-	11	13	18	18.2	19.8	-	3	4	6	7.0	7.7
Social security	7	5	15	-	-	-	21	16	39	-	-	-
Medical welfare for the poor	1	6	10	-	-	-	2	20	27	-	-	-
Health card	5	2	3	3	1.8	1.6	1	1	1	1	0.3	0.3
Private health insurance	1	1	1	-	-	0.6	1	1	1	-	-	0.7
Others												

Sources: 1. Reports on Health and Welfare Surveys, 1991, 1996 and 2001. National Statistical Office.
2. Viroj Tangcharoensathien et al. An analysis of data from the Reports on Health and Welfare Surveys, 2003, 2004 and 2006. National Statistical Office.

Note: The number of insured persons with private health insurance companies in 2004 was 2.88 million, or 4.4% of total population, but some of them had coverage from more than one scheme.

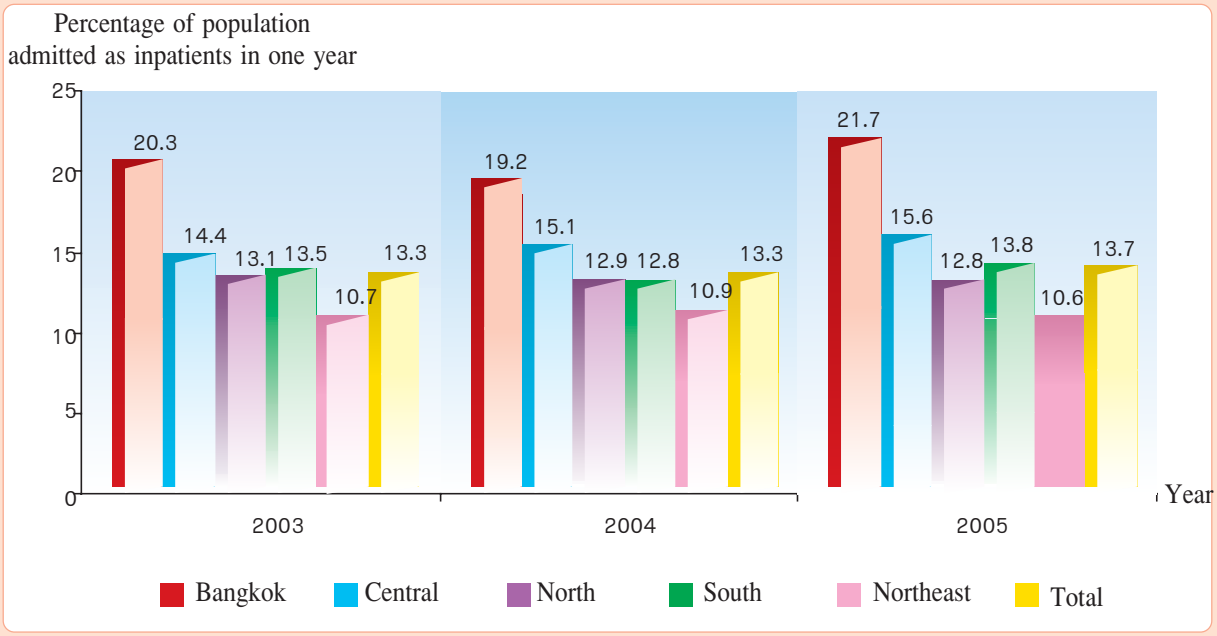
An analysis of the relationship between service utilization and the population/doctor ratios and between inpatient service utilization and the population/bed ratios (Figure 6.76 and Figure 6.77) reveals that the provinces with a lot of health resources (low population/doctor and population/bed ratios) will have higher utilization rates, confirming the influence of health resources on the chances of people's service utilization.

Figure 6.74 Rate of outpatient service utilization, 2003-2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Figure 6.75 Rate of inpatient service utilization, 2003-2005



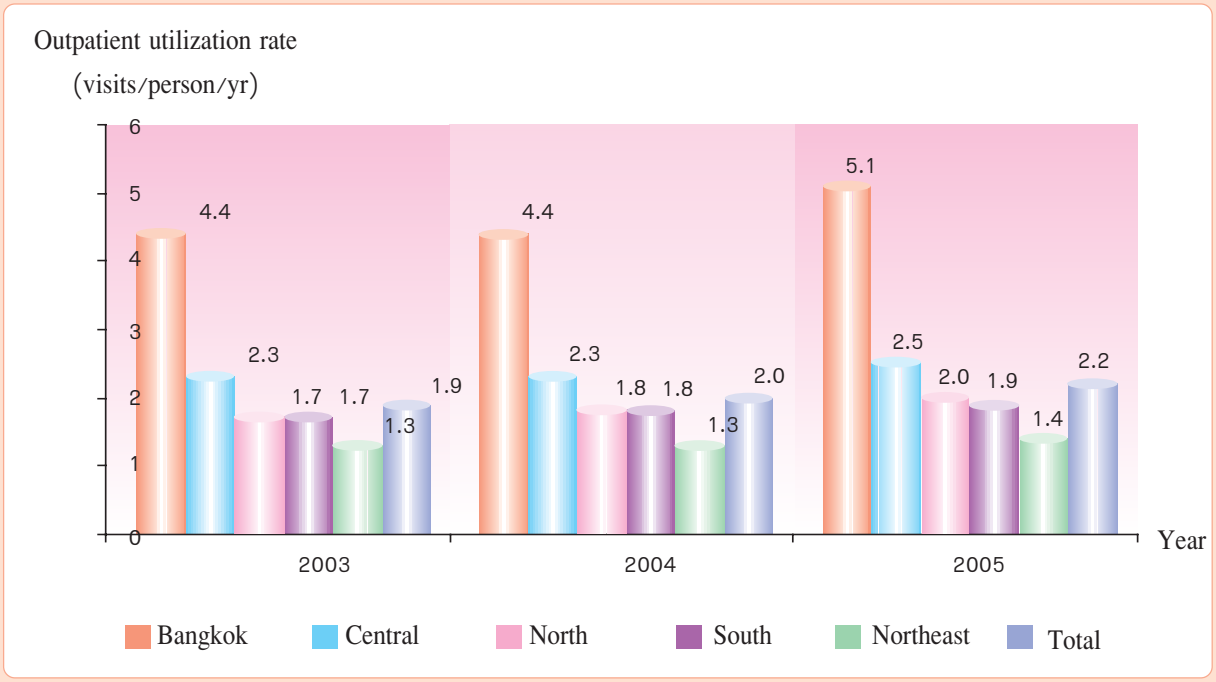
Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

5.2 Rate of Health Service Utilization

The utilization of health services at health facilities with inpatient beds is on a rising trend. In 2005, the rate of outpatient service utilization at hospitals under all agencies was 2.2 visits per person per year, the rate being highest in Bangkok and lowest in the Northeast. That reflects the rate of access to outpatient services being highest in Bangkok (including for outpatients coming from other provinces) (Figure 6.74). Similarly, the rate of inpatient service utilization was highest in Bangkok and lowest in the Northeast (Figure 6.75).

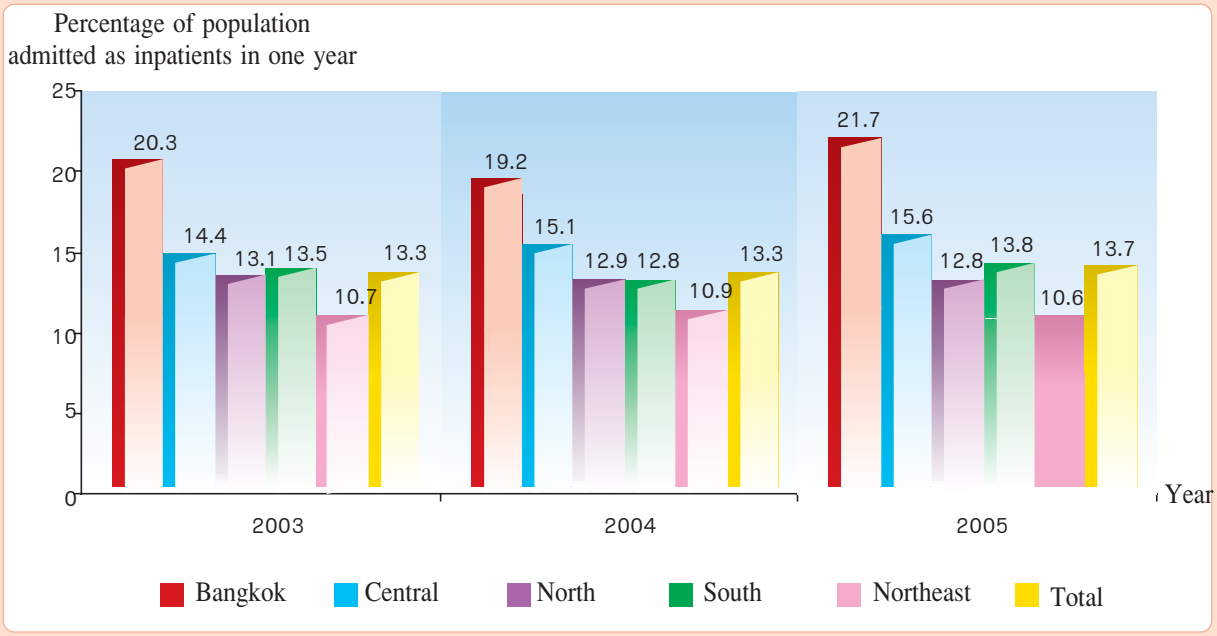
An analysis of the relationship between service utilization and the population/doctor ratios and between inpatient service utilization and the population/bed ratios (Figure 6.76 and Figure 6.77) reveals that the provinces with a lot of health resources (low population/doctor and population/bed ratios) will have higher utilization rates, confirming the influence of health resources on the chances of people's service utilization.

Figure 6.74 Rate of outpatient service utilization, 2003-2005



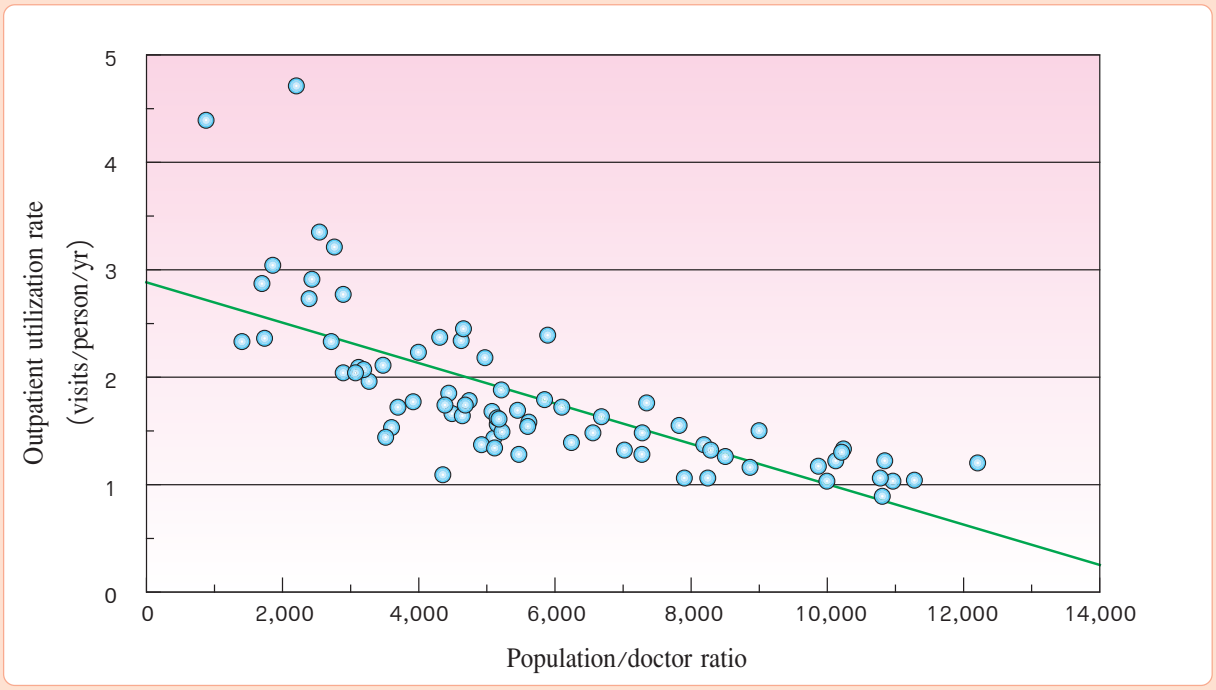
Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Figure 6.75 Rate of inpatient service utilization, 2003-2005



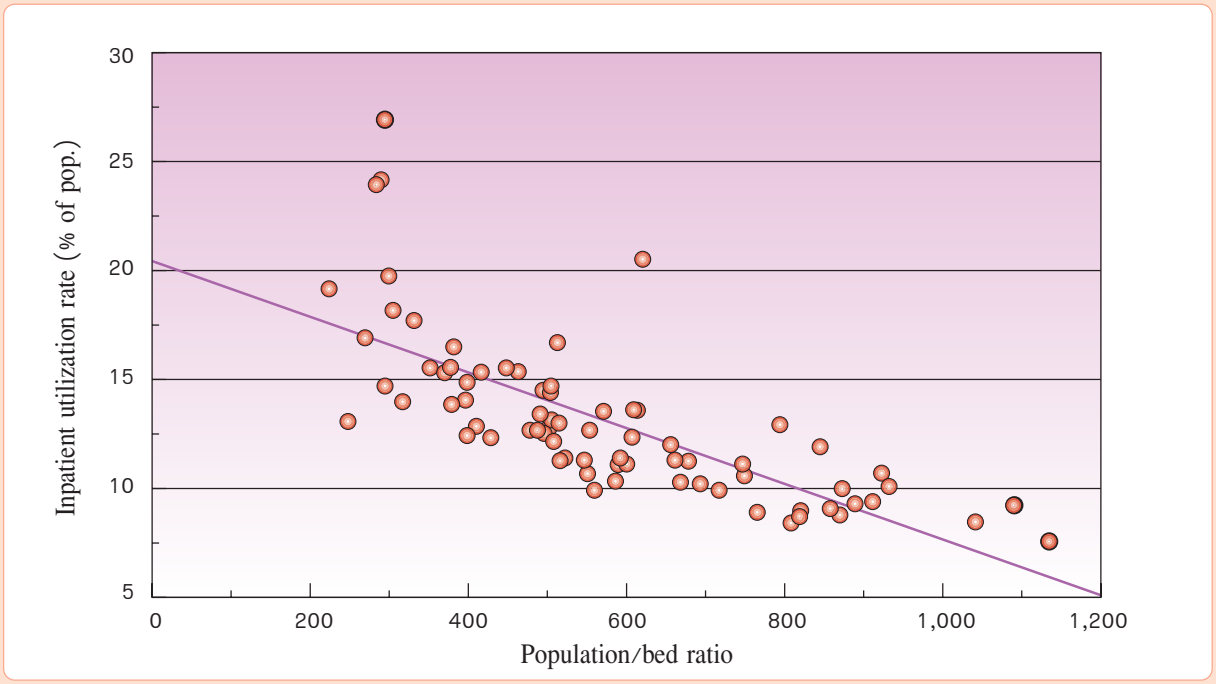
Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Figure 6.76 Relationship between the rate of outpatient service utilization and population/doctor ratios at provincial level, 2004



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

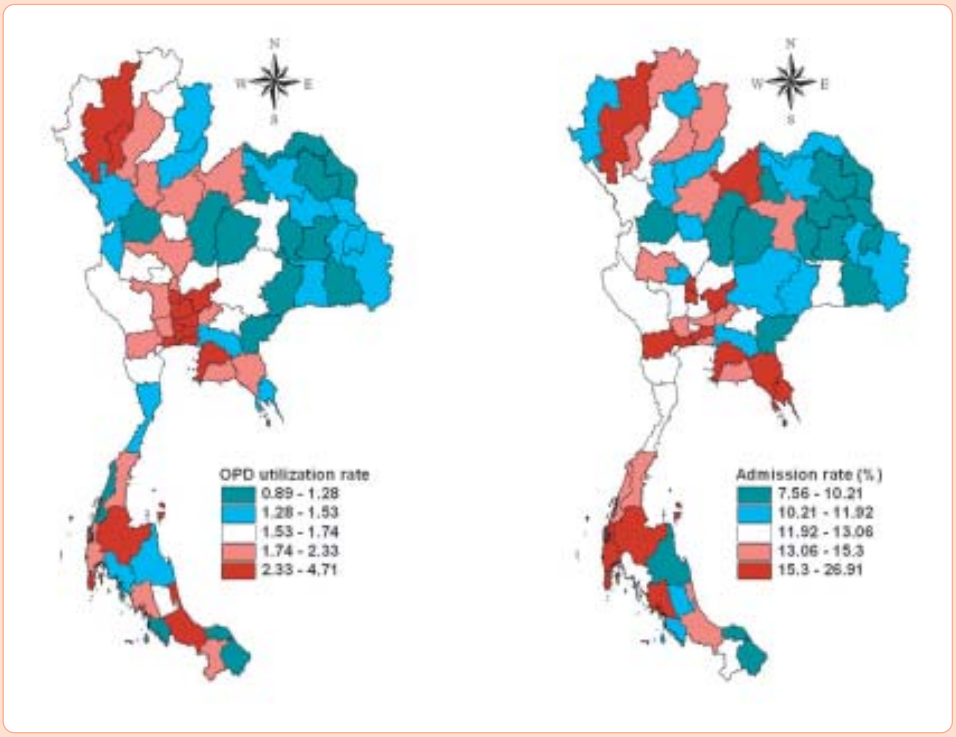
Figure 6.77 Relationship between the rate of inpatient service utilization and population/bed ratios at provincial level, 2004



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

A geographical distribution analysis of service utilization rates at provincial level reveals that the provinces that are the centres of the region and the provinces in the central region have a high utilization rate, while most provinces in the Northeast have a lower utilization rate than other provinces (Figure 6.78).

Figure 6.78 Geographical distribution of inpatient service (OPD) utilization rates and inpatient service (admission) rates at provincial level, 2004

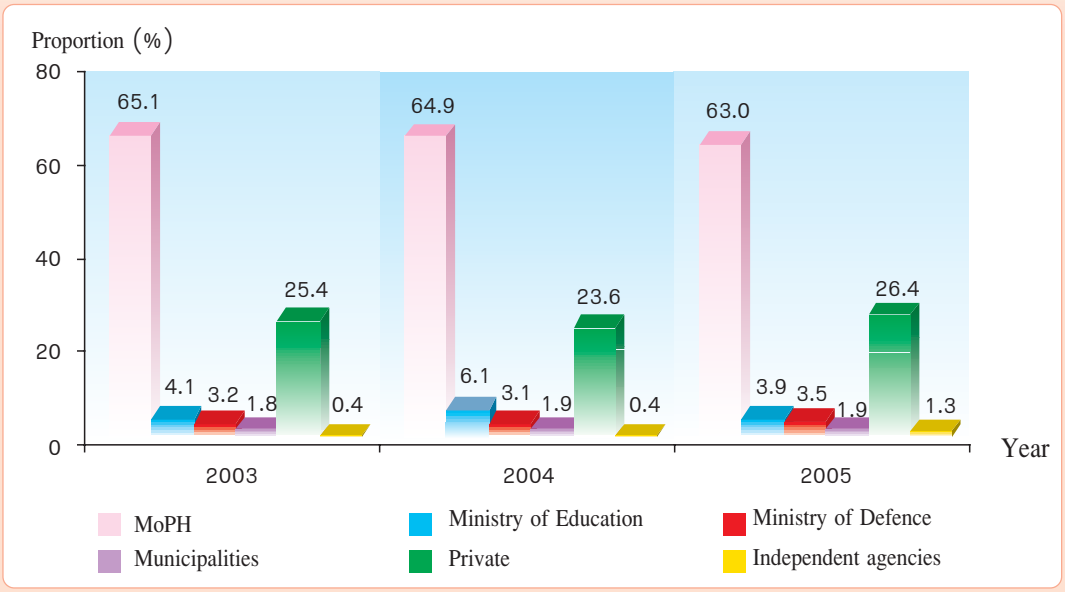


Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

5.3 Utilization of Health Services by Agency and Service Level

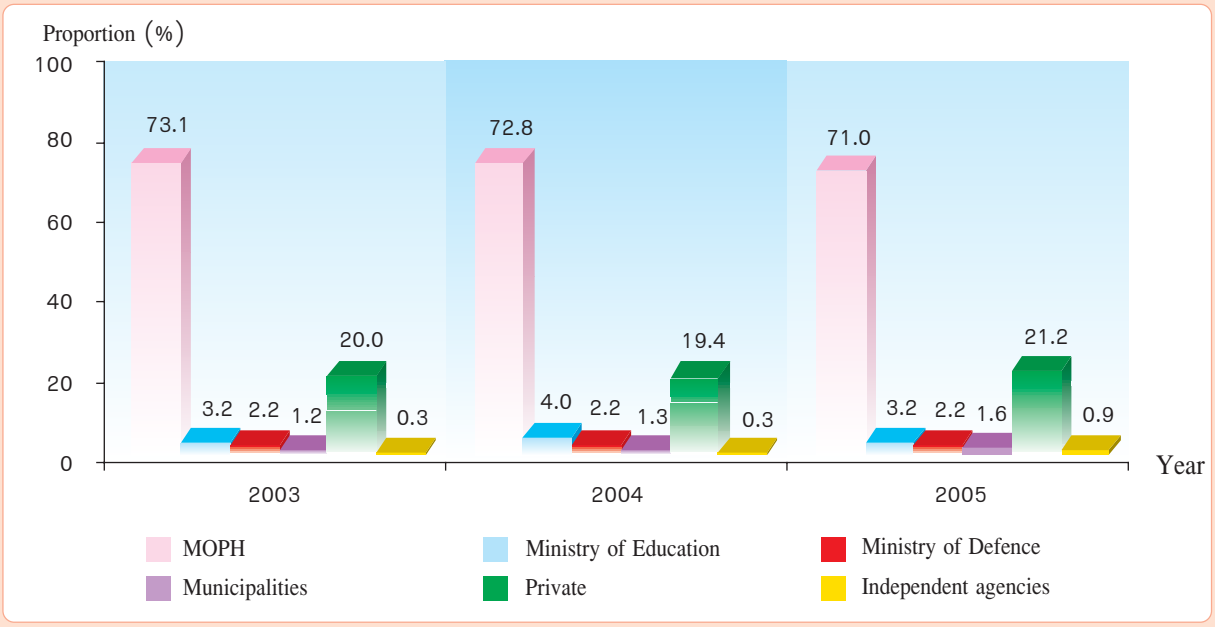
In 2005, the proportion of outpatients by agency of hospitals was highest for hospitals under the MoPH, followed by private and university hospitals (Figure 6.79). Similarly, the proportion of inpatients or admissions, for the same year, was highest in MoPH hospitals, followed by private and university hospitals (Figure 6.80).

Figure 6.79 Proportions of outpatients by agency of hospitals, 2003-2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

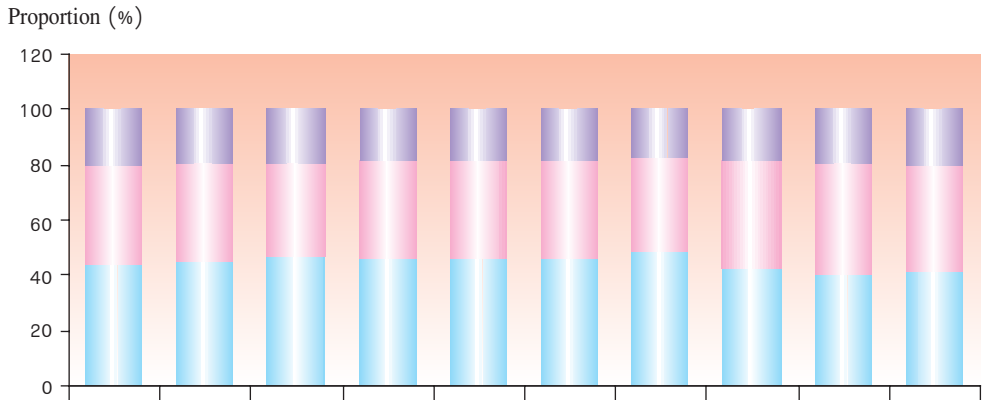
Figure 6.80 Proportions of inpatients by agency of hospitals, 2003-2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

In analyzing the proportions of outpatient service utilization, including the services at subdistrict health centres, only in MoPH hospitals (community, general and regional hospitals) to see the trends in service utilization by level of health facilities, it was found that in 2003 the proportion of outpatient utilization at health centres increased to 48% but decreased later on. But the proportion of outpatients at community, general and regional hospitals has increased slightly since 2004 (Figure 6.81). For the number of outpatients, the number at community hospitals has markedly increased since 2004 while the number at health centres declined slightly (Figure 6.82).

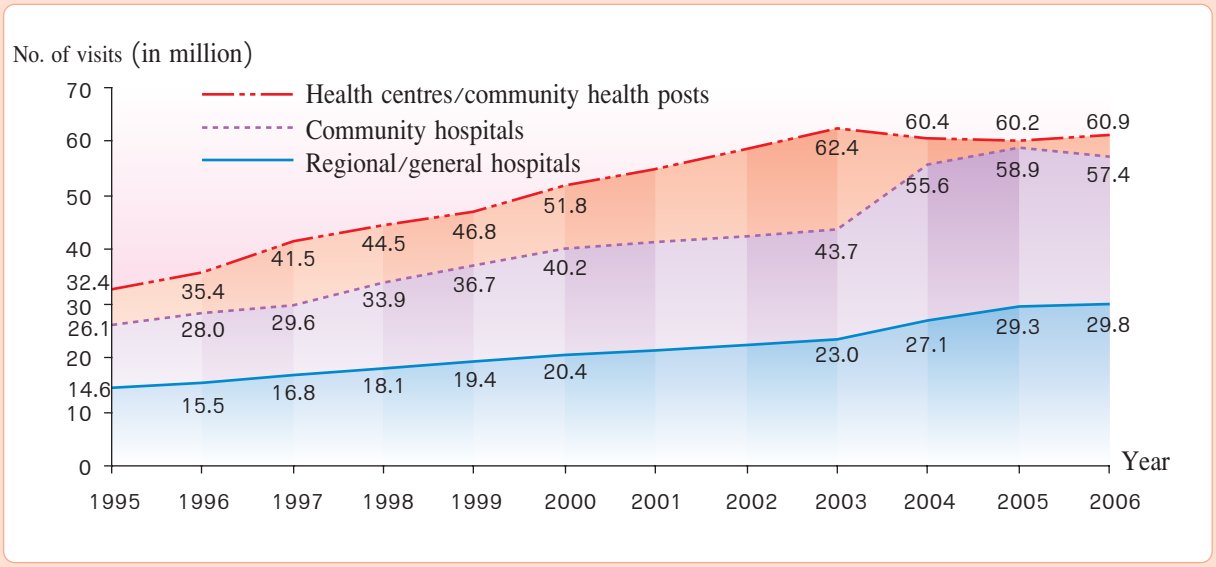
Figure 6.81 Proportions of outpatients by level of MoPH health facilities, 1995-2006



	1995	1996	1997	1998	1999	2000	2003	2004	2005	2006
Regional/ general hospitals	20.0	19.6	19.1	18.8	18.8	18.2	17.8	18.9	19.7	20.1
Community hospitals	35.7	35.5	33.7	35.1	35.6	35.7	33.8	38.9	39.7	38.8
Health centres/ community health posts	44.3	44.9	47.2	46.1	45.5	46.1	48.3	42.2	40.6	41.1

Source: Bureau of Health Service System Development, Department of Health Service Support, MoPH.

Figure 6.82 Numbers of outpatients (OPD visits) by level of MoPH health facilities, 1995-2006



Source: Bureau of Health Service System Development, Department of Health Service Support, MoPH.

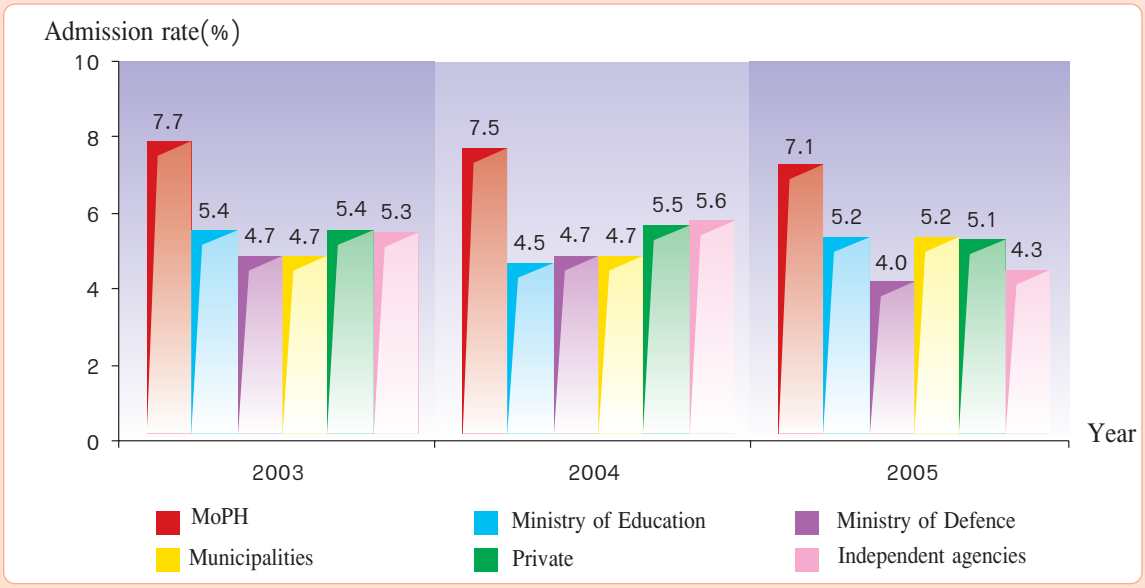
6. Efficiency and Quality of Health Service Delivery

6.1 Admission of Inpatients

Admissions of patients for medical treatment in hospital can be analyzed in terms of inpatient/outpatient ratio which reflects the chance of being admitted as inpatients for all outpatients (visits). With respect to the efficiency of inpatient care, if each patient has an equal health need, a greater number of admissions will reflect a lower level of efficiency as inpatient care will require more resources and higher healthcare costs. However, the severity of patient will have to be taken into account and it is associated with the accessibility to healthcare. A good access to health care will make outpatients less severe and there will be fewer admissions.

The health resources survey reveals that MoPH hospitals have the highest inpatient/outpatient rate, followed by hospitals under other agencies, with rates being close to each other (Figure 6.83).

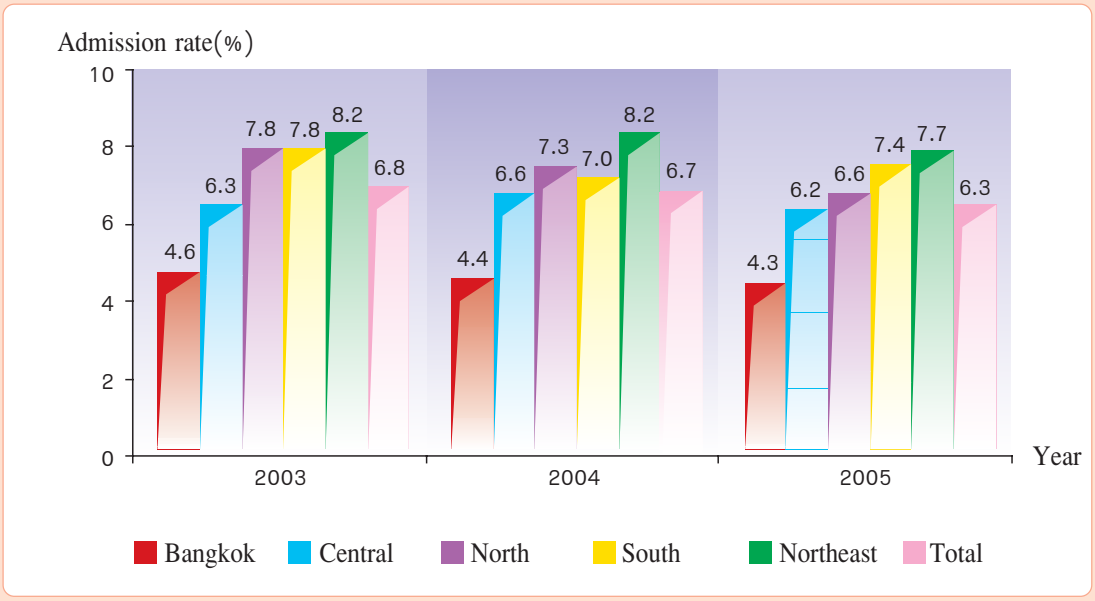
Figure 6.83 Rate of admissions (inpatients/outpatient) by agency of hospitals, 2003-2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

A regional comparison of admissions indicates that the Northeast has the highest inpatient/outpatient rate, while Bangkok has the lowest rate (Figure 6.84). Regarding efficiency, it may be interpreted that the Northeast has a tendency to have more admissions than other regions. But in reality such a situation may be a result of the difference in access to health care, i.e. outpatients in the Northeast may be more severe than those in other regions, thus a larger number of them will require inpatient care, due to lower level of access to curative care.

Figure 6.84 Rate of admissions (inpatient/outpatient) by region, 2003-2005



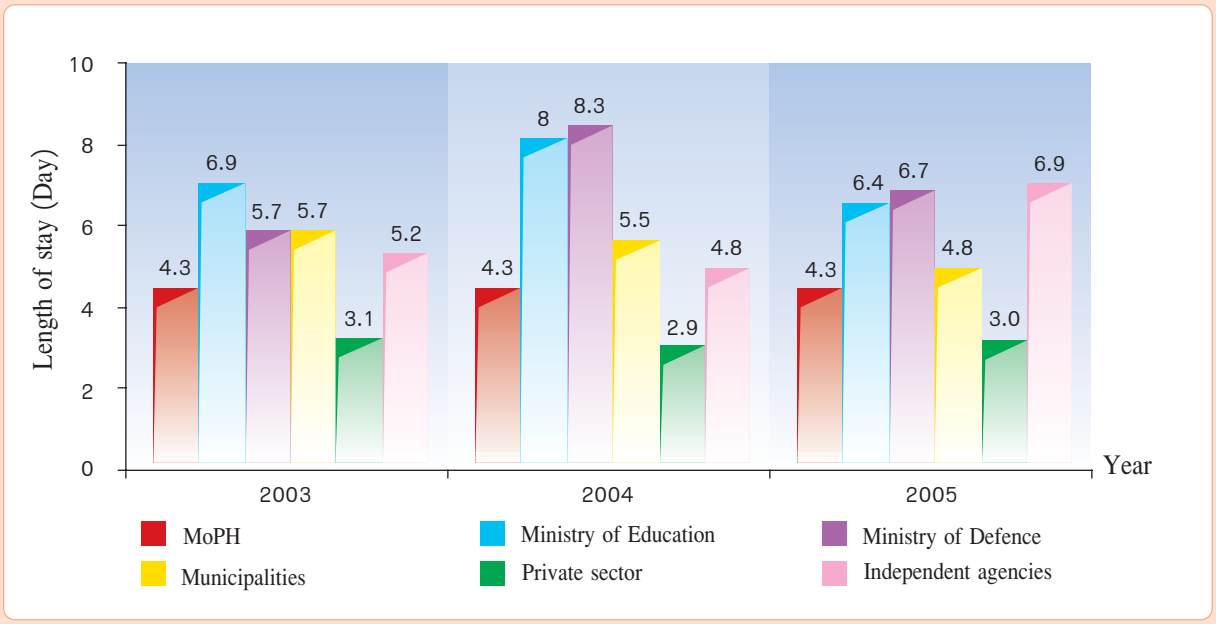
Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

6.2 Length of Stay of Inpatients

An analysis of the length of stay of inpatients may help reflect the efficiency of inpatient care to a certain extent. If all patients have an equal severity of illness, a longer length of stay will result in a higher treatment cost, meaning less efficient treatment.

Data from the health resources survey revealed that private hospitals had the shortest length of stay of three days, while those under universities and the Ministry of Defence had the longest, approximately 8 days, in 2004, which dropped to 6 or 7 days in 2005 (Figure 6.85). Such characteristics might be due to the severity of patents; hospitals with a high level of efficiency tend to admit patients with complexity resulting in a longer length of stay, especially in university hospitals.

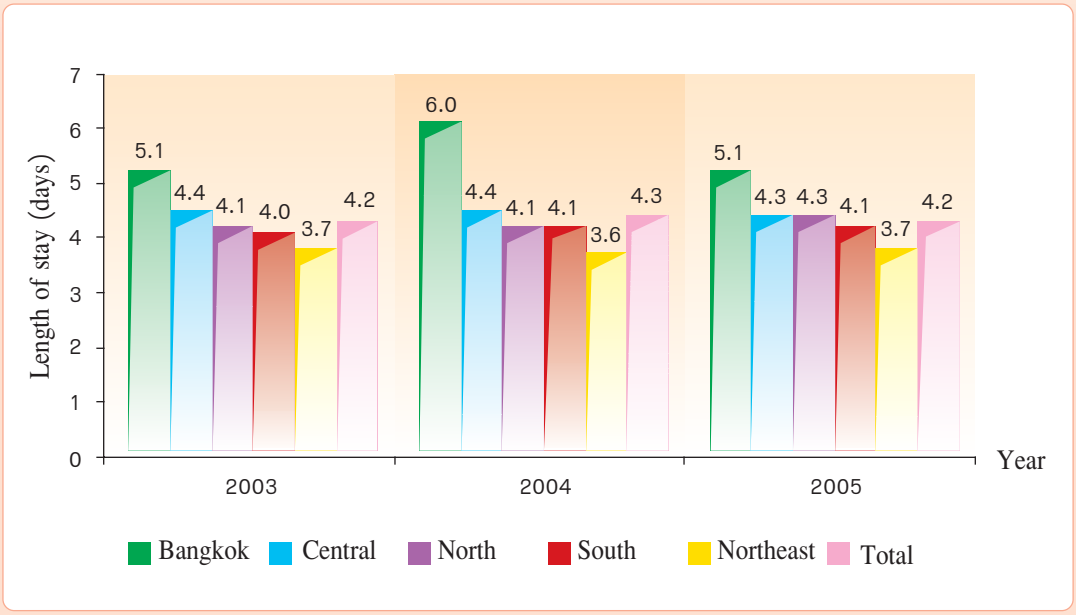
Figure 6.85 Average length of stay of inpatients by agency of hospitals, 2003-2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

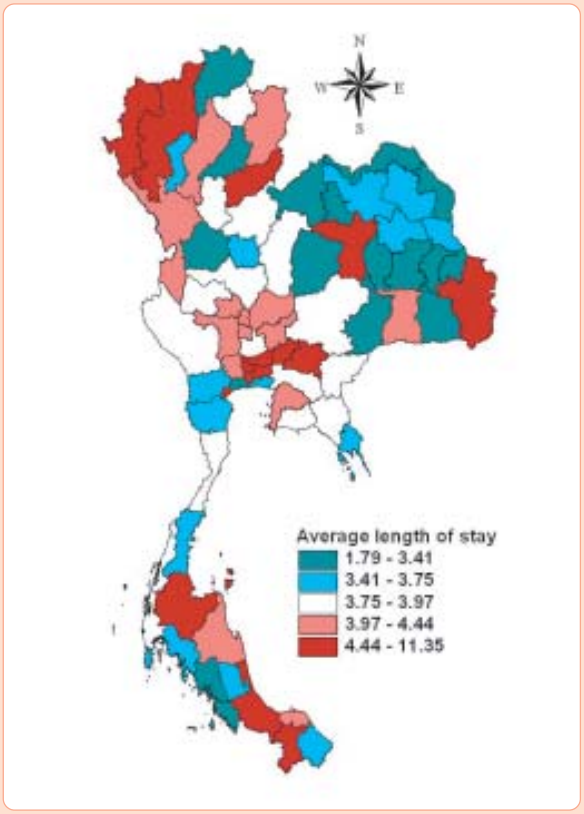
A regional analysis reveals that the length of stay for Bangkok is longest (5-6 days), while it is shortest (3.7 days) for the Northeast (Figure 6.86). Factors related to hospital capacity might make high-capacity hospitals in Bangkok admit patients with complexity and longer hospitalization. The same is true for provinces that are the centres of regions and some provinces in the Central, North and South (Figure 6.87).

Figure 6.86 Average length of stay of inpatients by region, 2003-2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Figure 6.87 Geographical distribution of average length of stay by province, 2004

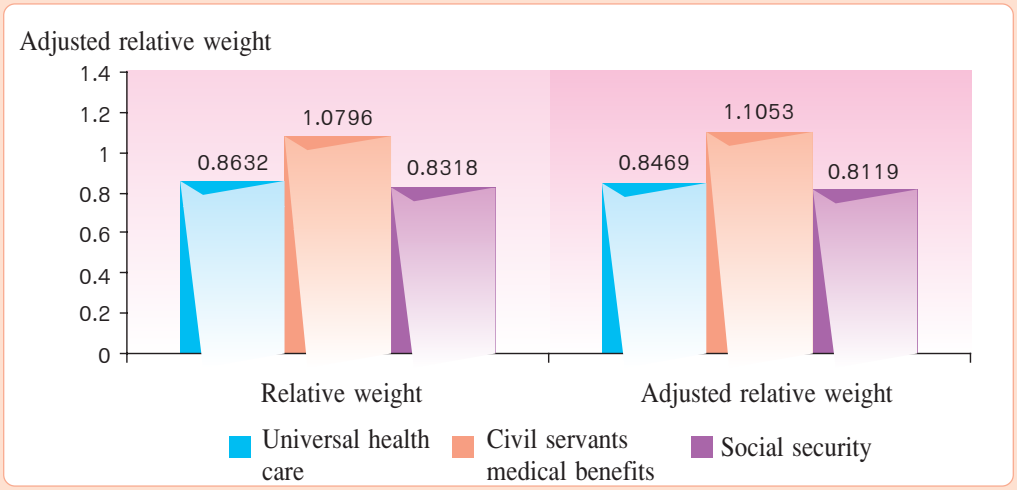


Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

6.3 Average Relative Weight

Average relative weight reflects the characteristics of patients hospitalized and the necessity in the use of resources for medical treatment of each patient. However, it partly reflects the hospital's decision to admit a patient as well. The data suggest that the average relative weight of patients who are civil servants (with state medical benefits entitlement) is greater than those under the universal health care and the social security schemes; those under the social security scheme have the lowest average relative weight (Figure 6.88).

Figure 6.88 Adjusted relative weights of inpatients under three health insurance schemes

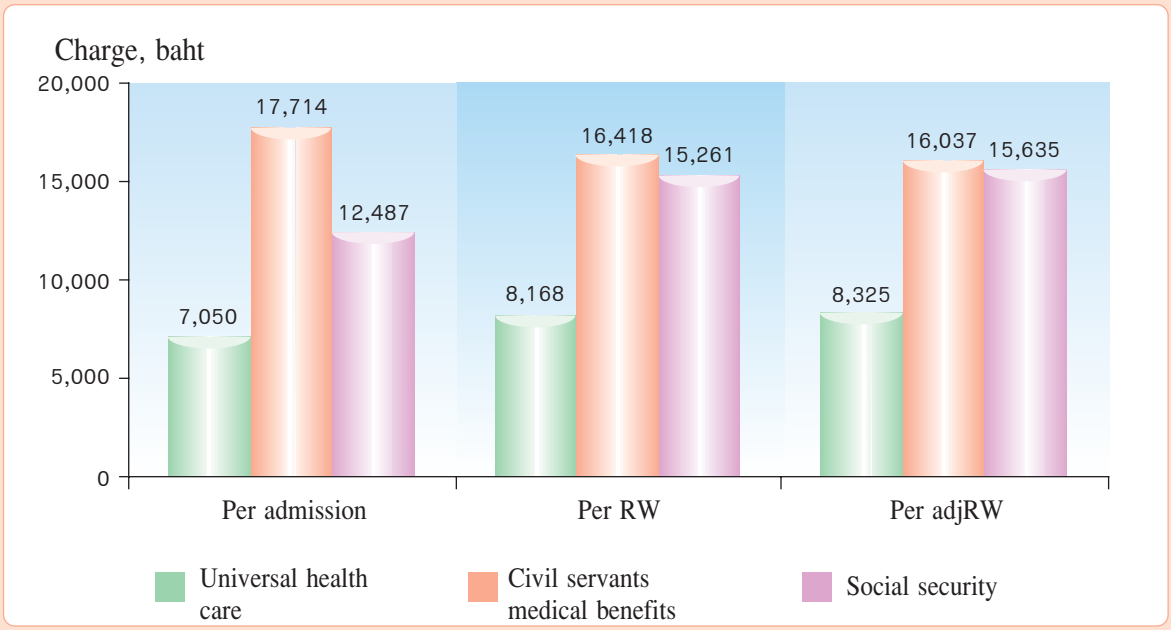


Source: Pinij Faramnuayphol. Analysis of inpatient data, 2004. National Health Security Office.

6.4 Average Charge per Relative Weight Unit

Charge per unit of relative weight reflects the cost calculation of hospital which is related to services provided, hospital costs and pricing method of each hospital. The data suggest that patients who are civil servants have the largest charge per admission, followed by those under the social security scheme. A comparison of relative weights reveals that the adjusted relative weights of civil servants and those with social security are close to each other, but two times greater than that for those under the universal healthcare scheme (Figure 6.89).

Figure 6.89 Average charges per admission, per relative weight and per adjusted relative weight of patients under three health insurance schemes



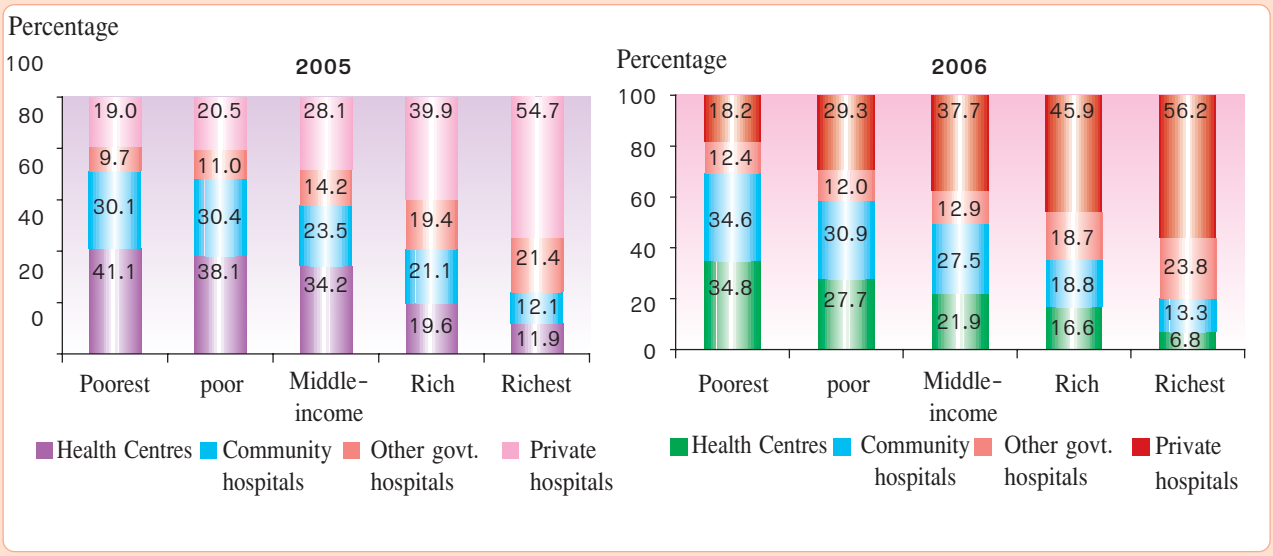
Source: Pinij Faramnuayphol. Analysis of inpatient data, 2004. National Health Security Office.

7. Equities in Health Services

7.1 Equities in Health Service Utilization

Chances of choosing health services for people are different depending on their socio-economic status. The 2005-2006 health and welfare survey revealed that, only for services at subdistrict health centres, community hospitals, regional/general hospitals, and private hospitals, the poorest group attended health centres the most (35-40%), while the richest group chose private hospitals the most (50%). That reflects the chances of choosing services; private hospitals are attended mostly by high-income groups and general/regional hospitals are also attended by a largest proportion of the richest group (Figure 6.90). The differences in the health service selection opportunity might affect the quality of services according to the capacity of health facilities; the more services will be required if the illness needs to be treated at a high-capacity facility.

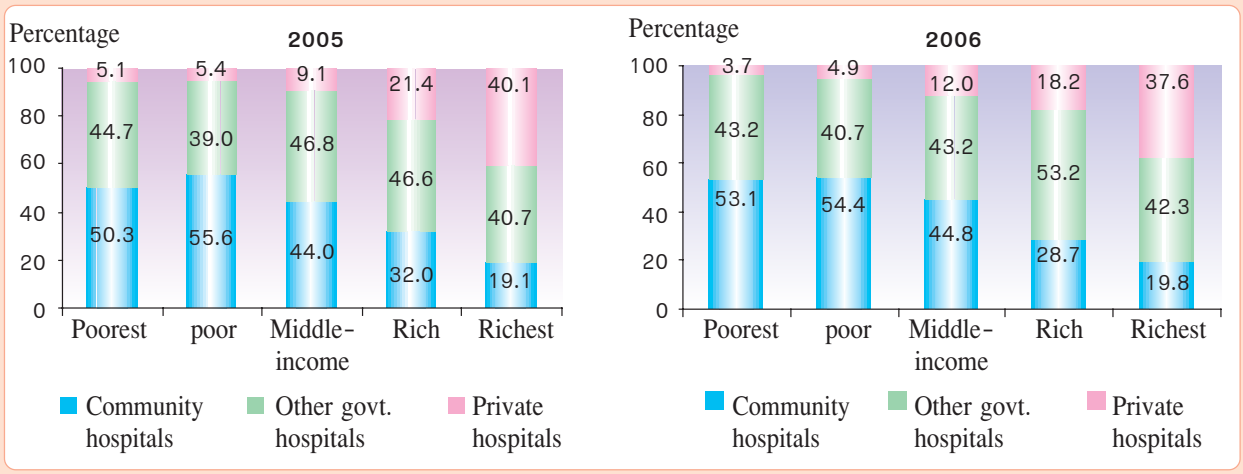
Figure 6.90 Percentage of health facility selection when ill by level of household's average monthly income, 2005-2006



Source: Viroj Tangcheroensathien et al. Analysis of data from the 2005-2006 Health and Welfare Survey, National Statistical Office.

For cases requiring hospitalization, the characteristics are similar, i.e. the poorest group would be admitted to community hospitals the most (50%), while the richest would have the highest chance of being admitted to private hospital (40%), compared with other income groups. However, hospitalization at general and regional hospitals is not much different; all income groups have a 40% to 45% chance of being hospitalized (Figure 6.91), indicating that the poorest group still has a rather high chance of getting admitted to high-capacity hospitals although their chance of getting hospitalized in private hospitals is smallest.

Figure 6.91 Percentage of health facility selection when hospitalized by level of household's average monthly income, 2005-2006



Source: Viroj Tangcheroensathien et al. Analysis of data from the 2005-2006 Health and Welfare Survey, National Statistical Office.

Besides, a comparison of health service utilization according to patients' entitlement reveals that the implementation of the universal healthcare policy has resulted in the people's access to and attendance of health facilities when ill increasing from 49% in 1991 to 71.3% in 2006. For the group without any health insurance, their chance of utilizing health facilities has increased from 47% in 1991 to 55.1% in 2006; and, for the groups with civil servants benefits and universal health care coverage, their utilization of health facilities when ill is highest, compared with other groups (Table 6.22).

Table 6.22 Morbidity rates and proportions of utilization of health facilities by type of medical welfare scheme, 1991, 1996, 2001 and 2004-2006

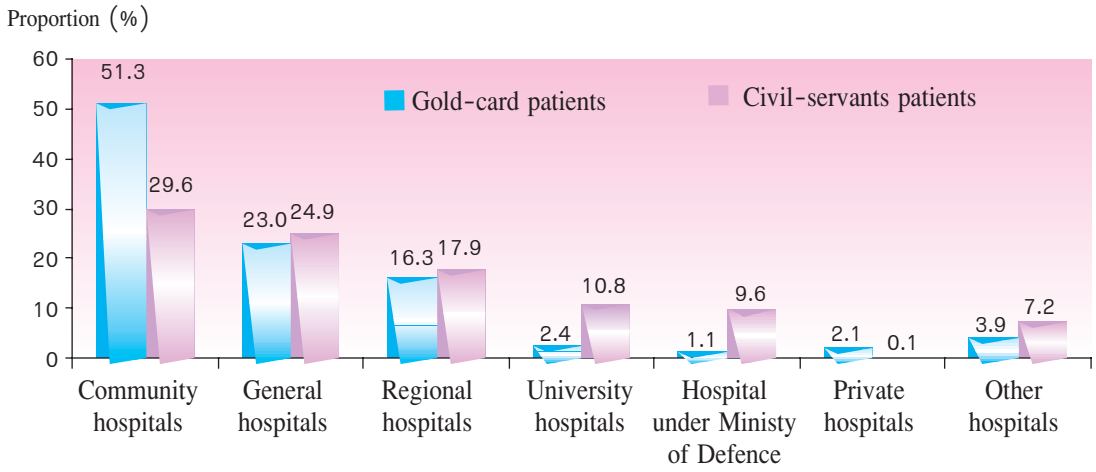
Welfare scheme	Morbidity rate (episodes/person/yr)						Percentage of utilizing health facilities					
	1991	1996	2001	2004	2005	2006	1991	1996	2001	2004	2005	2006
No health insurance	5.7	3.5	3.3	3.2	3.4	2.6	47	62	61	60.6	66.6	55.1
Universal (30-baht) healthcare scheme	-	-	3.4	5.1	4.8	3.4	-	-	62	72.8	76.5	72.1
Medical care for the poor	7.2	6.9	5.3	-	-	-	50	67	74	-	-	-
Health card, MoPH	7.0	4.5	3.7	-	-	-	55	68	71	-	-	-
Welfare for civil servants and state enterprise employees	5.4	3.7	3.6	4.8	4.5	4.1	60	71	75	73.1	75.1	75.8
Social security	-	2.5	2.5	3.0	2.7	1.9	-	58	66	63.0	68.6	66.8
Private insurance	4.4	3.5	3.0	1.9	2.1	2.4	42	72	65	60.2	77.0	50.6
Total	**5.9**	**4.0**	**3.9**	**4.7**	**4.4**	**3.3**	**49**	**65**	**70**	**71.6**	**75.3**	**71.3**

Sources: 1. Reports on Health and Welfare Surveys, 1991, 1996 and 2001. National Statistical Office.
2. Viroj Tangcharoensathien and colleagues. An analysis of data from the Reports on Health and Welfare Surveys, 2004-2006. National Statistical Office.

Note: The number of insured persons with private health insurance companies in 2004 was 2.88 million, or 4.4% of total population, but some of them had coverage from more than one scheme.

A comparison of proportions of hospitalization by level and category of hospitals of patients with different healthcare entitlements reveals that, based on data on patients claiming medical expenses, patients under the universal healthcare scheme (gold-card holders) have a higher proportion of hospitalization at community hospitals than the patients who are civil servants, while the patients who are civil servants have a higher proportion of hospitalization at general/regional hospitals, university hospitals and Ministry of Defence's hospitals than gold card holders. For private hospitals, data available are minimal due to limitations in claiming medical expenses (Figure 6.92). Such differences in the proportions reflect the differences in the choices of selecting hospitals for patients with different health insurance entitlements.

Figure 6.92 Proportion of hospitalizations in different types of hospitals of patients under two health insurance schemes



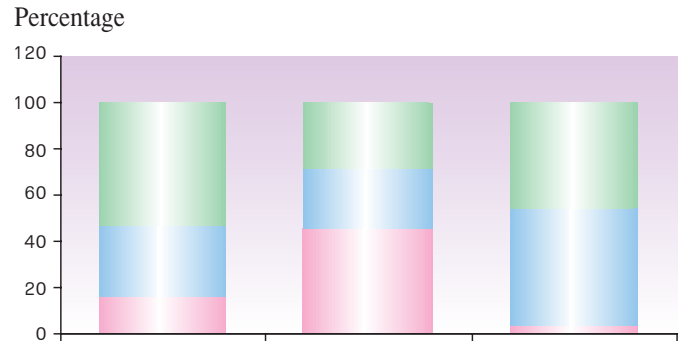
Source: Pinij Faramnuayphol. Analysis of inpatient data, 2004. National Health Security Office.

7.2 Equity in Health Services Delivery

Characteristics of services rendered by healthcare providers or health facilities may be different. Some medical treatment procedures have been selected for comparison purposes among patients with different health insurance converges, such as cesarean section and coronary artery surgery among patients under the civil servants medical benefits, universal healthcare and social security schemes, based on the inpatients medical expense claims database for 2004.

The rate of cesarean sections has reflected the joint decision on childbirth method of the obstetrician and the expectant mother. Actually, according to the medical indications, the rate of cesarean sections should not be much different. But the data have shown that the cesarean section rate for civil servants was as high as 46% whereas that for gold-card holders was only 16% and for social security members only 3% (Figure 6.93) .

Figure 6.93 Rates of cesarean sections among childbirth givers under three health insurance schemes

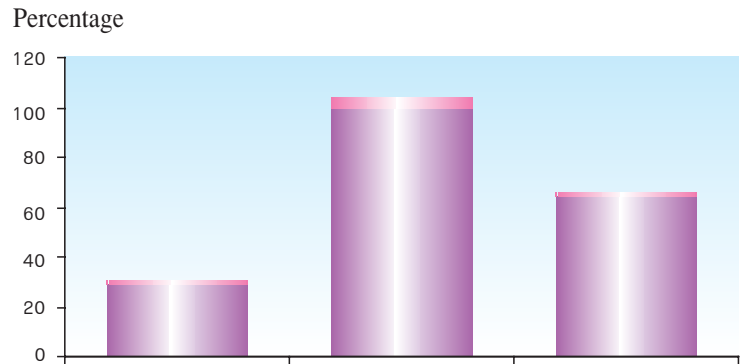


	Goldcard patients	Civil-servants patients	Social security patients
Natural childbirth	53.02	28.38	45.51
Vacummassisted childbirth	30.68	25.73	51.12
C-section	16.30	45.90	3.37

Source: Pinij Faramnuayphol. Analysis of inpatient database, 2004. National Health Security Office.

Regarding coronary artery surgery on patients with acute ischemic heart disease, major operations normally performed are coronary artery bypass graft (CABG) and coronary artery balloon dilation for removal of coronary artery obstruction. The data suggest that the rate of operations on patients who were civil servants was highest, followed by patients under the social security and gold-card (universal healthcare) schemes (Figure 6.94), reflecting the differences in opportunities to undergo surgical treatment for patients under different health insurance schemes, especially those who were gold cardholders.

Figure 6.94 Rates of heart surgeries on patients with ischemic heart disease under three health insurance schemes



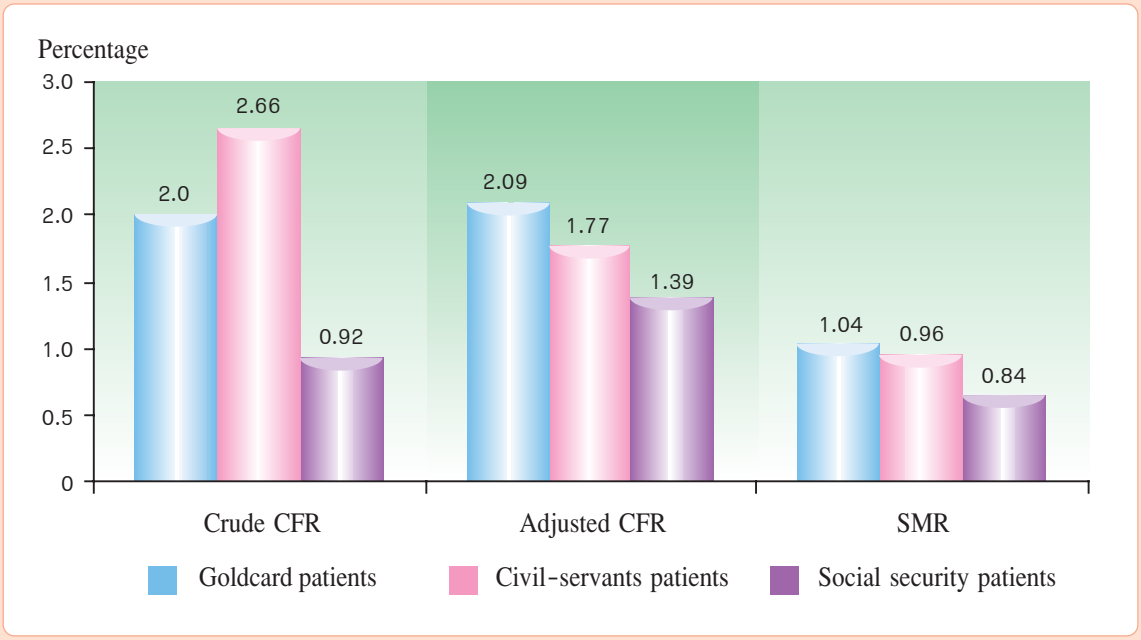
	Goldcard patients	Civil-servants patients	Social security patients
% Coronary bypass	0.13	0.46	0.18
% Removal of Coronary obstruction	2.90	9.93	6.45

Source: Pinij Faramnuayphol. Analysis of inpatient data, 2004. National Health Security Office.

7.3 Equity in Outcome of Health Services

The case-fatality rate of inpatients is regarded as "outcome" of health services. If the severity of all illnesses is equal, the chance of patients dying of each illness will be close to one another. An analysis of case-fatality rates, specifically age-adjusted case-fatality rates, by age of patients under three health insurance schemes revealed that gold-card patients (under the universal healthcare scheme) had the highest case-fatality rate of 2.09%, rather than civil servant-patients (under the civil servants medical benefits scheme) with the adjusted case-fatality rate of 1.77% and social security patients at 1.39%. Similarly, an analysis of standardized mortality ratios (SMR) revealed that the SMR for gold-card patients was 1.04 (chances of dying being 1.04 times of the expected value), which was higher than that for civil servant-patients (0.96) and social security patients (0.64) (Figure 6.95). This means that, having age adjusted, gold-card patients will have the highest case-fatality rate, followed by civil servant-patients and social security patients, probably associated with different illness characteristics of patients, service selection and capacity of health facilities.

Figure 6.95 Crude case-fatality rates, age-adjusted case-fatality rates, and standardized mortality ratios of patients under three health insurance schemes

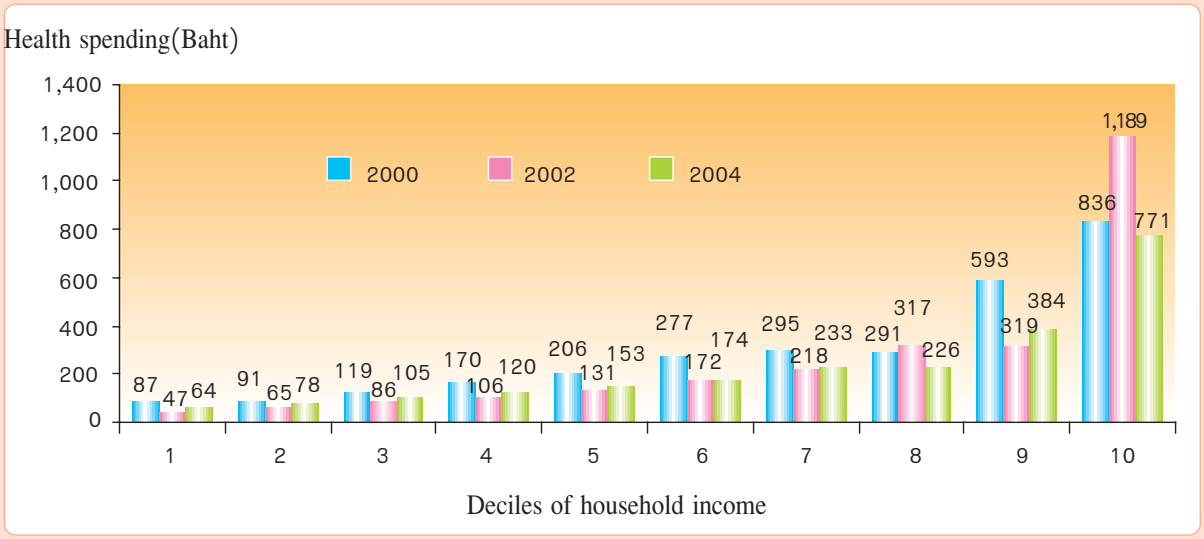


Source: Pinij Faramnuayphol. Analysis of inpatient data, 2004. National Health Security Office.

7.4 Equity in Healthcare Spending

Household health spending according to households' socio-economic status should be equitable, i.e. a poor household should pay less to the system than a rich household in an amount proportional to their household incomes. As a result of the universal healthcare policy, household health spending has decreased. In 2002, health spending among the poor groups (deciles 1 to 4) dropped by 27-45%. However, it is noteworthy that for the richest group (decile 10) their health spending increased by 42%, probably due to their use of health services beyond their entitlements or non-use of universal healthcare resulting in a higher health spending. But in 2004, health spending among the poor groups (deciles 1 to 4) increased by 10-30% which was lower compared to that for 2000; and it was noted that for the rich groups (deciles 8 to 10) health spending also dropped by 7-30% (Figure 6.96).

Figure 6.96 Comparison of average household health spending in 10 deciles of households before and after the launch of the universal healthcare scheme



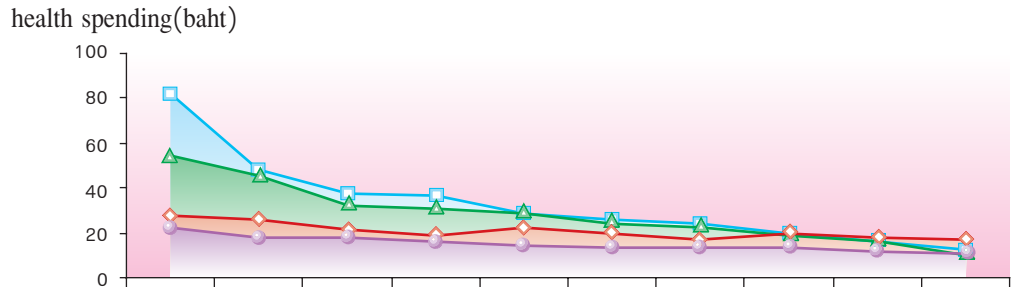
Source: - Viroj Tangcharoensathien. Financing of the Universal Healthcare System: Present and Future. International Health Policy Programme, 2004.

- Suphon Limwattananond et al. Analysis of data from households' socio-economic survey, 2004. National Statistical Office.

Note: Analysis was done only for the last quarters of 2000 and 2002.

According to an analysis of the proportions of household health spending by income group, the burden of people's health spending is not in accordance with their ability to pay. When comparing the proportion of health spending of each income group, low-income people have a higher proportion of health spending than high-income people (Figure 6.97). After the government launched the health insurance scheme for various groups of underprivileged people and the universal healthcare scheme, it was found that the differences in burden of health spending between the rich and the poor had a declining trend, from 6.4 times in 1992 to 1.6 times in 2002, but rising slightly to 2.1 times in 2004 (Table 6.23).

Figure 6.97 Percentage of health spending in relation to household income by decile of income, 1992, 1996, 2002 and 2004



	1	2	3	4	5	6	7	8	9	10
1992	8.17	4.82	3.74	3.65	2.87	2.57	2.45	1.99	1.64	1.27
1996	5.46	4.58	3.32	3.16	2.93	2.52	2.36	1.97	1.57	1.10
2002	2.77	2.59	2.14	1.90	2.20	1.98	1.74	1.92	1.83	1.71
2004	2.23	1.77	1.75	1.62	1.40	1.37	1.32	1.35	1.15	1.07

Source: Supon Limwattananon et al. Analysis of data from households' socio-economic survey, 2004. National Statistical Office.

Table 6.23 Proportion of health spending to household income by decile of income, 1992-2004

Year	Income decile										Difference of decile 1 and decile 10
	1	2	3	4	5	6	7	8	9	10	
1992	8.17	4.82	3.74	3.65	2.87	2.57	2.45	1.99	1.64	1.27	6.4
1994	7.56	4.75	4.49	3.60	3.26	3.03	2.53	2.32	2.03	1.26	6.0
1996	5.46	4.58	3.32	3.16	2.93	2.52	2.36	1.97	1.57	1.10	5.0
1998	4.22	3.07	2.95	2.90	2.59	2.43	1.94	2.00	1.57	1.23	3.4
2000	4.58	3.67	3.29	2.78	2.38	2.22	2.06	1.68	1.55	1.27	3.6
2002	2.77	2.59	2.14	1.90	2.20	1.98	1.74	1.92	1.83	1.71	1.6
2004	2.23	1.77	1.75	1.62	1.40	1.37	1.32	1.35	1.15	1.07	2.1

Source: Supon Limwattananon et al. Analysis of data from households' socio-economic survey, 2004. National Statistical Office.

In addition, it was found that, in 2004, most people including low-income group had a rather low burden of health spending in relation to income. Among the poorest, 82.2% of them spent less than 5% of their income on health and 94% of the richest also spent less than 5% of their income on health (Table 6.24).

Table 6.24 Percentage of households classified by percentage of household health spending in 10 decile groups, 2004

Decile	Health spending as percentage of household income						
	0-5%	6-10%	11-20%	21-30%	31-40%	41-50%	over 50%
1	82.2	7.3	4.7	1.2	0.3	0.1	0.8
2	91.4	5.2	1.9	0.7	0.2	0.4	0.4
3	92.2	4.6	2.2	0.3	0.1	0.1	0.5
4	92.2	5.0	1.7	0.4	0.3	0.2	0.2
5	92.2	4.8	1.9	0.4	0.3	0.2	0.2
6	92.5	4.7	1.8	0.6	0.2	0.04	0.1
7	94.2	3.1	1.7	0.4	0.2	0.03	0.4
8	94.6	2.9	2.0	0.3	0.1	0.1	0.03
9	94.5	2.8	1.6	1.0	0.02	0.0	0.1
10	94.0	3.9	1.5	0.4	0.1	0.0	0.1
Total	**92.0**	**4.4**	**2.1**	**0.6**	**0.2**	**0.1**	**0.3**

Source: Supon Limwattananon et al. Analysis of data from households' socio-economic survey, 2004. National Statistical Office.

Chapter 7

Protection of Thailand's Health System

A good health system must be based on morality, righteousness and ethical conduct with respect for rights, values and dignity of human being, leading to equality. Besides, the system must have a complete structure and interrelated/coordinated working mechanisms in an integrated manner, with good quality, efficiency, cost-containment, accountability, and joint responsibility as well as unity, knowledge base, continued learning and development, in line with personal ways of life and social norms, self-reliance in a suitable and sustainable manner and participation of all sectors in society for promoting health of all the people, i.e. "all for health and health for all".

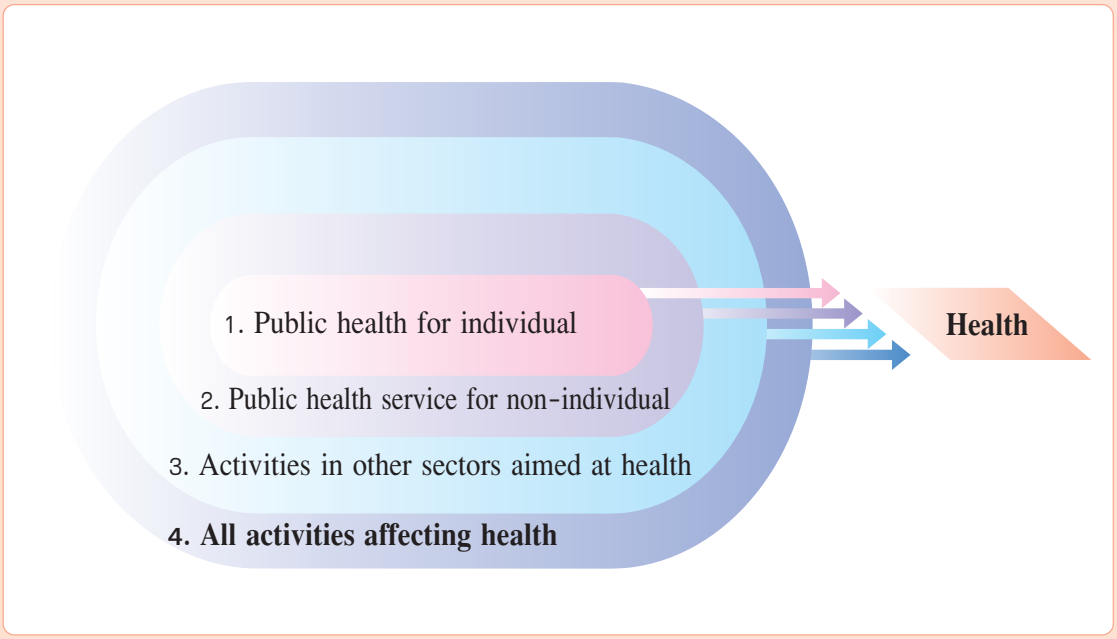
1. Scope of the National Health System

According to the National Health Act B.E. 2550 (2007) (Government Gazette, Vol. 124, Part 16Gor, 19 March B.E. 2550), **"health means the state of human being which is perfect in physical, mental, intellectual and social aspects, all of which are holistic in balance,"** and "health system means overall relations in connection with health."

"Public health system" means the management of activities related to disease prevention, curative care, health promotion and medical rehabilitation (Public Health Encyclopedia, 1988) and **"public health service"** means any service relating to health promotion, prevention and control of diseases and health hazards, diagnosis and treatment of illness and rehabilitation of person, family and community.

In summary, the "national health system" means various systems that cover the operations of health activities in all dimensions, while the public health system and the public service system are part of the national health system, as diagrammatically shown in the figure below.

Figure 7.1 Scope and meaning of health system



Source: National Health Act, B.E. 2550 (2007).

According to the figure above, the scope of health system can be described in four levels as follows:

Level 1: This is the narrowest level of health system which covers health services for individuals with respect to curative care, health promotion, disease prevention and rehabilitation.

Level 2: This level covers services outside the individuals such as disease prevention in the community, family and community health, but does not include other health-related activities such as water supply, sanitation, and legislation on reduction of lead content in fuels.

Level 3: This level covers activities of other sectors which are related to health such as solid waste disposal, water supply and road safety.

Level 4: This is the widest level that covers all activities that may have some effects on health, no matter whether they will have any health-related objectives or not, such as education, tourism, agriculture, city planning, justice, economy, etc.

The "Total health system" in the National Health Act covers all activities as described in "Level 4" above, while the public health system is a sub-system of the health system that covers activities in "Levels 1, 2 and 3", and "health care/service system" covers Level 1 activities and some activities of Level 2 such as family and community health.

2. Components of the National Health System

In drafting the National Health Bill, efforts were made to set up components of the health system in a comprehensive and coordinated fashion so as to obtain a desirable national health system. The components of the national health system are divided into 10 sub-systems as follows (Figure 7.2):

2.1 Health policy and strategy system

2.2 Health promotion system

2.3 Prevention and control of diseases and health hazards system

2.4 Public health services and quality control system

2.5 System for promotion, support, utilization and development of local health wisdom, Thai traditional medicine, indigenous medicine and alternative medicine

2.6 Health consumer protection system

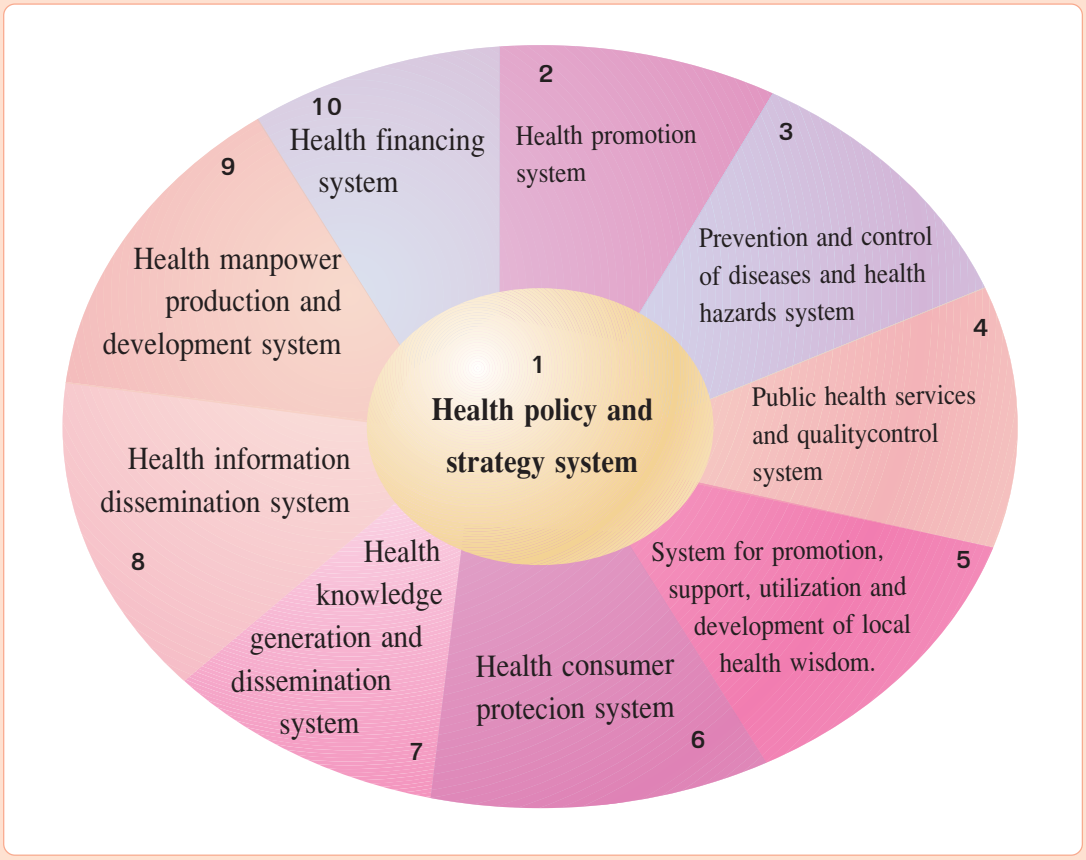
2.7 Health knowledge generation and dissemination

2.8 Health information dissemination system

2.9 Health manpower production and development system

2.10 Health financing system

Figure 7.2 Components of health system



Source: Modified from the National Health Act B.E. 2550 (2007).

2.1 Health Policy and Strategy System

Health policy and strategy include healthy public policy and public health policy. To formulate a good health policy and strategy system, emphasis should be placed on the participation of all sectors concerned to empower individuals, families, community and society, and to reduce social inequalities and injustice. The formulation process requires cooperation of all partners concerned and all sectors in society are to be encouraged to take responsibility for health, integrating interdisciplinary knowledge and technology. These policies and strategies have a broad scope such as policies on income distribution, wages, agriculture, industry, land use, city planning, energy management, environmental management, traffic accident prevention and control, alcohol and tobacco consumption control, all affecting health directly and indirectly. In addition, they include public health policies such as those on expansion and distribution of public health services, health security, prevention and control of diseases and health threats, HIV/AIDS prevention and control, consumer protection in food and drug, development of Thai traditional medicine and local wisdom, and primary health care.

Regarding the mechanism for developing health policies and strategies, the National Health Commission will coordinate with the government's policy and strategy formulation agency as well as other public and private health agencies. This is to create the process for developing health policies and strategies in a continuous manner with the participation of all concerned for the benefits of the majority of Thai people.

2.2 Health Promotion System

"Health promotion" means any act which is aimed at the fostering of a person's physical, mental and social conditions by means of supporting personal behaviors, social conditions and environments conducive to physical strength, a firm mental condition, a long life and a good quality of life (Health Promotion Foundation Act, 2001). It is a process of empowering personal and community's capacity to have a livelihood leading to good health, under supportive environments. And it is a process that enables the people to control the determinants of health resulting in better health, i.e. control their own behaviours so that they are prepared to modify the environments conducive to good health.

A health promotion system is thus a service rendered to the people by health personnel through health care delivery at various levels such as health-promoting hospitals which have concepts for hospital development and increase the role of hospitals as leaders of health promotion. Health promotion system in a broader context, according to the Ottawa Charter, views health promotion as a role of all sectors in society to develop healthy public policy, develop environments conducive to health, strengthen the community, develop personal skills, and reorient health service systems. As a result, there have been developments on several programmes such as healthy cities and healthy Thailand, healthy communities, and health-promoting schools. At present, the MoPH's Department of Health and the Thai Health Promotion Foundation (ThaiHealth) are the key supporting agencies.

2.3 System for Prevention and Control of Diseases and Health Threats

This system aims to decrease morbidity, mortality and disability, and to eliminate health threats, in an effective and timely manner, based on current knowledge and facts as well as the systematic approach of integrated technical and managerial operations. It does not mean the conventional system for disease prevention and control, but focuses on the prevention and control of health threats that cause illnesses and other problems. In the past, emphasis was normally placed on disease prevention and control, as well as project management in a vertical manner through the MoPH's mechanism with responsibilities distributed according to the nature of diseases such as communicable diseases, non-communicable diseases, environmental diseases, occupational diseases, and mental disorders. But currently, the system has been expanded to cover the prevention and control of factors affecting health including actions for minimizing health impacts from physical, biological and chemical factors (including infectious agents) and social systems. For example, in the case of avian influenza, which had an economic impact on the country through trade discrimination, there was a ban on imports of fresh chicken from Thailand; and several people lost their lives. Therefore, the prevention and control of diseases and health threats requires intersectional cooperation of all concerned. Central administration agencies, including the Ministry of Public Health, the Ministry of Agriculture and Cooperatives, the National Research Council, businesses, universities and others concerned, have to play a technical support role in keeping abreast of knowledge as well as local and international situations, and developing or seeking new knowledge for resolving the problem. Beside, efforts have to be made to monitor the mutation of avian flu virus and identify suitable measures for monitoring and evaluation of actions undertaken by various relevant agencies. Concurrently, regional/provincial and local administration authorities as well as the communities have to also coordinate with each other in mobilizing all resources for the prevention and control efforts. These include the setting up of public policies on sanitation, consumer protection, disease surveillance, and situation monitoring. Overall, this system in this context has a scope that is broader than that of medical and health system in the past.

2.4 System of Public Health Services and Quality Control

The system of public health services and quality control in Thailand has been developed from the concept of state health services for all the people in the form of social welfare. And until recently it has been transformed into the concept of universal coverage of health services under the responsibility of the government, or risk-sharing or self-reliance through personal savings. This is to create a tool that will lead to the goal of universal coverage, or access to, basic health services required for healthy living in an equitable manner. The new system has a clear separate role of services purchasers and service providers that equitably cover all localities and population groups so that the entire system is managed with efficiency, cost containment and quality assurance mechanisms.

Thus, a good public health service system means public services that are adequate,

equitable, accessible, of good quality, and efficient, not seeking unreasonable business profit. It also covers self-care at the individual, family and community levels, emergency services, primary care, secondary services and tertiary services, specialized services and emergency medical services. Moreover, there must be systems for development and accreditation of service standards and quality, and for assessment of health technologies that will be appropriately used in health services delivery.

2.5 System for Promotion, Support, Utilization and Development of Local Wisdom on Health, Thai Traditional Medicine, Indigenous Medicine and other Alternative Medicine

The system of local health wisdom means the body of knowledge, thoughts, beliefs and skills in health care that have been accumulated from life experiences and transmitted through culture of groups of people. The promotion, support, utilization and development of such local health wisdom have to be in accordance with local community's ways of life, traditions and culture, so as to respond to and support the principle of self-health-reliance and to provide several health services options.

In the past, local health wisdom was not systematically organized whereas present day's medical and health technologies have considerably advanced, resulting in local health wisdom being given less importance or missing. But when the health situation has changed, local health wisdom or non-mainstream medical care has been revised and become a new alternative. In 1993, the Institute of Thai Traditional Medicine was established under the Department of Medical Services; later it became the Department for Development of Thai Traditional and Alternative Medicine in 2002. That was the formal development of Thai traditional medicine since its abolishment from Siriraj Hospital in 1904 (Komatra Chuengsatiansup, 2004) and the movements towards new dynamics of medical diversity.

However, local health wisdom has to be further supported and developed as it has long been neglected. Dr. Komatra Chuengsatiansup (2004: 39-42), and Drs. Suwit Wibulpolprasert and Prapoj Petrakard and colleagues (2006) have made a number of strategic recommendations, namely: creation of mechanism for knowledge management by establishing an institute for research and development of Thai-style health care, establishment of a committee on local health wisdom policy to formulate policies and push for a national agenda on local health wisdom and to set up a Thai traditional medicine hospital, and to promote the development of networks for knowledge management and mapping for community health wisdom, and establishment of mechanisms for linking, communicating and networking with other world-class academic institutions related to medical and health derived from the new paradigm of science.

2.6 Consumer Protection System

Health consumer protection means any operation undertaken to provide protection for the people as consumers of health services/products in a safe and fair manner. So there must be

comprehensive systems for all relevant operations in this regard which include: health professional standard development, public health service standard development, health product standard development, information dissemination, counselling, complaint acceptance, inspection for justice provision, mediation, and remedies in case of damage. The designs of such systems must be based on people's rights so that they will live together in harmony which is a significant characteristic of Thai society.

In addition to the aforementioned systems, the promotion and support of people's system of consumer protection is essential through empowerment of non-governmental organizations working on health consumer protection in parallel with public sector's efforts. This is to supplement each other and set up a system of checks and balances.

2.7 Health Knowledge Generation and Dissemination

Over the past decade, Thailand has started to place importance on the generation and dissemination of knowledge about health. Several agencies have been established such as the Thailand Research Fund (TRF), the National Science and Technology Development Agency (NSTDA), and the Health Systems Research institute (HSRI). As a result, there has been a paradigm shift in health research in a systematic manner. More initiatives have been undertaken for health promotion; however, the utilization of research results and the management have not been carried out as expected. Therefore, in the future there should be a mechanism for setting directions and policies for management of research, administration of health resources, monitoring and evaluation of knowledge generation and dissemination system. In addition, all concerned have to promote, support and manage the establishment of a network or mechanism for health knowledge generation and dissemination. This is to ensure that research and knowledge management efforts are undertaken systematically and that the capacity of health system will be enhanced with decreased costs and more efficient results.

2.8 Health Information Dissemination System

A system for dissemination of health information is to be designed and developed in such a way that it is adequate and easily accessible to the people. Thus, the system has to be developed so that it is up to date and easily accessible to the public in a timely fashion. At present, the information can not reflect all dimensions of people's health and it is scattered in various agencies due to a lack of mechanism to collate, analyze and synthesize it so that it clearly shows the trends of rapidly changing situations. So mostly, the information is not accurate enough for actual utilization.

In the past, the dissemination of health information was done through the health education process by health personnel in healthcare facilities or by community health volunteers. So the information was rather limited, depending on the knowledge, understanding and beliefs of the informants. Sometime, the information was not up to date or not consistent with the advances in science

and technology as well as the rapidly evolving world. Some information did not correspond to the needs of the people who were facing specific health problems in various aspects. As the techniques of health information dissemination are now more modern, the people can seek the health information by themselves from various channels of media. If the information is managed in such a way that it is accurate, comprehensive, and relevant to the needs of people; the dissemination system to groups of professionals and the media, the modalities of health information dissemination will be revised and further extended from health personnel to the media and other groups of people, who have a more interesting technique of presentation. This can lead to the receipt of information of the people and society on a wider scale through various channels.

2.9 System for Production and Development of Public Health Personnel

This system covers subsystems of policy and production plan, production operations and development; the system requires specific knowledge and management. A good public health personnel system has to be a system that is efficient, of good quality, and able to create equity.

In the past, the system for production of health personnel was primarily linked to the public central administration system with the MoPH being the major agency deploying health personnel in the civil service system. But the production of personnel was under the national education system and the MoPH produced part of health personnel for its own deployment. Such systems had no specific mechanisms for policy and operational coordination at the national level. However, there were efforts for admitting students from provincial areas to study in certain health training programmes and, upon completion, go back to work in their own province of residence. This is to build up equity and resolve the problem of personnel shortages in rural areas. This mechanism is quite effective for nurses and health workers at the subdistrict health-centre level. But rural-urban brain drain is still a chronic problem for medical doctors. The problems are different in nature, depending on changing situations and factors. The system in the future has to adjust itself to cope with the changing situation in society, taking into consideration the participation of local administrative organizations, the private sector, and civil society, the reduction of dependence on state mechanisms. The new system has to be multifaceted; so it will be able to cope with the changing health system in a timely manner.

2.10 Health Financing System

Health financing means the financial management for health such as the use of tax measures to promote elderly care in the family, the promotion of private businesses to take care of their employees' health, the promotion of healthy environments, and the use of tax measures for tobacco and alcohol consumption control. It also includes the management of public finance for the provision of universal coverage of health services.

Financing of public health services means a financial system that creates a good service

system in all aspects, ensuring that all the people have equitable access to essential services without any financial barrier. In principle, health financing is to aim at building good health before repairing ill health with equity, transparency, accountability, efficiency, cost containment, and quality.

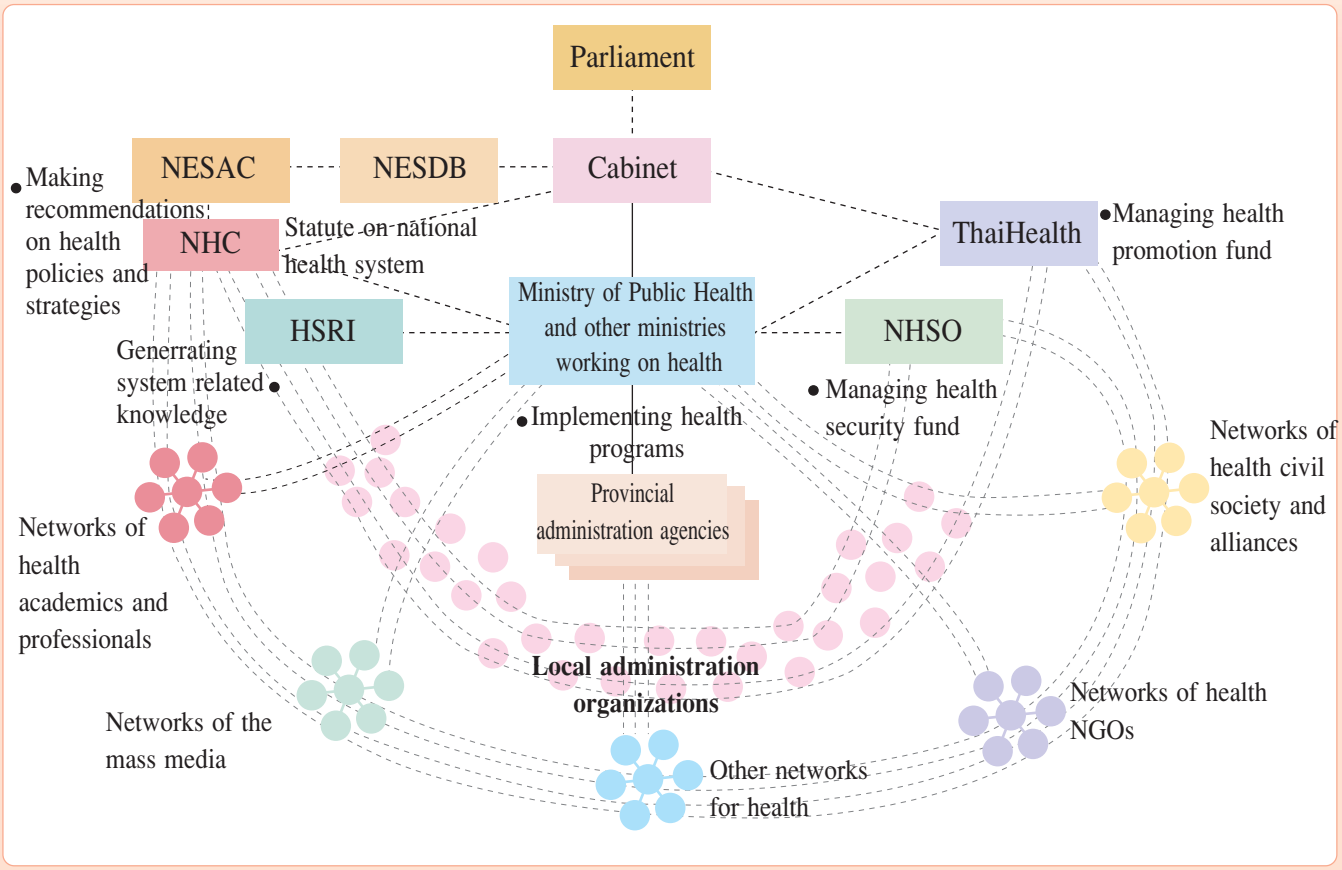
Thailand has had programmes on health financing for a long time such as the financial and tax measures (raising alcohol and tobacco taxes) and the enactment of the Health Promotion Foundation Act for collecting 2% tax on alcohol and tobacco for use in health promotion activities. Several other efforts have been made to build good health and protect or improve health conditions of the people and society. At present, developments in health financing for health services delivery are implemented in four major systems: universal healthcare system under the National Health Security Act of B.E. 2545 (2002), social security system, civil servants medical benefits system (for civil servants, state enterprise employees and family members), and private health insurance system.

The health financing system is regarded as one important system under the health system as it can be used as a tool in pushing forward the national health system in a desirable direction.

3. Mechanism for Protection of National Health System

In the past, when mentioning of mechanisms for the protection of the national health system, they were normally referred to mechanisms under the Ministry of Public Health, health facilities under other agencies, health educational institutions, health non-governmental organizations, for instance. But at present, the social context has changed considerably with new mechanisms taking part in health activities (Figure 7.3).

Figure 7.3 Linkages of protection mechanisms in the national health system



Notes:

NESAC	=	National Economic and Social Advisory Council
NESDB	=	National Economic and Social Development Board
NHC	=	National Health Commission
NHSO	=	National Health Security Office
HSRI	=	Health Systems Research Institute
ThaiHealth	=	Thai Health Promotion Foundation

As shown in the figure, the MoPH is the principal mechanism of the national health system and, as the core agency of the government; it is responsible for the operations of health programmes through its administrative, service delivery and technical agencies located across the country. In all such efforts, other ministries also play a role in health-related activities in various dimensions in a coordinated fashion, including for example the National Economic and Social Development Board, the Ministry of Interior, the Ministry of Education, the Ministry of Social Development and Human Security, and the Ministry of Labour. In addition, there are other independent mechanisms, some under the supervision of the MoPH, some are not, including: the Office of the Thai Health Promotion Foundation (ThaiHealth), responsible for the management of the health promotion fund supporting all sectors in society to widely carry out health promotion activities in all dimensions; the National Health

Security Office (NHSO), responsible for the management of the health security or insurance fund for providing health services to the people; the Social Security Office of the Ministry of Labour, responsible for the management of healthcare funds for workers and their family members; the Health Systems Research Institute (HSRI), responsible for the management of funds for supporting the creation and management of knowledge for health; the Institute of Hospital Quality Improvement and Accreditation (HA), responsible for the promotion and support of health service quality development in hospitals and other kinds of health facilities; and the Office of the National Health Commission, responsible for making recommendations on health policies and strategies to the government and all sectors in society using the participatory approach involving all concerned in the process of policy and strategy formulation process.

Moreover, there are several other mechanisms involved in the movements for health such as the National Economic and Social Advisory Council, health educational institutions and technical agencies, health professionals councils, health NGOs, the mass media, health charity organizations, and health civil society networks, such as the National Health Foundation, the Folk Doctor Foundation (Mor Chao Ban), the Consumer Protection Foundation, health civil society networks working on AIDS, village health volunteers networks, networks for Thai traditional and alternative medicine, and health assembly networks.

Besides, at the local level there are local administrative organizations such as the Bangkok Metropolitan Administration, Pattaya City, provincial administration organizations, municipalities, and Tambon (subdistrict) administration organizations, totalling more than 7,000 nationwide in number, each responsible for a wide variety of health activities according to the intent of the 1997 constitution and other relevant laws.

It is obvious that mechanisms involving health are numerous and different in their missions and they are not under the supervision of the MoPH rather they have to work collaboratively in a pluralistic society. However, the MoPH has to play a key role in coordinating the efforts of all agencies to create synergy and move forward the actions of all subsystems towards the achievement of the common goal of health for all. In this connection, the MoPH has to readjust its role as an operator only for essential activities and promote as well as support other organizations and mechanisms to function as operators to the maximum extent possible.

4. Agencies Implementing Health Programmes

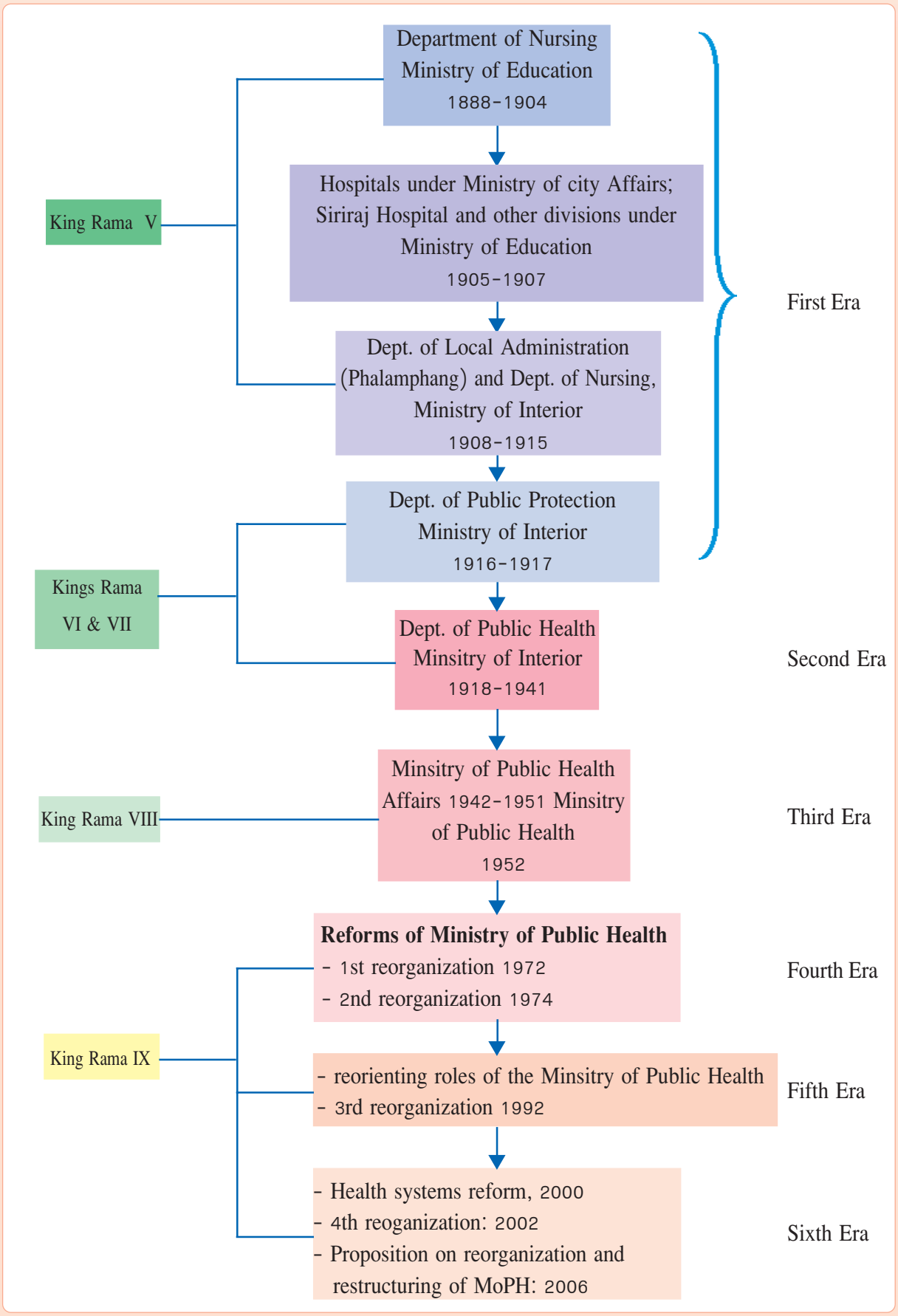
4.1 Ministry of Public Health

The MoPH is the core agency in the Thai public health system that implements health programmes with a budget share of more than 60%, almost all of which for rural health activities throughout the country. It takes the lead in healthcare delivery as well as setting public health policies for the country. Its major developments and administrative system are as follows:

4.1.1 Evaluation of the MoPH, 1888-present and Future Trends

The development of the MoPH began in 1888 when at that time it was the Department of Nursing under the Ministry of Education. It became the Public Health Department under the Department of Interior in 1918, until the establishment of the Ministry of Public Health on 10 March 1942, according to the Reorganization of Ministries, Sub-Ministries and Departments Act (No. 3) of B.E. 2485 (1942). Since then there have been several reorganizations, the first in 1972, the second in 1974, the third in 1992, and the fourth in 2002 with a major revision of roles, missions and structure. In 2006, the MoPH had a review of its roles, responsibilities and organization structure so as to lay down plans and restructure itself for keeping abreast of changing socioeconomic situations at the national and global levels. This is to efficiently improve the health status of Thai people and it is expected that the fifth reorganization/restructuring will be completed in the near future (Figure 7.4).

Figure 7.4 Evolution of the Ministry of Public Health, 1888-present



The Future Trends. The MoPH, especially agencies at the central administration level, will become smaller and serve as a mechanism in setting health policies and strategies, controlling, monitoring and setting standards, and coordinating with all other relevant sectors in society to jointly work on health in a systematic manner. Its roles as implementers will be decreased to perform only essential functions as almost all of the budget for health services delivery has been transferred to the National Health Security Office, which will make payments directly to healthcare facilities (without passing through the MoPH since May 2006). As for provincial administration agencies, provincial and district public health offices will become agencies under the jurisdiction of a provincial juristic person (provincial department) according to the provincial strategy-administration approach as well as the agreement to be developed in line with the national strategy. Regarding health facilities of all categories at all levels, they may be merged as a state juristic entity which is not a government agency, but under the supervision of the MoPH, responsible for providing health services to the people in their designated area, or they may be transferred to be under a local administration organization.

4.1.2 Authority and Administrative Structure of Ministry of Public Health

1) Authority and Mandate of MoPH

The Reorganization of Ministries, Sub-Ministries and Departments Act of B.E. 2545 (2002) provides that **"the Ministry of Public Health has powers and responsibilities related to the promotion of health, prevention/control and treatment of diseases, and rehabilitation of people's health, as well as other official functions as provided by laws which indicate that such functions are under the responsibility of the Ministry of Public Health".**

Its principal purpose is to make **all Thai citizens healthy, physically and mentally, with good quality of life, being able to live a happy life in society and being valuable resources of the country.**

2) Administrative Structure

The administrative structure of the MoPH is divided into two levels: central administration and provincial administration.

(1) **The Central Administration** (Figure 7.5) is composed of 10 agencies: (1) the Office of the Minister, (2) the Office of the Permanent Secretary for Public Health and (3) three clusters with eight departments as follows:

- **Cluster of Medical Services Development**, comprising three departments: Department of Medical Services, Department for Development of Thai Traditional and Alternative Medicine and Department of Mental Health.
- **Cluster of Public Health Development**, comprising two departments: Department of Disease Control and Department of Health.

- **Cluster of Public Health Service Support**, comprising three departments: Department of Health Service Support, Department of Medical Sciences, and Food and Drug Administration.

Besides, the MoPH has some other agencies under its supervision, but are not under any of the aforementioned clusters, as follows:

- **Agencies under MoPH's supervision**, totalling six agencies; four of them are in the process of getting their legislations enacted, i.e. Prabromarajchanok Institute (under the Office of the Permanent Secretary), National Institute of Health (under the Department of Medical Sciences), Medical Emergency Services Development Institute, and Institute of Hospital Quality Improvement and Accreditation, and two other agencies that have had their own laws: Health Systems Research Institute and National Health Security Office.
- **State enterprise (1):** Government Pharmaceutical Organization.
- **Public organizations:** According the Public Organization Act of B.E. 2542 (1999), state health facilities (regional/general/community hospitals and health centres) are expected to be converted into public organizations whenever they are ready. At present there is only one hospital, Ban Phaeo Hospital in Samut Sakhon province, which has become a public organization; some more are in the process of getting established.

In 2007, the Office of the National Health Commission was established according to the National Health Act of B.E. 2550 (2007) as a juristic person under the Prime Minister's supervision. Its key role is to coordinate with other state agencies responsible for policy and strategy formulation as well as other health-related public and private agencies in carrying out efforts at the policy, strategy and programme level for health.

Figure 7.5 Organization of Ministry of Public Health

Professional Councils · · **Ministry of Public Health** · · · · · · **Office of the National Health Commission**

Office of the Minister

Permanent Secretary

- **Office of the Permanent Secretary**
  - Bureau of Central Administration
  - Information and Communication Technology Centre
  - Praboromarajchanok Institute of Health Workforce Development
  - Bureau of Inspection and Evaluation
  - Bureau of Policy and Strategy

Provincial Administration

- Provincial Public Health Offices
- District Health Offices

Cluster of Medical Services Development
Deputy Permanent Secretary

- **Department of Medical Services**
  - Office of the Secretary
  - Personnel Division
  - Finance Division
  - Planning Division
  - Nopparat Rajathanee Hospital
  - Mettapracharak Hospital (Wat Rai Khing)
  - Rajavithi Hospital
  - Lerdsin Hospital
  - Sirindhorn National Medical Rehabilitation Centre
  - Institute of Dentistry
  - Institute of Pathology
  - Prasat Neurological Institute
  - National Cancer Institute
  - Thanyarak Institute
  - Chest Disease Institute
  - Institute of Dermatology
  - Institute of Geriatric Medicine
  - Queen Sirikit National Institute of Child Health
  - Bureau of Nursing
  - Bureau of Medical Technical Development
- **Department for Development of Thai Traditional and Alternative Medicine**
  - Office of the Secretary
  - Division of Compl'ry & Alternative Medicine
  - Institute of Thai Traditional Medicine
- **Department of Mental Health**
  - Office of the Secretary
  - Personnel Division
  - Finance Division
  - Planning Division
  - Social Mental Health Division
  - Srithurya Psychiatric Hospital
  - Mental Health Regional centres 1-12
  - Galyarajanagarindra Institute
  - Somdet Chaopraya Institute of Psychiatry
  - Rajanukul Mental Retardation Institute
  - Mental Health Technical Development Bureau

Cluster of Public Health Development
Deputy Permanent Secretary

- **Department of Disease control**
  - Office of the Secretary
  - Personnel Division
  - Finance Division
  - Planning Division
  - Bamrasnaradura Institute
  - Rajprachasamasai Institute
  - Office of the Disease Prevention and Control 1-12
  - Bureau of Epidemiology
  - Bureau of Occupational and Environment Disease
  - Bureau of Genneral Communicable Disease
  - Bureau of Vector-Borne Disease
  - Bureau of Non-communicable Disease
  - Bureau of AIDS, TB and STIs
- **Department of Health**
  - Office of the Secretary
  - Dental Health Division
  - Personnel Division
  - Planning Division
  - Finance Division
  - Nutrition Division
  - Sanitation and health Impact Assessment Division
  - Food and Water Sanitation Division
  - Reproductive Health Division
  - Division of Physical Activities and Health
  - Regional Health Promotion Centres 1-12
  - Bureau of Health Promotion
  - Bureau of Environmental Health

Cluster of Public Health Services Support
Deputy Permanent Secretary

- **Department of Health Service Support**
  - Bureau of Administration
  - Medical Registration Division
  - Division of Design and Construction
  - Medical Engineering Division
  - Primary Health Care Division
  - Health Education Division
  - Bureau of Health Services System Development
- **Department of Medical Sciences**
  - Office of the Secretary
  - Division of Cosmetics and Hazardous Substances
  - Division of Biological Products
  - Division of Planning and Technical Coordination
  - Division of Radiation and Medical Devices
  - Regional Medical Sciences Centres 1-12
  - National Plant Research Institute
  - Medicinal Plant Research Institute
  - Bureau of Quality and Food Safety
  - Bureau of Laboratory Quality Standards
  - Bureau of Drugs and Narcotics
- **Food and Drug Administration**
  - Office of the Secretary
  - Medical Device Control Division
  - Drug Control Division
  - Narcotics Control Division
  - Food Control Division
  - Improt and Exprot Inspection Division
  - Technical and Planning Division
  - Public and Consumer Affairs Division
  - Rural and Local Consumer Health Products Protection Promotion Division
  - Bureau of Cosmetic and Hazardous Substance Control

Agencies under the Supervision of MOPH :
- Health system Research Institute
- National Health Security Office
- Praboromarajchanok Institute of Health Workforce
- Development (Act required)
- National Institute of Health (Act required)
- Institute of Emergency Medical Services (Act required)
- Institute of Hospital Quality Improvement and Accreditation (Act required)

State Enterprise:
- Goverment Pharmaceutical organizations

Public organizations (Royal Decrees required)
- Health facilities (Royal Decree enacted for Ban Phaeo Hospital)

Source : *Ministerial Regulations of the Ministry of Public Health, 2002*

Note : *Public organizations and agencies under the supervision of the MOPH are not under any of the clusters.*

3) The Provincial Administration (Figure 7.6)

Public health agencies under the provincial administration are Provincial Public Health Offices, hospitals under the MoPH, District Health Offices, and health centres.

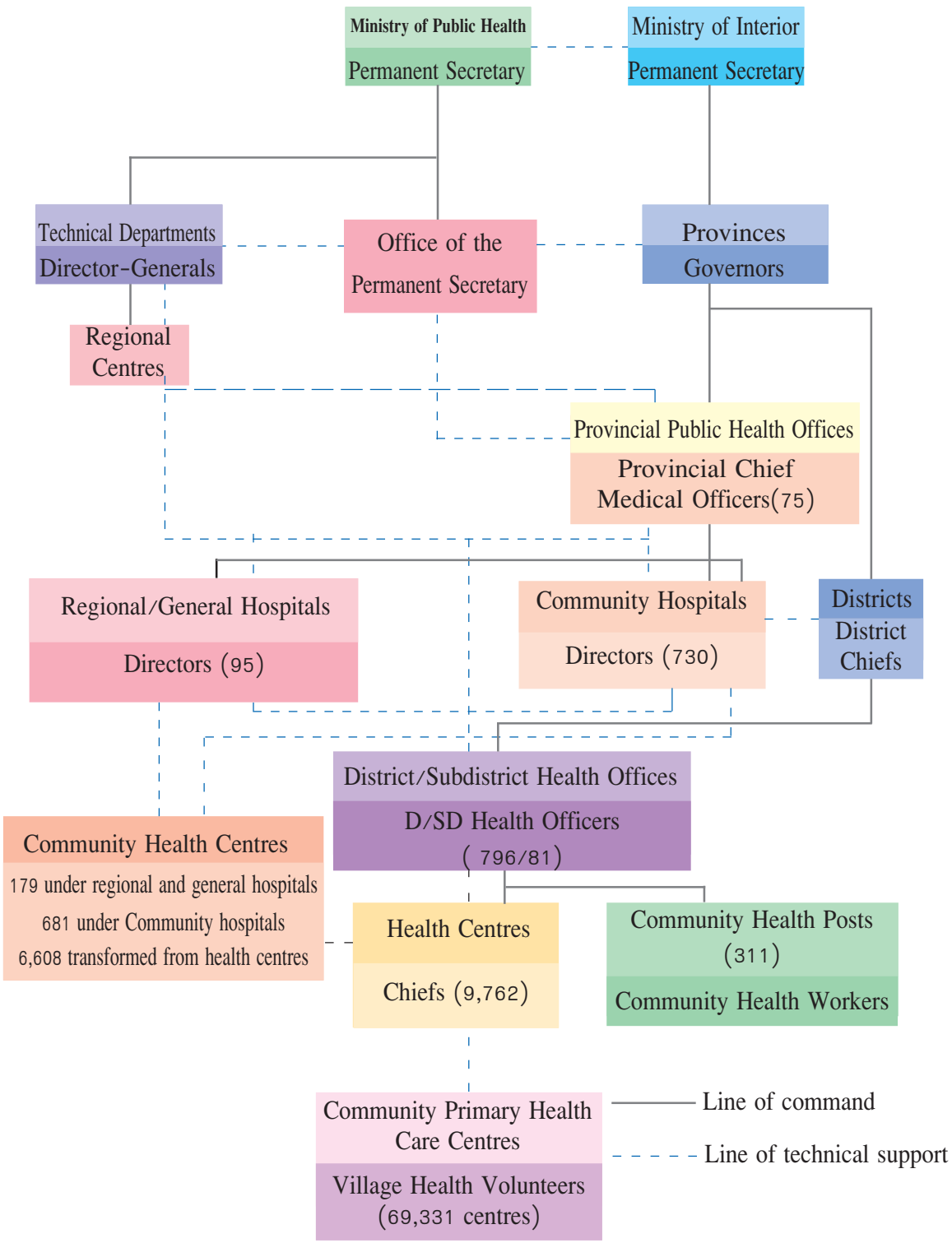
Since FY 2004, the government has changed the role of each provincial governor as chief executive officer (CEO) administering all activities within his/her jurisdiction on an integrated manner, aimed at achieving the state mission for the maximum benefit of the people. Thus, the Provincial Public Health Office in each province, which reports to the provincial governor, has to take part in resolving health problems at the local level, serving as one of the provincial administrators, with technical support from the MoPH.

In implementing the government's policy on universal health care, the MoPH has directed all hospitals and health centres to set up community health centres to take charge of health service delivery in a holistic and integrated manner. This is to continue providing health services to the people and community with the systems for home visits, counselling and referrals.

In 2006, there were 7,515 community (subdistrict) health centres across the country, of which 7,468 were under the MoPH including 179 under regional/general hospitals, 681 under community hospitals, and 6,608 transformed from health centres (67.7% of all 9,762 health centres), and 47 under private sector agencies.

Under the universal coverage of health care scheme, each of the provincial and community hospitals is a "contracting unit of primary care (CUP)" and health centres are supported by hospitals in terms of resources but are still under the supervision of the district health officer.

Figure 7.6 Organogram of Provincial Public Health Administration



4.1.3 Health-related Laws

There are a number of laws relating to health in the form of acts, ministerial regulations, orders and procedures as follows:

1) Acts under the responsibility of the MoPH (4 categories and 37 acts) are listed in Table 7.1.

Table 7.1 Acts under the direct responsibility of the Ministry of Public Health

No.	Act
1	Acts related to health service systems
	1.1 Medical Premises Act, 1998
	1.2 Health Systems Research Institution Act, 1992
	1.3 Thai Traditional Medicine Protection and Promotion Act, 1999
	1.4 Government Pharmaceutical Organization Act, 1966
	1.5 Health Promotion Foundation Act, 2001
	1.6 National Health Security Act, 2002
2	Acts related to disease prevention and control
	2.1 Public Health Act, 1992
	2.2 Communicable Diseases Act, 1980
	2.3 Zoonoses Act, 1982
3	Acts related to consumer protection in health
	3.1 Food Act, 1979
	3.2 Drugs Act, 1967; Amendment No. 2 (1975), No. 3 (1979), No. 4 (1985), and No. 5 (1987)
	3.3 Cosmetics Act, 1992
	3.4 Hazardous Substances Act, 1992
	3.5 Psychoactive Substances Act, 1975; Amendment No. 2 (1985), No. 3 (1992) and No. 4 (2000)
	3.6 Narcotics Act, 1979; Amendment No. 2 (1985), No.3 (1987) and No. 4 (2000)
	3.7 Medical Devices Act, 1988
	3.8 Royal Degree on Prevention of Volatile Substance Use, 1990; Amendment No. 2 (2000)
	3.9 Tobacco Product Control Act, 1992
	3.10 Non-smokers' Health Protection Act, 1992

Table 7.1 Acts under the direct responsibility of the Ministry of Public Health

No.	Act
4	Acts related to health professions 4.1 Medical Registration Act, 1999 4.2 Medical Profession Act, 1982 4.3 Nursing and Midwifery Profession Act, 1985; Amendment No. 2 (1997) 4.4 Pharmaceutical Profession Act, 1994 4.5 Dental Profession Act, 1994

2) Acts that the MoPH is not directly responsible for their implementation, but shares responsibilities with other ministries such as the Office of the Prime Minister and the Ministry of Interior

(1) Cemeteries and Crematoriums Act, 1985
(2) Drug Addicts Rehabilitation Act, 1991
(3) Rehabilitation of Disabled People Act, 1991
(4) Household and City Cleanliness and Orderliness Act, 1992
(5) Trade Secret Act, 2002
(6) The Act Establishing Youth and Family Courts and Trial Procedures for Youth and Family Cases, 1991
(7) National Health Act, 2007

3) Other health-related acts and announcements under other ministries' responsibilities.

(1) The Enhancement and Conservation of National Environmental Quality Act, 1992
(2) The Industrial Works Act, 1992
(3) Social Security Act (No. 2), 1990
(4) Vehicle Accident Victims Protection Act, 1992
(5) Workmen's Compensation Act, 1994
(6) Labour Protection Act, 1998
(7) Elderly People Act, 2003

4.1.4 Programmes/projects of the MoPH

The MoPH implements its programmes and projects under the National Economic and Social Development Plan and the Plan of Action (see details in chapter 3) in accordance with the

policies set by high-level health administrators, such as the Minister of Public Health and the Permanent Secretary for Public Health.

In implementing such programmes/projects, although in an integrated manner by provincial level health agencies, technical and resource support are still provided by central agencies in a vertical manner but with inadequate inter-agency coordination.

4.1.5 Human Resources of the MoPH

In the past 70% of MoPH personnel were civil servants and 30% were permanent employees. Since 1989 the proportion of permanent employees had declined to just 19.4% in 2006; and since 1999 the proportion of civil servants has steadily declined as there have been more and more "state employees". In 2004, the cabinet passed a resolution on 11 May 2004 to convert 27,385 state employees of the MoPH to civil servants, resulting in the increase in the proportion of civil servants to 80.1% in 2006 as shown in Figures 7.7 and 7.8.

In 2006, the MoPH had a staff of 211,891, of which 169,622 (80.1%) were civil servants, 41,074 (19.4%) were permanent employees, and 1,195 (0.5%) were state employees. The Office of the Permanent Secretary had the greatest proportion of personnel, i.e. 89.1% of all MoPH civil servants, 76.4% of all permanent employees, and 51.8% of all state employees; and the Department for Development of Thai Traditional and Alternative Medicine had the smallest (only 0.1% of all MoPH workforce). The Department of Disease Control had a lower proportion of civil servants compared with that of permanent employees (Table 7.2).

And in 2006, the MoPH recruited some state employees on contract so as to create flexibility in accordance with the modern state management procedures; so at present there are altogether 1,195 state employees, most of them are administrative and service support officials (Table 7.3).

Table 7.2 Numbers of civil servants, permanent employees, and state employees of MoPH, 2006

Department	Civil servants		Permanent employees		State employees		Total	
	No.	%	No.	%	No.	%	No.	%
Office of the Permanent Secretary	151,125	89.1 (82.5)	31,393	76.4 (17.1)	619	51.8 (0.3)	183,137	86.4
Department of Medical Services	7,572	4.5 (73.8)	2,582	6.3 (25.1)	112	9.4 (1.1)	10,266	4.8
Department of Health	2,009	1.2 (54.6)	1,621	3.9 (44.1)	48	4.0 (1.3)	3,678	1.7
Department of Disease Control	2,980	1.8 (47.7)	3,013	7.3 (48.2)	252	21.1 (4.0)	6,245	2.9
Department of Medical Sciences	973	0.6 (77.3)	263	0.6 (20.9)	23	1.9 (1.8)	1,259	0.6
Food and Drug Administration	602	0.4 (90.8)	60	0.1 (9.0)	1	0.1 (0.2)	663	0.3
Department of Health Service Support	3,265	1.9 (64.2)	1,712	4.2 (33.7)	109	9.9 (2.1)	5,086	2.4
Department for Development of Thai Traditional and Alternative Medicine	949	0.6 (69.0)	427	1.0 (31.0)	0	0.0 (0.0)	1,376	0.6
	147	0.1 (81.2)	3	0.01 (1.7)	31	2.6 (17.1)	181	0.1
Total	**169,622**	**100.0 (80.1)**	**41,074**	**100.0 (19.4)**	**1,195**	**100.0 (0.5)**	**211,891**	**100.0 (100.0)**

Sources: Personnel divisions/sections of all departments, MoPH, October 2006.

Notes: 1. Figures for civil servants and permanent employees of all departments are based on the numbers of actually filled positions in October 2006.

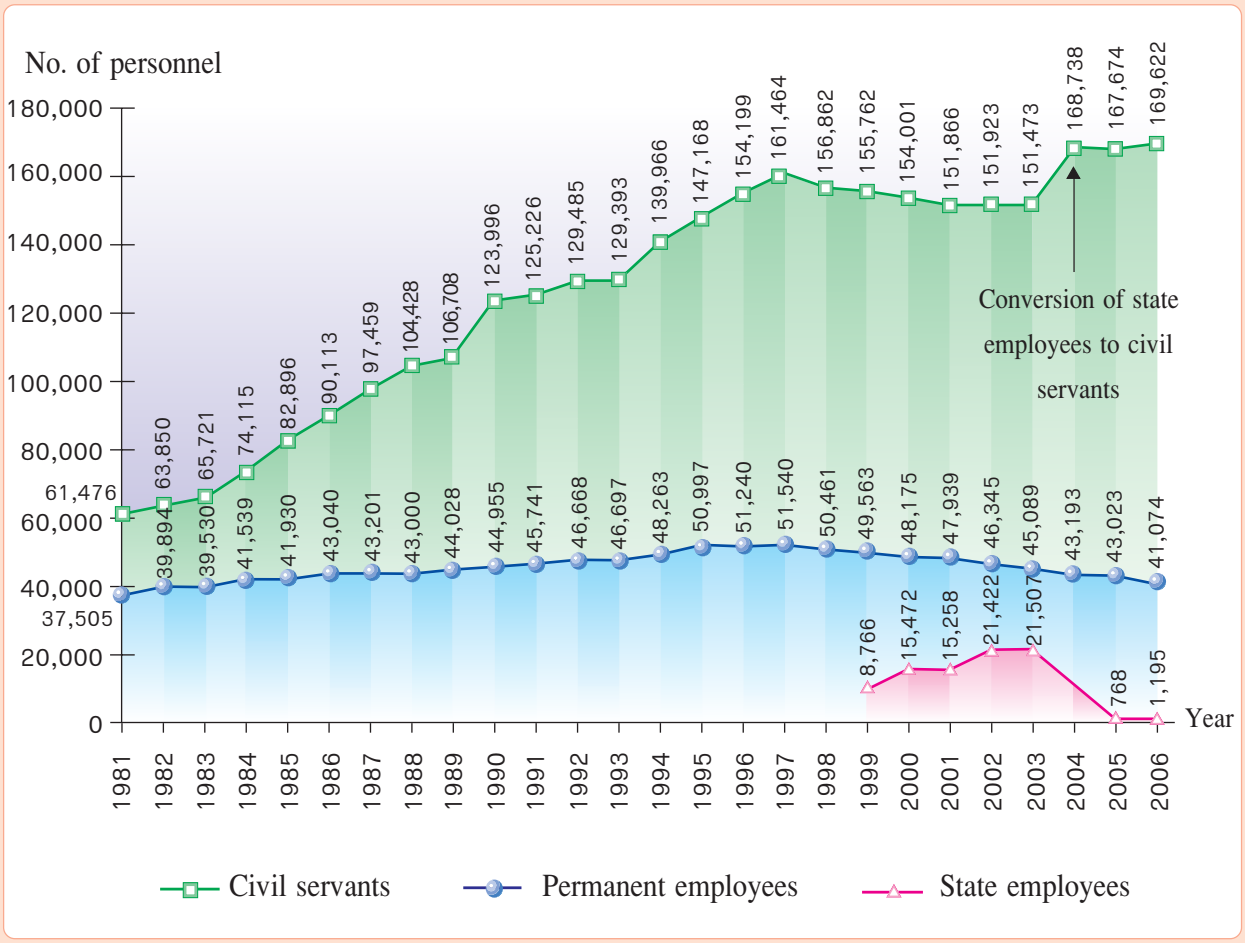
2. Figures in parentheses are percentages of their respective horizontal lines (of their own departmental totals).

Table 7.3 Number of state employees of MoPH by professional category, 2006

Professional category	Number of personnel
1. Financial and accounting specialists/procurement specialists	275
2. Diseases control officers/service support workers	199
3. Statisticians/computer specialists/computer system analysts	152
4. Professional nurses	104
5. Environmental specialists/health technical specialists	73
6. Administrative/financial/procurement/statistical/data recording officials	70
7. Occupational therapists/physical therapists	57
8. Medical technologists	51
9. Policy and plan analysts	43
10. Legal officers/specialists	29
11. Social welfare workers/psychologists	26
12. Personnel officers/human resources development specialists	21
13. Medical science officers	21
14. Foreign relations officers/public relations officers/ communication officers	18
15. General administration officers	17
16. Nutritionists	10
17. Technicians: civil engineering/mechanical/electrical/ electrical communication	10
18. Medical radiologists/medical radiology technicians/x-ray technicians	6
19. Researchers/research assistants	6
20. Librarians/library officials	3
21. Medical photographers/cardiology technologists	2
22. Pharmacists	2
Total	**1,195**

Source: Personnel divisions/sections of all departments, MoPH.

Figure 7.7 Numbers of civil servants, permanent employees, and state employees of MoPH, fiscal years 1981-2006

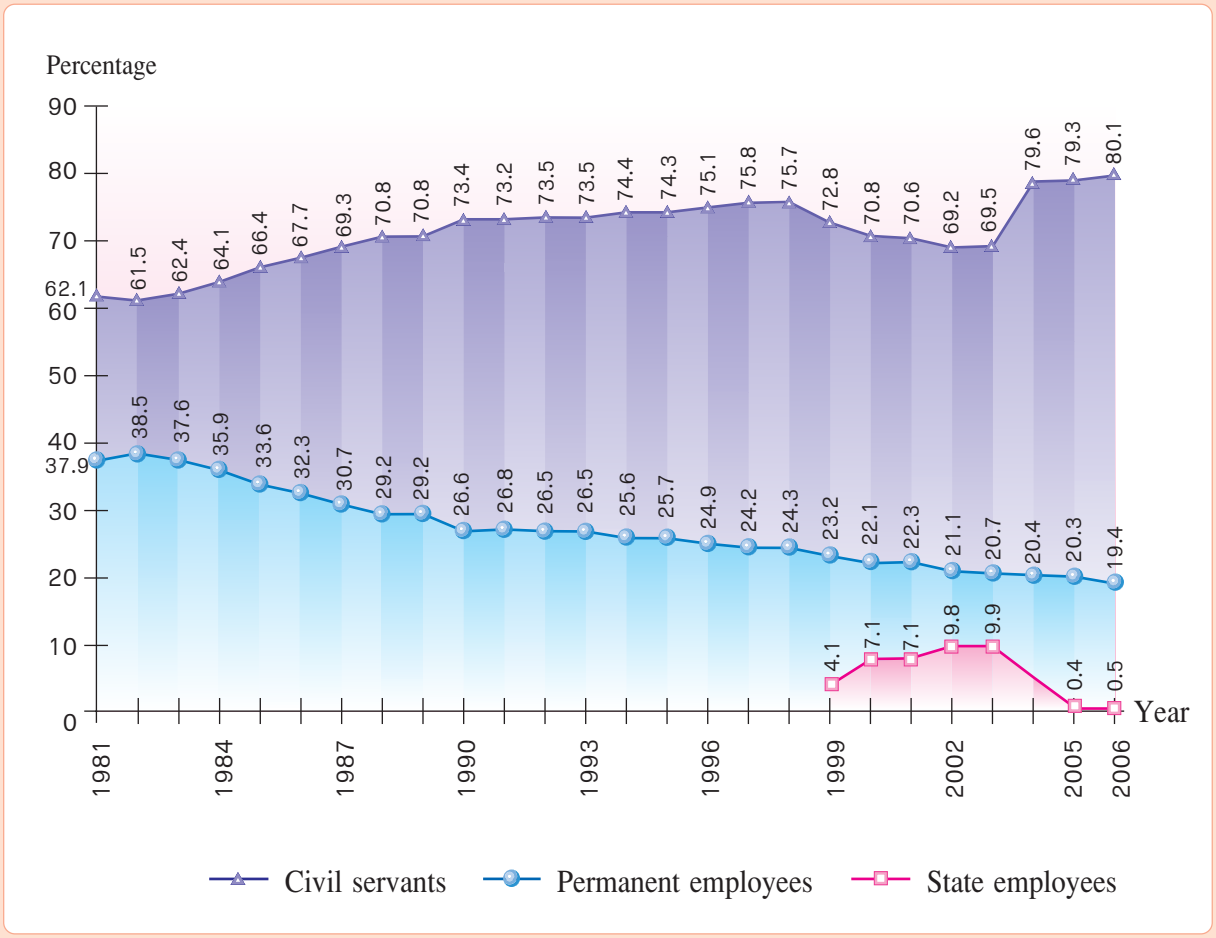


Sources: Data for 1981-1997 are derived from HEALTH DIARY of the National Health Association of Thailand.

Data for 1998-2006 are derived from personnel divisions/sections of all departments, MoPH.

Notes:
1. For 1998 onwards, the data represent actually filled positions.
2. Since 2004, MoPH has converted all state employees to civil servants.
3. Since 2005, MoPH has used a dual employment system, i.e. for state employees and civil servants.

Figure 7.8 Proportions of civil servants, permanent employees, and state employees of MoPH, fiscal years 1981-2006



Sources: Data for 1981-1997 are derived from HEALTH DIARY of the National Health Association of Thailand.

Data for 1998-2006 are derived from personnel divisions/sections of all departments, MoPH.

Notes:
1. For 1998 onwards, the data represent actually filled positions.
2. Since 2004, MoPH has asserted all state employees to civil servants.
3. Since 2005, MoPH has used a dual employment system, i.e. for state employees and civil servants.

The workforce of the MoPH classified by major group/profession includes 169,622 actually filled positions (2006) in 29 groups, excluding permanent employees and state employees (Table 7.4).

Table 7.4 Workforce of the MoPH (excluding permanent employees and state employees) by major group/profession: number and proportion of actually filled positions, 2006

Group/Professional category	Civil servants	
	No.	%
1. Professional nurses	69,142	40.8
2. Technical nurses	13,495	8.0
3. Community health officers	13,030	7.7
4. Health technical specialists	14,772	8.7
5. Health administration officers	9,555	5.6
6. Medical doctors	11,571	6.8
7. Correspondence, finance, logistics, statistics, data recording, computer, and typing officers	5,936	3.5
8. Pharmacists	5,767	3.4
9. Dental nurses, dental assistants, and dental health officers	4,311	2.5
10. Pharmaceutical assistants/officers	3,184	1.9
11. Medical science technicians	3,074	1.8
12. Dentists	2,884	1.7
13. X-ray/medical radiation officers	1,545	0.9
14. General administration officers	1,404	0.8
15. Medical technologists	1,148	0.7
16. Statisticians and computer specialists	1,067	0.6
17. Civil-works, electrical, and telecommunication engineers/technicians	831	0.5
18. Medical scientists and scientists	744	0.4
19. Policy and plan analysts	659	0.4
20. Physiotherapy and medical rehabilitation officers	596	0.3
21. Disease control officers	532	0.3
22. Social workers and psychologists	572	0.3
23. Personnel officers, training officers, professional registration officers, and human resource development specialists	465	0.3
24. Nutritionists	450	0.3
25. Public relations, information, audio-visual aid, communication, and library officers	425	0.3
26. Physiotherapists	429	0.3

Table 7.4

Group/Professional category	Civil servants	
	No.	%
27. Medical radiation specialists and medical physicists	289	0.2
28. Lecturers	190	0.1
29. Others	1,555	0.9
Total	**169,622**	**100.0**

Source: Personnel Divisions of all Departments of the Ministry of Public Health, October 2006.

Note: Major staffing patterns were re-designed and professionals re-categorized in 2002 according to the MoPH restructuring as part of the bureaucratic reforms, resulting in a decrease in the number of professional categories: the positions for health promotion specialists, disease control specialists, sanitation specialists and health education specialists were abolished, but the positions for health technical specialists have been established instead, for more flexibility in the process of transfer and assessment for taking such positions.

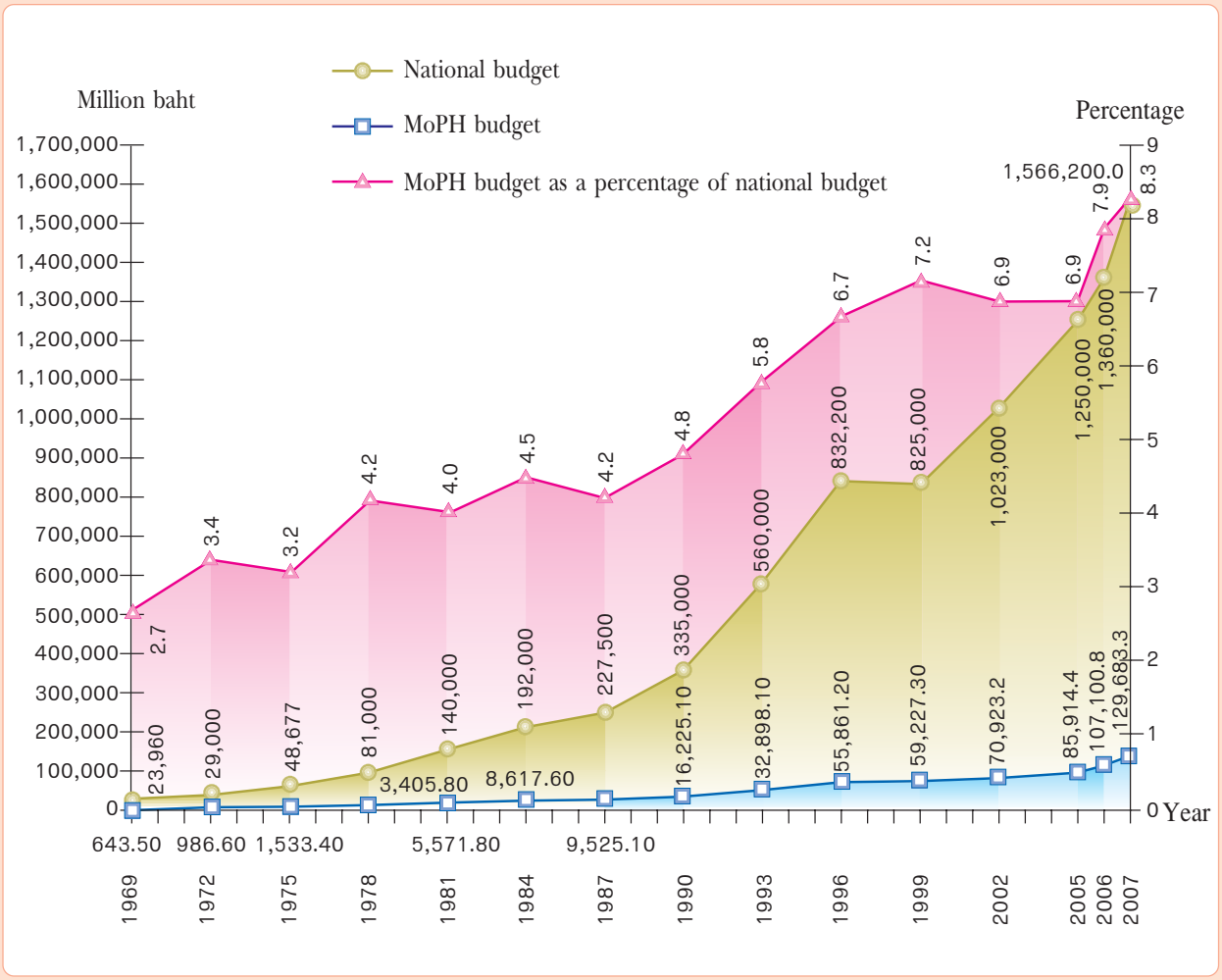
4.1.6 The Budget of the Ministry of Public Health

1) Proportion of the Budget

The proportion of annual budget allocated to the MoPH was 2.7-8.3% of the national budget during 1969-2007 (Figure 7.9) or approximately 0.4-1.4% of the gross domestic product (GDP). It can be noted that the MoPH's budget has increased significantly during the past decade, as the government has allocated more budget to the social service sector, due to a decrease in foreign debt repayments and security expenditure. Since the economic crisis in 1997, the foreign debts have increased from 5.0% in 1997 to 11.3% in 2007 (Figure 7.11). The proportion of MoPH's annual budget had declined until 2001. But since FY 2002, its annual budget has increased substantially as a result of the government policy on universal coverage of health care (Figure 7.10). In FY 2007, the budget is 62,319 million baht plus a health insurance revolving fund of 67,364 million baht, totalling 129,683.3 million baht, or 8.3% of the national budget (Figure 7.9).

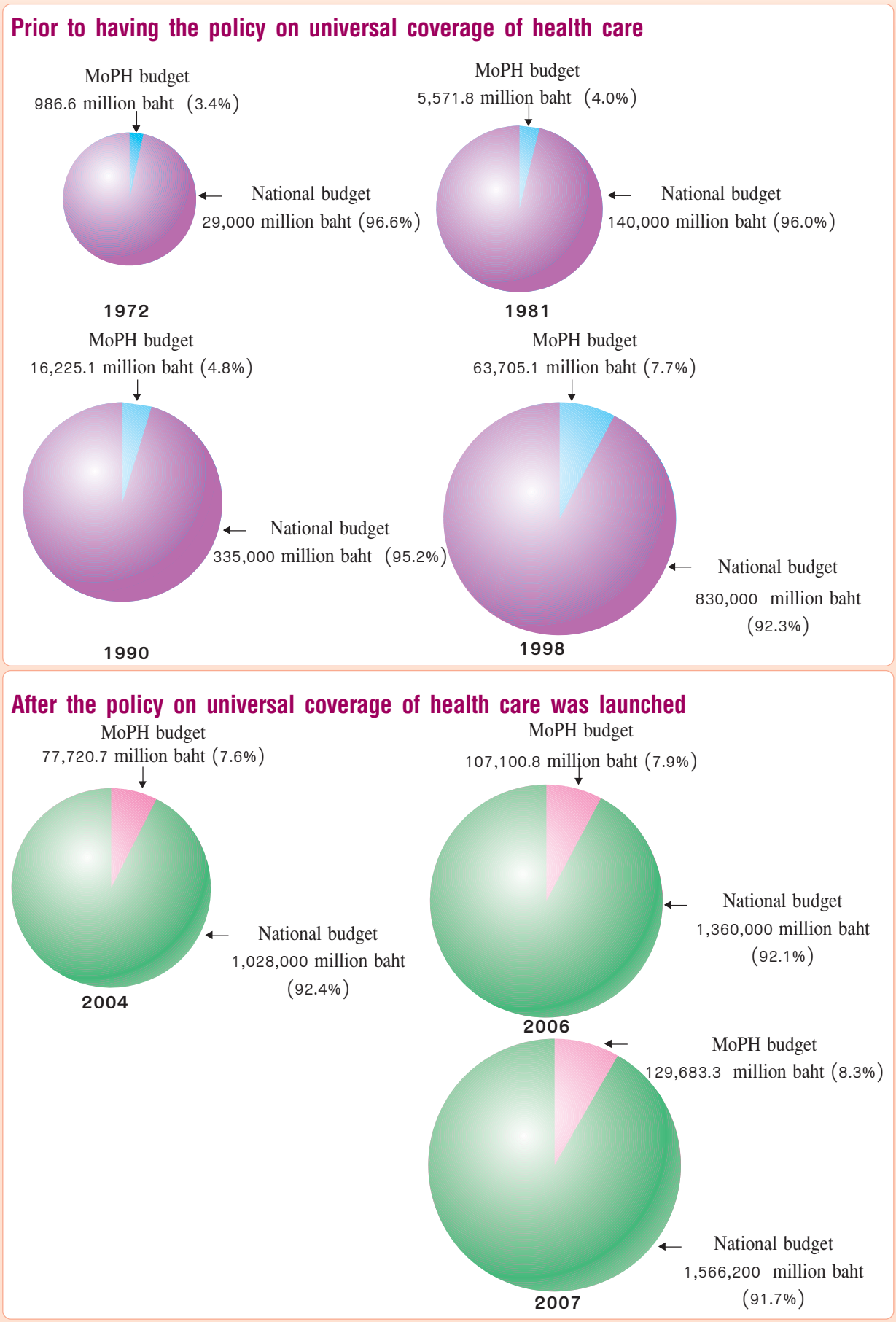
In real terms, the value of the budget for the post-economic crisis period (1998-2001) was less than that for 1996. It is noteworthy that there were large amounts of foreign loans during 1997-2001. But since the launching of the universal healthcare scheme in 2002, the value of the budget for 2002-2007 is 1.1-1.7 times higher than that for 1996 (Table 7.5).

Figure 7.9 Amounts and proportions of MoPH's budget compared with the national budget (present value), FYs 1969-2007



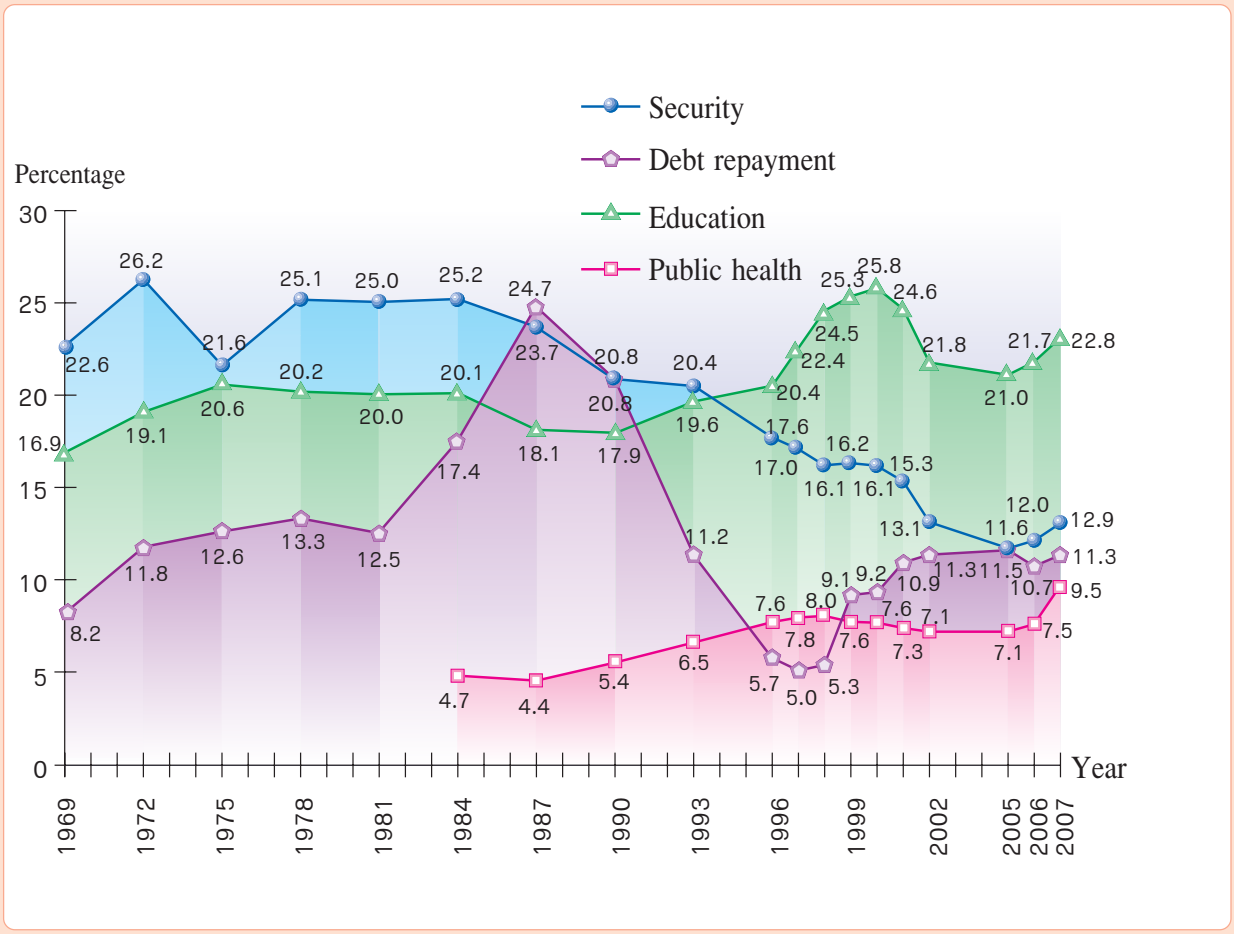
Sources: - Bureau of Policy and Strategy, Ministry of Public Health.
- Bureau of the Budget.

Figure 7.10 MoPH's budget compared with the national budget (baht)



Source: Figure 7.9

Figure 7.11 Proportions of security, debt repayment, education and public health budget, compared with the national budget, FYs 1969-2007



Source: Bureau of the Budget.

Note: There were no health budget data available for 1969-1981, as the health budget was included in the community social welfare service budget.

Table 7.5 MoPH's budget in present value and real terms (million baht)

Year	MoPH budget	Health insurance revolving fund	Total MoPH budget (present value)	Consumer price index (1994 = 100)	Budget at 2007 value	Increase/ decrease from previous year (2007 value)	As percentage of national budget
1992	24,640	-	24,640	92.1	40,960	-	-
1993	32,898	-	32,898	95.2	52,906	+29.2	5.8
1994	39,319	-	39,319	100.0	60,197	+13.8	6.3
1995	45,103	730	45,833	105.7	66,386	+10.3	6.4
1996	55,236	625	55,861	112.0	76,360	+15.0	6.7
1997	66,544	1,030	67,574	118.2	87,526	+14.6	7.3
			(68,934)		89,288	(+16.9)	(7.4)
1998	62,625	1,080	63,705	127.8	76,316	-12.8	7.7
			(65,065)		77,946	(-12.7)	(7.8)
1999	57,171	2,056	59,227	128.1	70,786	-7.2	7.2
			(62,787)		75,041	(-3.7)	(7.6)
2000	58,426	2,215	60,641	130.2	71,307	+0.7	7.1
			(63,001)		74,082	(-1.3)	(7.3)
2001	58,697	2,400	61,097	132.4	70,649	-0.9	6.7
			(61,563)		71,188	(-3.9)	(6.8)
2002	43,311	27,612	70,923	133.2	81,519	+15.4	6.9
2003	41,996	32,138	74,134	135.6	83,701	+2.7	7.4
2004	45,147	32,573	77,720	139.3	85,419	+2.1	7.6
2005	45,024	40,890	85,914	145.5	90,402	+5.8	6.9
2006	52,672	54,429	107,101	152.3	107,664	+19.1	7.9
2007	62,319	67,364	129,683	153.1[1]	129,683	+20.5	8.3

Source: Bureau of Policy and Strategy, Ministry of Public Health.

Notes:
1. MoPH's budget figures have included the budget of other agencies under MoPH's supervision, i.e. Health Systems Research Institute and National Health Security Office.
2. The numbers in ( ) include foreign loans for health programmes in 1997-2001: from Sweden, Denmark, OECF, The World Bank, Asian Development Bank and Japan (Miyazawa Plan) in 1997 for 1,360 million baht; in 1998 for 1,360 million baht; in 1999 for 3,560 million baht; in 2000 for 2,360 million baht; and in 2001 for 466 million baht.
3. For FYs 1995-2001, the MoPH received a supplementary budget for health insurance cards called "health insurance card revolving funds", which were previously included the MoPH's budget.
4. Since FY 2002, the MoPH has received a budget as "health insurance revolving fund" in stead of "health insurance card revolving fund"; the MOPH continued to administer the revolving fund of the National Health Security Office for the first three years after the National Health Security Act came into force.
5. [1]Consumer price index as of February 2007.
6. The health insurance revolving fund does not include personnel and operating costs.

2) Budget Allocation by Department

In considering the budget allocation for each department, it was found that in 2006 the National Health Security Office (including the health security revolving fund) received the largest amount of budget (52.5%), followed by the Office of the Permanent Secretary for Public Health (37.9%, including salaries for civil servants and employees, which are part of the universal healthcare budget), and the Department for Development of Thai Traditional and Alternative Medicine received the least (0.1%) (Table 7.6 and Figure 7.12).

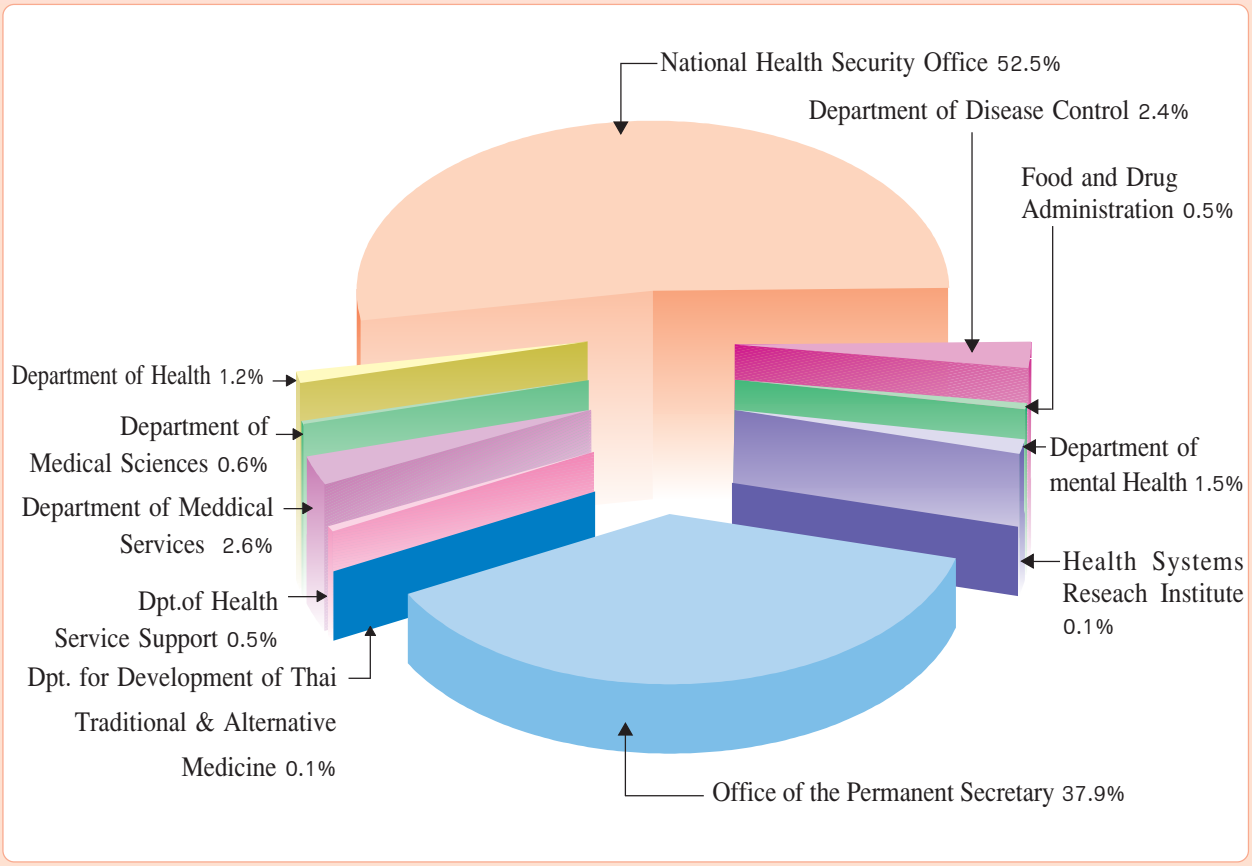
Table 7.6 The bubget of the Ministry of Public Health, 2000-2007

Department	Budget received (Million baht)															
	2000	2001		2002		2003		2004		2005		2006		2007		
	Amount	Amount	Increase/ Decrease from 2000(%)	Amount	Increase/ Decrease from 2001(%)	Amount	Increase/ Decrease from 2002(%)	Amount	Increase/ Decrease from 2003(%)	Amount	Increase/ Decrease from 2004(%)	Amount	Increase/ Decrease from 2005(%)	Amount	Increase/ Decrease from 2006(%)	Proportion (%)
- Whole country	**860,000.0**	**910,000.0**	**+5.8**	**1,023,000.0**	**+12.4**	**999,900.0**	**-2.3**	**1,028,000.0**	**+2.8**	**1,250,000.0**	**+21.6**	**1,360,000.0**	**+8.8**	**1,566,200.0**	**+15.2**	**-**
- MoPH	**60,640.9**	**61,097.2**	**+0.8**	**70,923.2**	**+16.1**	**74,133.9**	**+4.5**	**77,720.7**	**+4.8**	**85,914.4**	**+10.5**	**107,100.8**	**+24.8**	**129,683.3**	**+21.1**	**-**
- Office of the Permanent Secretary	46,487.4	46,691.6	+0.4	29,802.0	-36.2	28,978.7	-2.8	32,177.5	+11.0	32,096.6	-0.3	41,016.8	+27.8	49,115.0	+19.7	37.9
- Departmebt of Medical Services	3,083.7	3,189.3	+3.4	2,556.7	-19.8	2,490.4	-2.6	2,664.7	+7.0	2,721.6	+2.1	2,937.9	+7.9	3,421.8	+16.5	2.6
- Departmebt of Disease control	4,185.4	4,501.4	+7.6	3,670.1	-18.5	3,635.6	-0.9	4,081.5	+12.3	4,048.7	-0.8	2,736.3	-32.4	3,133.2	+14.5	2.4
- Departmebt of Health	4,073.8	3,755.2	-7.8	2,708.5	-27.9	1,185.6	-56.2	1,340.8	+13.1	1,361.2	+1.5	1,366.7	+0.4	1,559.5	+14.1	1.2
- Departmebt of Mental Health	1,478.5	1,628.3	+10.1	1,591.7	-2.2	1,553.2	-2.4	1,623.4	+4.5	1,721.7	+6.1	1,659.7	-3.6	1,888.6	+13.8	1.5
- Departmebt of Health Service Support	-	-	-	-	-	1,125.6	0.0	587.4	-47.8	597.8	+1.8	593.4	-0.7	651.3	+9.8	0.5
- Departmebt of Medical Sciences	815.9	804.5	-1.4	782.3	-2.8	747.3	-4.5	927.2	+24.1	973.1	+4.9	891.2	-8.4	838.2	-5.9	0.6
- Departmebt for Development of Thai Traditional and Alternative Medicine	-	-	-	-	-	73.7	0.0	120.1	+63.0	113.0	-5.9	113.1	+0.08	134.1	+18.6	0.1
- Food and Drug Administration	451.1	454.0	+0.6	464.0	+2.2	495.5	+6.8	507.1	+2.3	667.1	+31.6	613.1	-8.1	627.0	+2.3	0.5
- Health system Research Institute	65.1	72.9	+12.0	138.4	+89.8	109.9	-20.6	96.9	-11.8	88.7	-8.5	79.0	-10.9	99.4	+25.8	0.1
- National Health Security Office	-	-	-	1,597.4	-	1,600.0	+0.2	1,021.3	-36.2	625.0	-38.8	644.9	+3.2	810.9	+25.7	0.6
- Health Insurance Revolving Fund	-	-	-	27,612.0	-	32,138.5	+16.4	32,572.8	+1.4	40,889.9	+25.5	54,428.6	+33.4	67,364.1	+23.8	51.9
- Thai Traditional Medicine Wisdom Fund	-	-	-	-	-	-	-	-	-	10.0	0.0	20.00	+100.0	40.0	+100.0	0.03

Source: 1. Bureau of Policy and Strategy, Ministry of Public Health.
2. National Health Security Office.

Note: 1. For 1997-2001, the budget for the Office of the Permanent Secretary included the health insurance card subsidies.
2. For 2002-2006, the budget for the Office of the Permanent Secretary included salaries and wages were part of the universal health care budget.
3. The Department of Health Service Support and the Department for Development of Thai Traditional and Alternative Medicine, newly established agencies, according to the bureaucratic reform policy, have received their own budget since FY 2003.
4. The National Health Security Office, another newly established agency under the supervision of the MoPH, has received its own budget since FY 2002.

Figure 7.12 Proportion of MoPH's budget by agency, 2007



Source: Table 7.6.

Note: 1. The budget of the National Health Security Office includes the budget for the Health Insurance Revolving Fund.

2. For the Department for Development of Thai Traditional and Alternative Medicine, the budget has included that for the Thai Traditional Medicine Wisdom Fund.

3) Budget Allocation by Programme

MoPH's budget for 2002-2007 has been allocated for the implementation of nine major programmes (Table 7.7). It should be noted that the universal healthcare scheme is implemented in accordance with the policy of the present government. Thus, its budget has been increased in a much higher rate while those for other programmes tend to receive a smaller or constant budget (Figure 7.13).

Table 7.7 Health budget allocation by major programme, 2002-2007 (in million baht)

Type of programme	2002	2003		2004		2005		2006		2007		
	Amount	Amount	Increase/ Decrease from 2002	Amount	Increase/ Decrease from 2003	Amount	Increase/ Decrease from 2004	Amount	Increase/ Decrease from 2005	Amount	Increase/ Decrease from 2006	Proportion (%)
1. Universal health security	53,022.9	57,697.2	+8.8	60,431.2	+4.7	68,207.6	+12.9	78,535.7	+15.3	86,594.5	+10.3	66.8
2. Disease prevention/control and health promotion	7,619.9	6,292.0 [1]	NA	4,951.2 [2]	NA	2,968.4[3]	NA	2,944.0[3]	-0.7	3,584.7	+21.8	2.8
3. Health system development	1,519.6	1,674.0	+10.2	2,474.5	NA	3,292.2	+33.0	3,235.6	-1.7	4,026.5	+24.4	3.1
4. Support for the production and development of personnel	1,501.5	1,464.6	-2.4	1,495.9	+2.1	1,647.9	+10.2	1,919.3	+16.5	2,426.9	+26.4	1.9
5. Development of standards and quality health services and products	812.9	819.6	+0.8	1,085.0	+32.4	1,446.9	+33.3	1,513.1	+4.6	1,632.1	+7.9	1.3
6. AIDS prevention and control	698.7	885.1	+26.7	1,355.1	+53.1	1,321.5	-2.5	3,087.4[4]	+133.6	4,073.4	+31.9	3.1
7. Drug abuse prevention and resolution	524.7	538.2	+2.6	1,100.1	+104.4	842.1	-23.5	483.1	-42.6	526.5	+9.0	0.4
8. Thai traditional and alternative medicine	39.1	73.7	+88.5	120.1	+63.0	122.9	+2.3	126.9	+3.2	195.5	+54.1	0.2
9. Medicine rehabilitation services for patients and the disabled	65.7	79.5	+21.0	82.1	+3.3	87.1	+6.1	93.8	+7.7	120.4	+28.4	0.0001

Source : Bureau of Policy and Strategy, Ministry of Public Health.

Notes :

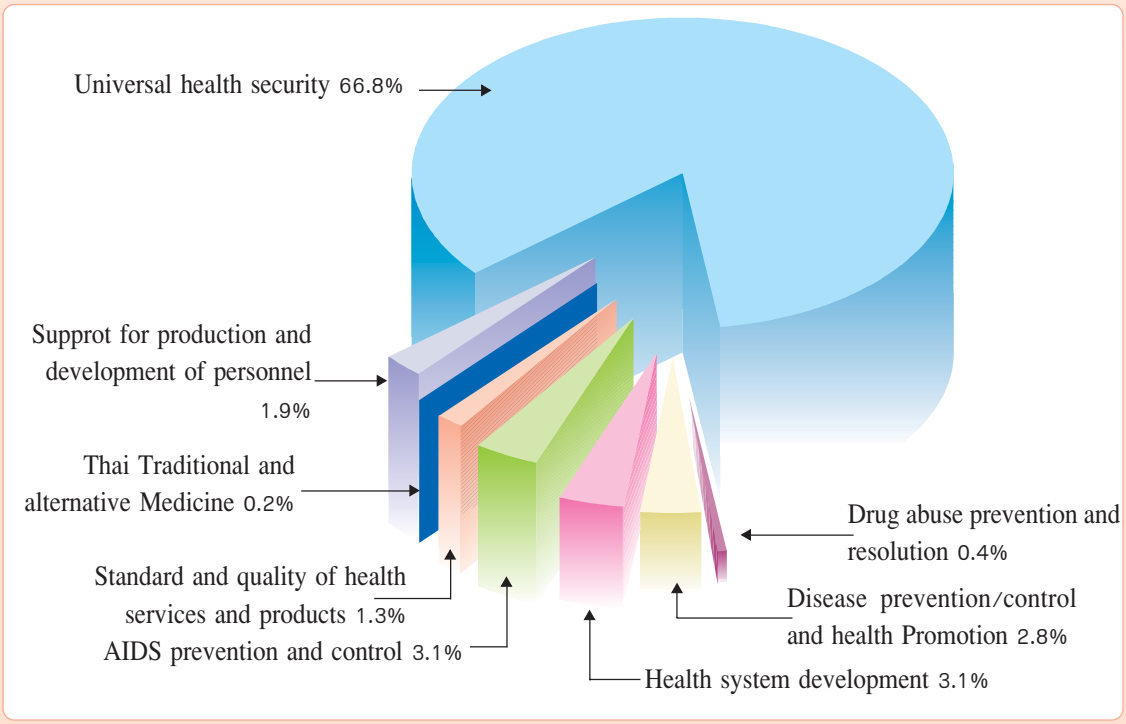
[1] For FY 2003, budget for the diesase prevention/control and health promotion was decreased as the Department of Health had transferred its programmes on environmental surveillance and analysis and water supply provision to the Ministry of Natural Resources and Environment, according to the bureaucratic reform policy

[2] Since FY 2004. budget for the disease prevention/control and health promotion has been decreased as the Department of Health has revised its role and thus the budget for such purpose has been shifted to the health system development programme.

[3] Since FY 2005, the budget for disease prevention/control of the Departments of Mental Health and Medical Services has been shifted to tertiary/specialty service programme; so their budget for such purpose has decreased.

[4] In 2006, the budget for antiretroviral drugs was 2,798 million baht and in 2007 it is 3,855.6 million baht; so the budget in HIV/AIDS programme has increased considerably.

Figure 7.13 Proportion of MoPH budget by major programme, 2007



Source: Bureau of Policy and Strategy, Ministry of Public Health.

4) Budget Allocation by Type of Expenditure

A large proportion of the budget of the Ministry of Public Health (31-53%) is used for staff salaries and wages and 28-50% for operating costs, which have been rising to more than 50% since 2002. The proportion of investment budget has changed considerably according to the economic conditions (by 11-39%; Table 7.8). And since 2002, despite the economic recovery, the government still maintains a low level of investment budget as it has implemented the universal healthcare scheme with a much higher budget for this purpose.

During the first economic crisis (1983-1986), the investment budget decreased from 22.1% in 1982 to 11.3% in 1987 (Figure 7.15). However, during the economic expansion in 1988-1996, the investment budget rose to 38.7% in 1997 but dropped again during the 1997 economic crisis to only 8.8% in 2001 and 6.8% in 2007. Consequently, new construction projects are almost none at present.

Notably, although the MoPH was allocated a much less budget during the economic crisis (Table 7.5), the MoPH still gives high priority to the budget allocation for helping the poor and underprivileged. The budget for such purposes has actually increased to the level higher than before (Table 7.9 and Figure 7.14). Between 2002 and 2007, the government continues to support such programmes, but in the form of health insurance revolving fund (capitation payment) covering a population of 46 million who have never had any other health insurance coverage. The annual capitation rates are 1,202.4 baht for 2002 and 2003, 1,308.5 baht for 2004, 1,396.30 baht for 2005, 1,659.2 baht for 2006, and 1,899.69 baht for 2007.

Table 7.8 Budget received by the Ministry of Public Health, FYs 1998-2007 (present value: amount in million baht)

Category of budget	1998		1999		2000		2001		2002		2003		2004		2005		2006		2007	
	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)	Amount	(%)
1. Salaries and wages	**24,503.3**	**38.5**	**26,407.5**	**44.6**	**28,355.8**	**46.8**	**28,807.6**	**47.2**	**29,532.3**	**41.7**	**33,035.0**	**44.6**	**34,664.7**	**44.6**	**34,818.1**	**40.5**	**42,908.7**	**40.1**	**47,518.7**	**36.6**
1.1 Salaries and permanent wages	24,458.0	38.4	26,361.6	44.5	28,310.0	46.7	28,757.0	47.1	29,489.2	41.6	32,991.3	44.5	34,620.4	44.5	34,770.9	40.5	42,769.8	40.0	47,314.6	36.5
1.2 Temporary wages	45.3	0.1	45.9	0.1	45.8	0.1	50.6	0.1	43.1	0.1	43.7	0.1	44.3	0.1	47.2	0.1	138.9	0.1	204.1	0.1
2. Operating budget	**21,794.2**	**34.2**	**23,825.7**	**40.2**	**25,304.1**	**41.7**	**26,910.6**	**44.0**	**35,786.5**	**50.4**	**37,780.6**	**51.0**	**37,864.8**	**48.7**	**46,224.4**	**53.8**	**56,376.0**	**52.6**	**73,330.7**	**56.6**
2.1 Compensation supplies and miscellaneous	9,927.9	15.6	9,491.6	16.0	9,755.3	16.1	9,728.1	15.9	4,403.5	6.2	5,667.1	7.6	6,607.7	8.5	6,448.9	7.5	5,523.1	5.2	7,848.2	6.1
2.2 Public utilities	843.6	1.3	811.2	1.4	851.8	1.4	848.0	1.4	325.0	0.4	317.0	0.4	309.0	0.4	411.7	0.5	368.7	0.3	384.2	0.3
2.3 Subsidies	10,360.0	16.3	12,773.2	21.5	13,606.0	22.4	14,171.5	23.2	3,964..7	5.6	3,166.4	4.4	2,275.4	2.9	2,014.3	2.3	2,107.0	1.9	2,740.8	2.1
2.4 Other expenses	662.7	1.0	749.7	1.3	1,091.0	1.8	2,163.0	3.5	27,093.3	38.2	28,630.1	38.6	28,672.7	36.9	37,349.5	43.4	48,377.2	45.2	62,357.5	48.1
3. Investment budget																				
3.1 Equipment land and construction	17,407.6	27.3	8,994.1	15.2	6,981.0	11.5	5,379.0	8.8	5,604.3	7.9	3,318.3	4.4	5,191.2	6.7	4,871.8	5.6	7,816.1	7.3	8,833.8	6.8
Total	**63,705.1**	**100.0**	**59,227.3**	**100.0**	**60,640.9**	**100.0**	**61,097.2**	**100.0**	**70,923.2**	**100.0**	**74,133.9**	**100.0**	**77,720.7**	**100.0**	**85,914.3**	**100.0**	**107,100.8**	**100.0**	**129,683.2**	**100.0**

Source : Bureau of policy and Strategy, Ministry of Public Health.

Notes :

1. For FYs 1997-2001, subsidies include health insurance card counterpart funds: 1,030 million baht for 1997;1,080 million baht for 1998 2,056 million baht for 1999; 2,215 baht for 2000; and 2,400 million baht for 2001.
2. For FYs 2002-2006, other expenses include health insurance revolving funds less the investment budget for the National Health Security Office, which is 24,183.2 million baht for 2002; 28,608.8 million baht for 2003;28,652.4 million baht for 2004;37,286.3 million baht for 2005;48,296.4 million baht for 2006; and 60,717.8 million baht for 2007.
3. For FYs 2002-2007, MoPH's investment budget include the investment of the National Health Security Office, which is3,428.8 million baht for 2002; 1,929.6 million baht for 2003; 3,920.4 million baht for 2004; 3,603.7 million baht for 2005; 6,132.2 million baht for 2006; and 6,646.3 million baht for 2007.

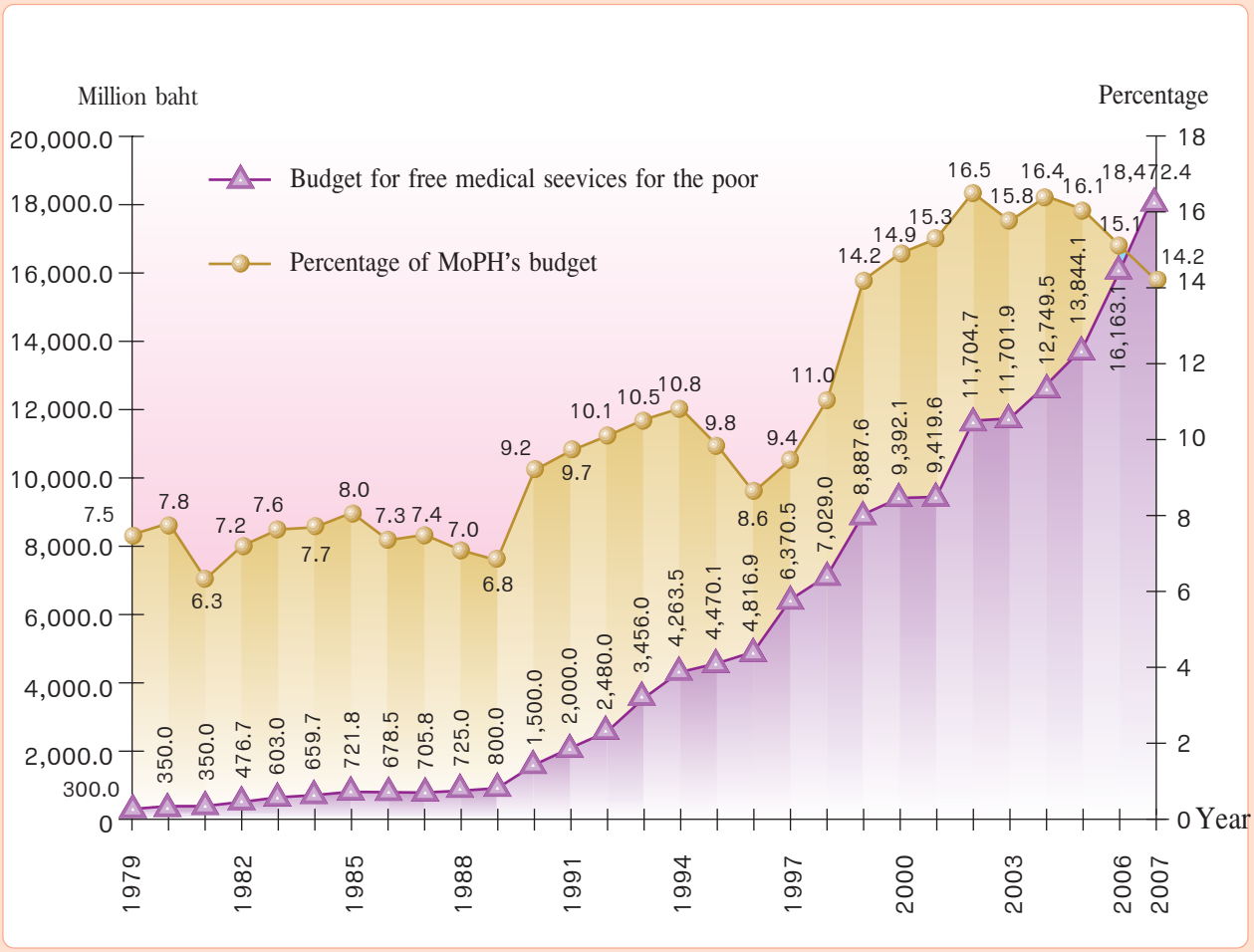
Table 7.9 Budget for free medical services for the poor and underprivileged, 1979-2007

Year	MoPH's budget (million baht)	Budget for free medical services for the poor and underprivileged (million baht)			Percentage of MoPH's budget
		Present value	2007 value	Increase/decrease (real terms, %)	
1979	3,976.9	300.0	1,009.5	-	7.5
1980	4,494.5	350.0	983.2	-2.6	7.8
1981	5,571.8	350.0	872.7	-11.2	6.3
1982	6,652.3	476.7	1,129.8	+29.5	7.2
1983	7,902.4	603.0	1,377.9	+22.0	7.6
1984	8,617.6	659.7	1,494.1	+8.4	7.7
1985	9,044.3	721.8	1,596.9	+6.9	8.0
1986	9,274.7	678.5	1,475.5	-7.6	7.3
1987	9,525.1	705.8	1,496.6	+1.4	7.4
1988	10,372.5	725.0	1,480.0	-1.1	7.0
1989	11,733.1	800.0	1,548.4	+4.6	6.8
1990	16,225.1	1,500.0	2,747.0	+77.4	9.2
1991	20,568.6	2,000.0	3,463.8	+26.1	9.7
1992	24,640.4	2,480.0	4,122.6	+19.0	10.1
1993	32,898.1	3,456.0	5,557.9	+34.8	10.5
1994	39,318.7	4,263.5	6,527.4	+17.4	10.8
1995	45,832.6	4,470.1	6,474.7	-0.8	9.8
1996	55,861.2	4,816.9	6,584.5	+1.7	8.6
1997	67,574.3	6,370.5	8,251.5	+25.3	9.4
1998	63,705.1	7,029.0	8,420.5	+2.1	11.0
1999	59,227.3	8,405.6	10,046.0	+19.3	14.2
	(62,787)	(8,887.6)	(10,622.1)	(+26.0)	(14.2)
2000	60,640.9	8,910.1	10,477.2	+4.3	14.7
	(63,001)	(9,392.1)	(11,044.0)	(+4.0)	(14.9)
2001	61,097.2	8,966.3	10,368.1	-1.0	14.7
	(61,563)	(9,419.6)	(10,892.3)	(-1.4)	(15.3)
2002	70,923.2	11,704.7	13,453.4	+29.8	16.5
2003	74,133.9	11,701.9	13,212.1	-1.8	15.8
2004	77,720.7	12,749.5	14,012.6	+6.1	16.4
2005	85,914.3	13,844.1	14,567.2	+4.0	16.1
2006	107,100.8	16,163.1	16,248.0	+11.5	15.1
2007	129,683.3	18,472.4	18,472.4	+13.7	14.2

Sources: 1. Bureau of Policy and Strategy, Ministry of Public Health.
2. National Health Security Office.

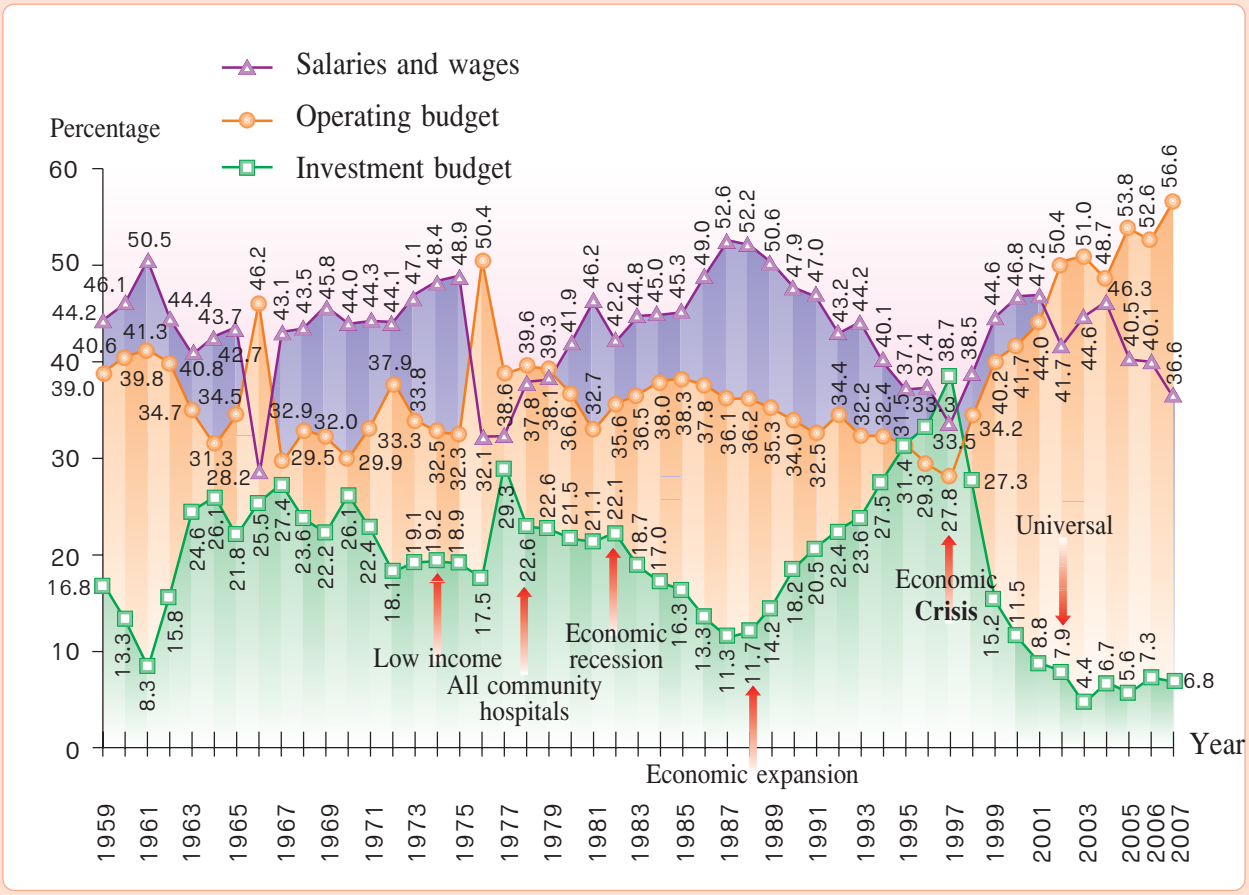
Notes: 1. Figures in ( ) include the loans from the Asian Development Bank and the World Bank, i.e. 482 million baht for 1999; 482 million baht for 2000; and 453.3 million baht for 2001.
2. Numbers of health insurance cards (non-30-baht co-payment): 24,336,250 cards for 2002; 24,330,386 cards for 2003; 24,359,065 cards for 2004; 24,787,262 cards for 2005; 24,353,691 cards for 2006; and 24,309,727 cards for 2007.

Figure 7.14 Budget for free medical services for the poor and underprivileged as percentage of MoPH's budget, 1979-2007



Source: Bureau of Policy and Strategy, Ministry of Public Health.

Figure 7.15 Percentage of MoPH budget by budget category, 1959-2007



Source: Bureau of Policy and Strategy, Ministry of Public Health.

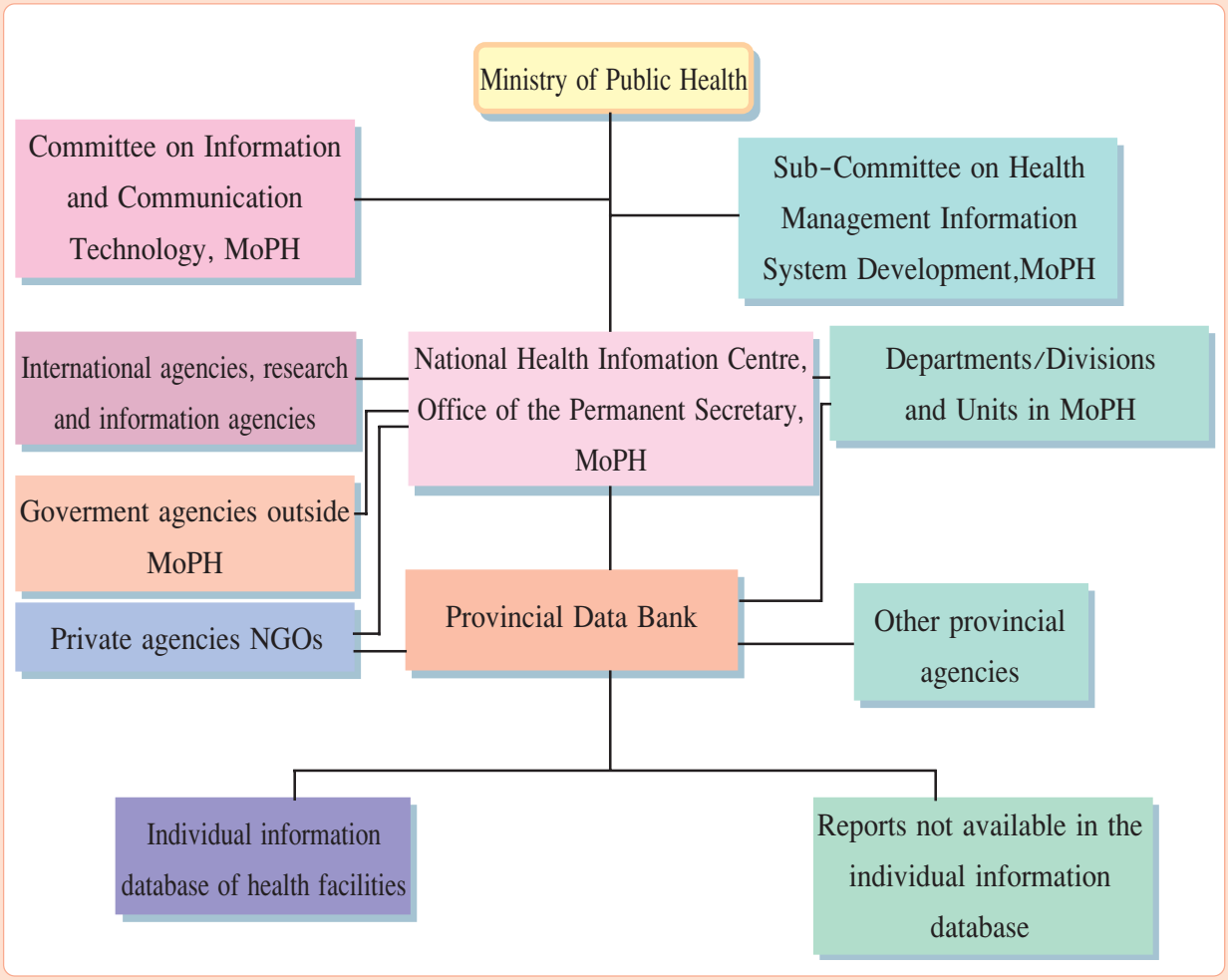
4.1.7 Health Information System (MoPH only)

Prior to the 4th National Development Plan period (1977-1981), the MoPH collected a lot of health information reports and statistics, but they were scattered in various agencies. As a result, it was rather hard for compiling them for proper use; and the analyses were incorrect resulting in the low levels of data quality and accuracy. Therefore, since the 4th plan period, the MoPH has implemented the Health Information System Development Project aimed at improving the quality of health information so that it is accurate and comprehensive. The modern technology has been introduced to the development of health information system and the capacity building, using computerized systems at the central and provincial levels. The Management Information System has also been established so that the administrators are able to use the information for decision-making at all management levels.

During the 7th-8th Plan periods, the MoPH abolished a number of unnecessary reporting systems, by supporting provincial health surveys and national health examination surveys. In 1997, the MoPH also started collecting information related to all health systems in Thailand as a report on a biennial basis called. “Thailand Health Profile”.

During the 9th and 10th Plan periods (2002-2011), there is a reform of the MoPH health information system, using the modern management information system reform approach based on the electronic individual cards. Under the new system, the structure is of the same standard linking all agencies concerned together as well as the smart-card system in the future. This is in response to the performance achievement indicators such as KPI, E-inspection and the Ministry Operations Centre (MOC) (Figure 7.16).

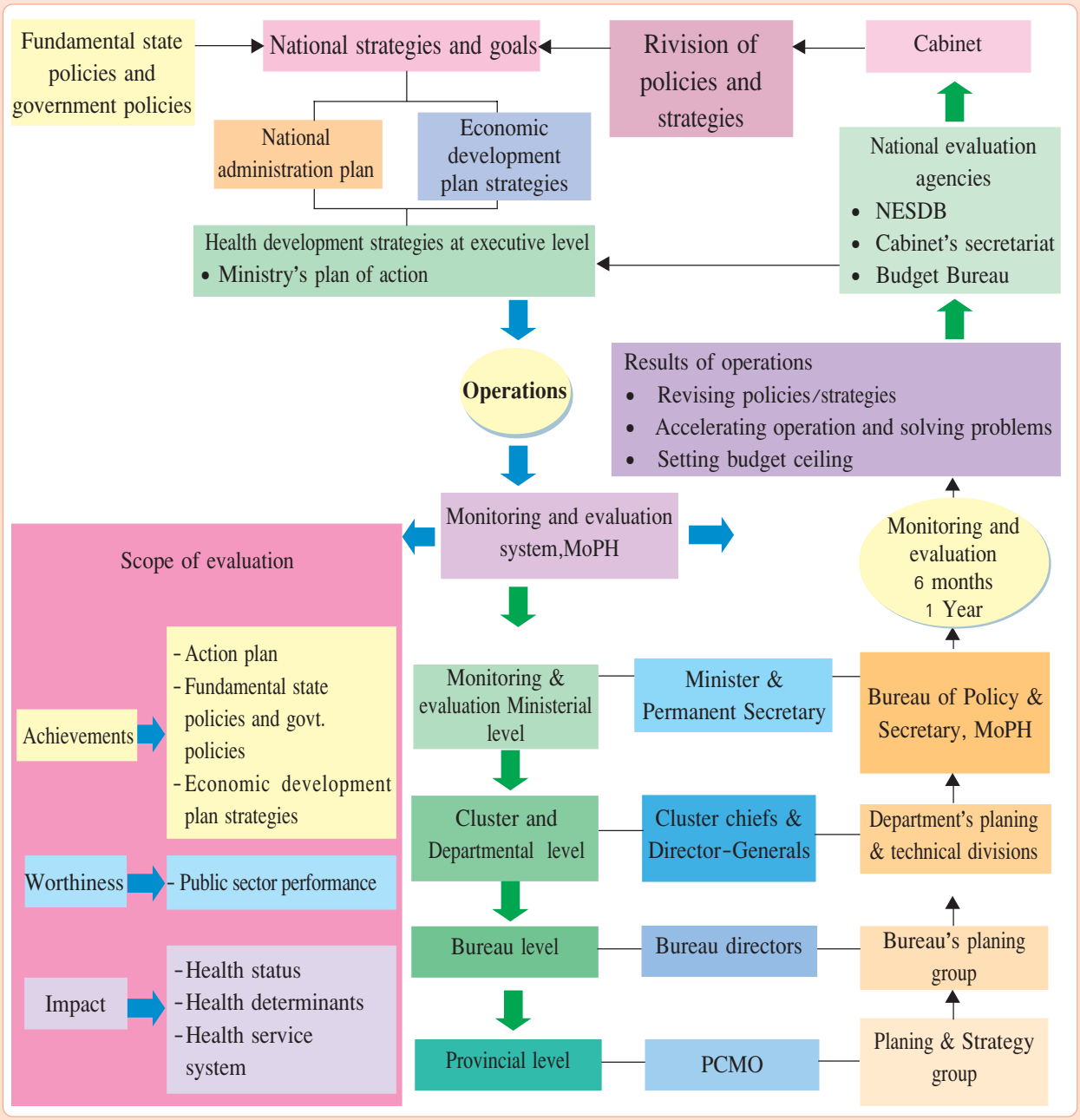
Figure 7.16 Linkages and network of the management information system, MoPH



4.1.8 Monitoring and Evaluation System

As the government has adopted the new public management principle, emphasizing the responsibility for results and outcomes that will affect the people, all government agencies have to lay down their goals and strategies to serve people's needs and use the results-based budget allocation mechanism, beginning in fiscal year 2003. The MoPH has also developed its monitoring and evaluation system as a key management mechanism to illustrate the achievements of program operations and impacts on the people by using key performance indicators (KPI) for the purpose of achieving the goal of Thai people's health development. However, that system is used only for program under the responsibility of the MoPH (Figure 7.17).

Figure 7.17 MoPH's monitoring and evaluation system



4.2 Agencies Supporting Health Programme Implementation

4.2.1 Public Sector Agencies Supporting and/or Implementing Health Activities

1) Public sector agencies providing health services and producing health personnel are the Bangkok Metropolitan Administration (BMA), the Ministry of Education (Office of the Higher Education Commission), the Ministry of Interior, and the Ministry of Defence.

2) Public sector agencies implementing health-related activities in connection with the environment, workers, children and women are the Ministry of Industry, the Ministry of Science and Technology, the Ministry of Agriculture and Cooperatives, the Ministry of Labour, the Ministry of Social Development and Human Security, the Ministry of Education, and the Ministry of Natural Resources and Environment.

3) Public sector agencies supporting the implementation of health programmes in an efficient and effective manner include the National Economic and Social Development Board (planning support), the Bureau of the Budget (budgetary support), the Civil Service Commission (health manpower support), Thailand International Development Cooperation Agency (international assistance), the National Statistical Office (information support), the Thailand Research Fund (TRF) and the Health Systems Research Institute (HSRI) (medical and health research support), the Thai Health Promotion Foundation (health promotion support), the National Health Security Office (standardized and equitable universal health insurance support), and in 2007, the National Health Commission Office is established (coordination support in health policy and strategy).

4) Public sector agencies responsible for health services for specific groups are the Social Security Office of the Ministry of Labour and the Insurance Department of the Ministry of Commerce.

4.2.2 Private For-Profit Health Organizations

In the past, most private health facilities were not-for-profit organizations. In addition to providing health services, after the period of rapid economic expansion period (1987-1997), the private sector has expanded considerably in the forms of private hospitals and clinics. Moreover, some private health facilities play a relatively little role in producing health personnel.

In privately-run for-profit medical facilities, 13 groups of investors have been formed and listed in the Stock Exchange of Thailand (2006). Such corporates and networks include Aekchon Hospital, Bangkok Dusit Vejakarn Hospital, Krung Thon Hospital. Mahachai Hospital, Chiang Mai Medical Business Co. Ltd., Wattana Hospital Group, Nonthavej Hospital, Ramkhamhaeng Hospital, Smitivej Hospital, Vibhavadi Hospital, Bamrungrad Hospital, Sikharin Hospital, and Bangkok Chain Hospital Public Limited Company

4.2.3 Health Non-governmental Organizations

There are some 300 to 500 not-for-profit private organizations working on health in Thailand; most of them are foundations or associations registered with the Ministry of Culture (Office of the National Cultural Commission and/or the Ministry of Interior). So a lot of them are juristic persons, but several other small NGOs are non-juristic-person agencies, such as the Rural Doctors Club and the Drug Studies Group.

Generally, these organizations receive financial support from international agencies, and from in-country donations, including government subsidies.

The MoPH allocated approximately 49.2 million baht each year during 1992-1997 and only 12-46 million baht each year during 1998-2007 for four major programmes of those NGOs: healthcare for the elderly, healthcare for the disabled and disadvantaged, healthcare for mothers, children and youths, and others. In 2007, a total budget of 12.0 million baht has been provided to 72 NGOs (82 projects) for their relevant health programmes (Table 7.10). Besides, another 36 million baht was provided to 672 NGOs working on HIV/AIDS in 2006 (Table 7.11) as they all would help the government in implementing health-related development programmes.

Besides, specialized agencies of the United Nations such as the World Health Organization has started to provide financial aids to several non-profit organizations: previously WHO provided such grants for public sector agencies only.

Table 7.10 Number of non-governmental organizations with funding support from MoPH, 1992-2007

Year	No. of organizations			No. of projects			Budget, baht		
	Requesting	Supported	%	Requesting	Supported	%	Requested	Allocated	%
1992	45	42	93.3	91	72	79.1	85,600,000	49,200,000	57.5
1993	142	119	83.8	264	185	70.1	160,844,928	49,200,000	30.6
1994	416	305	73.3	909	654	71.9	334,481,098	49,200,000	14.7
1995	362	103	28.5	615	287	46.7	205,348,213	49,200,000	23.9
1996	150	106	70.7	491	219	44.6	192,234,358	49,200,000	25.6
1997	142	78	54.9	420	180	42.8	230,287,800	49,200,000	21.4
1998	152	101	66.4	258	174	67.4	129,016,142	35,000,000	27.1
1999	177	114	64.4	541	223	41.2	241,270,797	35,760,000	14.8
2000	163	92	56.4	493	191	38.7	257,227,874	46,582,300	18.1
2001	152	66	43.4	411	166	40.4	160,768,084	33,557,800	20.9
2002	161	70	43.5	327	124	37.9	161,955,967	34,965,922	21.6
2003	235	128	54.5	411	251	61.1	160,813,010	34,831,160	21.7
2004	106	70	66.0	295	182	61.7	103,900,200	26,369,545	25.4
2005	104	76	73.1	210	156	74.3	91,655,450	26,454,000	28.9
2006	77	52	67.5	118	69	58.5	71,072,240	20,000,000	28.1
2007	91	72	79.1	127	82	64.6	89,877,311	12,000,000	13.3

Sources: - For 1992-2001, data were derived from the Medical Registration Division, Department of Health Service Support.
- For 2002-2007, data were derived from the Primary Health Care Division, Department of Health Service Support.
- Public and Consumer Affairs Division, Food and Drug Administration.

Note: The Food and Drug Administration provided financial support to consumer protection NGOs during1999-2003 only.

Table 7.11 Number of NGOs involved in HIV/AIDS programmes and the MoPH budgetary support, 1992-2006

Year	No. of organizations			No. of projects			Budget, baht		
	Requesting	Supported	%	Requesting	Supported	%	Requested	Allocated	%
1992	37	23	62.2	42	35	83.3	66,125,734	11,900,000	18.0
1993	38	36	94.7	61	56	91.8	33,123,818	15,000,000	45.3
1994	101	76	75.2	120	91	75.8	72,903,868	10,300,000	14.1
1995	115	94	81.7	209	153	73.2	350,765,292	75,000,000	21.4
1996	186	122	65.6	308	188	61.0	267,232,488	80,000,000	29.9
1997	268	184	68.7	385	247	64.1	309,015,357	90,000,000	29.1
1998	434	244	56.2	725	343	47.3	494,739,684	90,000,000	18.2
1999	596	371	62.2	931	458	49.2	450,972,885	87,262,350	19.3
2000	625	293	46.9	882	372	42.2	368,671,357	60,000,000	16.3
2001	497	371	74.6	730	457	62.6	403,438,189	70,000,000	17.4
2002	660	444	67.3	922	522	56.6	370,340,183	70,000,000	18.9
2003	712	519	72.9	987	605	61.3	337,938,984	70,000,000	20.7
2004	678	508	74.9	868	577	66.5	289,624,851	70,000,000	24.2
2005	795	637	80.1	935	657	70.3	277,646,531	70,000,000	25.2
2006	860	672	78.1	909	692	76.1	210,968,670	36,000,000	17.1

Source: Bureau of AIDS, Tuberculosis and Sexually Transmitted Infections. Department of Disease Control, MoPH.

Chapter 8

Health Security in Thailand

This chapter analyzes the development of health security in Thailand in the past, at present, and in the future as to how it should be implemented. It includes four parts: (1) evolution of health security system in Thailand before 2002, (2) the 2001 transition to universal coverage of health care, (3) development of subsystems to support the universal coverage of health care, (4) achievements of the operation of health security, and (5) the outlook.

1 Evolution of Health Security System in Thailand before 2002

After the establishment of the Ministry of Public Health in 1942, the government specified that, in 1945, the people had to copay for health care provided by state health facilities. Later several health insurance schemes were developed for specific population groups, which can be classified into six major schemes as follows:

1) Medical Service Welfare for the People Project, formerly known as the Medical Services for the Poor Project, started in 1975.
2) Voluntary Health Insurance with Government Subsidies Project for the people in the non-formal employment sector who were ineligible to receive any medical services normally provided by the government for those in the formal sector. It was actually transformed from community health insurance funds of the MoPH that began in 1983.
3) Civil Servants Medical Benefits Scheme for civil servants and state enterprise employees beginning in 1978.
4) Compulsory health insurance schemes required by the government for employees in the private sector, including the Workmen's Compensation Fund (beginning in 1974) covering illnesses from work-related activities and the Social Security Scheme (beginning in 1990).
5) Compulsory Motor Vehicle Accident Victims Protection Project covering illnesses or injuries from traffic accidents beginning in 1993 as required by the 1992 Act.
6) Private voluntary health insurance operated by private health insurance companies, originated from health insurance businesses of transnational companies operating in Thailand before 1910.

1.1 Medical Service Welfare for the People (MSWP) Project

The prime objective of this project was to provide medical services to the poor and underprivileged. Initially, in 1975 the project covered only poor people, but later was extended to cover the elderly in 1989 and children under 12 years of age, the disabled, war veterans, and religious leaders in 1992, and community leaders as well as village health volunteers including their families in 1994. At the beginning stage, free medical service cards were issued to the poor at the discretion of healthcare providers; until 1979, the people's income was used to determine the poverty level when a 3-year card was given only to those who were considered to be poor as determined by subdistrict and district-level officials. This project covered 30% of the population in 2001.

The benefits of the project included outpatient and inpatient medical care except for certain services. In the beginning, the cardholders could obtain services only at MoPH health facilities with health centres saving as the front-line providers. In 1997, the eligible person can receive health services directly at the hospital with health centres as its network members, the reason being every individual should be eligible to see a physician. In the meantime, state-run health facilities under other ministries also joined the scheme under the overall management of the MoPH. In the beginning, the financial management was undertaken at the central level, which allocated the budget to the provincial level for further allocation to health facilities under their respective jurisdiction. Beginning in 1997 there were cooperative efforts in the financial management of the scheme through the national project management committee and provincial committees, according to the Regulations of the Prime Minister's Office on the Management of the Medical Service Welfare Project. Provinces were allotted a capitation budget according to the number of people registered under the project. Around this period, Thailand faced an economic crisis and had to take loans from the World Bank under the Social Investment Project (SIP); and the MoPH requested a loan for medical service fee payments to health facilities in six provinces, according to the capitation rate, on a pilot scale, for outpatients and DRG-weighted global budget for inpatients. This model was later adopted as the universal healthcare scheme.

However, the major problems of the project were the lack of coverage and accuracy in card issuance for the poor. An evaluation of the card issuance process for each round indicated that a lot of poor people did not receive the healthcare cards while a rather large number of card-receivers were not really poor.

1.2 Voluntary Health Insurance with Government Subsidies Project (VHIP)

The MoPH implemented this project (commonly known as voluntary health card project) between 1983 and 2001 in two major phases. In the first ten years (1983-1992), the scheme was operated as community funds aimed at increasing access to essential primary health services by setting low-priced health cards including maternal and child health cards, family medical care cards, and individual medical care cards (later on only family cards were used). It was expanded rapidly during

the first two years but slowed down steadily after that due to MoPH's unclear policy on his matter. During the second half of the scheme (1993-2001), as a result of the project evaluation, a systematic improvement in the scheme operations was undertaken to become a full-scale voluntary health insurance scheme beginning in 1994. Under the new scheme, the national and provincial health insurance funds were established with the government subsidizing half of the health-card price (1,000 baht each); each one-year card was valid for a family of not exceeding five members. In the last phase of the scheme, the government subsidy was increased to two-thirds of the card price (1,500 baht each).

The scheme was popular among the people and expanded widely particularly in rural areas. In 2001, the scheme coverage was 23.4% of Thai population.

The benefits of the scheme were not quite different from those for the MSWP scheme. During the initial stage, which was administered by the community fund, there was a limitation on the number of visits for medical care and a ceiling of coverage; and the cardholder was required to attend the health centre first and, if referred by the health centre, he/she might go to hospital for further medical care. When the full-scale voluntary health insurance scheme was implemented, such limitation and requirements were abolished; and the cardholder could go directly to the district hospital in their area. Moreover, a new card could be obtained from another province in case the person temporarily or permanently migrated during the year.

However, the problem of this scheme was a lack of good risk distribution as it was a voluntary insurance scheme and only one premium rate, resulting in a larger-than-normal proportion of cardholders with health risks and a low rate of cost recovery, particularly in the provinces with low coverage rates in relation to the population.

1.3 Civil Servants Medical Benefits Scheme (CSMBS)

The government and state enterprises have had a medical service welfare system for civil servants and state enterprise employees as well as their spouses, children and parents since 1978. Its aim is the provide welfare to boost morale for state officials and employees using the budgets of the government and state enterprises, covering approximately 8.5% of Thai population in 2001.

The benefits under this scheme are better than those under other schemes in that the eligible person can seek medical treatment at any state-run health facilities and, in case of emergency, at a private hospital (with a limitation on reimbursement) for civil servants. But for state enterprise employees, mostly they are free to choose any hospital as they wish; and their benefits are not much different from other schemes. However, there may be fewer exceptions; for example, they are eligible to the treatment for chronic kidney failure and organ transplantation.

The medical service welfare for civil servants of central and provincial administration agencies is managed by the Comptroller-General's Department, while that for officials of local administration organizations and state enterprises is managed by each particular organization or

enterprise. For outpatients, they have to pay for medical expenses first and get reimbursed later; for an inpatient, with a letter of eligibility certification from his/ her parent agency, the hospital can submit a claim for medical expenses directly to the Comptroller-General's Department. (Since 2005, eligible persons with chronic illness and pensioners have been able to register with a hospital to directly claim medical expenses from the Comptroller-General's Department, without paying for services first, for outpatient care; this mechanism is being extended to other groups of civil servants). Under this scheme, fee-for-services payments are made to the hospital; but for state enterprises, the benefits might vary according to their financial status and mostly have a cap on maximum coverage.

The major problem of this scheme is the rapid increase in the medical expenditure resulting from the fee-for-services payment mechanism.

1.4 Public Sector Compulsory Health Insurance Scheme

In the private employment sector, there are two funds: (1) Workmen's Compensation Fund covering work-related illnesses or injuries of employees with premiums paid only by employers and (2) Social Security Fund (SSF) covering employees' illnesses, disabilities, deaths, and retirements, with premiums jointly paid in equal proportion by the employees, employers, and the government. The SSF's aim is to provide security for employees when they get sick based on the principles of risk sharing and support for each other between the people with better and poorer economic status and between the healthy and the sick. In the initial stage, this scheme covered only employees in business places with 20 employees or more. Later on, it has been extended gradually to cover businesses with 10 employees, 5 employees, and 1 employee, respectively. In 2001, the SSF covered 7.6% of Thai population.

The benefits under this scheme are similar to those under other schemes provided by the government for outpatient/inpatient, maternity, and dental services. The eligible person may choose to register at any public or private hospital under the scheme and may change the hospital registered once a year.

This scheme is managed by the Social Security Office of the Ministry of Labour through the Social Security Commission. The medical service fees are paid to contracted hospitals in different forms, i.e. capitation for general inpatient/outpatient care; additional payments according to types of services, chronic illness and high-cost care; and compensation for childbirth, dental care, and emergency medical care for accident victims outside the contracted hospital.

1.5 Motor Vehicle Accident Victims Protection (VAVP) Act

Health insurance for injuries from traffic accidents is compulsory insurance required of all owners of motor vehicles and motorcycles registered to pay insurance premiums. The scheme aims to protect persons injured from road traffic accidents and provide them with suitable medical services

and also provide compensation for cases with disabilities or deaths. It is a compulsory insurance scheme for all registered vehicle owners and managed by a private company. Its major problem is the duplication of eligibility with other health insurance schemes; and it has complex steps and regulations for reimbursements, resulting in a transfer of payments to other insurance funds or state hospitals.

1.6 Private Voluntary Health Insurance

In Thailand most private health insurance plans are an integral part of life insurance or accident group insurance. The purpose of private health insurance is to cover the risk of medical care payment that may occur in the future. The premiums are usually dependent on the risk level of the individual or group of individuals. The role of private health insurance is rather limited and its market is confined only to groups of people with a rather good economic status who can pay the premiums. In 2001, only 1.2% of Thai population were reported to have private health insurance.

The benefits of private health insurance mostly cover inpatient medical expenses, which are generally higher than outpatient medical expenses, with a cap on protection coverage while income-loss compensation is also paid during illness.

Significant features of different health insurance schemes prior to the launch of the universal healthcare scheme are as shown in Table 8.1.

1.7 Conclusion

Prior to 2002, with a segregated development approach, Thailand had several health insurance schemes with different objectives; the Medical Service Welfare for the People Project focused on providing protection for the poor, the elderly and children. Generally, it was an important social projection scheme, but it could not protect the poor as expected. Moreover, it had inadequate budgetary support to provide suitable medical services. The Civil Servants Medical Benefits Scheme for government officials and state enterprise employees, including their family members, faces a problem of efficiency because hospitals tend to over-provide medical services (beyond the need) under the fee-for-service payment mechanism, resulting in a considerable increase in medical care expenditure each year. As for the Social Security Scheme, a payment system for hospitals has been rather good; it is a capitation payment which should be an option for the long-term reform in Thailand. The Government-subsized Voluntary Health Insurance System was problematic in terms of risk sharing, resulting its financial unsustainability in the long run. Findings from research studies and political will leading to the financing system reform in 2002 will be discussed in section 2.

Table 8.1 Major characteristics of health insurance schemes before 2002

Characteristics	MSWP	VHIP	CSMBS	SSF	VAVP	Private insurance
Type	State welfare	Voluntary insurance with govt. subsidies	Welfare	Compulsory insurance with govt. support	Compulsory for vehicle owners	Private voluntary insurance
Target group	The poor and underprivileged	People living above poverty line with no insurance	Govt officials and state enterprise employees and families	Employees in private sector	All people affected by vehicle accidents	General public
Coverage rate of all Thai population (2001)	30%	23.4%	8.5%	7.6%	All	1.2%
Benefits						
• Outpatient services	State	State(MoPH)	State/private	State/private	State/private	State/private
• Inpatient services	State	State(MoPH)	State/private	State/private	State/private	State/private
• Registration with hospital	Required	Required	Not required	Required	Not required	Not required
• Benefit exceptions	15 cases	15 cases	-	15 cases	-	diseases
• Childbirth	Covered	Covered	Covered	Covered	None	None
• Physical checkups	None	None	Covered	None	None	Maybe
• Services not covered	Special room	Special room	-	Special room	-	-
Financing						
• Sources of funds	Govt budget	Household and 1/2 to 3/4 of govt subsidies	Govt budget	Employees, employers and state in equal proportion	Vehicle owner	Household
• Payments for services	Govt budget	Capitation & performance-based	Fee for service	Capitation & performance-based	Service-based	Service-based
• Copayment	None	None	When attending private hospital	Amount exceeding ceiling, childbirth, emergency	Amount exceeding ceiling	Amount exceeding ceiling
Major problems	Accuracy and coverage of the poor	Lack of good risk sharing	Rapid increase in expenditure	Cover only during employment	Duplication of eligibility and payment	Risk selection

2. Transition in 2001 to Universal Health Care

2.1 Processes for Policy Formulation and Drafting National Health Security Bill

1) Policy Formulation Process

The significant change in the Thai Health Service system happened after the Thai Rak Thai Party announced the universal coverage of health care policy, commonly kwon as "30-baht health care", in its general election campaign and decided to keep its promise when its won the 6 January 2001 election. Then the universal health care policy become one of the nine urgent policies of the government.

In March 2001, the government held a workshop to develop guidelines for implementation of the universal health care policy, which are in summary as follows:

"The universal health security policy aims to establish a health insurance scheme for the people by creating a service quality control system which separates service purchasers from service providers (MoPH). The state has the duty to distribute health risks and expenditure, using the government budget. Besides, this scheme has a mechanism for the containment of medical care cost using pre-negotiated, close-ended system of payment to health facilities. There are two funds under the health security scheme: (1) for the employment sector, expanding the social security fund to cover medical service welfare for civil servants and state enterprise employees including their families and (2) for the non-employment sector, using the universal health security scheme. Both funds will provide similar benefits and finally will become a single payment and benefit package system or will be merged as a single fund."

The universal health care scheme (30-baht health care) has covered 45.40 million people (73% of Thai population) with a budget from taxpayers' money of 55,000 million baht each year (2002). During the transition period, the budgetary management was undertaken by the MoPH, allocating the budget for all provinces. At the provincial level, the provincial health office was responsible for managing the fund at the area level under the guidance of the area health board. After the National Health Security Office (NHSO) was established in 2003, the MoPH has gradually phased out its management role. The expansion of the universal health care coverage has been carried out step by step. During the initial stage, it was implemented on a pilot scale in 6 provinces with only state hospitals providing medical services; in the second stage, the scheme was extended to another 15 provinces with some private hospitals participating; in the third stage, the scheme covers the entire country and some (13) districts of Bangkok; and in the fourth stage, it covered all districts of Bangkok and the entire country in April 2002.

The policy was actually implemented, leading to changes, because of three aspects of development: the policy for problem-solving or policy stream, raising of problems or problem stream, and political support or political stream. When all the three aspects of development converged,

a window of opportunity was open. The general election was regarded as a major opening of opportunity that caused the universal health care policy to be adapted on a state policy agenda.

❑ Policy stream. A group of technical staff of the MoPH had been working continuously since 1993 to seek ways to solve the problems and push for the adoption of the policy that they desired. They also tried to revise the policy for problem-solving until it was acceptable to all sectors concerned, the public and politicians.

❑ Problem stream. The problem related to access to health care was recognized by the public and decision-makers and it had to be resolved. The mechanism that caught the attention of all concerned to the provision of health care in the universal health security system was the decreasing income of the people resulting from the economic crisis, coupled with the presentation of the sufferings in the health system by a nongovernmental organization as well as the network for universal healthcare.

❑ Political stream. This is the change in the government and having a political party that was interested in health system reforms and proposed a policy that was in response to the problems and people's needs.

It is noteworthy that the building of knowledge was important in formulating the policy. Besides, the linkage with civil society and other networks created powers for policy adoption, while politicians were the people who opened the window of opportunity. All these factors supported the "triangle moving a mountain" strategy in the public policy movement.

2) Legislative Process

In 1995-1996, the MoPH and the House Commission on Public Health once drafted a universal health insurance bill, but could not got it passed into law.

A new effort was made again after the promulgation of the 1997 Constitution which prescribed that no less than 50,000 eligible voters could jointly proposed a law to the Speaker of the House of Representatives for deliberation. At that time 60,000 people signed the legislation proposal; so a group of academics, NGO representatives and interested members of the public drafted the National Health Security Bill. A statement supporting the universal health care was signed by all NGO representatives in October 2000 (before the January 2001) general election, The Bill was submitted to the House Speaker in 2001.

During that period of time, the political party that adopted the universal health care policy for its election campaign actually expanded the health insurance scheme in April 2001. The party also drafted a National Health Security Bill and then submitted it for the cabinet's approval and later on submitted it to the parliament.

In the meeting of the House of Representatives, there were six bills on universal health care for the House deliberation: one from the cabinet, four from political parties and one from the people (supposed to be submitted directly to the House, but the process of examination of the names of 60,000

eligible voters/signatories could not be completed in time, the House decided to submit it on behalf of the people).

The Bill was reviewed in four sessions of public hearings in the North, Northeast, South and Bangkok; then it was revised and submitted to the Senate. During the Senate's deliberation, there were news coverage, meetings, talks and discussions on the Bill by health professionals, government officials and eligible persons under the Social Security Scheme. They all called for revisions in the Bill as they deemed appropriate. The labour group wanted to delete the provision related to the workmen's compensation and social security funds; representatives of health professionals, despite their support for the Bill, wanted to reduce the Bill's role in controlling their operations and giving some monetary assistance to the health care recipients who were adversely affected by the medical treatment provided by the health facility. Based on the comments from all concerned, the Senate Commission revised some points of the Bill as requested.

Finally, the National Health Security Act was enacted and published in the Government Gazette on 18 November 2002 and coming into force on the next day, 19 November 2002. The main features of the Act are as shown in Table 8.2.

Table 8.2 Main features of the National Health Security Act, B.E. 2545 (2002)

Feature	National Health Security Act
1. Definition of health services	Services for disease prevention, disease diagnosis, medical treatment, health promotion, and rehabilitation, including Thai traditional and alternative medicine services.
2. Right to receive health services	Every person has the right to receive health services that are of good standard and in an efficient manner as prescribed in this Act.
3. Fixed health service unit	A primary care unit located in residential or working district/ subdistrict of the eligible person is the fixed health service unit, except for a good reason, accident or emergency and patient referral.
4. Management of the state health insurance schemes existing before the Act comes into force	Any eligible person under any existing law will have the right to receive health services according to that law. The National Health Security Board shall be prepared and set up a mechanism for the provision of health services according to this Act.
5. National Health Security Board (NHSB)	The Board has 30 members, including the Public Health Minister as chairperson and five representatives of the civic sector as members.
6. National Health Security Office (NHSO)	A state agency and juristic person under the supervision of the Public Health Minister. The NHSB selects for appointment and dismisses the Secretary-General of NHSO.
7. Funding sources of the National Health Security Fund	The funds for service provision come from the annual government budget and other incomes. The NHSB regrets the annual budget from the cabinet as the operating cost of NHSO.
8. Preliminary monetary assistance in case a service recipient is damaged by the medical treatment provided by the service unit	Not exceeding 1% of the budget that will be paid to service units will be withheld for use as preliminary assistance money for the service recipient who is damaged by the medical treatment provided by the service unit.
9. Quality and Standard Control Board	The Board comprises 35 members, including the president elected from among the members and five representatives of the civic sector.
10. Health facilities and standards of medical treatment	- Service units and their networks are to be registered. - Criteria are set for payments for health services.
11. Standard control for health facilities	An investigation committee is established to investigate, make recommendations, and report to the Quality and Standard Control Board.

Source : Sirivan Pitayarangsarit, Pongpisut Jongudomsuk, Thavorn Sakulpanich and colleagnes. The Process for Formulating Universal Coverage of Health Care Policy and the National Health Security Act, 2004.

2.2 Major Essence of Reform

1) Principles of the Universal Coverage of Health Care

The goal of the universal health care is to guarantee that every citizen will have access to essential health care as fundamental right of the people, and to set up a system for members of society to "share suffering and happiness" due to illness, which will promote fraternity and helpfulness in society.

The three principal targets are: (1) universal coverage, (2) all Thai citizens receive health care according to the standardized benefit package, and (3) there is a master plan as well as coordination mechanism for all agencies on the basis of policy, financial and institutional sustainability.

The design of the universal health care scheme is as follows:

(1) The budget for medical treatment will be from the tax system. Eligible persons will pay 30 baht per visit when receiving health care except for health promotion and disease prevention services. Exemption of the fee is extended to the people who were previously covered under the Medical Welfare for the Poor and Underprivileged Project such as poor people, children, the elderly, monks and veterans.

(2) A primary care unit near people's residences is the front-line service unit that serves as the main service contractor and the unit for registration of eligible persons.

(3) The financing system is a cost-containment system on a long-term basis with a close-ended and performance-related system of payments to health facilities.

(4) The benefit package is the same as those under other state health insurance schemes.

(5) The quality assurance system is used in monitoring the service quality development programme.

(6) For policy administration, the decentralization of management authority to provincial administration is used, under the responsibility of the area fund management committee.

(7) There is a clear purchaser-provider split in order to make the examination, monitoring and evaluation system more efficient.

2) Restructuring of the Health Security System

(a) Establishment of the National Health Security Office (NHSO) as the Service Purchaser

The NHSO uses the service purchasing mechanism in efficiently managing the scheme and serves as the representative of consumers in examining service quality and checking the balance of power in the service system, which was previously under the MoPH (which acted as both system monitor and service provider, having no incentive to assess its own service quality as consumers' representative).

According to the recommendations for the administrative structure reform of the universal health care scheme, there should be a national health security committee charged with the monitoring of policies of all state-run health insurance schemes, i.e. Social Security Fund, Civil Servants Medical Benefits Scheme, and the Universal Coverage of Health Care Scheme. The purpose was to standardize the benefit packages and payment mechanism to health facilities. At the local level, an area health board is used serve as the representative of the three funds in contracting health facilities under the scheme (Figure 8.1). However, during the transition period (2001-2002), there was no royal decree on practical guidelines for other funds and thus the NHSC supervises only the policy implementation of the universal health care scheme.

(b) Establishment of the Medical Injury Compensation System

This kind of fund is regarded as an innovation aimed at providing compensation to an individual damaged by medical treatment without proving any fault first (pure no-fault system). This is to relieve the suffering of the damaged person. The fund has the following advantages:

1. Preliminarily providing relief from suffering for damaged persons, without restricting their right to compensation from other system.

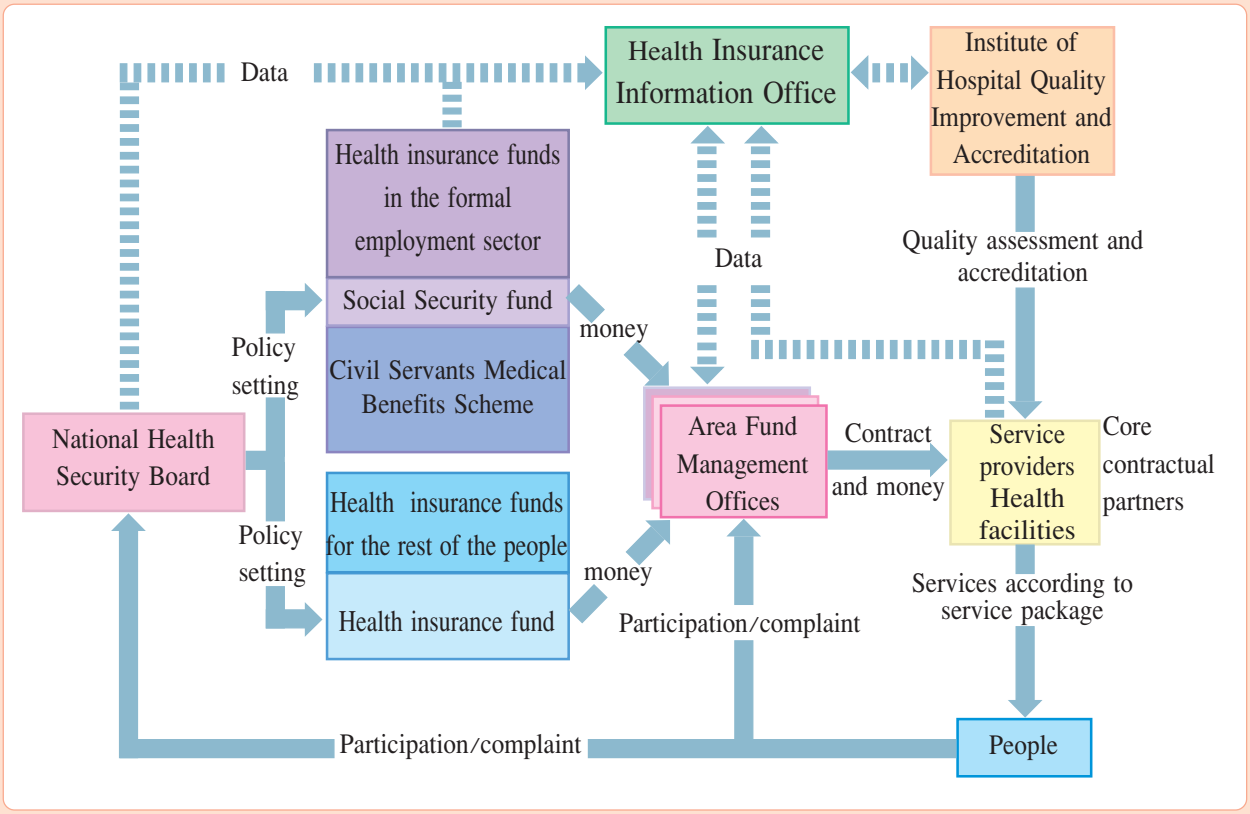
2. Promoting the development of medical care quality, making service providers become aware of the damage that may occur the service recipients. The NHSO uses two measures for this purpose: monitoring the quality of health facilities for preventing the damage due to an inevitable cause and having recourse to the wrong-doer or the negligent person.

3. Protecting physicians or service providers from undue litigation, using the mediation and reconciliation principle.

4. Managing the risk sharing effect by using the money earmarked or withheld from the universal health care fund (1% of medical expenditure) so that health service providers used not pay high premiums on insurance from a private firm.

Results of the operations are yet to be seen.

Figure 8.1 Proposed restructing of the health insurance system



Source: Working Group on Development of Structure of the Universal Coverage of Health Care Scheme, MoPH (2001).

2.3 Health Insurance System in Thailand after April 2002

In summary, after the change in cabinet and the implementation of the universal health care scheme, covering eligible persons under the medical service welfare scheme and the health card project and expanded to cover those who had never had any insurance before, the coverage of health insurance has risen to 92.5% of the Thai population, including 74.2% under the universal health care scheme, 6.6% under the civil servants medical benefits scheme, and 11.5% under the social security scheme, while the rest are under small systems such as politicians and Thais residing in other countries. Approximately 4.6 million people or 7.5% of entire population are not registered in any health insurance scheme.

A brief comparison of the three major schemes (see Table 8.3) is as follows:

1) Benefits: There is similarity in the benefit packages under the social security scheme and the universal health care scheme. Basically, the benefits cover inpatient and outpatient services, childbirth service and dental care, with exceptions for 15 specific cases, annual checkups, and special room changes. The universal scheme does not cover kidney dialysis for cases with chronic kidney failure, while the medical service welfare scheme had no exceptions. Disease prevention and health promotion services are included in the benefit package of the universal scheme. All three schemes use the national essential drug list in the benefit packages.

2) Sources of financing and co-payments: The universal health care scheme is financed by the government taxation system and requires that the eligible person pay 30 baht per visit, except for the underprivileged. Similarly, the civil servants medical benefits scheme is financed with tax money, but requires co-payment when attending private hospital. The social security scheme receives funding from three parties: employees, employers and the government; co-payments are required when the medical expenditure exceeds the established ceiling as well as for childbirth or emergency care.

3) Methods of payment to health facilities: The method for the universal coverage scheme is similar to that for the social security scheme, i.e. capitation as well as performance-related payment such as DRG for inpatients. The method used in the civil servants medical benefits scheme is fee for service.

However, there have been efforts to further improve the three schemes so that they have similar features to ensure equitable access to health care, which has to be pursued in the future.

Table 8.3 Major characteristics of health insurance schemes in Thailand, September 2002

Characteristics	Universal health care	Civil servants medical benefits	Social security
Type	State welfare	Fringe benefit	Social insurance, compulsory
Target group	People outside the civil servants and social security schemes	Civil servants, state enterprise employees, and their families	Employees in the private sector
Population coverage *	74.2%	6.6%	11.5%
Benefits			
• Outpatient services	Public/private	Public/private	Public/private
• Inpatient services	Public/private	Public/private	Public/private
• Registration with hospital	Required	Not required	Required
• Benefit exemptions	15 events	-	15 events
• Childbirth	Covered	Covered	Covered
• Physical checkups	None	Covered	None
• Services not covered	Special room, kidney dialysis	-	Special room
Financing			
• Sources of funds	Government budget	Government budget	Employees, employers and state
• Payment method	Capitation and performance-related	Fee-for-service	Capitation and performance-related
• Co-payment	Fee, 30 baht per visit	When using private hospital	Amount exceeding the ceiling, childbirth and emergency services

*Note: Total population of 61.2 million, National Health Security Office, September 2002.

3. Development of Subsystems in Support of the Universal Health Care System

3.1 Development of Personal Information Database

The social security system is the first state health insurance system that has and use the personal information database for eligible persons. Later in 2001, the MoPH created a preliminary personal information database for use in the universal health care scheme, used on the personal database of the Registration Administration Bureau of the Department of Provincial Administration of the Ministry of Interior. According to the Social Security Office and the household survey, the database of the universal health care scheme in the initial stage had some problems related data accuracy. Duplication of eligibility was found in 12.4% of all eligible persons (April 2002). Later, with the NHSO's correction, the duplication rate went down to less than 1%.

In July 2005, the government set a policy to integrate the administration of all state health insurance schemes and assigned the NHSO and the Comptroller-General's Department to jointly manage the Civil Servants Medical Benefits Scheme. Then the effort for improving the personal information database for eligible persons under the CSMBS began to be seriously made and it was expected to be completed by December 2006.

In summary, the personal information database has been improved after using it in the management of the universal health care scheme. It has been actually used and linked to databases of other agencies concerned, causing checking and updating the information on a regular basis. Such checking also occurred as a result of the people being allowed to access and check the information even though the correction can be made only the by authorized official.

3.2 Development of Primary Care and Referral Systems

Recently, there have been policies and operations for development of primary care units in the following aspects:

1) Development of standard criteria for fixed service units and assessment for recognition of service units

The standard criteria of service units reflect the basic need for improving and monitoring the quality of service units in the health insurance system. In the past, the standard criteria focussed primarily on inputs, such as infrastructure, number of personnel, equipment, etc, being stipulated according to the size of population in the designated area (for example, a service unit with one physician is to cover a population of not exceeding 10,000).

The assessment for recognition of service units according to the established criteria prier to providing services under the health insurance system, in the past, focused on private hospitals (as the scheme could not deny the participation of public hospitals). Until 2006, a policy was set to assess both public and private hospitals; the results of assessment of public hospitals will be used for designing a development plan for the next phase.

2) Support for innovations and development of primary care units (as ideal PCUs)

In 2004, NHSO organized a Universal Coverage Innovation Award (UCIA) programme aimed at boosting morale of operational staff and collecting/disseminating outstanding activities for use as examples for other agencies. Also organized was the program for improving the quality of PCUs to become PCUs of excellence or ideal PCUs. Moreover, this effort also aimed to promote the learning process and self-development of each PCU in a continuous manner, under which each PCU was to assess itself according to the developed assessment tool and then prepared a request for funding for improvement of what deemed to be deficient. Out of 1,451 PCUs applying, 562 PCUs were supported, one-third of them being projects related to development of diabetic and hypertensive patient care.

Moreover, in 2005, NHSO and the MoPH's Department of Health Service Support initiated a programme on health centres' quality development according to the MoPH standards of community health centres. The aim was to develop 800 health centres; after programme implementation, 530 health centres or 66% of the target met the assessment criteria.

3) Development of a model for development and quality assurance of primary care

During the past decade, hospital quality improvement and accreditation (HA) was the trend that was widely recognized. Most public and private hospitals voluntarily participated in the HA programme. And all state-run health insurance schemes agreed to use the HA system and the central quality development system.[1]

However, the HA system focused on quality development of hospitals, not covering services at primary care units. So the NHSO recognized the importance of the development of a system for improving primary care quality and accreditation by supporting the Health Care Reform Project[2] to conduct a research project on this mater. At present, a project proposal is being developed.

4) Development of Personnel Capacity and Infrastructure

During the first phase of the universal health care system, the capital replacement fund was part of the capitation budget and allocated for structural improvement at the primary and specialized[3] care facilities. Mostly, it was for the expansion of excellent centres, but there was no policy on investment in primary care structure.

Later, the NHSC gave more importance to investment in human capital. In 2005, a capital replacement fund of 100 million baht (2.8% of total capital replacement fund) was allocated for manpower development at the primary and specialized care levels. But, actually only 10% of such

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[1] Resolution of the coordinating committee of the Comptroller-General's Department, the National Health Security Office, and the Social Security Office, No.5, 29 March 2006, Novotel Thipwiman Resort and Spa, Phetchaburi Province.

[2] This Project Office has been renamed as Community Health System Development Institute.

[3] Initially, 30% of capital replacement fund was allocated for investment in specialized care facilities, especially cancer centres, heart disease centres, and emergency medical service centres. Later, the proportion has gradually declined to only 10% in 2006.

budget was used for workforce development at the primary care level. At the regional level, 130 resource persons were trained so that they would help establish 12 regional training centres and further train 1,800 trainers at the provincial and district levels. In 2006, the NHSC allocated another 1,062 million baht or 17.2% of total capital replacement fund for the development of infrastructure and personnel at the primary care level, aimed at establishing 200 community medical centres (CMCs), expanding training programmers for primary care units, providing compensation for trained personnel and supporting the reduction of outpatients' numbers at large hospitals.

Giving importance to primary care units recently, especially when the universal health care policy is implemented, has resulted in a change at primary care units to a certain extent, particularly an increase in the number of personnel (Table 8.4).

Table 8.4 Proportion of personnel at primary care units before and after the implementation of universal health care policy (excluding physicians, dentists and pharmacists), 2004

Item	Health Centres	PCUs at community hospitals	PCUs outside community hospitals	PCUs at reginal-general hospitals	PCUs outside regional-general hospitals	Total
Sample size	442	76	17	3	3	577
Proportion of PCUs with personnel:						
declining (%)	11.09	14.47	5.88	0.00	33.33	11.61
unchanged (%)	42.53	38.16	35.29	33.33	33.33	41.77
rising (%)	46.38	47.37	58.82	66.67	33.33	46.62

Source: Supattra Srivanichakorn et al. Assessment of Situations at Primary Care Units in 36 Provinces, August 2004.

Note: "personnel" in this study include technical nurses, technical staff, health administration officers, health officers, and dental hygienists.

Besides the investment in the development of primary care units, recently there have been efforts to develop other mechanisms that are supportive of primary care services including:

1) Policy on reduction of workload of outpatient departments at large hospitals

In 2006, the MoPH announced its commitments to the Thai people,[4] one of which was developing state hospitals as "modernized hospitals" according to the "quick and non-crowded service" principle. The aim is to reduce overcrowding at 12 large hospitals using the strategy on developing primary care units in urban areas and distributing patient care workloads to such primary care units. In this effort, the target hospitals are to improve the quality of primary care units, create public confidence in the units, and establish an efficient referral system.

2) Development of referral systems and admission coordination centres

A referral system links to each other the health services at all levels to ensure continuous care and access to essential care. An efficient referral system must have a two-way mechanism for referring "patients" and "information" about health problems and medical treatment the patient has received at leach level.

In the past, the referral system in Thailand was efficient to a certain extent. After the implementation of the universal health care policy, the rural referral system has been improved and become more efficient with the establishment of the geographical information system (GIS) and the categorization of contracted service units of the NHSO, which has established "referral service units" and a private hospital can participate as a "referral service unit" resulting in the availability of more channels for referrals.

A "referral coordination centre" was established to coordinate with hospitals with capacity to care for heart disease patients and a register of patients waiting for heart surgery. In this effort, the centre can coordinate with another hospital with fewer patients on its waiting list for surgery and the patient can undergo a surgery faster. Besides, the centre has coordinated inpatient admissions at hospitals in Bangkok. According to the cumulative data of the NHSO as of March 2006, patients in Bangkok needed assistance in seeking beds for admission for various reasons, namely, admissions at private hospitals not participating in the project (72.99%), no beds available at treating hospitals (11.01%), patients requiring care beyond first hospital's capacity (13.69%), seeking beds for patients under other welfare schemes (2.04%), and others (0.28%). It was found that beds could be obtained for 64.4% of the cases. The centre can coordinate with a number of private hospitals to join the bed reservation project by revising the payment system as a special incentive for hospitals participating in the project.

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[4] MoPH's commitments to Thai people in 2006. A document on MoPH performance for 2005, 30 December 2005.

3.3 Coordination among Various Health Insurance Schemes

The three state-run health insurance schemes have different characteristics, creating management difficulties for health facilities and double standards of medical care. The universal health care scheme was created based on the lessons learned from other schemes, especially the social security scheme. So both systems are not quite different.

Although there are tides against the integration for solidarity in the management of state health insurance schemes, agencies responsible for the three schemes, including the social Security Office, the National Health Security Office, and the MOF's Comptroller-General's Department see the importance of coordination so that the management systems of the schemes are in the same direction, supportive of each other for their maximum efficiency, and minimizing inequalities among the schemes. So there was a cooperation agreement among the three agencies[5] to establish a committee on coordination for development of health insurance systems in 2004, comprising executives from the three agencies, with the top administrator of each agency taking turn as chairperson on a one-year term basis. The Secretary-General of NHSO was chairperson for the first year. As a result of the establishment of the committee and other working groups set up at a later date, some joint development outputs are as follows:

1) Central standards of health insurance funds. The standards include the standard data set and coding system, the standard fee schedule, use of the hospital accreditation system as the central system for quality development of contracted hospitals, and the standards of contracted hospitals at different levels.

2) Development of databases for common use. The databases developed are the health insurance eligibility database of Thai people, the hospital profile of all hospitals participating in the schemes, and the database on service utilization of eligible persons.

3) Coordination for reduction of duplication. The achievements of this effort include the development of health service practice guidelines (HSPG), assessment visits to tertiary hospitals,[6] analysis of data on service utilization of eligible persons under the Civil Servants Medical Benefits Scheme for reduction of duplication of personal data, development a system for hospitals to serve as claimants for eligible persons in case of outpatient service (no need for an outpatient to pay first as practised in the past), and examination of service fee compensation for appropriate cost containment with the NHSO taking the lead in such an effort.

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[5] Cooperation agreement among the Comptroller-General's Department, the Social Security Office and the National Health Security Office for development of health service systems, 19 January 2004.

[6] Initially, there was an effort to coordinate joint visits for assessing contracted hospitals, but there were some problems related to differences in health insurance systems; so the universal health care scheme uses the area-based mechanism for this purpose while the social security system uses the central mechanism.

3.4 Revisions of the National Essential Drug List, 1996, 1999 and 2004

The drug expenditure estimate for Thailand in 2001 was 46,639 million baht or 27.4% of overall health expenditure, which is rather high compared with those for other countries or even developed countries. Measures for controlling the use of non-essential drugs are necessary; and one of the measures is to develop a "national drug list" to select and compile a list of drugs essential for health of Thai people. The sub-committee on national drug list development, under the National Drug Committee, was the key mechanism in this effort.

Drug list development has been continually undertaken from the "1979 MoPH Drug list" and the "1981 National List of Essential Drugs" to the "1996 National List of Essential Drugs" that was based on the WHO guidelines covering basic drugs significantly required for people's health care and resolving national health problems. It was later on revised in 1997, in accordance with the 1997 economic crisis, based on the ability to pay and socio-economic impact. The 1999 National List of Essential Drugs included four lists, one of which is for hospitals and health care facilities including drugs that were classified according to their pharmacological and therapeutic properties into 23 groups, totaling 932 items.

The most recent revision of the national drug list was undertaken in 2004, taking into consideration several aspects of changes in the health system, namely: (1) burden of disease, (2) health service reforms, especially with the universal health care system, (3) improvement of efficiency under the "good health at low cost" policy, and (4) development and promotion of rational drug use according to the health service practice guidelines (HSPG). The drugs in the 2004 National List of Essential Medicines are classified into five sub-lists or lists as follows:

List A means a list of medicines for use at all levels of health facilities.

List B means a list of medicines for indications or certain diseases for which medicines on **List A** cannot be used or inefficacious, or which can be used in lieu of **List A** temporarily in case **List A** medicines cannot be procured.

List C means a list of medicines that are used for treatment in areas of specialty by an expert or by someone who has been authorized by the director of that particular health facility with an established measure for monitoring their use.

List D means a list of medicines which have several indications, but only some indications are appropriate or have a tendency to be incorrectly prescribed, or have a high cost and their indications and conditions for use have to be specified.

List E means a list of medicines for a special project of a state agency.

In the early stage, the process of revising the drug list was quite slow. In 2005, the NHSO supported the process so that the list is up to date and medical professionals as well as the general public are more confident in the quality of medicines.

4. Achievements of the Health Security System

The achievements of the universal health care scheme being described in this section are derived from the summary report of the study on equity of financing system in Thailand conducted by the International Health Policy Programme which was based on an analysis of the 2004 database.

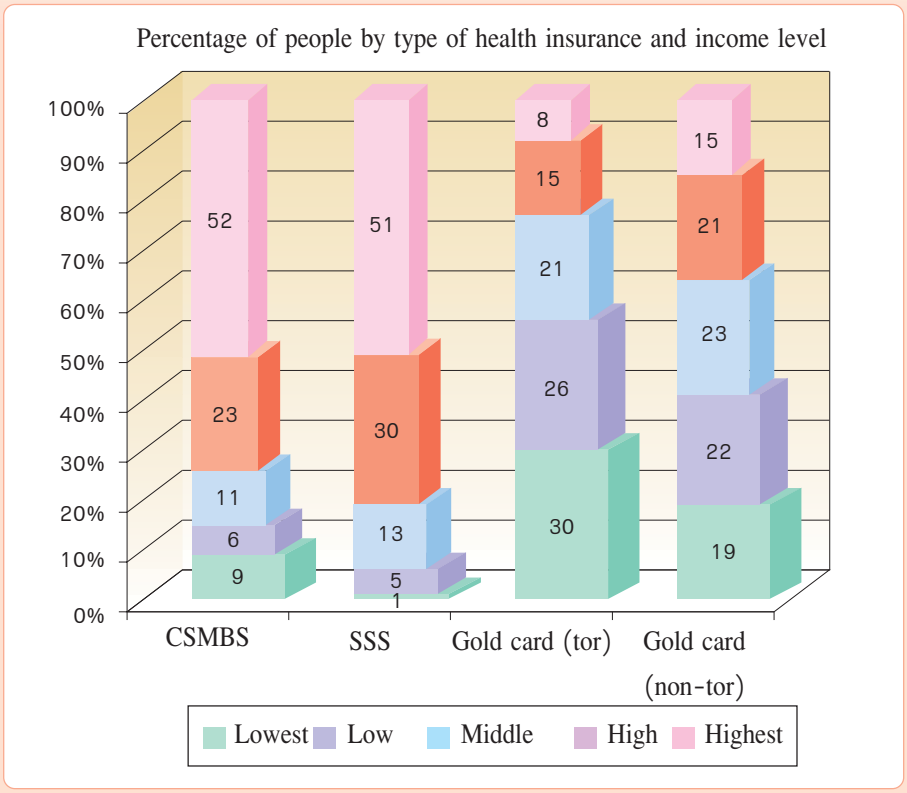
4.1 The Health Security System and the Rich and Poor

According to the 2004 health and welfare survey conducted by the National Statistical Office, when the population is divided into five groups according to household income, the universal health care cards (category "Tor" which exempts 30-baht-per-visit payment) have been distributed to the lowest income group as many as 30% and to higher income groups in lower proportions, respectively. The eligibility for universal health care is more widely spread among the poor than those for welfares under the civil servants benefit and social security funds.

For the universal health care cards of "non-Tor" category which require a 30-baht-per-visit payment have been distributed in general to all income groups in the proportions which are not so different (Figure 8.2).

However, there are some people in the lowest income group that have no exemption for the 30-baht payment; on the contrary, some people in the highest income group receive exemption for such a payment as a result of the Medical Welfare for the Poor and Underprivileged originally of the MoPH which could not effectively screen the poor into the scheme and excluding the non-poor from the scheme.

Figure 8.2 Proportions of poor and rich people in deferent medical welfare systems



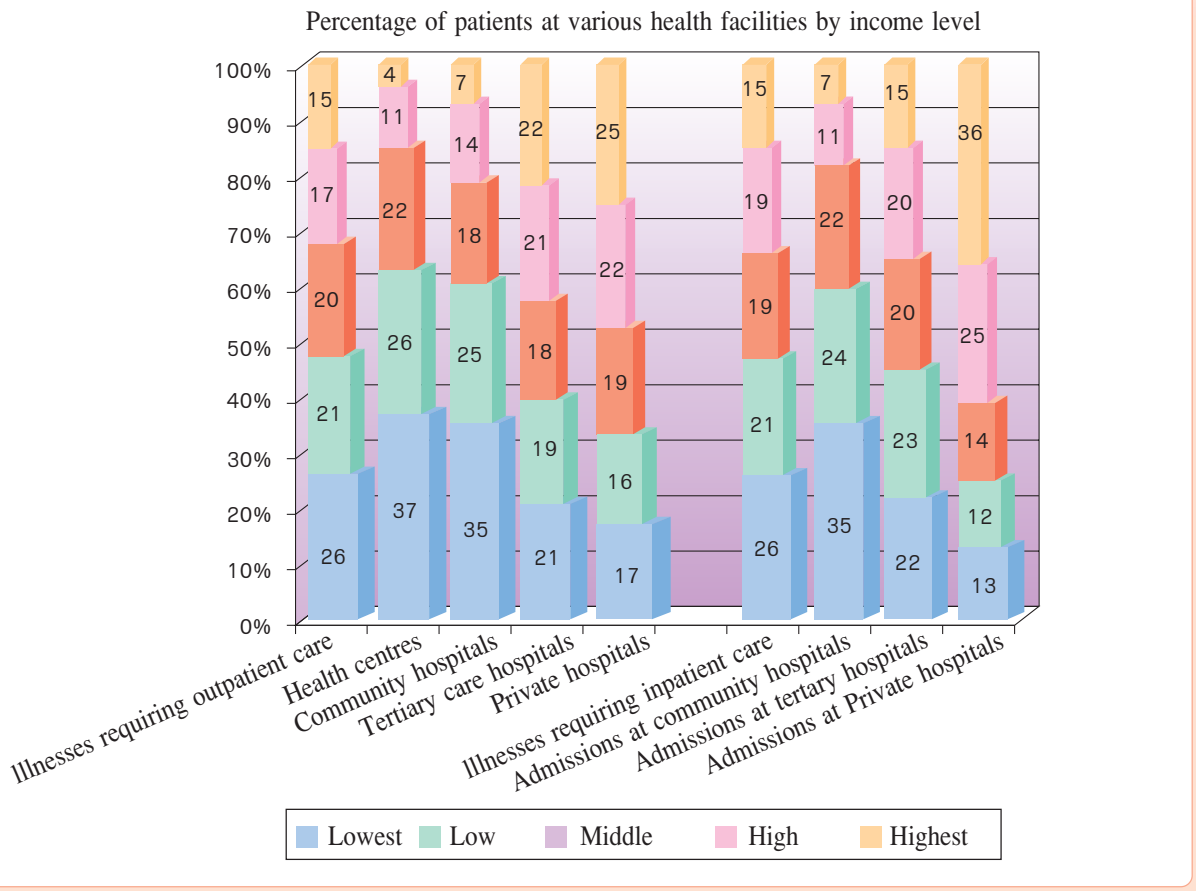
Source: Report on Health and Welfare Survey, 2004. National Statistical Office.

4.2 Illness and Service Utilization of the Rich and Poor

For the lowest-income group, their illness rate was highest at 26% of all patients while the illness among the highest income group was only 15% (Figure 8.3). The distribution of outpatients was close to that for inpatients.

While the proportion of illness for lowest-income group was 26%, their proportion of outpatient services was as high as 37% at health centres, 35% at community hospitals, 21% at state tertiary care facilities, and 17% private hospitals. For the highest income group, their illness rate was 15% and the proportion of their service utilization at state tertiary care facilities was 22%. This is due to the fact that most low-income population live in rural areas and have difficulty accessing tertiary care facilities that are normally located in Mueang Districts (in provincial cities). So when they get sick, mainly with illnesses that only require outpatient care, low-income population tend to seek medical care at the subdistrict or district level.

Figure 8.3 Proportions of people reporting illnesses (percent)



Source: Report on Health and Welfare Survey, 2004. National Statistical Office.

An analysis of inpatient services revealed that the proportion of low-income people using inpatient care was similar to that for outpatient care at state hospitals. At tertiary care hospitals, the proportion of high-income people using inpatient services was consistent with their illness proportion, i.e. The highest-income group had an illness proportion of 15% and an inpatient service proportion also of 15%, while their proportion of using outpatient services was as high as 22%. That was due to the fact that the highest-income group tended to use inpatient services at private hospitals at a high proportion of 36%.

4.3 Either Rich or Poor People Benefit from the State Health Budget

This study estimated the benefits the people received from the government health budget, based on the analysis of the differences of the costs of health services at various levels of state health facilities and the out-of-pocket household health expenditures. The concentration curve can illustrate the relationship between the proportion of health care subsidies and the proportions of five groups of people (poorest to richest) according to their household's economic status. The horizontal axis represents the commutative number of people by economic status order, from poorest to richest;

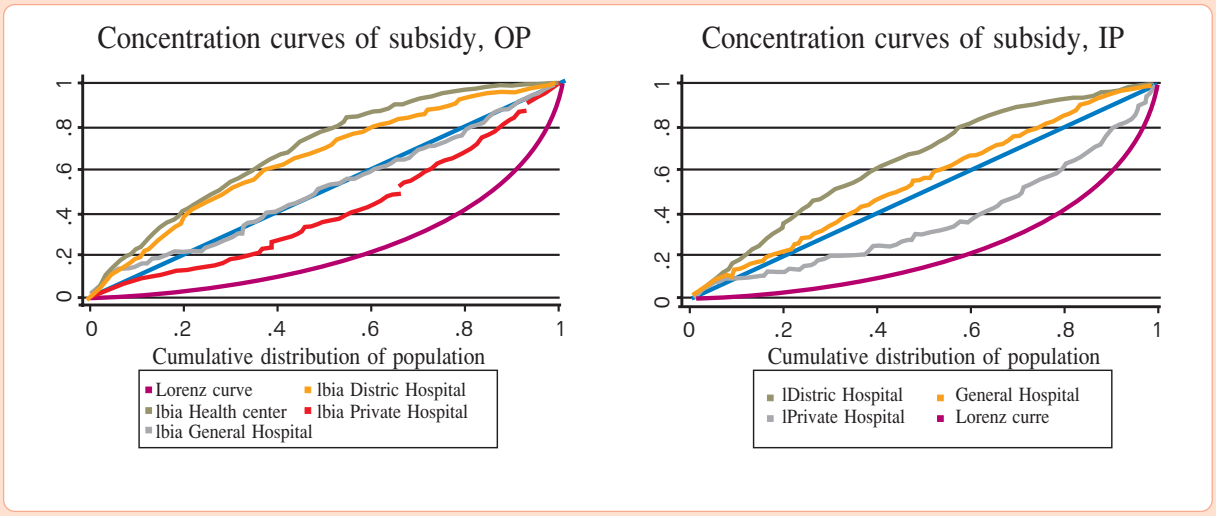
the vertical axis represents the cumulative budget for health care for such people. If the subsidy has a perfect equity between the rich and poor, the relationship will be above the equity line, which is the 45° diagonal between the two axes. That means the subsidy amount is in the same proportion as the number of people in each economic status level. For example, the poorest group (first 20% of entire population) receives 20% of the total subsidy and the richest group (last 20% of entire population also receives 20% of the total subsidy (Figure 8.4).

If the poor receive a larger proportion of subsidy than the rich, the concentration curve will be above the 45° diagonal line. That means the poorest group (first 20% of entire population) receive more than 20% of total subsidy; on the contrary, if the subsidy is mostly concentrated in the rich group, the concentration curve will be under the 45° diagonal.

In addition to using the concentration curve, the comparison of the proportion of subsidy and the proportion of five population groups can be illustrated by using the concentration index (CI), which is two times the area between the diagonal line (equity line) and the concentration curve, ranging from -1.0 to 1.0. If the concentration curve is above the diagonal line, i.e. the poor having a higher proportion of subsidy, the CI will have a negative value, but if the concentration curve is under the diagonal line, i.e. the subsidy being concentrated among the rich rather than the poor, the CI will have a positive value.

Besides, if we want to see whether the health care subsidy can bridge the economic gap between the rich and the poor, a comparison can be made between the concentration line and the Lorenz curve, which shows income distribution in the population. If the income is concentrated among the rich, the Lorenz curve will be under the 45° diagonal. The higher the concentration line of health care subsidy is above the Lorenz curve, the more the subsidy can help bridge the economic gap between the rich and the poor. In such a case, the relative equity or Kakwani index will have a negative value.

Figure 8.4 Concentration curves of health care subsidies for outpatient and inpatient services at different levels of health facilities



The analysis of the data on outpatient care subsidy at public health facilities from the 2004 health and welfare survey revealed that at the health centre and community hospital level, the CI was negative. That means the proportion of subsidy for the low-income group was higher than that for the high-income group (CI -0.357 for health centres and CI -0.276 for community hospitals). For state tertiary hospitals, the healthcare subsidy for the low-income group was close to that for the high-income group (CI 0.003, the concentration line was close to the diagonal or the equity line).

The subsidy of healthcare expenditure for inpatients at community hospitals was similar to that for outpatients, i.e. the low-income group received a higher proportion of benefits than the high-income group (CI -0.272). Regarding the subsidy of inpatient care at provincial hospitals and other state hospitals, the benefit for the low-income group was also higher than that for the high-income group, but at a lower level than that at community hospitals (CI -0.087).

On the contrary, the health care subsidy at private hospitals was mostly concentrated among the high-income group (CI 0.184 for outpatients and 0.256 for inpatients). It is noteworthy that even though the CI values for private hospitals were positive, the concentration curve was closer to the equity line than the income distribution Lorenz curve was. So it can be stated that financing and health services in Thailand have helped reduce relative economic inequity even at private hospitals: Kakwani index being -0.352 for outpatients and -0.277 for inpatients.

Chapter 9
National Health System Reform and Health Decentralization

1. National Health System Reform

The process of national health system reform began officially in 2000 when the government issued the regulations of the Prime Minister's Office on National Health System Reform of 2000, establishing the National Health System Reform Commission (HSRC) chaired by the Prime Minister and charged with the support for the drafting of the National Health Bill and the recommendations for national health system reform, having the National Health System Reform Office (HSRO) established as an ad hoc agency under the Health Systems Research Institute (HSRI) to serve as the secretariat.

The drafting of the National Health Bill to be used as a principal law on health used a participatory approach involving all sectors in society so that Thai people across the nation could participate in thinking, recommending, and drafting the Bill; the drafting process was also used as a tool for joint learning in Thai society.

1.1 Background of the National Health System Reform

Over the past 30 years, there have been efforts of a group of health leaders within and outside the MoPH to develop a proposal for national health planning using the community-based approach. There were recommendations for medical education reform, using the community as the centre rather than the large hospital which was nearly impossible. There was also an effort to set up a National Health Council to serve as a mechanism for formulating national health policies with the participation of all sectors concerned as health is regarded something that involves a number of people in the government and civic sectors.

Later there was a policy on distribution of health services to rural areas at the district and subdistrict levels nationwide. District hospitals and subdistrict health centres were established all over the country and the **"primary health care"** strategy was adopted to promote people's participation in health services. That was clearly considered as health service reform focusing on rural areas.

In 1992, the Health Systems Research Institute (HSRI) Act was enacted during the premiership of Mr. Anand Punyarachun to serve as a state agency, but not a regular civil service agency, under the supervision of the MoPH. HSRI's duties include the creation of body of knowledge related to the public health system (during that period, "public health system" was more commonly used than "health system") in response to changes that will occur in the future. The knowledge created by HSRI was important for health system reform at a later date.

At the 1996 technical conference, organized by HSRI on 1-2 February 1996, on **"health reform: a new strategy for system development,"** there was a preparation for reforms of several health systems. And Dr. Prawase Wasi wrote a book entitled **"System Reforms for Health"**. In the preface, Dr. Prawase stated that:

*"Health means perfect happiness in physical, mental and social aspects, which is the ultimate goal of life and development, and the linkage of all factors affecting health is called " **health system** ".*

The health system includes other factors outside the health sector such as social, economic, environmental and political factors; the health care system is part of the health system.

A health system of a country or a region or on any issue is specific for that particular country, region or issue as it is dependent on its specific cultural, governmental, social, economic and political factors. So it is impractical to use the knowledge of health system from other places, but its own health system research has to be undertaken to gain an insight on the working conditions and the direction in which the system is moving. Then the health system will be properly improved.

While things are rapidly changing, the health system reform is essential. If there is no reform, the old system will be at a disadvantage, affected by the new situations and problems, *which* ***will severely affect the health, economic and social systems.*** *Thus, health system reforms are becoming a great trend globally.*

In reforming a health system, it is necessary to have systematic thinking.

The ***major thinking process*** *has to cover the entire system as fragmented thinking, or thinking in one's own area of interest, would not result in a health system reform. This point is to be especially emphasized as we have been familiar with fragmented or minor thinking. There are people who are in a position to do a major thinking, but do a minor thinking. So we need to form a group of knowledgeable and capable people to do a major thinking, covering the entire system so as to have a health system reform for all the people."*

Dr. Prawase also mentioned about the need for health system reform, based on the use of knowledge and the management for social movement, and suggested eight paths for health system reform as follows:

1. Creation of a system for all concerned to participate in the reform process.

2. Research on major trends that will affect health.
3. Research aimed at creating the value of health and health indicators of society.
4. Research aimed at promoting and supporting the culture of health.
5. Evaluative research on health service systems.
6. Reform of the health service system.
7. Promotion of civil society for health.
8. Research for drafting a national health law or a health system reform bill.

The term **"health system"** began to have a clearer meaning as a system that is broader than medical and public health matters, broader than the health service system. And the direction for health system reform movement has become more clearly envisioned.

The efforts for health service system reform, which is a subsystem the health system, had a lot of problems related to service distribution, personnel distribution, service quality, inequities, financing and ethics, even though all governments have tried to resolve such problems and improve the health service system. The MoPH set up the Health Care Reform Project in 1996, in collaboration with the European Union (EU), with Dr. Sanguan Nittayarumphong being a key person in creating the knowledge, personnel development, pilot studies on models of health service systems, and pushing for policy reforms. The most important achievement of this project was the pushing for adoption of the universal coverage of health care (30-baht health care) scheme by the Thaksin Shinawatra government in 2001. Following the adoption was the promulgation of the National Health Security Act of B.E. 2545 (2002). The project worked very closely with the people's network for universal health care, which could collect 50,000 signatures of people for proposing the National Health Security Bill in 2001.

In 1997, Thailand had a new constitution and was faced with a severe economic crisis. The new constitution opened a new era of "participatory democracy" in parallel with "representative democracy". In 1997, the seventh Senate Commission on Public Health (the last senate prior to the promulgation of the 2006 Interim Constitution) set up a working group to prepare **"a report on national health system"**, chaired by Prof. Dr. Prasop Rattanakorn with Prof. Dr. Kasern Wattanachai as vice chairman and Dr. Supakorn Buasai as secretary. The report contained recommendations for health system reform in accordance with the 1997 Constitution of Thailand.

This technical paper comprehensively mentioned about eight essential elements for a desirable national health system, i.e.: (1) purpose, intent and principles, (2) rights, duties, equality and security in health of the people, (3) health promotion and disease prevention, (4) service system, (5) resources and investment in health system, (6) mechanism for quality examination and health protection, (7) management of health information and knowledge, and (8) role of the government and devolution to local administrative organizations. In each element, there were descriptions about the

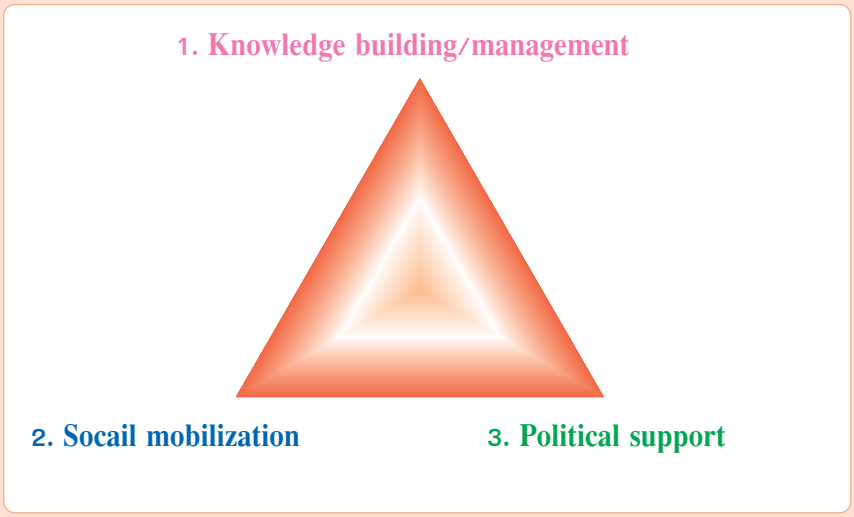
principles, purpose, desirable characteristics and meaning of changes in the existing health system. Also presented were concrete examples and recommendations for legislation in the future. Some essential parts of the report led to the drafting of the National Health Bill and a part became the slogan **"building before repairing health"**, which was widely used in a later stage in the promotion of the strategy for creating good health before repairing ill health.

In July 2000, the Regulation of the Prime Minister's Office on National Health System Reform was issued. Its rationale was that "whereas the current national health system cannot help the people to be healthy and have a good quality of life, there is a rising prevalence of diseases and health threats, and the health management system is inefficient, of low coverage and not in accordance with the intent of the Constitution of the Kingdom of Thailand."

1.2 Strategy and Progress of National Health System Reform

The process for national health system reform used a "triangle that moves a mountain" strategy, emphasizing the linkages between knowledge building/management, social mobilization, and political support as shown in the figure below.

Figure 9.1 The "triangle that moves a mountain" strategy



Source: Prawase Wasi, 2002.

1) Knowledge Building/Management or Technical Work

This effort creates the wisdom, which is a basis for health system reform, in coordinating the understanding of political groups and civil society so that they can jointly build up a clear intention for health system reform. It is like a guiding tool for society to get away from misconception that may influence the interest groups in the health system. It will also help gather relevant experiences and knowledge from within and outside the country for presentation to the

participants in the health system reform process to use in making decisions in a scientific and unbiased manner. The collective efforts of academics from various disciplines were made in analyzing and digesting technical data and presenting it to the public to understand and learn as well as to synthesize the knowledge for health system reform together with political groups and civil society. Then the movement for reform would be clearer (Wiput Phoolcharoen, 2001).

2) Social Mobilization

Social mobilization is the creator of social power so that civil society will become stronger and get involved in pushing for political changes at the local and national levels; the political reform resulting in the 1997 Constitution was a result of civil society's power formed in a systematic manner. The constitution was an important tool for increasing and expanding the potential of civil society to become stronger. Members of civil society included interest groups and professional organizations as well as those assembled to protect the public benefits. They all developed their experiences and expanded their networking in working on issues of common interest. The power of civil society could thus more clearly reflect the problems and health needs (Wiput Phoolcharoen, 2001).

3) Political Support

Political support or power is the power in the democratic system which has representatives of all Thai people to carry out the legislative functions. Political power also carries out the administrative functions through state officials implementing the policies set by politicians. Political power is thus important in changing the policy structure, budget, and relevant laws in response to the intent of health system reform. Regarding the decentralization of political power, at present, the mechanism of local politics has evolved into political power responsible for the missions linking to health system in each locality. It is the power group that has drawn attention of all sectors even though local politicians are "new hands" taking charge of administering the health system at the community level. If we all can help create their potential and seek clarity of the model and role in maintaining the health system of each locality, local politics will become a principal power in health system reform (Wiput Phoolcharoen, 2001).

The new government formed in 2006 stated in its social policy that "the government is committed to creating a strong society for the people in the nation to live happily together on the basis of reconciliation and righteousness." In its health policy, item 3.4 states that "Develop people's well-being in the physical, mental, social and intellectual dimensions by reforming the health system to reduce risk factors related to behaviours and the environment emphasizing public participation, and develop the health service systems for normal and emergency situations in a well-balanced manner covering health promotion, disease prevention, medical treatment and rehabilitation, which are of good quality with a wide coverage and equity, and will propose the legislation of a national health law."

The three coordinated forces according to the "triangle that moves a mountain" strategy are the principal guidance for bringing about a paradigm shift that will lead to partnerships for designing an organization and creating linkages among organizations and networks under the health system. This is to respond to people's needs in a globalized social and economic system and to the rapid evolution of health-related science and technology (Wiput Phoolcharoen, 2001).

1.3 Progress and Chronology of the National Health System Reform Process 2000

- Jan 2000 — The Health Systems Research Institution (HSRI) established the National Health System Reform Office (HSRO) as a temporary office.
- Jan-July 2000 — The body of knowledge was synthesized about subsystems under the health system, based on the knowledge that had been continuously created for nearly 10 years, with HSRI as the lead agency.
- Mar 2000 — The Senate Commission on Public Health proposed a report entitled **"Report on National Health Reform: Recommendations according to the 1997 Constitution of the Kingdom of Thailand"**, based on the knowledge accumulated by HSRI.
- July 2000 — **Issuance of the Regulation of the Prime Minister's Office on National Health System Reform; establishment of the National Health System Reform Commission (HSRC)** and HSRO to get the reform functions completed within three years.
- Aug 2000 — HSRI organized a conference on **"Civil Society's Wisdom for Thai People's Health"** with 12 networks and 1,500 participants making recommendations and perspectives for health system reform in various aspects.
- Nov-Dec 2000 — Development of a conceptual framework on national health system reform for use in publicizing with all sectors in society.

2001

- Jan-Aug 2001 — Holding more than 100 public forums nationwide by people's networks to seek opinions on the conceptual framework of the national health system.
- 1-5 Sept 2001 — Holding a **"Health Market"** forum for exchanging experiences in health promotion with about 150,000 participants. A national health assembly was also held for 1,599 partnerships with 5,000 people to discuss and seek comments on the conceptual framework of national health system.
- Oct-Dec 2001 — Synthesis of recommendations and drafting of essential points for inclusion in the National Health Bill.

2002

* Feb-Apr 2002 — Holding approximately 500 public forums by people's networks at the district and

provincial levels with approx. 40,000 participants to solicit comments on the draft essential points.

- Apr-May 2002 Synthesis and review of the essential points and **preparation of the National Health Bill.**
- June-July 2002 Presentation of the National Health Bill at provincial health assemblies in all provinces and in specific-issue health assemblies for review and comments; more than 100,000 people participated in the assemblies.
- 8-9 Aug 2002 Seeking comments on the National Health Bill at a national health assembly with approx. 4,000 participants from more than 3,000 partnerships or alliances of all sectors in society. **The Prime Minister also participated, gave a special address and agreed to take the lead in legislating the law.**
- Sept-Oct 2002 Revision of the National Health Bill; its final draft was accepted by the HSRC and then submitted to the Cabinet for further action.
- 1-7 Nov 2002 A campaign on **"Joining Hands for Promoting Health Following the Royal Footsteps"** was organized by all sectors of civil society, including five lines of running and cycling rallies during the same period of time across the country. **There was a collection of 4,717,119 names of Thai citizens who supported the legislation of the National Health Act. The names were handed over to the President of Parliament to show the intention of the people.**
- Dec 2002 The National Health Bill was accepted for consideration by the Cabinet Meetings Screening Committee.

2003

- Jan 2003 The Cabinet Meetings Screening Committee, chaired by Mr. Chaturon Chaisaeng, endorsed the National Health Bill and forwarded it to another screening committee chaired by Mr. Visanu Kruangarm for reconsideration according to the cabinet's resolution of 21 January 2003.
- Feb-July 2003 Area health assemblies/forums were held in four regions of the country to seek ways to test and develop mechanisms prescribed in the National Health Bill.
- June 2003 The Cabinet approved an extension of the timeframe of the HSRC and HSRO for not exceeding two years (not beyond 8 August 2005) to oversee the legislation of the national health law.
- Aug 2003 The national health assembly 2003 was held to review six issues of public policies and organize activities/forums for exchanging learning experiences in various dimensions of health promotion. There were approx. 3,000 participants at the assembly.

2004

- Jan-Feb 2004 The civil society networks that helped draft the National Health Bill joined hands in establishing a **"Network for Promotion of People's Law Proposition Process (PLP)."** The network's purpose was to study ways for the civic sector to propose a law according to the 1997 Constitution as they had deemed that the National Health Bill had been with the Cabinet **for quite a long time and there was no sign as to when it would be endorsed by the Cabinet.**
- Feb-Mar 2004 The PLP gathered names of people who supported the National Health Bill (target, 150,000 names) coordinated by the Community Organizations Development Institute.
- 27 May 2004 The PLP handed over a list of 120,000 names of people who supported the National Health Bill to the President of Parliament.
- Feb-Aug 2004 Area health assemblies and specific-issue health assemblies/forums were held (173 forums for a total of approx. 32,600 participants) to review six public policy issues.
- July 2004 The Cabinet Meetings Screening Committee, chaired by Mr. Visanu Kruangarm, endorsed the National Health Bill that had been **on hold at the cabinet level for about one and a half years.**
- Aug 2004 The Cabinet approved the National Health Bill in principle and forwarded it to the Council of State for urgent review/revision by its special committee and further submission to Parliament.
- Sept 2004 A national health assembly 2004 was held on agriculture and food for health for approx. 3,500 participants from all sectors to review 10 sub-issues.

2005

- Mar-June 2005 Sixty-four forums or sessions of area health assemblies and specific-issue health assemblies with approx. 8,000 participants were held to review eight groups of public policies.
- Apr 2005 The National Health Bill proposed by the people (95,410 names of people passing the qualification examination process) was included in the agenda of the meeting of the House of Representatives.
- 7-8 July 2005 A national health assembly 2005 was held for approx. 3,800 participants to review the major issue of well-being and another 12 sub-issues.
- July 2005 The National Health Bill that was endorsed by the Cabinet was revised/endorsed by the special committee of the Council of State; later it was endorsed by the HSRC and MoPH.
- 23 Aug 2005 The Cabinet approved the National Health Bill that had been revised by the Council

of State and sent it to the House Coordination Commission for review and submission to the House of Representatives.

- 30 Nov. 2005 The Prime Minister signed a letter transmitting the National Health Bill to the Speaker of the House of Representatives for urgent deliberation.
- 14 Dec. 2005 The House of Representatives deliberated the National Health Bill in its first reading and unanimously accepted it (277 votes accepting and 3 abstaining) and resolved to use Cabinet-endorsed version for further deliberation/revision by a 47-member special commission.

2006

- Feb 2006 The dissolution of Parliament resulted in five versions of the National Health Bill (submitted by the Cabinet, civic sector, and political parties) having to await the deliberation of the following House of Representatives.
- 19 Sept 2006 There was a coup d'etat (democratic reform) and an abrogation of the 1997 Constitution of Thailand, resulting in the dropping of the National Health Bill.
- 3 Nov 2006 The new government of Prime Minister Gerneral Surayud Chulanond presented in its policy statement to the National Legislative Assembly, item 3.4, that there would be a national health system reform.
- 7 Nov 2006 The Cabinet approved the National Health Bill again and forwarded it to the National Legislative Assembly for deliberation.
- 22 Nov 2006 The National Legislative Assembly accepted the Bill in principle in its first reading (118 votes for, 5 against and 1 abstaining) and set up a 33-member special commission to review/revise the Bill.

2007

- 4 Jan 2007 The National Health Bill was deliberated by the National Legislative Assembly in its second and passed into law in its third reading by a voting of 154 in favour, 9 against and 2 abstentions.
- 19 Mar 2007 The National Health Act was published in the Government Gazette, Vol. 124, Part 16 Gor, and effective on 20 March 2007.

1.4 National Health Act: A Tool for Health System Reform

The National Health Act is expected to be the principal law for health and while it was being drafted, it was expected to be a tool for all sectors of Thai people to take part in the process for exchanging experiences and learning from each other to transform disease-oriented thinking into well-being-oriented thinking.

The Act was designed and prepared by the extensive participatory process; its essentials or highlights are as follows:

(1) The meaning of "health" is expanded to go beyond medical and health issue to mean a human condition that is perfect in physical, mental, social and intellectual aspects, linked to each other in a well-balanced manner, leading to the opening of opportunity for all sectors in society to jointly work for building health and resolving health problems as well as health risk factors in an efficient manner in all localities.

(2) Description of important rights and duties on health that have never been prescribed in any other laws, such as the right to live in a healthy environment, right to receive health information sufficient for making a decision to accept or refuse any health service, and the right to refuse medical intervention intended merely for delaying death of the terminally ill patient.

(3) Establishment of the National Health Commission (NHC) comprising the Prime Minister as chairperson and representatives from the public sector, academics, health professionals and the civic sector, and charged with making policy recommendations to the Cabinet on health policies and strategies. The NHC is a national mechanism that will promote the participation of all sectors in society to move forward the national health system through the participatory process of healthy public policy formulation and to push for the implementation of such policies in a concrete manner.

(4) Organization of national health assemblies (forums) and support for holding of area health assemblies and specific-issue health assemblies on a continual basis as a process for all sectors in society to participate in the healthy public policy formulation and the exchange of experiences in health interventions that will lead to the implementation of various health approaches, rather than just waiting for health services or assistance from the state or health professions.

(5) A requirement for the NHC to prepare a **statute or constitution on national health system,** which will be submitted to the Cabinet for approval and to the House of Representatives and the Senate for acknowledgement. Then the statute will be published in the Government Gazette for use as a framework and guidance in formulating policies, strategies and operational guidelines of health programmes of all sectors in society. The statute preparation process will involve all sectors in society as widely as possible and its review is to be done at least once every five years in accordance with the changing context of society.

In accordance with the aforementioned essential matters, the benefits that the people and society will receive once the National Health Act comes into force are as follows:

(1) There will be a national mechanism with participation from the political and government sector, the academic and professional sector, and the civic sector that will jointly oversee the direction of healthy public policies, supporting health programme operations of the government, MoPH and other health agencies in all sectors.

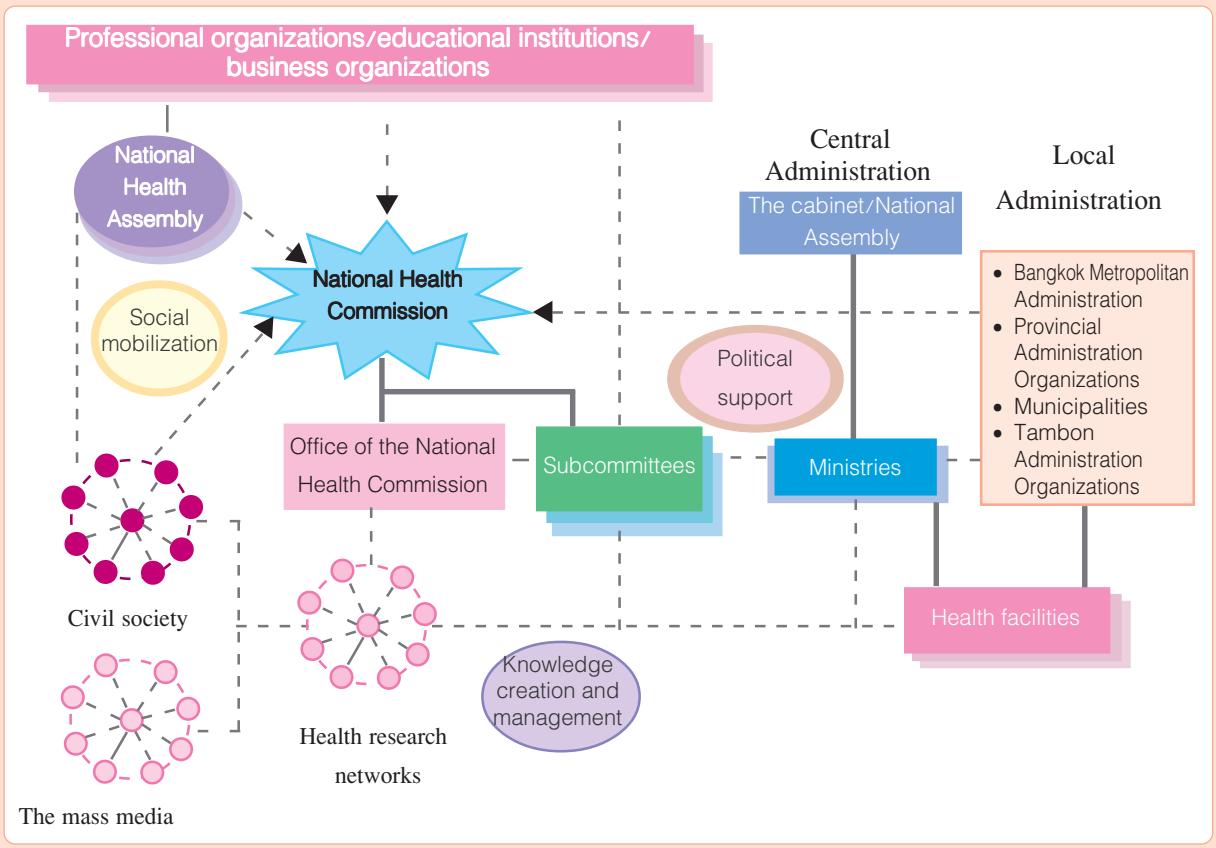
(2) There will be a mechanism and process of health assemblies or forums as one of the public participation mechanisms according to Sector 76 of the 1997 Constitution for all sectors in society to take part in the formulation and implementation of healthy public policies.

(3) There will be a statute of national health system for use as a framework and guide for formulating health policies, strategies and operational guidelines of the country that all state agencies, local administration organizations, and other relevant agencies will jointly use in their health programmes.

(4) The improvements and revision of various sub-systems in the national health system will be undertaken appropriately and in accordance with the desirable national health system under the oversight mechanism of the National Health Commission.

(5) In the long run, there will be a reduction in morbidity, disability and mortality of Thai people, as well as a reduction or slight increase in health expenditure, which will lessen the state's burden related to health spending according to the universal health care policy and also reduce people's overall health spending.

Figure 9.2 Relationship of various mechanisms under the new health system



Source: Suwit Wibulpolprasert, 2005.

Furthermore, there have been misunderstandings about the National Health Act, the National Health Security Act, and the Public Health Act, the table below provides brief comparative descriptions of the three Acts as follows:

National Health Act	National Health Security Act	Public Health Act
1. The drafting process: by 3 parties (political and state officials; academics and professional groups; and civic sector); began in 2000 emphasizing public participation; enacted as law in 2007.	- By the government according to its policy: began in 2001; enacted as law in 2002; people also participated by submitting 50,000 names in proposing people's version of the law.	- By the public sector; became a law in 1992 (some parts being amended).
2. Coverage: total health systems, beyond medical and public health systems.	- Health service system.	- Public health activities.
3. Purpose: For use as a tool for all sectors in society to jointly work on health matters: - the process is supported by public sector; - the output will be used to support the operations of all sectors; - de-emphasizing the use of state power; - developing the health system with a dynamic process (through the statute of national health system and participatory process in formulating healthy public policies.	- A tool for state affairs administration. - Setting up rules and mechanisms for public sector financing of universal coverage of health care.	- A tool for state affairs administration. - Setting up rules and mechanisms for management in public sector.
4. Process of policy development: participatory healthy public policy process, a tool for participation in health of all sectors in society.	- Use of health financing reform system as a tool for health service system reform to ensure universal coverage of essential health services.	- Use of state power to deal with public health activities such as cleanliness, markets, animal raising, and any operations with potential health hazards.
5. The Commission: Prime Minister as chairperson and representatives of public, civic, and professional groups as members.	- Public Health Minister as chairperson and representatives of other relevant agencies as members.	- Permanent Secretary for Public Health as chairperson, director-generals as members, and DG of Health Department as secretary ; no representatives from other partners.

2 Decentralization in the Health Sector

2.1 Achievements of Decentralization in Health

According to the Plans and Process for Decentralization to Local Government Organizations Act of B.E. 2542 (1999) enacted in accordance with the 1997 Constitution of the Kingdom of Thailand, all ministries including the MoPH are required to develop a detailed plan of action to decentralize their missions, resources and personnel to local government organizations (LGO) which include Tambon or subdistrict administrative organizations (TAO or SAO), municipalities, and/or provincial administrative organizations (PAO) within 10 years (by 2010).

The Decentralization Act also sets a target on increasing the proportion of central budget to be allocated to LGOs from 9% of total state revenue in 1999 to 20% in 2001 and 35% in 2006. With the additional revenue, LGOs will have to play an important role in making preparation for social services in several forms in line with local administration laws. Their major responsibilities include:

1) Building of essential infrastructure
2) Improvement of people's quality of life, i.e. **health** and education services
3) Management of communities and society
4) Planning and investment at local level and promotion of tourism
5) Management of natural resources and the environment
6) Management of Thai culture and wisdom

The Act has led to the development of the **2000 planning on decentralization to LGOs and the Plan of Action for Decentralization** to LGOs of B.E. 2545 (2002), published in the Government Gazette on 13 March 2002.

Regarding the devolution of health activities, the MoPH has undertaken the following:

1) Setting up an Area Health Board (AHB) to take responsibility for the transfer of health facilities to LGOs, aimed at transferring a group or network of health facilities and the universal coverage of health care services to AHB by the end of 2003.

In 2002, an AHB was set up in each of 52 provinces (focussing on 10 provinces) by the MoPH to act as an advisory board; but the operation was put on hold as more efforts had to be made in implementing urgent policies on health system reform according to the universal health care policy and the public sector reform according to the Reorganization of Ministries, Sub-Ministries and Departments Act of B.E. 2545 (2002).

2) Transferring health missions to LGOs. The plan was to transfer 41 health missions to LGOs, of which 16 have been undertaken as shown in Table 9.1, including:

(1) Programmes on infrastructure: 7 missions related to water resources and rural water supply systems.

(2) Programmes on quality of life promotion: 5 missions on health promotion, 1 on environmental health, 1 on subsidy for health behaviour development, 1 on mental health promotion and mental problem prevention in specific target groups, and 1 on laboratory analysis services.

Table 9.1 Transfer of health missions to local government organizations by programme

Major mission	Mission	Agency	No. of missions			
			Total	Transferred	Remaining	Remarks
Infrastructure	**Public utilities**					
	- Water resources/rural water supply system	DOH	7	7	-	To Ministry of National Resources and TAOs
Promotion of quality of life	- Health promotion	DOH	12	5	7	
	- Environmental health	DOH	4	1	3	
	- Water supply	DOH	1	-	1	
	- Food sanitation	DOH	1	-	1	
	- Occupational health	DOH	1	-	1	
	- Health facilities: building/repair	OPS	1	-	1	
	- Universal health care	OPS	1	-	-	Not to LGOs, but to NHSO
	- Subsidies for health promotion development	OPS	1	1	-	To DLA/ TAOs
	- Mental health promotion and problem prevention in specific target groups	DMH	1	-	-	
	- Development of personnel and communities for communicable disease surveillance, prevention and control	DDC	1	-	1	In the eligibility package

Major mission	Mission	Agency	No. of missions			Remarks
			Total	Transferred	Remaining	
	- Communicable disease surveillance, prevention and control	DDC	1	-	1	In the eligibility package
	- Primary medical diagnosis and treatment	DDC	1	-	1	Ongoing
	- Food subsidies for leprosy patients	DDC	1	-	1	Ongoing
	- Welfare subsidies for leprosy patients		1	-	1	Ongoing
	- Production of public information materials on food and drugs	FDA	1	-	1	Ongoing
	- Capacity building for consumers and legal rights claims	FDA	1	-	1	Ongoing
	- Creation and expansion of networks for local health consumer protection	FDA	1	-	1	Ongoing
	- Inspection and follow-up for consumer protection purposes of health products at points of sale	FDA	1	-	1	Ongoing
	- Health services in Bangkok, its vicinity and urban areas	DMS	1	-	1	Upgrading as tertiary care underway
	- Laboratory analysis services	DMSc	1	1	-	
			41	7	27	

Source: Decentralization Support and Development Group, Bureau of Policy and Strategy, MoPH.

Note: DDC = Dpt of Disease Control; DLA = Dpt of Local Administration; DMH = Dpt of Mental Health; DMS = Dpt of Medical Services; DMSc = Dpt of Medical Sciences; DOH = Dpt of Health; FDA = Food and Drug Administration; OPS = Office of the Permanent Secretary, MoPH.

In summary, the decentralization of health missions has progressed to a certain extent but not as intended in the 2002 action plan. Thus, the MoPH has to revise its direction and operational plan in the near future.

2.2 Future Plan on Decentralization in Health

1) Principles of Decentralization in Health

The principles of decentralization as prescribed in the 1997 Constitution, the 1999 Decentralization Act, and the 2000 Plan of Action for Decentralization to Local Government Organizations are as follows:

1.1) **Emphasis on people's maximum benefits.** LGOs are expected to have capacity in **making decisions on long-term actions**, resolving health problems, and implementing decentralized programmes so that the local health service system will be established and maintained in an **equitable and efficient manner with good quality**.

1.2) **Emphasis on flexibility and dynamism.** Actions related to decentralization are to be flexible according to capacity feasibility and changing circumstances, as well as lessons learned, leading to a **continuous** decentralization process and **sustainable** health development.

1.3) **Emphasis on participatory action system.** It is essential to create a strong participatory mechanism/process involving central/provincial/local officials and local residents in making a joint decision, through the process of consultation, or **based on good intention, love, goodwill, and forbearance, avoiding egotism** and self-assertiveness. This is to make the transfer of actions move forward smoothly and in line with the **specific features of the health care system**.

It is noteworthy that to make LGOs have a 35% share of state revenue is not the major goal of the decentralization for health.

2) Scopes of Missions to Be Transferred

The missions to be transferred to LGOs may be divided into two categories:

2.1) **Characteristics of mission, i.e.** missions on medical treatment, health promotion, disease prevention and rehabilitation.

2.2) **Breadth and coverage of missions;** some services might be specific to certain individuals or families or can be implemental in the community; certain LGOs can rapidly take over all missions relating to disease prevention (with environmental condition improvement) and health promotion.

3) Features of Decentralization in Health

There could be four features of decentralization (which are integrable) as follows:

3.1) **LGOs as service purchaser:** LGOs are the owners of the budget (from their own revenues or state budget transferred under the universal health care scheme) and the health care

purchasers from public and private health facilities within and outside their jurisdiction.

In this regard, LGOs' capacity will have to be enhanced so that they will be able to effectively handle the financing and health care quality systems.

3.2) **LGOs' operations in collaboration with central/provincial administration agencies.** In this case, a LGO may collaborate with the universal health care scheme in investing in health promotion activities or with several health centres or hospitals in developing a health service system structure.

3.3) **LGOs' partial operations.** Some LGOs may take responsibility for programmes on community environmental condition development and health promotion.

3.4) **LGOs' full operations.** Some LGOs may own health facilities and operate all health programmes in their jurisdiction.

Which feature, programme or when any LGO will undertake the decentralized health system is to be in accordance with the principles mentioned in 1).

4) Models for Mission Transfer to LGOs

There could be several models of transfer which may be adjusted according to the readiness of parties concerned, locality's suitability and circumstances as follows:

4.1) **Segregative transfer.** Certain health facilities may be transferred to different levels of LGOs, such as a health centre to a TAO, a hospital to a municipality or PAO.

4.2) **Service network transfer.** An entire network of health centres and hospitals in a certain locality may be transferred to a LGO or area health board (AHB) with operational involvement of the LGO.

4.3) **Transfer to an autonomous public organization (APO).** An APO may be specifically established to manage health services in collaboration with a LGO in each locality; any health facility or network of health services may be set up as an APO; or an AHB may be set up as an APO.

4.4) **Transfer to a service delivery unit (SDU).** Each hospital may be set up as a SDU under the supervision of a Health Facility Authority (or Hospital Authority), which is a public organization under the supervision of the MoPH, with LGO's involvement in the system management.

The operations of Model No. 4.3) and 4.4) may not be considered as direct mission transfer as the LGO that is involved in the management does not own the system.

5) Mechanism and Process for Supporting Decentralization

In order that the decentralization is undertaken in accordance with the principles, scopes, features and models mentioned above, the mechanism and process for supporting decentralization in health are set up as follows:

5.1) **Mechanism and process for decision-making.** A mechanism and process must be set up and developed with the involvement of **all sectors** at different levels to review and make decisions on the direction, model, process and steps of the transfer in **each locality** and at each level. Then there will be various models, directions and steps for mission transfer, **which will not be similar in all localities**, namely:

At the national level: there will be an ad hoc subcommittee on health decentralization under the committee on health decentralization.

At the provincial level: the AHB, chaired by the provincial governor and/or the chief executive of the PAO with all LGOs representatives as members, can be in charge of this function.

At the district level: the district health board (DHB), chaired by the district chief officer and/or municipal mayor, can take this role.

At the Tambon (subdistrict) level: the Tambon health board (THB), chaired by Tambon chief (Kamnan) and/or the chief executive of the subdistrict administrative organization, can take this role.

5.2) **Mechanism and process for supporting the transfer operations.** The mechanism and process mentioned in section 5.1 have to be developed and supported, especially with regard to the capacity building for all LGOs as follows:

5.2.1) **General support:** The support required for all features and models of transfer includes: the process for development of LGO's capacity in implementing the health system, the development of health information system, the development of a system for networking of all health facilities, the development of budgeting system coordination (particularly under the universal health care system), and research studies as well as model development.

5.2.2) **Specific feature/model support:** For the transfer of specific feature/model of health system, the support may include: the enactment of a royal decree establishing a public organization, a legislation setting up an AHB as a juristic person, and the development of criteria, standards and guidelines for the transfer of health facilities at various levels to LGOs.

5.3) **Mechanism Structure**

5.3.1) **At the central level, the Health Decentralization Support and Development Group of the Bureau of Policy and Strategy, MoPH,** is the coordinating unit working under the guidance from the Committee on Decentralization to Local Government Organizations. The Group also coordinates with several ad hoc subcommittees and other technical departments. **In the future the Group will be upgraded as a Bureau, independent of the Bureau of Policy and Strategy**.

5.3.2) **At the provincial level,** the decentralization process is supported and coordinated by the provincial public health office, the district health office, and the health centre, at its own level.

6) Major Conditions of the Transfer Operations

In the operation of health decentralization, there are major conditions and rights as well as the transfer system that have to be discussed and agreed to as follows:

6.1) **Health personnel.** The decentralization and mission transfer greatly affect the livelihood and future of health personnel. Thus, the operation in this aspect has to be carried out carefully and clearly to ensure that, after the transfer, **their rights and dignity will not diminish**. The personnel will have to be **continuously developed; their transfer to another agency will have to be conveniently processed in the same manner as before**. Most importantly, the personnel at all levels have to be thoroughly informed about these matters and there must be a system/mechanism to make this operation move forward smoothly.

6.2) **Financial management system.** The sources of budget from the LGO, community, central agencies or NHSO will have to be **clear so as to ensure the system's sustainability**. However, there might be some differences in the funding sources for decentralized activities in each locality.

6.3) **Establishment of health system in emergency and crisis situations.** The mobilization of health resources from various agencies has to be properly undertaken whenever an emergency or crisis occurs such as during a major disease epidemic or disaster. **There must be a system that will ensure a rapid and efficient mobilization of resources for relief purposes**.

6.4) **Establishment of health service system.** There must be linkages among health promotion, disease prevention, curative care and rehabilitation services at the individual, family and community levels. The service systems for special localities must be set up such as those for border areas, highlands and remote areas with a small population including areas with a lot of migrant workers.

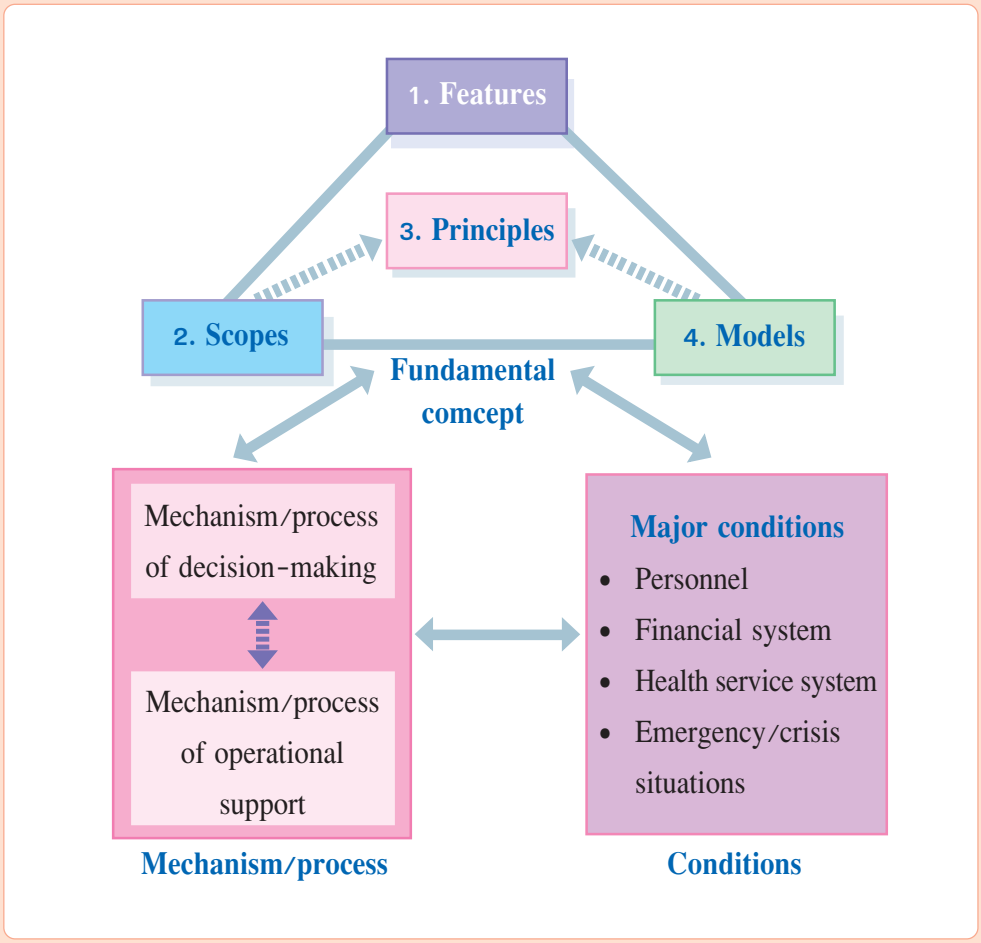
7) Progress of the Decentralization Operations

7.1) **Transfer of health centres to TAOs.** A committee as well as three subcommittees has been set up to lay down mechanisms, process, criteria and methods for readiness assessment of LGOs that will take over health centres. A transfer operations manual containing the mechanism, process and monitoring/evaluation guidelines has been prepared. It is expected that the actual transfer operation can be undertaken on a pilot scale by mid-2007, beginning with the TAOs that have received the outstanding good governance awards and participated in the health development programmes (e.g. co-financing with NHSO in community health development funds or providing scholarships for local students to study/train at health institutions and taking them back to work in their own local organizations).

7.2) **Development health facilities under their supervision as public organizations.** A committee has been set up to develop a system for establishing/operating MoPH health facilities as public organizations and service delivery units (SDU). The committee is working on the criteria and

selection of health facilities that are ready to do so; and it is expected that a royal decree on establishing certain hospitals as public organizations will be enacted in mid-2007.

Figure 9.3 Conceptual framework of health decentralization



5. The Outlook

The review of the achievements of the universal health care scheme has revealed that it is a good project and beneficial for the people, especially those in income quintiles 1 (the poorest) and 2 (the poor). The district health services system comprising the community hospital and health centres in its network has translated policies into action in a concrete manner effectively for eligible persons as it is easily accessible, near their houses, and of good quality to a certain extent. To maintain the role and expand the services at the district level to increase equality in the health system, it is necessary that the budget and human resources be adequately allocated and suitable for their operations.

In 2007, kidney replacement services (haemodialysis, perinatal dialysis and kidney transplantation) are not part of the benefit package of the universal health care scheme despite the fact that such services are available under the civil servants Medical Benefits Scheme and the Social Security Scheme. This is due to the high costs of services, approximately 200,000 to 300,000 baht per year and the government is not in a financial position to provide such services to all the patients. However, if any eligible person under the universal healthcare scheme struggles to buy such services out of pocket, his/her family will become penniless as the service fee is very high and they have to borrow some money from other people or sell their property or production factors to cover the expenses. So the government should make a decision to do something to help relieve the financial burden of the needy family. For example, the kidney replacement services may be provided to some patients with potentially high

returns, such as someone who is young and the head of household; or various financing sources should be sought for this purpose from such agencies as the state, foundations, or donations with some co-payments from the patients. Providing or not providing services to a patient has drawn some criticism about social fairness and ethics of resource allocation.

Chapter 10
Popular Health Sector and Health System Development

The popular health sector can be presented from various social perspectives; anthropologically, it is a large health care system with several levels from the individual to family, group and social network, including the knowledge, beliefs and activities related to health. And largely it has a cultural element; thus, it exists in various forms depending on local ecology and has been an integral part of people's livelihood that is always dynamic.

In connection with the health system, the popular health sector is associated with the professional sector and folk or indigenous sector at the individual and structural level. In the beginning phase of the implementation of the primary health care strategy, in the late 20th century, the government gave a high priority to the popular health sector, supporting the people to be actively involved in the health system essentially having village health volunteers (VHVs) in all villages across the country play a key role in community health development.

At present, there are 791,383 VHVs[1] nationwide and they have become part of the health workforce, representing the civic sector and playing a significant role in the Thai health system. The concept of voluntarism began when the primary health care strategy was initially implemented in the 20th century, with evolution according to the socio-political conditions and health situation in each period. With the rising number of VHVs and the expansion of their role, which is well-known and recognized by the state and the people, it can be said that thirty years of the Thai health development have seen health volunteers[2] or VHVs playing a significant role in such efforts and helping community health activities effectively. Such development efforts could not have been successful if only state health officials had acted without people's involvement.

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[1] Records of Health Volunteers Profile as of 30 April 2006. Primary Health Care Division, MoPH.

[2] Generally, "village health volunteers" are called "health volunteers" as they have assumed an increased role.

The Health Volunteers' Capacity and Development Strategy Assessment Project,[3] in 2006, conducted quantitative[4] and qualitative analyses of the changing role and capacity of health volunteers as well as a review of concepts and health/social situations in the areas of operations together with their networks. The project has found the development of social capital with potential for further improvement that is beneficial and valuable for the public and the Thai health system as follows:

1. The Process of Health Voluntarism and Increasing Number of Female VHVs

It was found that, overall more and more females are selected as VHVs rather than males in every region; the proportion being 2.33 females to 1 male and; among new VHVs there are more females and males. According to the VHVs profile database, there are 236,833 male VHVs (29.93%) and 551,299 female VHVs (69.66%); 3,251 (0.41%) with gender unidentified, as shown in Table 10.1 and Figure 10.1.

Table 10.1 Proportion of female VHVs to one male VHV, 1993-2006

Year	Female VHVs per 1 male VHV
1993	1.7553
1994	1.8144
1995	1.8729
1996	1.9233
1997	1.9994
1998	2.0378
1999	2.0786
2000	2.1203
2001	2.1618
2002	2.1953
2003	2.2656
2004	2.3112
2005	2.3340
2006	2.3410

Source: Saengtien Ajjimangkul et al. Report on Assessment of VHVs Capacity and Their Changing Roles. In: Health Volunteers' Capacity and Development Strategy Assessment Project, 2006.

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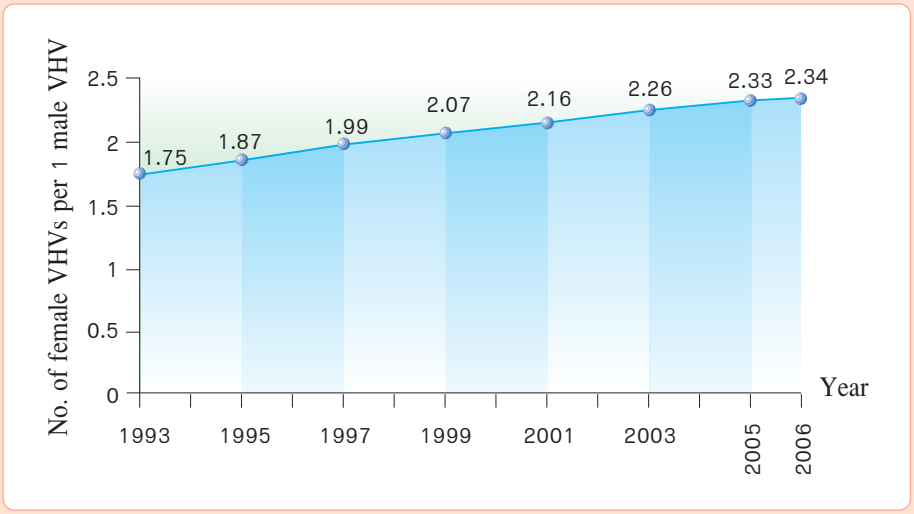
[3] Komatra Chuengsatiansup et al. (2006). Health Volunteers' Capacity and Development Strategy Assessment Project, supported by the Health Systems Research Institute and the Bureau of Policy and Strategy, MoPH.

[4] Saengtien Ajjimangkul et al. (2006). Report on Assessment of VHVs Capacity and their Changing Roles. In: Health Volunteers' Capacity and Development Strategy Assessment Project.

Figure 10.1 Proportion of female VHVs to one male VHV, 1993-2006



Source: Saengtien Ajjimangkul et al. Report on Assessment of VHVs Capacity and Their Changing Roles. In: Health Volunteers' Capacity and Development Strategy Assessment Project, 2006.

2. The Role of VHVs

An analysis of VHVs' role in the primary health care programme revealed that mostly VHVs were active in disseminating health information to villagers (96.4%), followed by health survey, health leadership, knowledge dissemination, and health service provision (91.5%, 81.3%, 78.6% and 74.5%, respectively). Their roles were less active in referring patients to the health centre, community-based disease surveillance, and people's right protection (54.6%, 48.5% and 48.5%, respectively) as detailed in Table 10.2.

Table 10.2 Percentage of VHVs under study with their roles in primary health care activities and specific actions in descending order

Role of VHVs	No action(%)	Action (%)
1. Dissemination of health information to villagers (Specific action: health examination/screening for hypertension, diabetes, breast cancer and cervical cancer; avian influenza surveillance; Aedes mosquito control; advice on health cards; mobile medical units; drug abuse; vaccination; and welfare services for the elderly and disabled.)	3.6	96.4
2. Health survey (Specific action: surveys on basic minimum needs or BMN, health situation, population, migrant (unregistered) population, poultry raising, Aedes mosquito breeding places, child population and vaccination coverage, elderly people, pregnant women, and eligible persons under social security and universal health care schemes.)	8.5	91.5
3. Health leadership (Specific action: promotion of exercise; advice on food hygiene; encouraging villagers to take part in epidemic disease surveillance; avian influenza surveillance; house-to-house survey on dengue haemorrhagic fever and leprosy; zoonotic and communicable disease surveillance; and anti-mosquito fogging campaign.)	18.7	81.3
4. Provision of knowledge to villagers (using the person-to-person method or through the media such as the village public address system or community radio.)	21.4	78.6
5. Health service provision (Examples: testing/measuring blood sugar levels, blood pressure, height and weight of children, pregnant women and the elderly; first-aid and preliminary medication services; and wound dressing.)	25.5	74.5
6. Referrals of patients to health centres (Method: using a motorcycle to take a patient to the health centre; assistance to disaster victims; taking patients to health centres or community hospital; basic medical care; and calling for an ambulance.)	45.4	54.6
7. Disease surveillance in communities (Examples: surveillance on avian influenza, dengue haemorrhagic fever and diarrhoea; inspection of grocery stores and food hygiene; cleaning of households; health care for community members; and management of solid waste and wastewater.)	51.5	48.5
8. Rights protection (Examples: setting up a checkpoint to inspect food vending vehicles for consumer protection purposes; giving advice on people's eligibility under the universal health care scheme; inspecting grocery shops including the FDA logo on food package labels; giving advice on registration of disabled persons, checking product labels, and health cards; managing food system, wastewater and solid waste.)	51.5	48.5

Source: Saengtien Ajjimangkul et al. Report on Assessment of VHVs Capacity and Their Changing Roles. In: Health Volunteers' Capacity and Development Strategy Assessment Project, 2006.

Even though VHVs play an active role in several primary health care activities, their role in other aspects of social welfare is rather limited. Only 161 VHVs (39.1%) were found to play such a role in serving as:

- Folk or indigenous healers (30 VHVs or 18.6%);
- Experts on plant growing or use of medicinal plants (61 VHVs or 37.9%);
- Experts on organic agriculture, compost, and liquid compost (29 VHVs or 18.0%);
- Hosts of radio programmes and village public address systems and public relations workers (37 VHVs or 23%);
- Resource persons or moderators on panel discussions (33 VHVs or 20.5%);
- Others such as members of local election committees and members of technology transfer committees; members of food processing groups and occupational promotion groups; village livestock volunteers; masters of ceremonies on various occasions; and leaders of exercise and recreational activities (42 VHVs or 26.1%).

3. Capacity of Provincial VHVs Clubs

According to MoPH's policy, provincial VHVs clubs were established in 1992 and it was found that, based on their 14 years of operation, a rather large number of them are managed by VHVs (29 clubs or 65.9%) and are able to effectively carry out joint activities with other networks/partners (31 clubs or 81.8%). However, during the past few years, the MoPH did not allocate any budget for supporting the VHVs clubs, so their operation is dependent on their own capability and support from provincial health officials concerned.

4. Strengths of VHVs

The survey on the VHVs' role in primary health care activities reveals a clear tendency that existing VHVs are capable of undertaking activities that can be accomplished within a short period of time such as dissemination of knowledge or information to villagers, conducting community surveys (basic minimum needs, health conditions, population, poultry, vaccination, etc.), campaigns on disease control such as seasonal occurrence of avian influenza and dengue haemorrhegic fever. The efficiency in carrying out these activities, however, is dependent on their age and occupation as more than 61.4% of VHVs have to earn a living to support their children's schooling and unemployed ones; 44.4% of VHVs are farmers and 25.4% are employees or daily wage workers. As they are family's breadwinners, their achievements in health activities cannot be highly expected; there should be no expectations to have them spend their time regularly on health as detailed in Table 10.3.

However their strengths are the process of health voluntarism with a high level of community's recognition and a broader role in health as well as the tendency to have more and more young people as volunteers.

Most VHVs (over 70%) have their own group-work process, particularly for activities related to information dissemination, surveys, health service provision and disease surveillance in the community.

- Working in collaboration with state officials: most of them (approx. 60%) participate in disease surveillance, health services and eligibility protection.
- Working by each individual: very few VHVs work on their own except for taking patients to the health centre; 51.1% did that on their motorcycles.

Table 10. 3 Percentage of VHVs under the study with a role in primary health care

VHVs' role	Working process (multiple answers)				
	By oneself	With others	With state official	With VHVs	With leaders or other groups
1. Disease surveillance in community (n = 335)	10.7	91.9	66.9	81.5	40.9
2. Surveys (n = 377)	18.8	89.7	40.1	78.2	32.4
3. Information dissemination (n = 397)	15.5	88.8	53.2	77.4	53.2
4. Health services (n = 307)	12.1	93.5	73.9	70.0	12.7
5. Leadership in health (n = 301)	26.6	79.1	40.2	59.8	35.2
6. Eligibility protection (n = 200)	20.5	83.0	61.0	58.0	25.0
7. Knowledge for villagers (n = 324)	30.9	79.0	33.6	57.1	38.0
8. Patient referrals to health centres (n=225)	51.1	55.1	15.6	39.6	16.4

Source: Saengtien Ajjimangkul et al. Report on Assessment of VHVs Capacity and Their Changing Roles. In: Health Volunteers' Capacity and Development Strategy Assessment Project, 2006.

5. Numerous Models of Health Voluntarism in Communities

The trends in the occurrence of numerous models of health voluntarism in communities take place simultaneously corresponding to political changes, resulting in a wide scale of social participation. At the same time, activities of nongovernmental organizations working for public benefits have provided a linkage for some VHVs to have different roles in society, from participatory learning as well as social movements and other forms of voluntarism within and outside the health system, such as friends help friends volunteers, To Be Number One, Jit Ahsa (voluntarism) network, doing good deeds for His Majesty the King volunteers, hospital services volunteers, orphans massage volunteers, friendship therapy volunteers, disabled persons care volunteers and elders care volunteers. Moreover, there are a lot of foreign volunteers working in Thailand, particularly after the occurrence of tsunami; their voluntary spirit has triggered awareness of other volunteers especially young people to help the victims. Then the process and networks of voluntarism have been more clearly initiated. New social situations have resulted in the creation of several forms of voluntarism; and VHVs as a community organization have played a more active role in the learning and implementing development activities.

6. The Worth of VHVs in Community Health Development

The assessment of the satisfaction of community leaders and Tambon or subdistrict administration organization (TAO) officials with the VHVs' role at present revealed that most of them (81 respondents or 86.2%) were satisfied and only a small number (13 respondents or 13.8%) were unsatisfied.

Regarding their opinions on the acceptance and performance of VHVs, the respondents indicated that the people highly accepted VHVs (95.5%), VHVs were a mechanism that had to be continued in the village (80.7%), VHVs were capable of cooperating with health officials effectively (95.5%), and VHVs were able to design a plan to seek budget from the TAO (69.3%) (Table 10.4).

Table 10. 4 Opinions about acceptance and performance of VHVs in communities (n = 88)

Role of VHVs in communities	Disagree		Agree	
	Totally disagree	Rather disagree	Rather agree	Totally agree
1. Villagers highly accept VHVs	1.1	3.4	43.2	52.3
2. Villagers receive a lot of information on health care from VHVs	1.1	9.1	52.3	37.5
3. VHVs are able to effectively coordinate with health officials	0	4.5	37.5	58.0
4. VHVs are able to effectively develop a plan to seek budget from TAO	5.7	25.0	45.4	23.9
5. At present, health officials can provide health services and resolve community health problems on a wide scale; so there is no need to have VHVs in the village	62.5	18.2	10.2	9.1

Source: Saengtien Ajjimangkul et al. Report on Assessment of VHVs Capacity and Their Changing Roles. In: Health Volunteers' Capacity and Development Strategy Assessment Project, 2006.

The respondents opined that VHVs had a rather extensive role in social and health development, mostly in disease surveillance (88.8%), followed by village surveys (74.5%), eligibility protection (56.7%), and health leadership (54.4%).

7. Constraints in VHVs' Operations

Among the VHVs under the study, their major problems and obstacles in performing their duties include: villagers not recognizing the importance of their role (27.4%), working with more difficulties due to lack of community's cooperation (26.8%), lack of incentives for VHVs (25.5%), and most VHVs lacking the skills for their operation (21.4%).

However, VHVs' minor problems are: lack of knowledge in implementing health activities (56.0%), having inadequate time for community (46.0%), and VHVs not recognizing the value of their role (33.6%).

VHVs' obstacles in community health actions include: non-recognition by other agencies (55.8%), inadequate budget and spending difficulties (43.1%), community not participating in the activity (37.3%), and no TAO's policy on VHV development (15.0%).

8. Conclusion

In general the role of health volunteers or VHVs is quite related to the policy context of the government. New policies initiated/launched during the past decade, such as health decentralization and universal healthcare, have resulted in the restructuring and revision of roles in the health system, which affect the VHVs' missions in the development of popular health sector.

The findings of the VHVs' capacity and development strategy assessment project, which can be used for an analysis of the strategy for supporting VHVs in accordance with the rapidly changing social and health situations, can be summarized in seven major points as follows:

1) As the concept and models of actions related to health volunteers are a product of historical developments, with changes in political and health situations during the past two decades, it is necessary to revise such a concept and models according to such changes.

2) There are now approximately 800,000 VHVs, who are extremely valuable assets; and most of them, either selected or volunteering, are the people who have the intention to devote themselves to work for a better health status of their communities.

3) Among the existing VHVs, as many as 70% of them are females and 35% of them are of the new generation having been volunteers for less than five years.

4) Most of existing VHVs are capable of accomplishing short-term tasks, such as community surveys and disease prevention campaigns, since they have got a lot of work to do but with constraints in performing long-term tasks such as chronic patient care.

5) Most of existing VHV's do not have so high educational and economic background; how can a larger number of people with better quality and economic status be drawn into the health voluntarism process?

6) That the support system has changed according to the decentralization policy has affected the relationship between VHVs, local authorities and the MoPH, despite the establishment of a coordinating mechanism at all levels, very little are the VHVs involved in the coordinating mechanism higher than the provincial level.

Another observation is that, when the support for VHVs comes from various sources, they have to work in response to the intention or agenda of supporting agencies which normally have different expectations or goals of themselves. Then VHVs have to adjust themselves according to such expectations. So the challenge is that if the VHVs cannot integrate all the tasks required by different agencies (with different agendas) into the local agenda, the development efforts will lack the integration, resulting in VHVs not belonging to the community. This is because outside agencies have more influence on the work direction and, thus, there has been a call for VHVs to belong to the community, which is consistent with the direction of decentralization and health civil society promotion. The aim is to have VHVs become a local organization working on strengthening the popular health sector in the future.

Chapter 11
Surveillance System for Disease Control and Public Health Emergencies

1. Public Health Emergency

Talking about a "medical emergency", everyone will think of a patient in a critical condition, on the borderline between life and death, relying on the rapidity and preparedness of the medical team to diagnose and treat correctly. For instance, a patient with an acute heart attack in a shock condition or a respiratory failure may die within a matter of minutes or hours if he/she does not receive a proper medical attention.

A "public health emergency", the term that has been increasingly talked about lately, has a slightly different meaning in that, rather than happening with an individual patient, it occur in a community with a large number of residents being threatened rapidly with a disease or disaster. If the health team lacks the preparedness and rapid response capacity to appropriately diagnose and control the disease or disaster, a large number of the community members will get sick within a short period of time, say a few days, a week or a month, severely affecting the economic and social conditions. Public health emergencies may include an epidemic (such as severe acute respiratory syndrome or SARS, avian influenza), food poisoning (botulism) from canned bamboo shoots, chemical poisoning from contaminated food or water, a natural disaster, including intentional use of biological or chemical substance for human destruction. These days we have seen a rising number of new kinds of public health emergencies and the responsibility for coping with them cannot be transferred to local authorities or the private sector as the response has to be undertaken in a systematic, rapid and immediate manner within the country and in cooperation with other countries.

This report aims to illustrate the benefit of the disease/disaster surveillance system of Thailand, which has been trying to improve itself to help the national health system to better respond to public health emergencies.

2. International Health Regulations 2005 and Response to Public Health Emergencies

In 1969, WHO Member States adopted the first International Health Regulations which required all countries having cholera, plague or yellow fever to report to WHO whether there were any patients with any of such diseases; if so, how many cases, in which city. That was because these diseases can spread from one community to another, from one country to several other countries, across the continent or the world. At that time, emphasis was placed on measures related to seaport and airport checkpoints as they were believed to be the entry and exit point of communicable diseases.

Later it was found that the International Health Regulations 1969 did not receive adequate attention and practice due to the fact that if any country reported on any of the diseases to WHO or the international community, there would be a negative impact on exports, tourism and image of that country. So a lot of countries did not cooperate in following the regulations.

In the late 1990s, WHO tried to review the International Health Regulations and there was an outbreak of SARS because the People's Democratic Republic of China, the source of the outbreak, did not report on the cases of pneumonia of unknown cause, which had a high case-fatality rate. The disease spread continuously to 32 other countries, causing a vast negative health, social, economic, travel and political impact. As a result, all WHO Member States recognized the importance of cooperation in conducting a surveillance system of a disease or event that may constitute a "public health emergency of international concern", which is the essential part of the revised International Health Regulations, endorsed in 2005 and entering into force in mid-2007 for all Member States to implement.

A "public health emergency of international concern" means an extraordinary event which may be a communicable disease, a chemical contamination, a natural disaster that may potentially cause a disease outbreak or illness among the populations of other countries, and that requires international cooperation in coping with such an event. If such an event occurs, the member state has to report to WHO urgently. In case there is no report from the originating state, WHO, based on the information received from other sources, will implement direct or indirect measures to obtain the facts about that particular event. The criteria for determining whether any event should be regarded as a public health emergency of international concern include: its severity higher than normal situation or expected level, its impact on international travel or trade, etc.

Besides, the World Health Assembly has urged Member States to build, strengthen and maintain the capacities required for the surveillance and control of public health emergencies. So the MoPH should carry out and examine its national capacities and preparedness for such purposes.

3. Communicable Disease Surveillance System and Development in Thailand

The MoPH's disease surveillance system has continuously evolved, beginning with the

notification of diseases of public health importance in the early stage, i.e. malaria and yaws, implemented as vertical programmes with their own personnel for case detection, collecting data on patients from the provinces for use in monitoring the trends in morbidity, mortality and spread of disease, and implementing control measures in a complete-cycle manner. Later, there were other disease prevention and control efforts for the entire country such as the cholera epidemic control, the smallpox eradication project, and the childhood immunization programme against poliomyelitis, diphtheria, pertussis and tetanus. Thus, there was a need to set up a national unit for disease surveillance and investigation, using the integrated disease notification principle.

According to the reorganization of the MoPH in 1972, a Division of Epidemiology was established under the Office of the Permanent Secretary for Public Health. The Division had its own epidemiology officials assigned to collect data on illnesses, deaths and other epidemiological information on diseases of public health importance and then prepare a patient and disease notification card (Ror Ngor 506) for use at the provincial level for reporting to the central administration.

Initially, the provincial epidemiological workers received salaries directly from the Epidemiology Division. Later on, since the disease surveillance/epidemiology was integrated into the provincial health programme, the Epidemiology Unit has become part of the Planning and Evaluation Section of the Provincial Public Health Office (PPHO), each province has one or two staff members. For regional, general and community hospitals, each has to assign one of its workers to serve as disease reporting workers. Each year training courses were organized to train new workers to take on this assignment. In the disease notification system when the reports are sent to the PPHO, the epidemiology worker will analyze the data and prepare a weekly disease surveillance report for submission to the Provincial Chief Medical Officer. If an unusual event is noticed, the epidemiology worker as well as a disease control worker (of the Disease Control Section) will go out to conduct the disease investigation and take appropriate action for controlling the event.

Even though the disease surveillance system has been continuously implemented and revised, there are still some problems as follows:

1. The negligence of the original intent of surveillance. The number of notifiable diseases has been steadily increased from only 20 diseases initially to more than 70 at present, only to know how many people were sick with such diseases, which is the concept of data collection for statistical presentation purposes. But for disease surveillance, actually its concept is to conduct surveillance on priority diseases only, such as those with potential to cause an outbreak in a short period of time. So the disease surveillance system places emphasis on the rapidity in getting the information; thus a disease investigation team is sent out to the community in which the patient live to find out the facts so that suitable actions can be undertaken to control the disease or immediately eliminate the risk factors.

2. A misconception that the outbreak occurrence is a mistake. A lot of health administrators

think that if the number of reported cases of a priority disease is high, they will be regarded as being inefficient in their disease control programme. So there are delays in reporting cases; only those with laboratory confirmations are reported. Sometime, they do not report at all; some report under another disease such as reporting cholera as acute diarrhea.

3. Unity of disease surveillance and disease control. In the past, the programmes on epidemiology and disease control were normally not under the same department: at the central level, the Epidemiology Division was under the Office of the Permanent Secretary, not the Department of Disease Control; but at the provincial level, the Epidemiology Unit was under the Planning and Evaluation Section; then all the relevant efforts were not made by a single team. After the public sector reform in 2003, the Division of Epidemiology was upgraded as the Bureau of Epidemiology and transferred to the Department of Disease Control. At the provincial level, even through the Epidemiology Unit and the Disease Control Unit were put under the same section, the Technical Support Group, some epidemiology activities remain under the Planning and Strategy Section. This structural change placed the emphasis on surveillance for action, not only for making a budgetary request, which should be in the right direction. However, the number of full-time disease surveillance personnel is too small, on average only one or two officials in each province and there are no established positions in regional/general or community hospitals.

4. Surveillance and Rapid Response Team (SRRT)

Over the past four years, Thailand were faced with several major public health emergencies, i.e. SARS in 2002, avian influenza in 2003, tsunami in 2004, and most recently botulism food poisoning from canned bamboo shoots in 2006. These events will be elaborated in the next sections as to how the country's surveillance system responded to such public health emergencies.

In the past, when there was a major epidemic, a "war room" or "ad hoc operations centre" would be established to handle such an incident. Occurring quite frequently was the cholera epidemic, for which a team of epidemiology workers, disease control workers and sanitation workers as a "Special Response Team" had to rush out to the place of occurrence with the capacity to identify the case, source of transmission and risk factors, and to improve sanitation conditions or other factors that may cause the epidemic. Once the mission had been accomplished, the team would be dissolved.

When the SARS outbreak occurred, as proposed by the Department of Disease Control and approved by the MoPH, each province set up at least two operations teams consisting of a physician, an epidemiologist, a lab technician and a disease control officer, and tasked with identifying SARS contacts. The teams were on duty 24 hours a day; as soon as they were notified of a suspect, they were able to rush to the site immediately. When the outbreak was over, the concept of health emergency response team was adopted and a permanent team has been set up at each level.

During the avian influenza outbreak, the MoPH renamed the team as "Surveillance and Rapid Response Team or SRRT" and set the target for each and every district to have at least one team and at least one provincial SRRT in every province, including Bangkok, which has got a team located at every public health centre. At the regional level, there is a Regional SRRT and at the national level, the Central SRRT.

In order for the SRRT operations to be efficient, the MoPH has made efforts to develop four major elements as follows:

Element 1: Development of policies and strategies

- Adopt the concept of SRRT as a policy and include it in the national strategic plan on avian influenza prevention and control (2005-2007)
- Set up a committee at the ministerial level to oversee this mater and also adopt it as a key performance indicator of the Public Health Development Cluster and the Department of Disease Control.
- Adopt SRRT as a key mechanism in implementing the IHR 2005 by setting up a surveillance unit in each and every service unit.

Element 2: Development of surveillance system

- Reduce the number of notifiable disease so that only priority diseases remain on the list and their data are extremely essential for responding to the health threats.
- Develop operational standards for each disease, including the importance of the notifiable disease, definition, reporting criteria, public health measures to be taken and up-to-date knowledge.
- Use information Technology to support the rapid reporting and the reduction of workload, such as reporting via the Internet, beginning with avian influenza in the areas with frequent outbreaks.
- Promote the collaboration with agencies within and outside the ministry in sending samples/specimens for laboratory analysis so as to know about the causative agent or chemical.

Element 3: Personnel development

- Train SRRT members in all provinces and districts in 2004-2005.
- Learn from field operations, in real-life disease investigations and case studies such as the case of food poisoning from canned bamboo shoots.
- Organize a short-term training course for medical doctors/team leaders and other technical officers.

- Produce more epidemiologists in the FETP to serve as the knowledge base.

Element 4: Promote personnel and information networks in-country and abroad

- Develop information exchange networks and "Outbreaklist" for disseminating outbreak news and up-to-date news from within and outside the country for SRRT members across the country as soon as the event occurs.
- Organize annual meetings for network members within each province, each region and across the country, for presentations of SRRT operations and other technical advancements.

5. Case Studies on Surveillance of Diseases/Health-Risks in Response to Public Health Emergencies

5.1 SARS

In late 2002, the outbreak of severe acute respiratory syndrome (SARS) originated in Guangdong Province of China, with the first reported case of atypical pneumonia that did not respond to antibiotics. The disease rapidly spread to other countries. The World Health Organization received reports on SARS from 32 countries (8,436 cases, 813 deaths). Finally, it was found that the causative agent is a new strain of coronavirus (SARS-CoV). Thailand was one those countries, the first case being a WHO official coming into the country for medical treatment.

The Department of Disease Control issued the guidelines for disease surveillance on 14 March 2003, signaling agencies concerned to pay attention to atypical pneumonia through the weekly disease surveillance report. The MoPH sent out a formal directive on 19 March 2003 requiring that all agencies undertake a strict surveillance measure. On 1 April 2003, a conference was held by the MoPH to lay down measures to cope with disease outbreaks that might occur in the country. Situation reports were rent from all provinces and summarized as a ministry's report for 96 consecutive days.

The SARS coronavirus is an emerging infectious agent; and nobody knows clearly about the agent, its mode of transmission and disease progression. What was know in the beginning stage of the epidemic was that it was a virulent infectious disease with a high case-fatality ratio and health personnel were the high-risk group. And the information about the agent, disease progression and disease control guidelines implemented by various countries and organizations were changing all the time. The public and the media were very much interested in the epidemic. The public perceptions about anything related to the patients and health facilities had a social impact on both patients and hospitals as SARS had an image of a dangerous infectious disease. So all kinds of information were regarded as secret and, as a result, it was more difficult to undertake measures relating to coordination as well as patient and contact isolation. Most health personnel had no direct experience in this kind of operation; materials for prevention of catching the respiratory tract infectious agent, which were N95

masks, and other protective devices were scare because they were not prepared in advance and thus assistance had to be sought from WHO.

However, the disease surveillance system was established by:

- Preparing a manual for disease investigation (three revisions) and distributing it to all trainees, provincial public health offices, regional disease control offices (Nos. 1-12), and via the Internet at <http://epid.moph.go.th/sars/investSARS%2020_06_46.doc> and <http://www-ddc.moph.go.th/sars_center.html>
- Training approx. 250 officials from provincial public health offices and regional disease control offices.
- Accepting notifications of probable cases and undertaking disease investigation or coordinating the investigation of 313 cases in 52 provinces; resulting in a conclusion that the were 31 suspects and 9 probable cases.
- Following up on all contacts that health officials were notified of until a decision could be made as to whether they were not ill, suspects or probable cases; for the suspects and probable cases, a total of 1,016 cases were put under surveillance for 10 days after the last day of contact with the patient; they were:

  132 household contact cases (avg. 3 cases/patient)

  154 close contact cases (avg. 4 cases/patient)

  730 health personnel contact cases (avg. 18 cases/patient)
- Collecting specimens from 110 patients for lab confirmatory testing for coronavirus; it was found that 1 was SARS coronavirus and 2 were mycoplasma (the results were used in excluding 2 non-probable cases; thus, there were actually only 9 probable cases). For most cases, the interpretations of the lab tests could not be clearly made since the second specimens could not be collected as the patients were foreigners.

Lessons learned from the disease surveillance, investigation and follow-up are:

- The preparedness of hospitals and personnel with respect to the isolation of severe infected cases were not as efficient as expected because the infrastructure of the hospital was inadequate and the personnel were lacking confidence and skills in patient care, making them scared.
- There was a lack of proper preparedness plan and drills for health agencies to conduct disease surveillance, investigation and control measures in emergency situations; and there were no reserves of necessary equipment/supplies for surveillance and investigation.
- The enforcement of laws related to epidemic control was problematic in some practical aspects, such as loss of income while being isolated at home and expenditure incurred while being quarantined at the hospital.

- The fear of society of the epidemic during the critical period, viewing the patient as objectionable; even when the patient had died, the people did not allow religious/traditional funeral rites to be held as usual.

5.2 Avian Influenza

Even though the SARS epidemic has subsided for some time since July 2003, Thailand is not complacent about it. Rather, the MoPH has drawn up a SARS preparedness plan in case the epidemic re-occurs; and a system for surveillance on pneumonia patients coming in from aboard is underway.

In around November 2003, there were internal rumours about unusual deaths of farm and domestic chickens in Nakhon Sawan province. Later, there were reports on unusual deaths in other provinces in the central region. An investigation team was sent out by the Bureau of Epidemiology to Chachoengsao province; samples of the chickens with unusual deaths were collected and sent for lab testing at Mahidol University. The lab results revealed that the infection with influenza group A (not H1 or H3) viruses was found in several organs of the dead chickens. Then the MoPH instructed the Provincial Public Health Offices in the provinces with unusual deaths of chickens to undertake surveillance on illnesses and deaths due to influenza or pneumonia. Until mid-January 2004, there were two reported cases/deaths of acute pneumonia in Suphan Buri and Kanchanaburi provinces; lab tests confirmed influenza group A (H5N1) viral infection in both cases. On 23 January 2004, the MoPH made the first announcement that cases of avian influenza patients were found and all provincial public health offices were instructed to set up a team ready to conduct a disease investigation as soon as the hospital found a suspected case. The investigation team had to go out to the affected village, inspect the environmental condition, find out whether there have unusual deaths of poultry, find additional cases of suspected cases, educate the villagers about avian influenza, and monitor the illness among villagers in that village for at least 10 days.

Between early 2004 and the end of December 2006, Thailand reported 25 confirmed cases of avian influenza and 17 deaths, including:

- 2004: investigation of 2,920 suspected cases; 17 confirmed cases and 12 deaths.
- 2005: investigation of 3,244 suspected cases; 5 confirmed cases and 2 deaths.
- 2006: investigation of 5,641 suspected cases; 3 confirmed cases and all 3 deaths.

The avian influenza surveillance effort has significantly changed the approach of disease surveillance because every time when there is a case notification from the hospital, the disease investigation has to be undertaken, including specimen collection, lab testing, and visits to the community. Daily reports are to be prepared and submitted to high level administrators who will hold a press conference whenever a confirmed case is reported. This is to make the control effort transparent and thus this kind of action is regarded as a real surveillance of disease.

5.3 Natural Disasters and Tsunami

The 25 December 2004 tsunami, a natural disaster whose epicentre was at the Sumatra Island, hit six southern provinces of Thailand and caused a serious damage to the beaches and tourist attractions in Phang-nga, Phuket, Krabi and Ranong provinces and some damage in Trang and Satun provinces, with a total of 5,383 deaths and 8,457 injuries.

The problems arising after the giant waves or tsunami attack were homelessness of the affected people and the lack of food, clean water supply, clothing, etc. The government and local as well as international organizations urgently rushed in to provide temporary shelters, food, water and other necessities. In theory, whenever there are a lot of homeless people living together in a certain place, it is highly probable that there will be outbreaks of communicable diseases. When the provincial SRRT officials in the affected provinces had undertaken other duties such as directing and coordinating relief efforts, the MoPH had to send more than 100 medical emergency service teams to provide medical services to the victims, whereas, the Department of Disease Control also sent central and regional SRRTs regrouped as 12 teams to help for six weeks in the most severely affected provinces of Phang-nga and Phuket.

Each SRRT had two major missions: (1) prevention of diseases, especially vector-borne, including chemical spraying, mosquito-breeding-place destruction, distribution of insecticide-treated bednets, etc. and (2) proactive disease surveillance, investigation and control.

For the second mission, the proactive surveillance focused on disease and risks of public health importance in the affected provinces, which were 22 illnesses in 5 syndromes or groups: diarrhoeal diseases, respiratory tract, fever, cephalomeningitis, and other groups, namely, wound infection, injury and jaundice. Some other diseases of public health importance were related to the list in the following week. The sites of surveillance were 77 health centres 22 public hospitals, and 4 private hospitals 2 disaster victim temporary housing centres, and 2 disaster victim identification centres.

The teams developed forms for recording patient's information, daily disease report, and cause of illness investigation, for all the illnesses under surveillance.

The Department of Medical Sciences supported this effort by sending some medical scientists and provided equipment/supplies for collecting samples/specimens for lab testing including aerobic and anaerobic bacterial culture and virological testing.

At the temporary housing centres, there were mobile medical teams from various agencies taking turn providing services to the victims; and the SRRT members had to collect the diagnosis data by themselves and conduct an analysis to find out whether there were any unusual increases in incidence of any diseases, so that a disease investigation could be carried out immediately.

As a result of the intensive/proactive disease surveillance after the tsunami attack, several

interesting events were noticed leading to nine epidemiologic investigations, seven of which were related to diarrhoea and food poisoning. The responsible SRRT conducted the cause of illness investigation and outbreak control, including giving advice on sanitation improvement and personal hygiene to high-risk groups until there were no outbreaks on a wide-scale and no deaths. For another two events were related to malaria (only a few cases were diagnosed) and dengue haemorrhagic fever, more cases of DHF were reported but no evidence was found to link the increase with this disaster. After that the central/regional teams had transferred their functions to provincial health authorities for further action as the situation had begun to become normal and the local health officials could resume their regular duties.

5.4 Botulism Food Poisoning Associated with Canned Bamboo Shoots

On 15 March 2006, there was a merit-making ceremony in Nawaimai village of Pakhaluang subdistrict in Ban Luang district of Nan province. The villagers used bamboo shoots that were preserved in cans during the rainy season to prepare the food for lunch for merit-makers when the ceremony had ended. In the afternoon, a few villagers from that village visited Ban Luang Hospital for medical treatment, until at dusk, 10 villagers from that village visited the hospital at the same time with the symptoms of stomach upset and difficulty speaking/breathing; some of them required a respirator, luckily, the attending physician was a former trainee in the Field Epidemiology training Programme (FETP); together with other hospital staff, the physician could investigate and find out that all the villagers were from the same village and all had a history of eating canned bamboo shoots. This had led the physician to think of botulism food poisoning. And as a result, an SRRT was sent out to the village immediately to conduct a disease investigation. The team, via the public address system, requested all villagers who had eaten canned bamboo shoots to see the doctor and collected all remaining canned bamboo shoots in the affected and neighboring villages to destroy all of such bamboo shoots. In this operation, 209 cases of botulism were examined and treated, of whom 134 were hospitalized including 42 with respiratory failure in need of intensive care in an ICU and respirator. Meanwhile, as botulism antitoxin was not available in Thailand, requests were made for the antitoxin from the U.S. Centers for Disease Prevention and Control (50 doses), the United Kingdom (20 doses) and Japan (23 doses). Upon receipt, antitoxin injections were given to severe cases and got 17 cases transferred to other central and provincial hospitals for further medical care. As a result of these efforts, no deaths were reported, primarily because the finding of the outbreak and cause of outbreak investigations conducted by the SRRT, together with the capability of the medical team in case management as well as the critical care management could all be handled effectively. Thus, the loss of life could be prevented in a manner that has never been reported before in the past or in other countries.

6. Lessons Learned and Recommendations

Thailand has had medical and public health development continuously. During the last decade, several changes resulted in such development, one of which is the social tide related to decentralization to local governments and universal health care for the people. The implementation of the capitation budgeting principle has resulted in the health promotion and disease prevention programmes not having their own budget in a clear-cut manner. The MoPH has to transfer missions related to sanitation and medical services to local governments and give the private sector a greater role in the health system. But one of the missions that cannot be transferred to local or private sector agencies is the management of public health emergencies. According to the new International Health Regulations, adopted by the World Health Assembly in 2005, the definition of "a public health emergency" has been expanded to cover a communicable disease, a natural disaster, an accident and an intentional use of biological or chemical substance for harming the community. It is up to the government to build up its own capacity to cope with any of such emergencies for preventing, monitoring and inspecting them, and responding to them immediately with a technical back-up, adequate budget, and trained and highly skilled response team members.

The MoPH has used the experiences in the surveillance of communicable diseases in revising it surveillance mechanism so that it is more intensive, focussing on its application in emergency situations. This is accomplished by creating a Surveillance and Rapid Response Team (SRRT) in each and every district across the country, working without holidays on a network basis. So the MoPH was able to cope with new public health emergencies such as the SARS epidemic, the avian influenza epidemic, the prevention of communicable diseases after the tsunami attack in six southern provinces, and lastly the botulism outbreak due to eating canned bamboo shoots in Nan province.

However, this system is in its beginning stage and encountered with a number of problems. Importantly, the government has to support the MoPH, incorporating the mission relating to public health emergency response into the structure of the ministry, the provincial public health offices, regional/general hospitals, community hospitals, and district health offices, with adequate numbers of physicians and technical officers trained in epidemiology and adequate budget.

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