

3. Epidemiological Transition

3.1 Causes of Death

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 5.7). This is consistent with the results of the Burden of Diseases Study which revealed that the disease burdens in terms of disability-adjusted life years (DALYs) from non-communicable diseases were twice 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 5.5).

Nevertheless, 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.

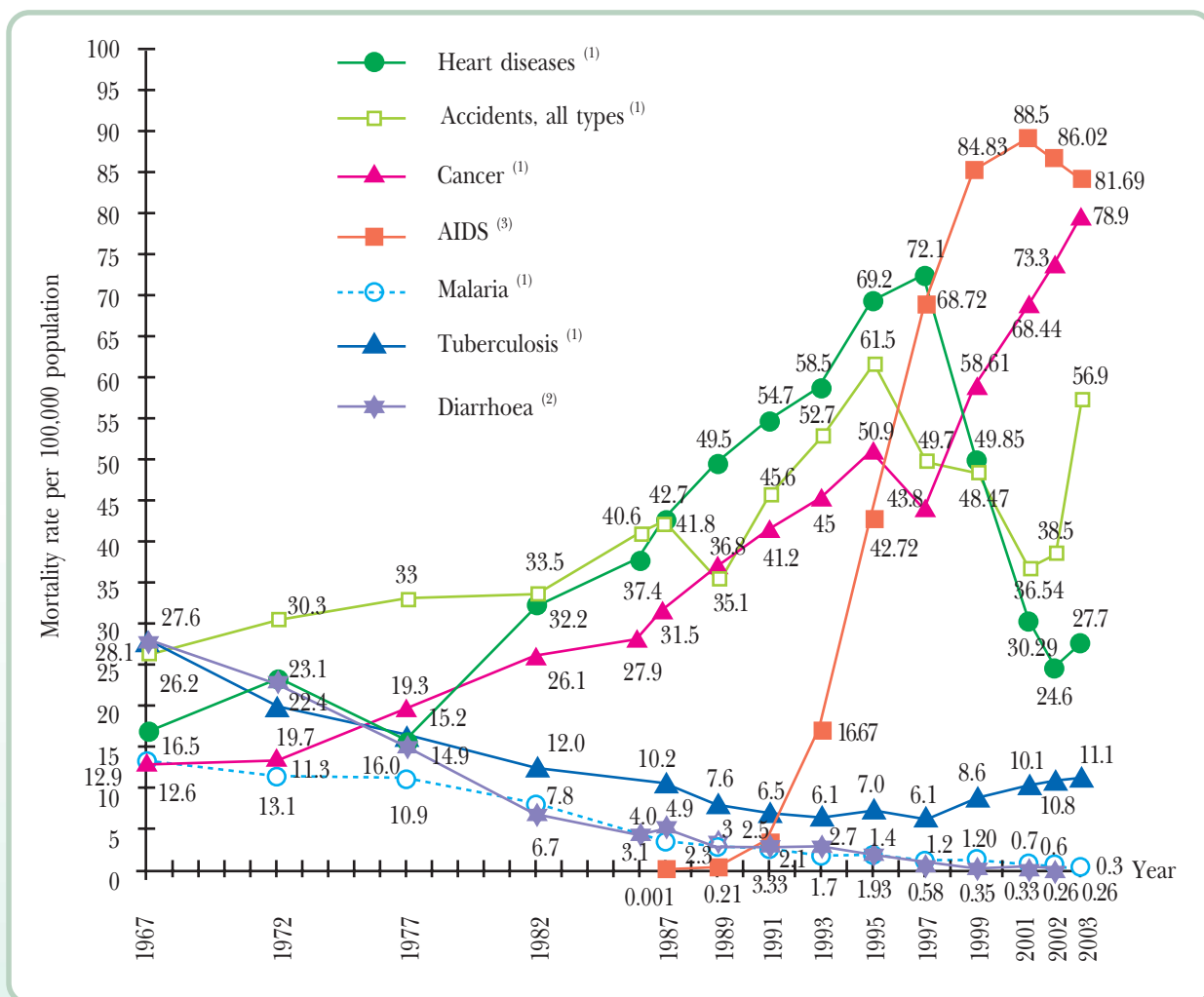
For all age groups, the study revealed that the leading cause of death was the diseases of circulatory system (18.6% of all causes), more than half of which were due to cerebrovascular diseases; the second leading cause was cancer and tumors (16.2%), nearly half of which were liver/bile-duct and lung 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 the diseases of circulatory system and 16.5% for cancer/tumors in females and 18.2% for infectious diseases and 16.6% for the diseases of 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 | Major causes of death | | Remarks |
|-------------------|---|---|-----------------------------|
| | Males | Females | |
| Under 1 year | Premature birth, low birth weight, pneumonia, systemic infection | Premature birth, low birth weight, congenital heart defect, pneumonia | Due to HIV infection, 5.7% |
| 1-4 years | Accidental drowning, pneumonia | Accidental drowning, pneumonia | Due to HIV infection, 13.3% |
| 5-14 years | Accidental drowning, road traffic accident | Accidental drowning, road traffic accident | Due to HIV infection, 7.9% |
| 15-24 years | Road traffic accident, HIV infection, suicide | HIV infection, road traffic accident, suicide | |
| 25-44 years | HIV infection, road traffic accident, suicide | HIV infection, road traffic accident, suicide | |
| 45-59 years | Liver/bile-duct cancer, cerebrovascular diseases | Liver/bile-duct cancer, cerebrovascular diseases, diabetes | |
| 60-74 years | Cerebrovascular diseases, liver/bile-duct cancer, chronic/obstructive pulmonary disease | Cerebrovascular diseases, diabetes, liver/bile-duct cancer | |
| 75 years and over | Cerebrovascular diseases, cancer, chronic/obstructive pulmonary disease, cardiac ischemia | Cerebrovascular diseases, chronic/obstructive pulmonary disease | |

Figure 5.7 Mortality Rates due to Major Causes of Death, Thailand, 1967-2003



Sources: ⁽¹⁾ Bureau of Policy and Strategy, Ministry of Public Health.

⁽²⁾ Bureau of Epidemiology, Department of Disease Control.

⁽³⁾ Working Group on Forecast of HIV-infected Cases. Forecast of HIV-infected Cases in Thailand, 2000 - 2020, 2001.

Table 5.5 Percentage of Causes of Disability-Adjusted Life Years (DALYs) Lost of Thai People by Age Group, 1999

| Age group (years) | Percentage of cause of DALY lost | | | | | Total |
|-----------------------------|----------------------------------|--------|---------|---------|-------------|-------|
| | 0 - 4 | 5 - 14 | 15 - 44 | 45 - 59 | 60 and over | |
| - Communicable diseases | 56.7 | 32.8 | 34.8 | 14.6 | 11.3 | 27.7 |
| - Non-communicable diseases | 36.6 | 39.6 | 42.7 | 74.7 | 85.2 | 58.3 |
| - Accidents | 6.7 | 27.6 | 22.5 | 10.8 | 3.5 | 14.0 |

Source: Working Group on Development of Burden of Disease Indicators. Bureau of Policy and Strategy, Ministry of Public Health.

In measuring the health status of Thai people using DALYs⁵ as the indicator, it was found that HIV/AIDS is the number one leading cause of DALYs lost in both males and females (17% for males and 10% for females), the second and third causes were road traffic injuries and cerebrovascular disease respectively among males, and cerebrovascular disease and diabetes respectively among females (Table 5.6).

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 asphyxia;
- Age group 15-29 years: major health problems are HIV/AIDS, road traffic injuries, drug abuse, schizophrenia, and alcohol use;
- 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 disease, emphysema, and diabetes.

Table 5.6 Major Diseases Attributable to Disability-Adjusted Life Years (DALYs) Lost of Thai People by Sex, 1999

| No. | Male | | | Female | | |
|-----|---------------------------------------|------------|---------|------------------------------|------------|---------|
| | Disease | DALYs lost | Percent | Disease | DALYs lost | Percent |
| 1 | HIV/AIDS | 960,087 | 17 | HIV/AIDS | 372,947 | 10 |
| 2 | Road traffic injuries | 510,907 | 9 | Cerebrovascular diseases | 280,673 | 7 |
| 3 | Cerebrovascular disease | 267,567 | 5 | Diabetes | 67,158 | 7 |
| 4 | Liver cancer | 248,083 | 4 | Major depression | 145,336 | 4 |
| 5 | Diabetes | 168,372 | 3 | Liver cancer | 118,384 | 3 |
| 6 | Ischemic heart disease | 164,094 | 3 | Knee osteoarthritis | 117,963 | 3 |
| 7 | Emphysema | 156,861 | 3 | Road traffic injuries | 114,963 | 3 |
| 8 | Being assaulted/ murdered | 156,371 | 3 | Anaemia (iron deficiency) | 112,990 | 3 |
| 9 | Suicide or self-inflicted injuries | 147,988 | 3 | Ischemic heart disease | 109,592 | 3 |
| 10 | Drug dependence | 137,703 | 2 | Cataract | 96,091 | 2 |

Source: Bureau of Policy and Strategy. Burden of Disease and Injuries in Thailand, 2002.

⁵ Disability-Adjusted Life Years (DALYs): 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".

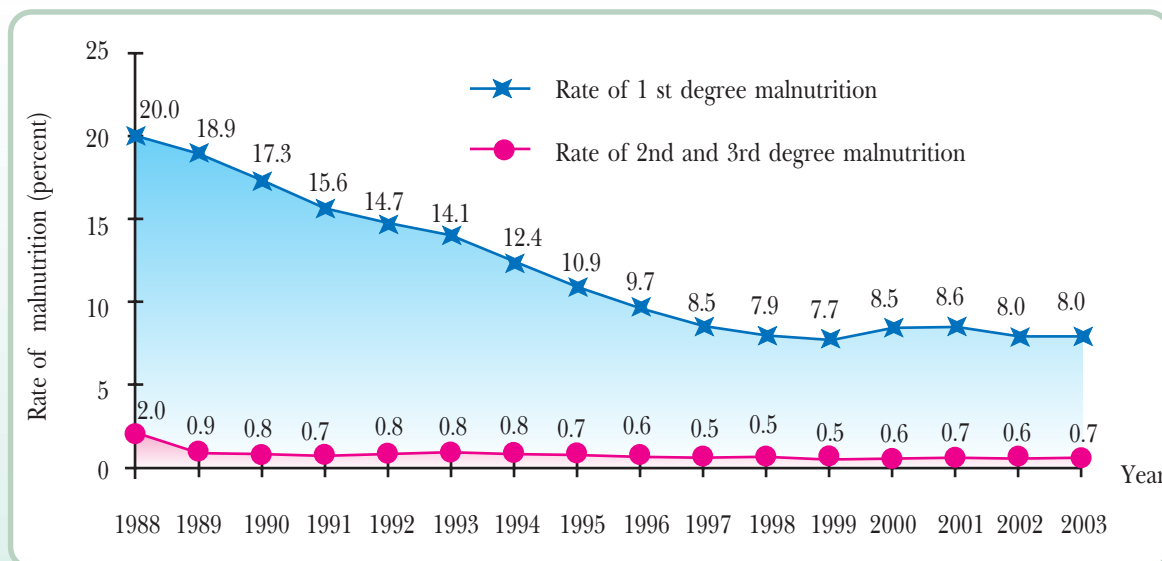
3.2 Public Health Problems with Declining Trends

3.2.1 Malnutrition

The nutritional status of preschool children has generally improved (Figure 5.8). 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 eight times greater than that for Bangkok (Table 5.7).

According to the World Health Report,⁶ it was estimated that in 2000 approximately 27% or 168 million children under 5 years of age worldwide were malnourished (weigh-for-age scale), making them more vulnerable to death due to diarrhoea and pneumonia.

Figure 5.8 Situation of Protein and Energy Malnutrition among Children Aged 0-5 Years, Thailand, 1988-2003



Source: Department of Health, Ministry of Public Health.

⁶ Pathom Sawanpanyalert (editor). World Health Report 2002: Reducing Risks and Promoting Health. 2003.

Table 5.7 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.

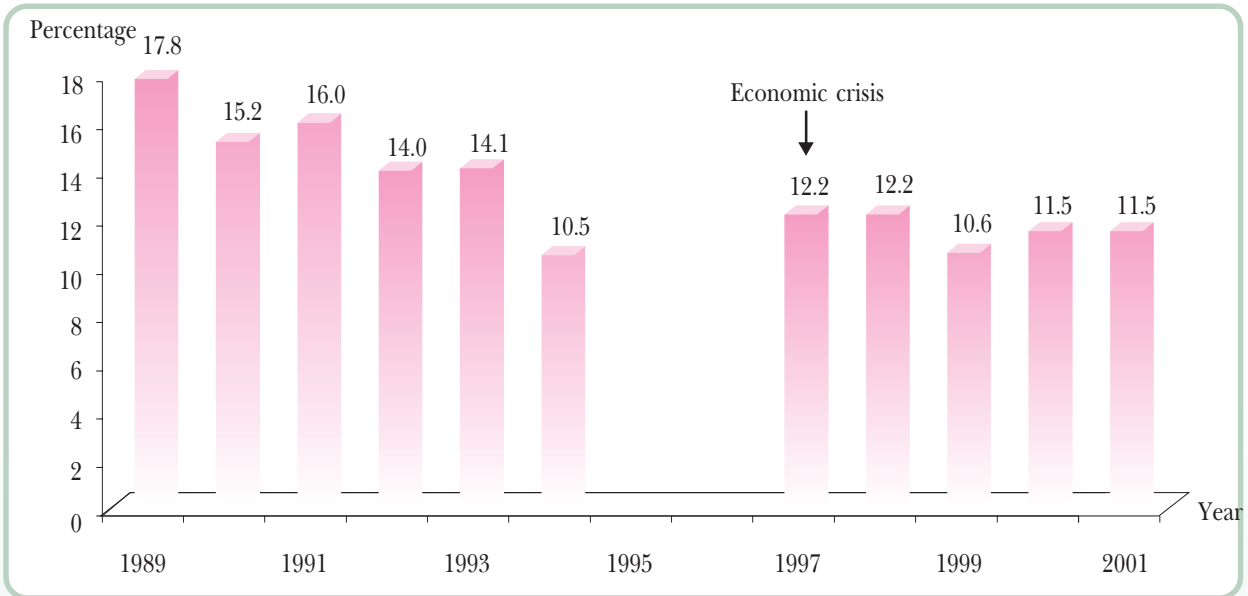
(2) Bureau of Policy and Strategy, Ministry of Public Health.

Notes: For 1989-1996 and 2002-2003, there was no survey on the hilltribes.

For 2002-2003, there was no survey in Bangkok.

The rate of underweight primary schoolchildren dropped steadily from 17.8% in 1989 to 10.5% in 1994. Nonetheless, during the economic crisis, the rate increased slightly (Figure 5.9).

Figure 5.9 Proportion of Underweight Primary Schoolchildren, 1989-2001



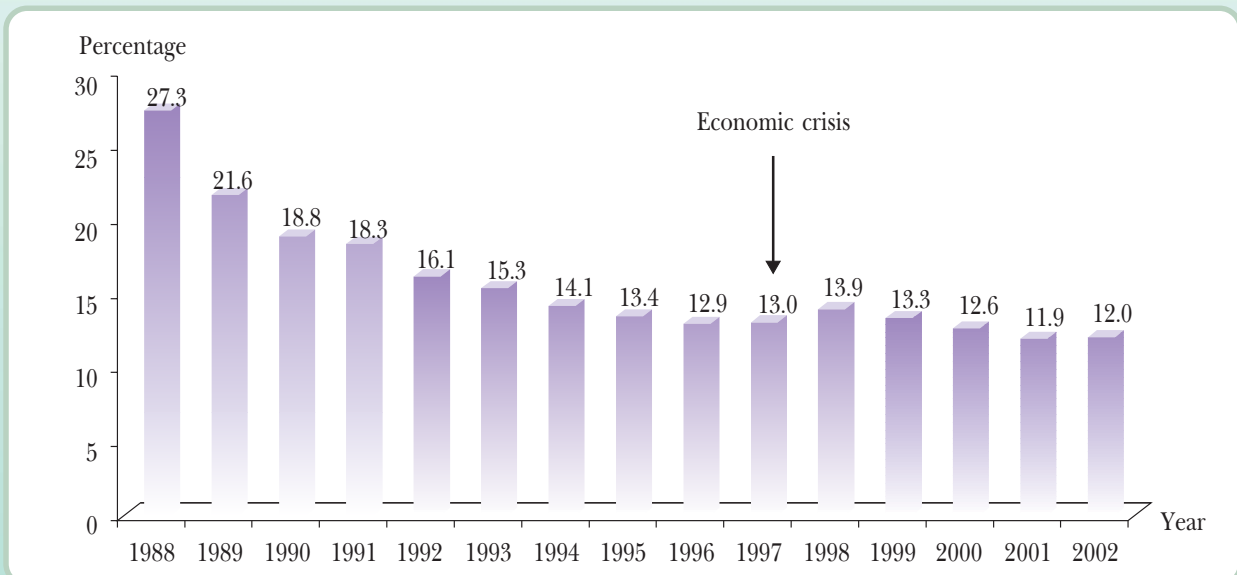
Source: Department of Health, Ministry of Public Health.

Note: For 1995, 1996, and 2002 onward, there were no surveys on malnutrition among primary schoolchildren.

3.2.2 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 12.0% in 2002 (Figure 5.10).

Figure 5.10 Proportion of Anaemic Pregnant Women (Hct <33%), 1988-2002

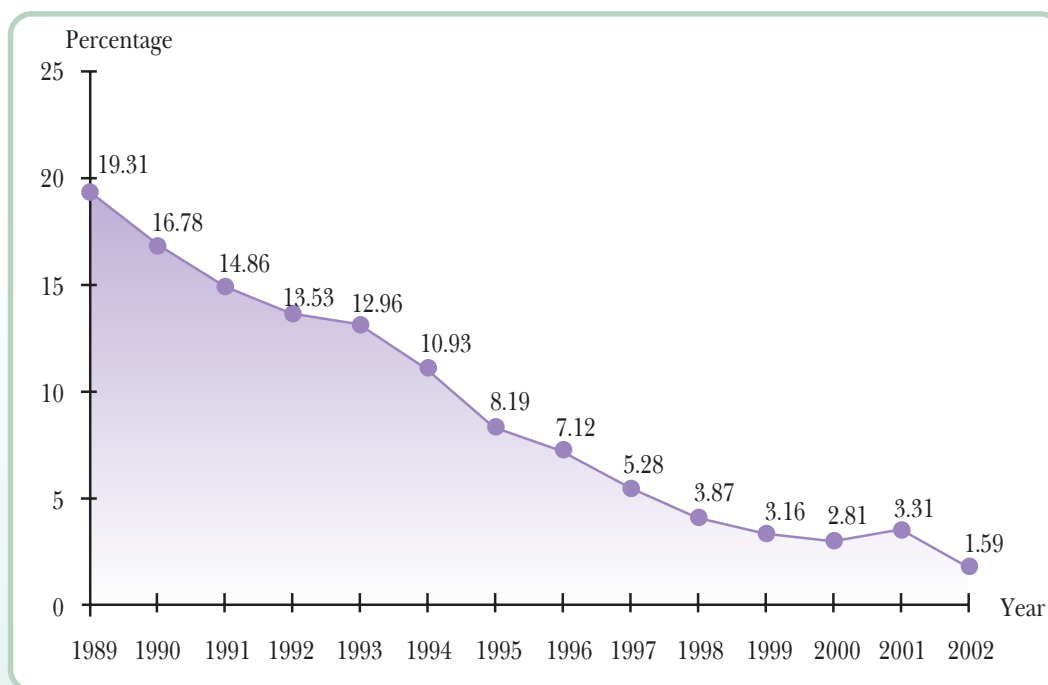


Source: Department of Health, Ministry of Public Health.

3.2.3 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 has dropped from 19.31% in 1989 to 1.59% in 2002 (Figure 5.11); and the average goitre prevalence rate has also dropped to 1.3% in 2003.

Figure 5.11 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.

3.2.4 Vaccine-preventable Diseases

Since the Ministry of Public Health has launched the Expanded Programme on Immunization (EPI) in target population groups, the immunization coverage has remarkably improved (Table 5.8 and Figure 5.12).

Table 5.8 Coverage of Immunization Against Vaccine-Preventable Diseases in Different Target Groups, 1982-2002

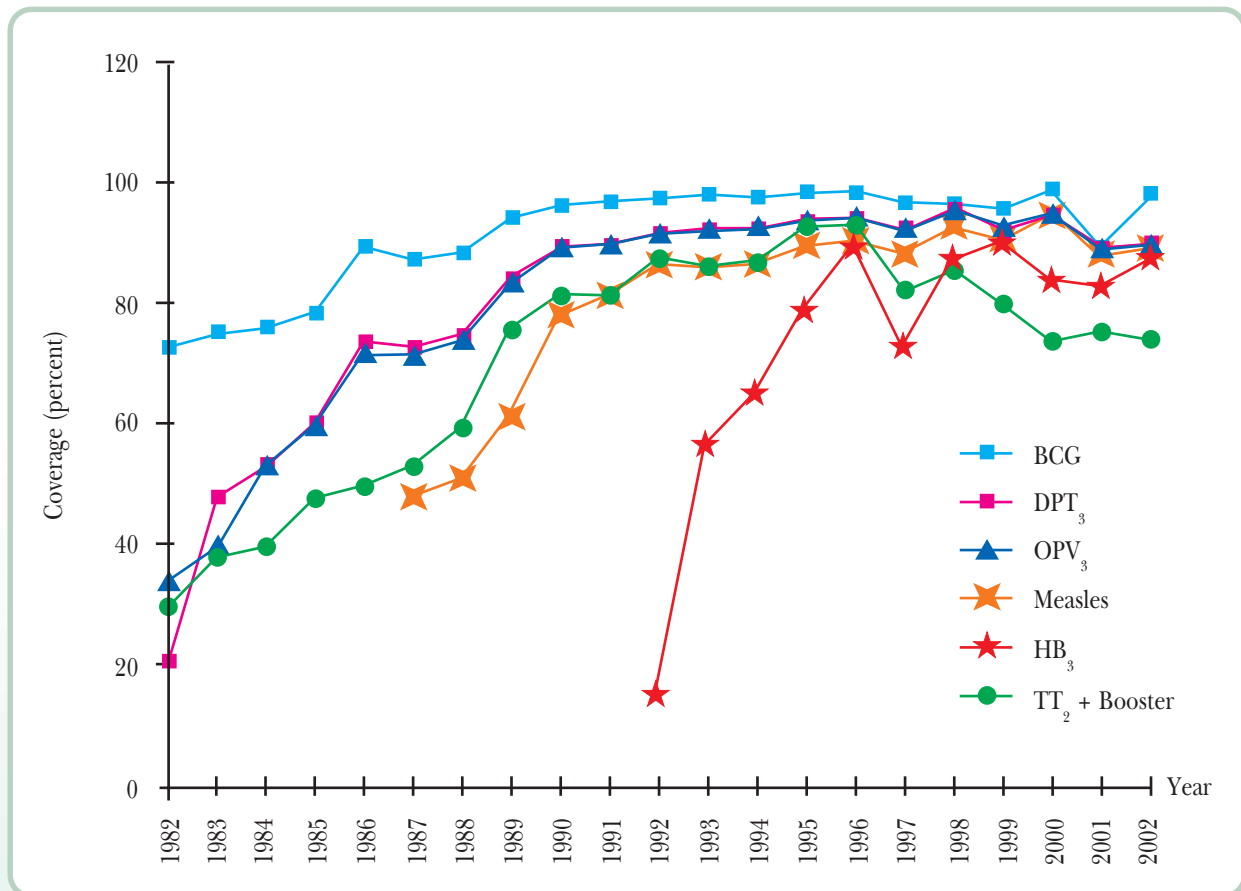
| Activity | Coverage (percent) | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--|
| | 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⁾ | |
| 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 | |
| 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 | |
| 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 | |
| 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 | |
| HB ₃ (%) | - | - | - | - | - | - | - | - | - | - | 15.4 | 57.1 | 65.6 | 79.3* | 90.7 | 88.5 | 93.0 | 90.4 | 94.9 | 87.9 | 88.8 | |
| 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 | |

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, Ministry of Public Health, MoPH.

* The 1st Provincial Health Survey (1995).

Figure 5.12 Coverage of Immunization: BCG, DPT₃, OPV₃, HB₃, Measles among Children and TT₂+ Booster among Pregnant Women, 1982-2002



Sources: (1) Department of Disease Control, Ministry of Public Health.
 (2) Bureau of Policy and Strategy, Ministry of Public Health.

As a result of such a high immunization coverage, the morbidity rates of such vaccine-preventable diseases have a tendency to decline (Table 5.9 and Figure 5.14). However, it is noteworthy that in 2001-2002, the incidence of measles increased slightly partly due to an epidemic among the hilltribe people (Figure 5.13).

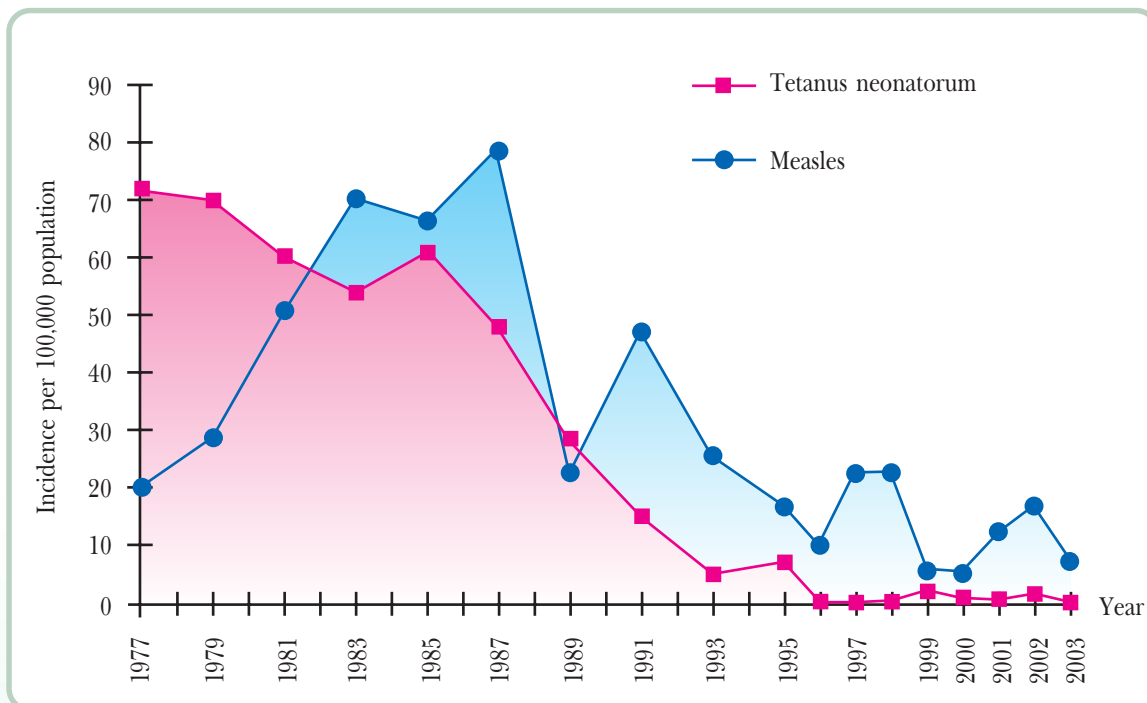
Besides, it was noted that the hepatitis B infection had a rising incidence, probably resulting from a more extensive surveillance effort (Figure 5.15).

Table 5.9 Incidence Rates of Major Vaccine-Preventable Diseases in Thailand, 1977-2003

| Incidence of vaccine-preventable diseases per 100,000 population | | | | | | |
|--|---------|-----------------------|------------|-----------|---------------|-------------|
| Year | Measles | Tetanus neonatorum | 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 |

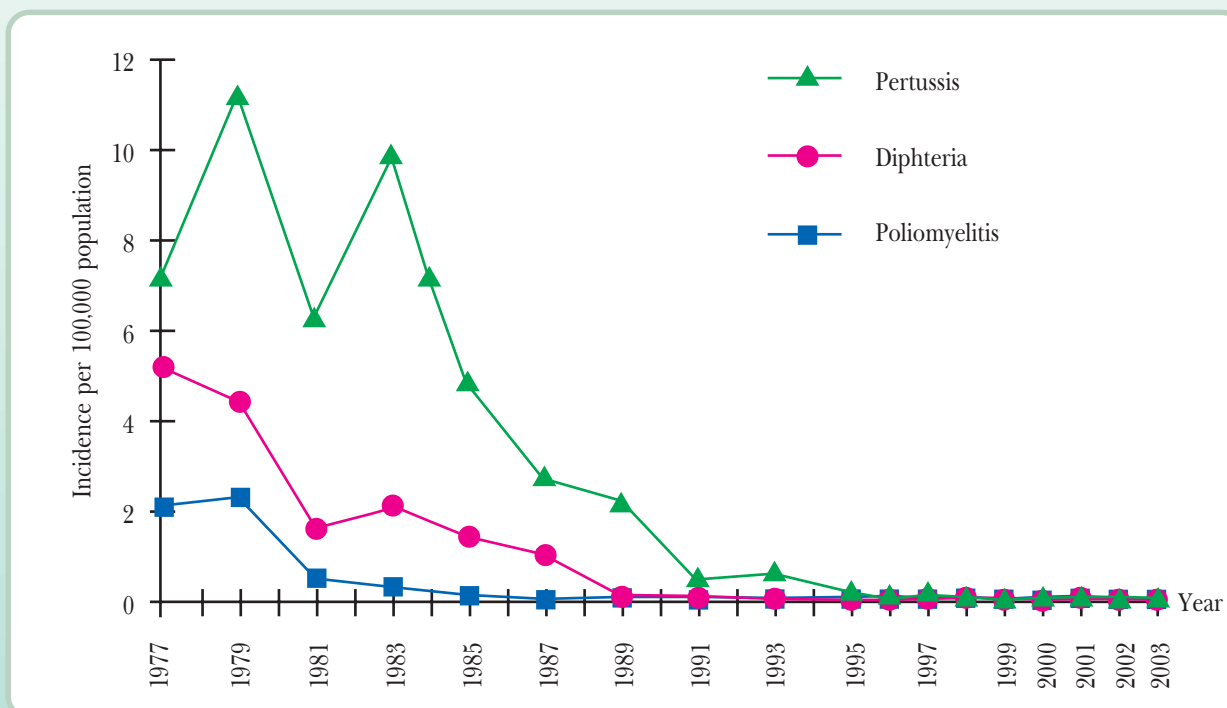
Source: Bureau of Epidemiology, Department of Disease Control.

Figure 5.13 Incidence of Tetanus Neonatorum and Measles in Thailand, 1977-2003



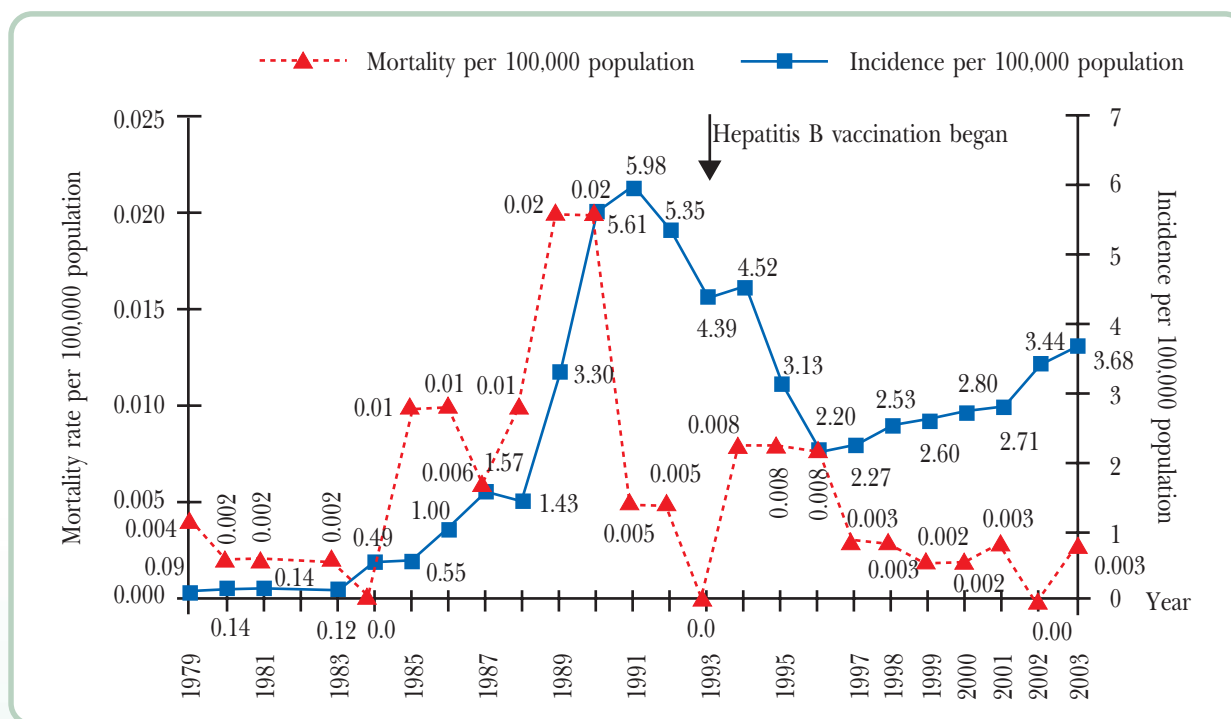
Source: Bureau of Epidemiology, Department of Disease Control.

Figure 5.14 Incidence of Pertussis, Diphtheria, and Poliomyelitis in Thailand, 1977-2003



Source: Bureau of Epidemiology, Department of Disease Control.

Figure 5.15 Incidence and Mortality Rates of Hepatitis B in Thailand, 1979-2003



Source: Bureau of Epidemiology, Department of Disease Control.

3.2.5 Helminthiases

Overall, the prevalence of intestinal parasitic diseases has been declining, except for liver fluke whose prevalence is relatively increasing in the North (Table 5.10). 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.⁷

Table 5.10 Prevalence Rate 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 |

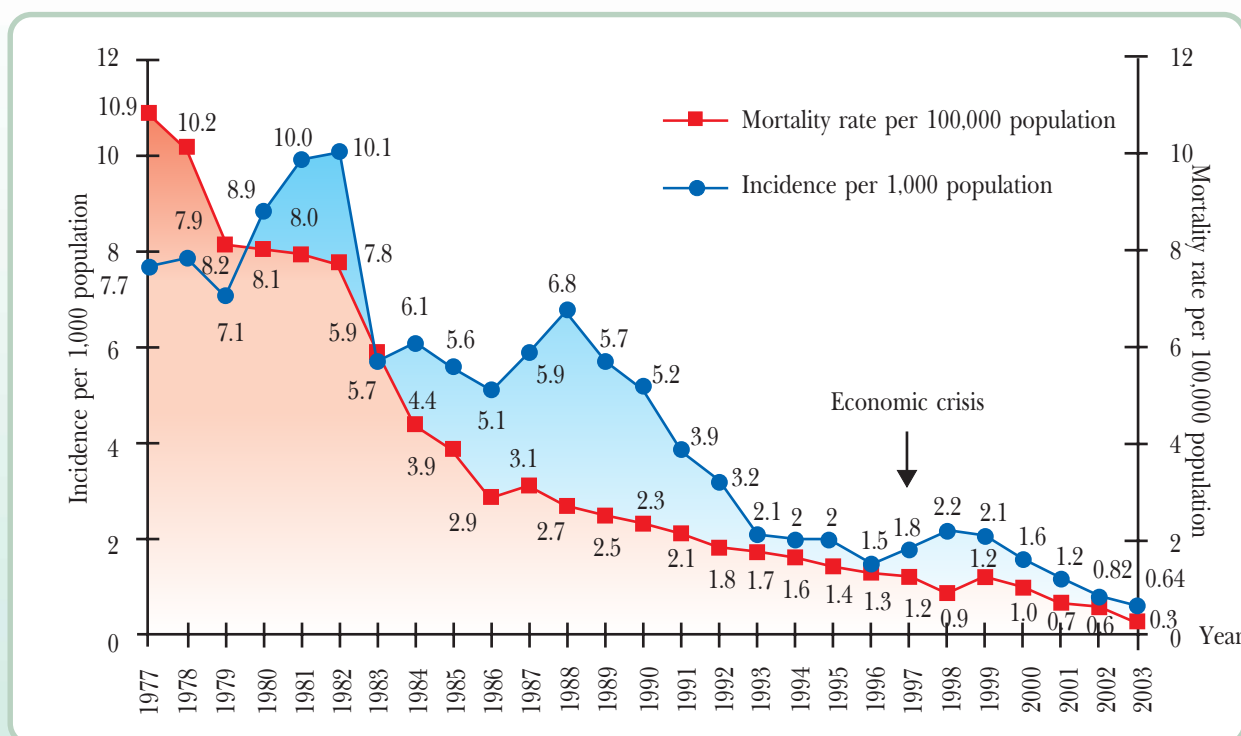
Source: Department of Disease Control, Ministry of Public Health.

⁷ 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.

3.2.6 Malaria

Thailand has succeeded, to a certain extent, in its malaria control efforts, leading to a considerable reduction in incidence and mortality rates (Figure 5.16). 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 involved with the discontinuation of DDT spraying, El Niño phenomena and the restructuring of communicable disease control programmes. As a result, Malaria Units were upgraded 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 5.16 Incidence and Mortality Rates of Malaria in Thailand, 1977-2003

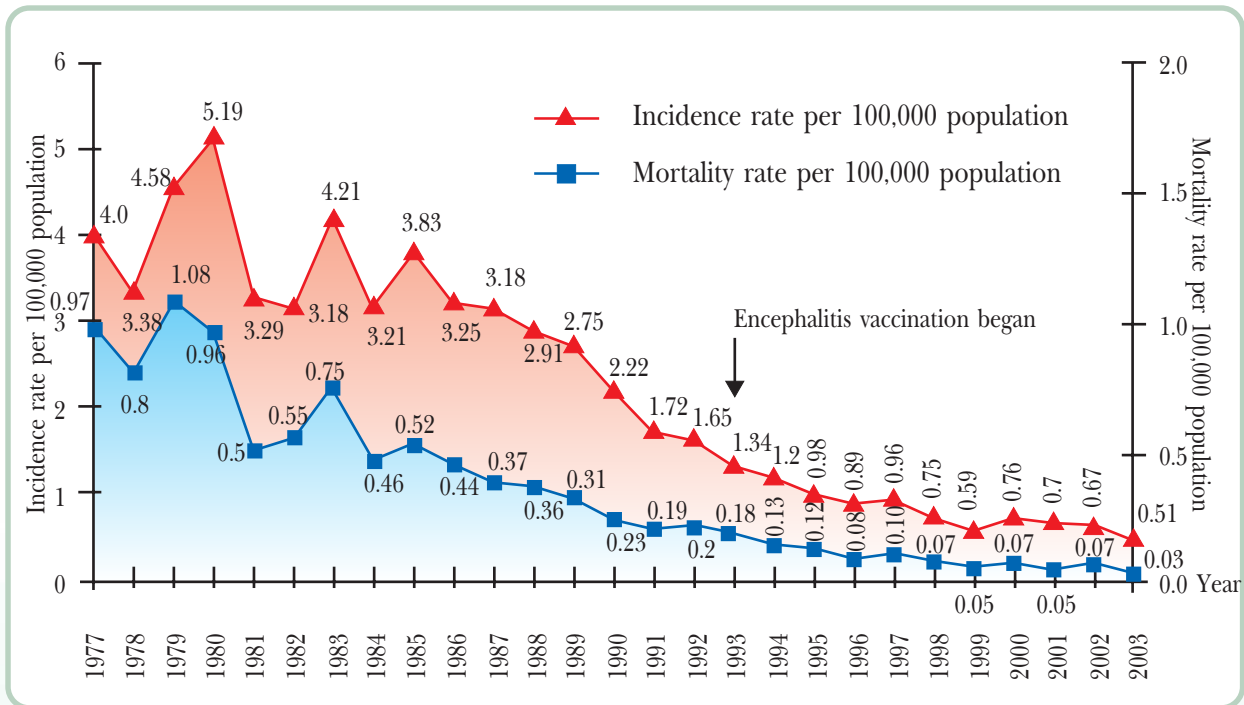


Sources: (1) Department of Disease Control, Ministry of Public Health.
(2) Bureau of Policy and Strategy, Ministry of Public Health.

3.2.7 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 5.17). In 2003, the incidence of encephalitis was recorded at 0.51 per 100,000 population and the mortality at 0.03 per 100,000 population.

Figure 5.17 Incidence and Mortality Rates of Encephalitis in Thailand, 1977-2003



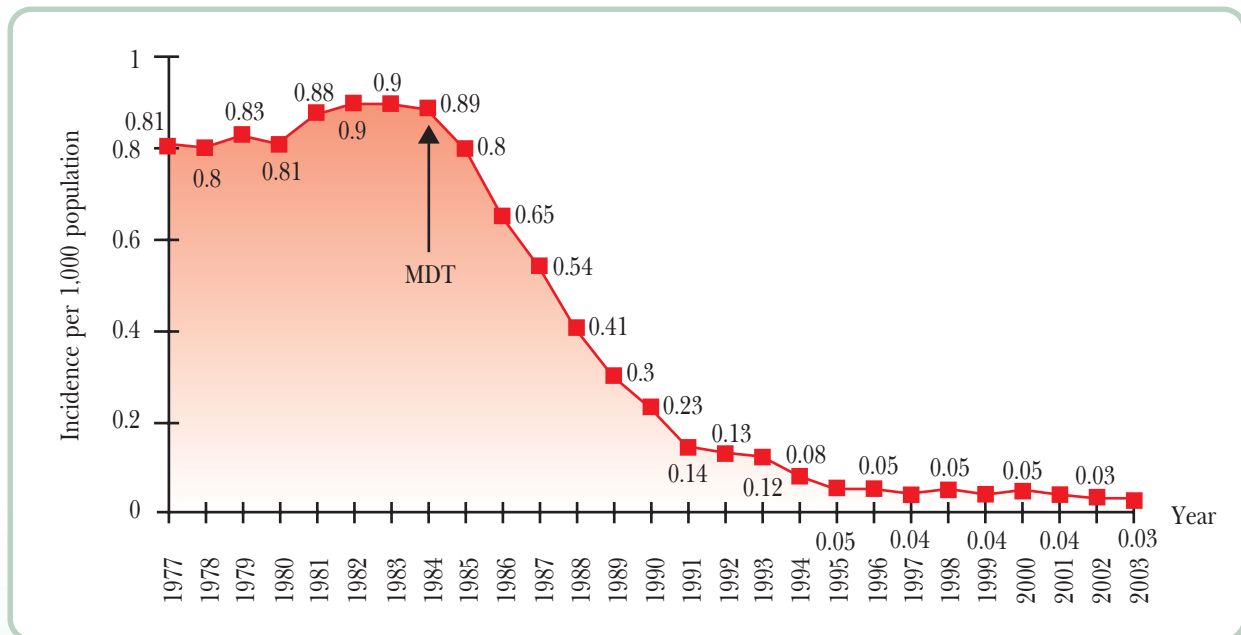
Source: Bureau of Epidemiology, Department of Disease Control.

3.2.8 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 0.03 per 1,000 population in 2003 - a nearly 100-fold reduction (Figure 5.18). 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 5.18 Incidence of Leprosy in Thailand, 1977-2003



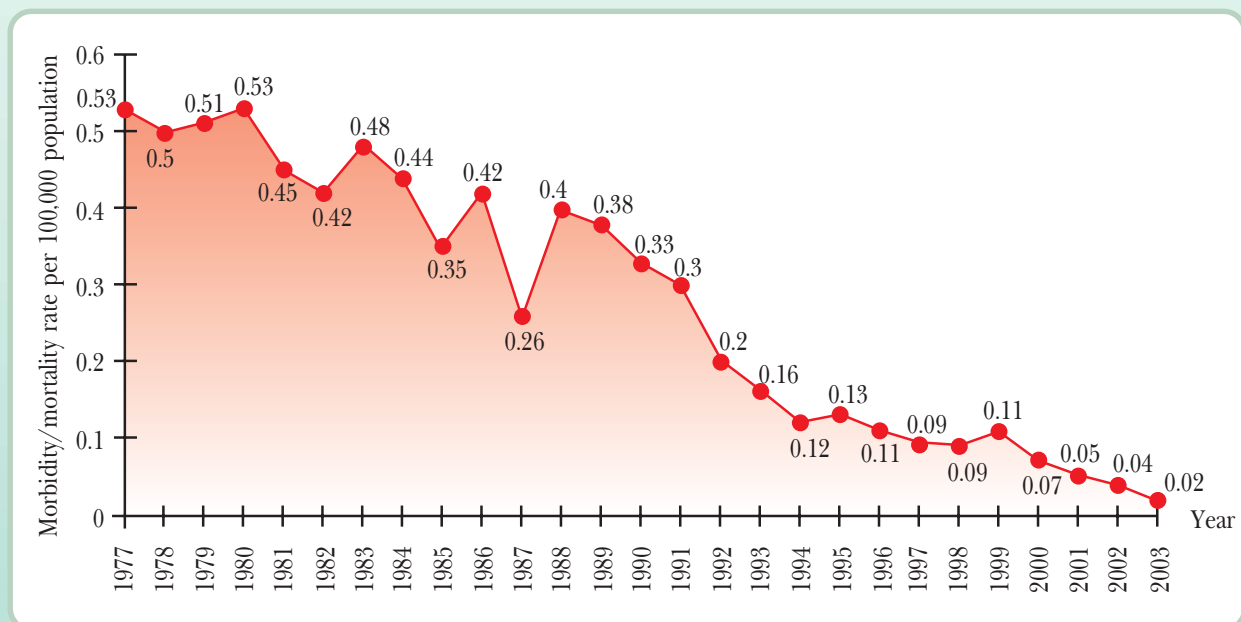
Source: Department of Disease Control, Ministry of Public Health.

Note: MDT = Multiple-drug therapy

3.2.9 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 0.02 per 100,000 population in 2003 (Figure 5.19).

Figure 5.19 Morbidity/Mortality Rate of Rabies in Thailand, 1977-2003

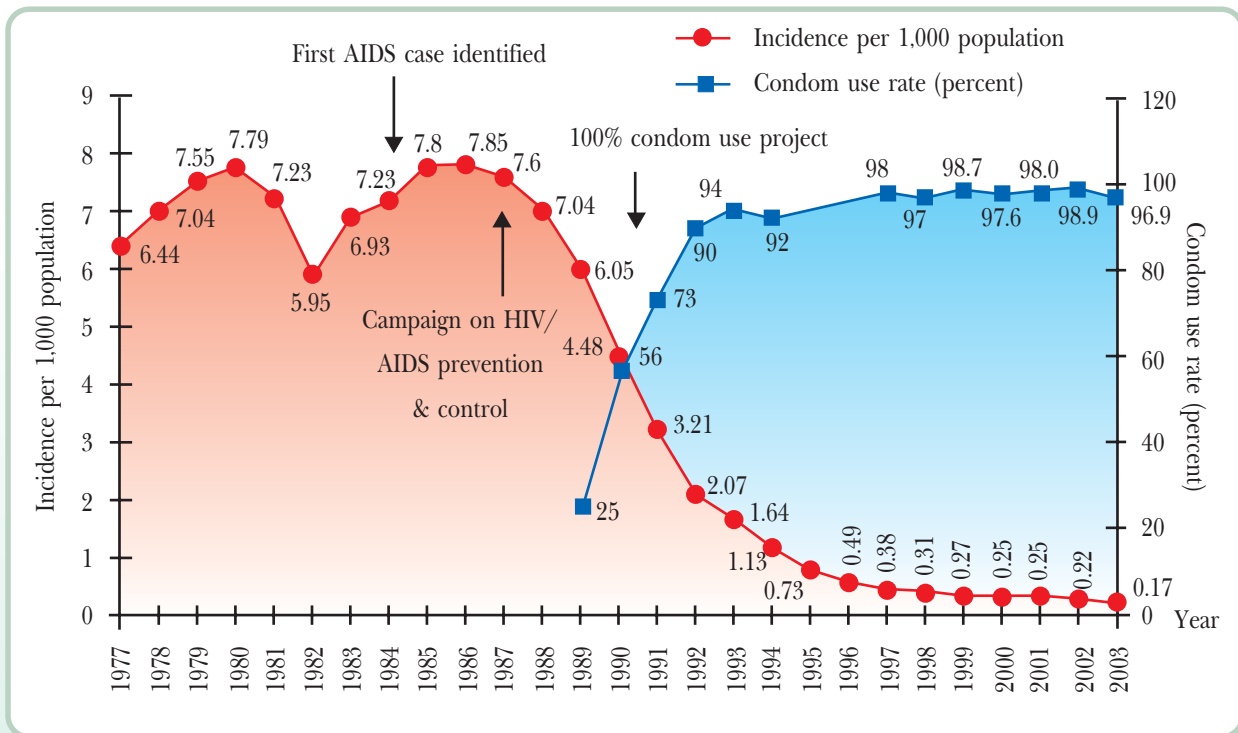


Source: Bureau of Epidemiology, Department of Disease Control.

3.2.10 Sexually Transmitted Infections (STIs)

Overall, the trends in STI prevalence in Thailand between 1977 and 2003 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 2003 (Figure 5.20) as a result of the intensive campaigns on HIV/AIDS prevention and control.

Figure 5.20 Incidence of Sexually Transmitted Infections and Condom Use Rate among Female Commercial Sex Workers (CSWs), Thailand, 1977-2003



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 pseudogonorrhoea.

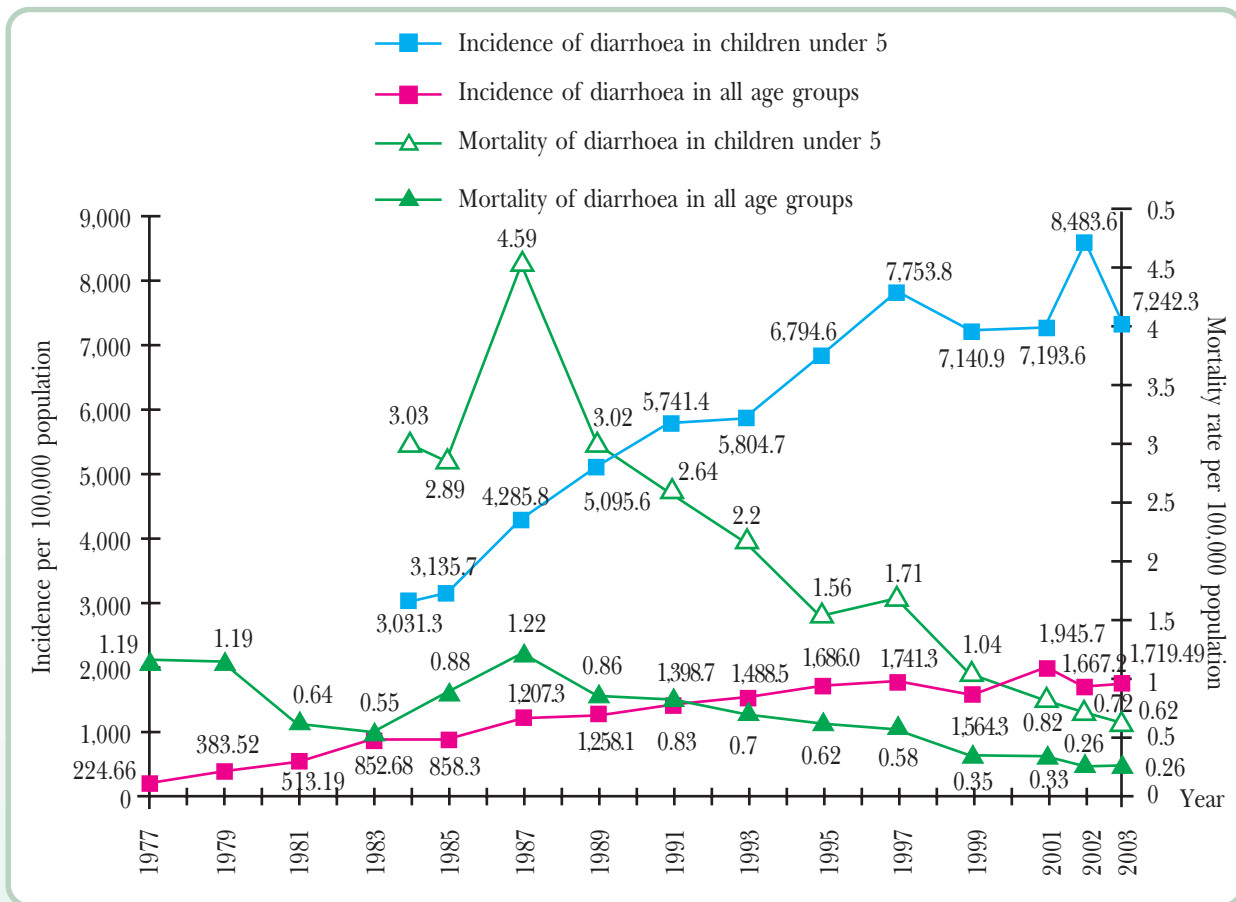
3.3 Public Health Problems with Minimal Changes

3.3.1 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 5.21). A recent provincial health status survey revealed that the diarrhoea incidence in children has been declining over the past five years from 6.0 episodes/person/year in 1995 to 3.6 episodes/person/year in 2001.⁸ Nevertheless, the incidence is 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 health services and extensive coverage as well as the success of the campaign on oral rehydration therapy (ORT).

⁸ Bureau of Policy and Strategy, Ministry of Public Health. In-depth Analysis of the Data of Provincial Health Status Survey, 2003.

Figure 5.21 Incidence and Mortality Rates of Diarrhoea in Thailand, 1977-2003



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

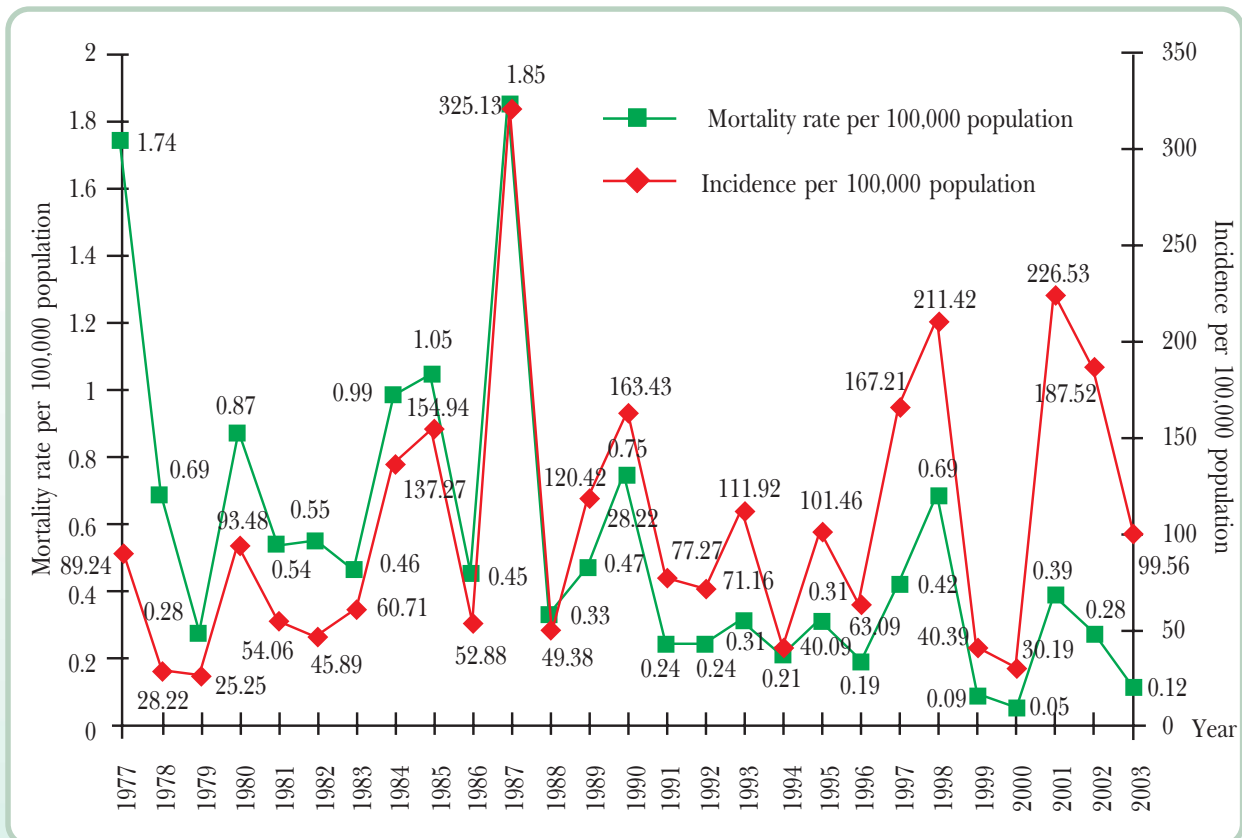
| Type of areas | Illness (episodes/person/year) | | | |
|------------------|--------------------------------|------------|------------|------------------------|
| | 1995 | 1996 | 2001 | Target, 8th Plan |
| Municipality | 4.9 | 3.1 | 3.4 | |
| Non-municipality | 5.2 | 3.4 | 3.9 | |
| Total | 6.0 | 3.4 | 3.6 | Not exceeding 1 |

Source: Provincial Health Status Surveys, 1995, 1996, and 2001.

3.3.2 Dengue Haemorrhagic Fever

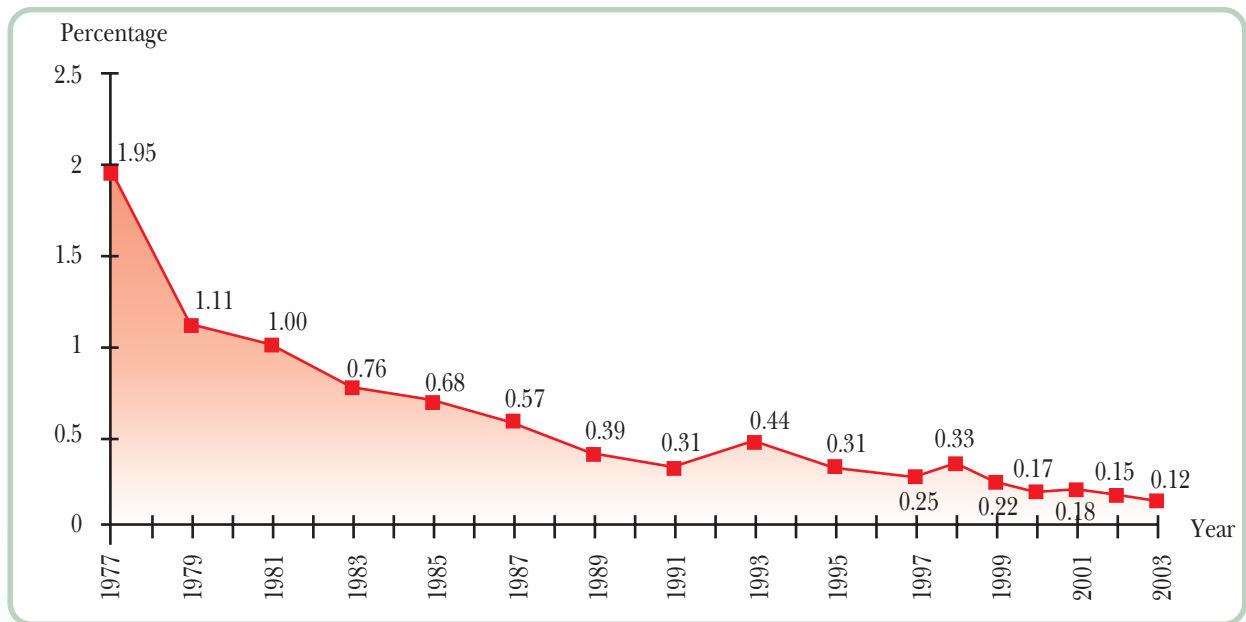
Dengue haemorrhagic fever has been a major public health problem of the country over the past 30 years without a declining trend. In particular, in 1997, 1998, 2001 and 2002, there was a rising trend with an epidemic occurring every two years. However, the DHF case-fatality rate has been declining (Figure 5.22, 5.23)

Figure 5.22 Incidence and Mortality Rates of Dengue Haemorrhagic Fever, Thailand, 1977-2003



Source: Bureau of Epidemiology, Department of Disease Control.

Figure 5.23 Case-Fatality Rate of Dengue Haemorrhagic Fever, 1977-2003

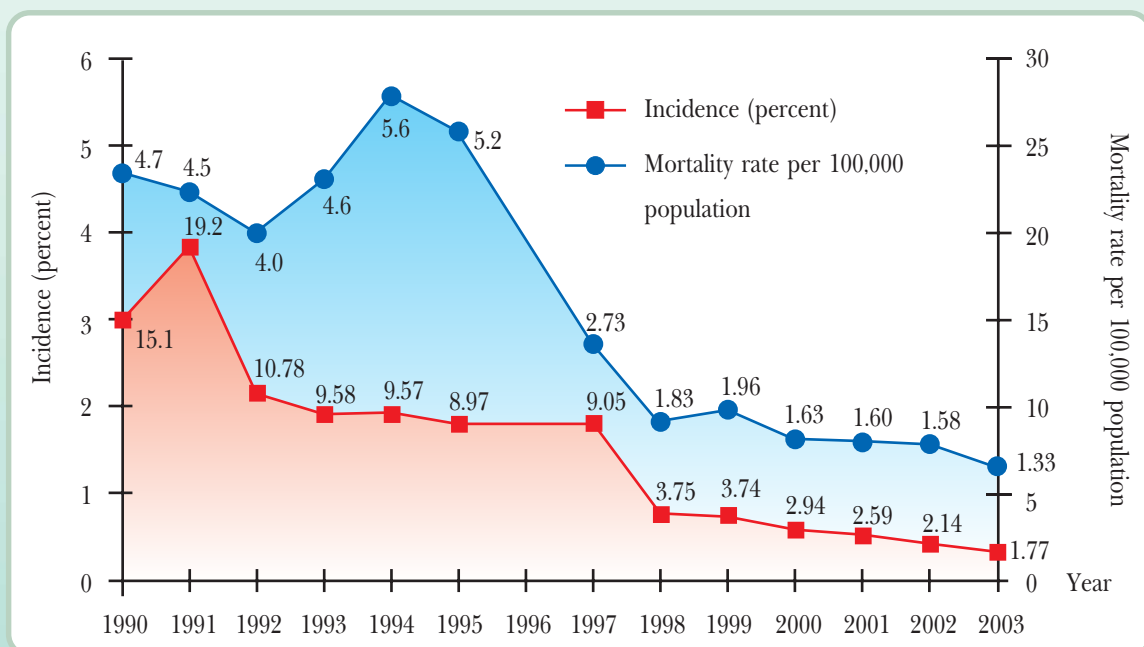


Source: Bureau of Epidemiology, Department of Disease Control.

3.3.3 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 1.33% in 2003; and its mortality rate (per 100,000 population) has steadily dropped from 15.1 in 1990 to 1.77 in 2003 (Figure 5.24).

Figure 5.24 Incidence and Mortality of Pneumonia in Children under Five in Thailand, 1990-2003



Sources: (1) Department of Disease Control, Ministry of Public Health
 (2) Bureau of Epidemiology, Department of Disease Control.

3.4 Public Health Problems with Rising Trends

3.4.1 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 1989-2003, the situation and trends can be summarized as follows:

Blood Donors. The prevalence increased from 0.28% in 1989 to 0.81 % in 1992, and then gradually dropped to 0.27% in 2003 (Figure 5.25).

Pregnant Women Attending Antenatal Care Clinics. The prevalence climbed from 0.68% in 1991 to 2.29% in 1995, and then gradually reduced to 1.23% in 2003 (Figure 5.25).

Injecting Drug Users. The prevalence was approximately 30-43% throughout the period 1989-1997. After 1997, the prevalence has been soaring to 50.77%, and fell to 33.33% in 2003 (Figure 5.26).

Male Clients Attending STI Clinics. The prevalence jumped from 2.50% in 1990 to 8.5% in 1994 and remained stable at 7-9% during 1995-1999, but declined to 4% in 2003 (Figure 5.26).

Direct Female CSWs. The prevalence rose from 3.47% in 1989 to 33.15% in 1994, and fell to 10.63% in 2003 (Figure 5.26).

Indirect Female CSWs. The prevalence escalated from 2% in 1990 to 10.14% in 1996. Since then the rate has gradually declined to 3.88% in 2003 (Figure 5.26).

Military Recruits or Conscripts. The prevalence increased from 1.6% in 1990 to 4% in 1993, and since then has dropped to 0.5% in 2003 (Figure 5.27).

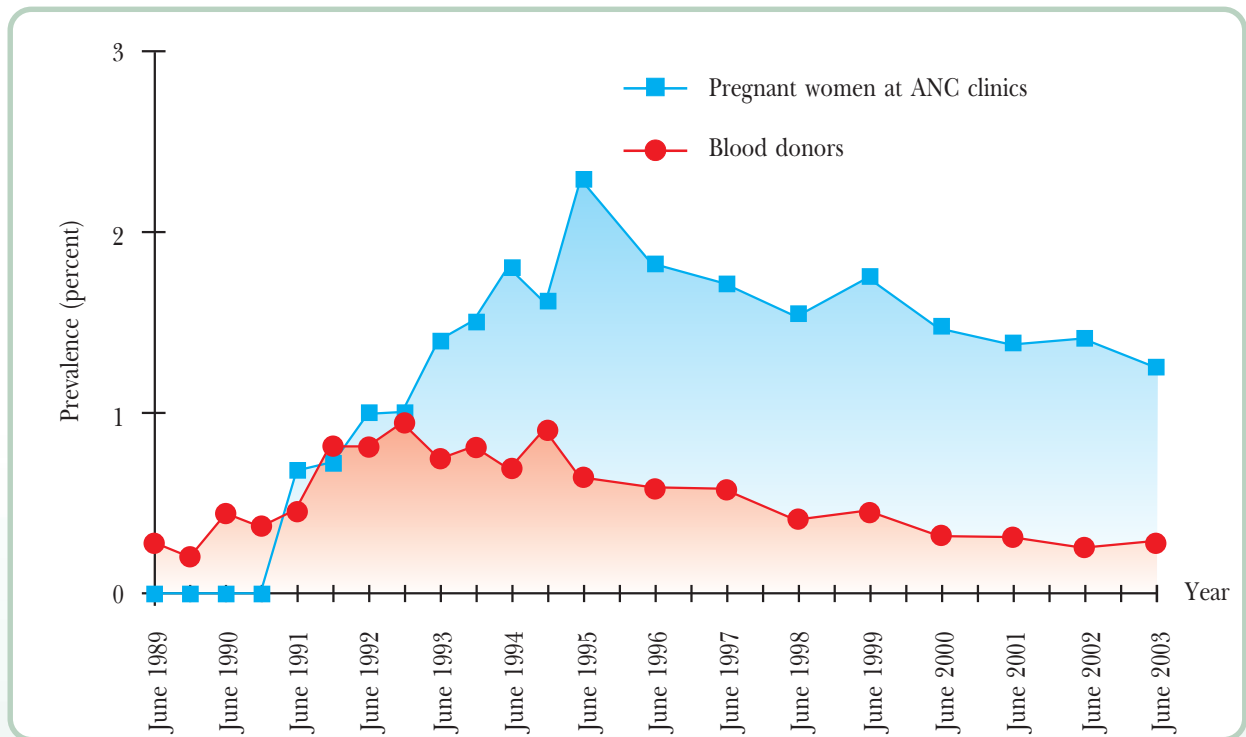
Among the drug addicts admitted to the Northern Regional Centre of Drug Dependence Treatment, a survey revealed that, in the past decade, a rising trend in HIV infection was found among the hilltribe people; an increase from 2.7% 1989 to 9.5% in 1998. In contrast, the HIV infection rate among the Thai people dropped from 27.1% to 16.2% during the same period. In regard to their demographic, social, and behavioural characteristics, the HIV infection among this population group is not only a result of injecting drug use, but also of sexual transmission⁹ (Figure 5.28).

In general, 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 5.20).

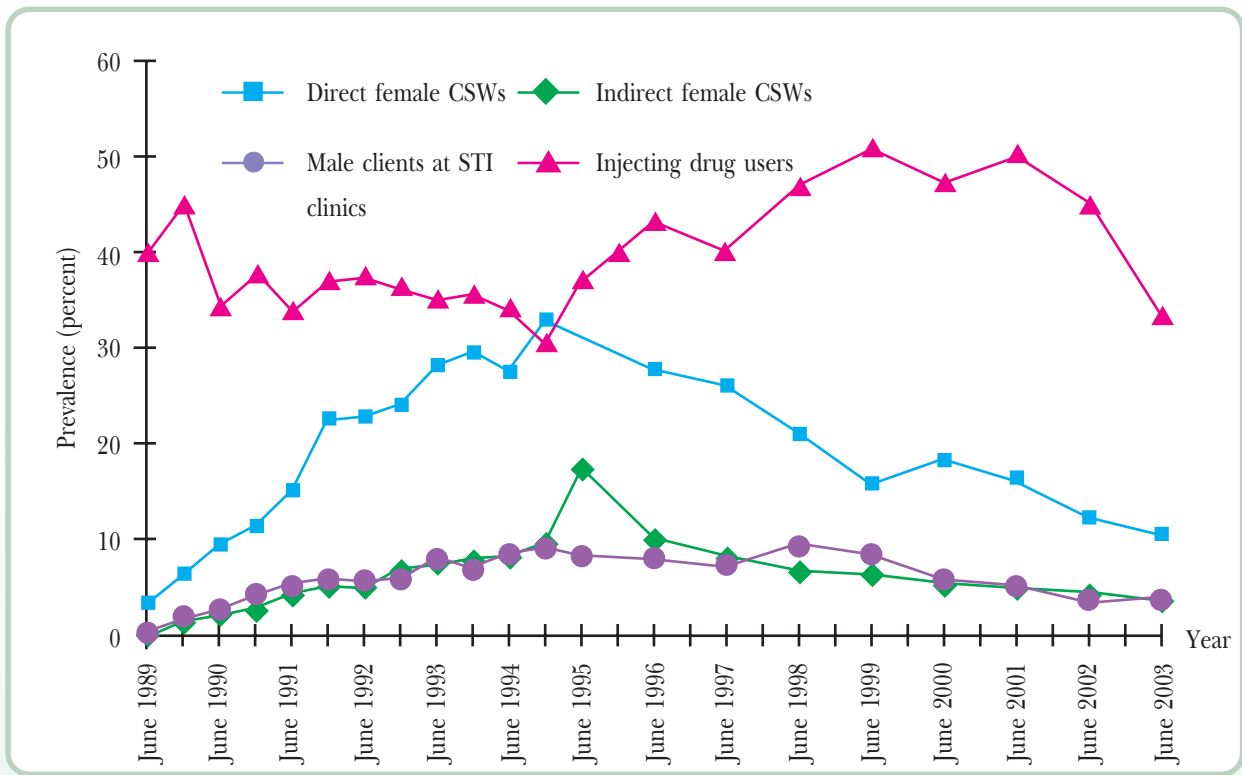
⁹ Usanee Puengpan and La-iad Thirawat. HIV Infection among the Drug Addicts Admitted to the Northern Regional Centre of Drug Dependence Treatment, 1989-1998, 2000.

Figure 5.25 Prevalence of HIV Infections in Blood Donors and Pregnant Women at the ANC Clinics in Government Hospitals, 1989-2003



Source: Bureau of Epidemiology, Department of Disease Control.

Figure 5.26 Prevalence of HIV Infections in Direct and Indirect Female CSWs, Male Clients at STI Clinics, and Injecting Drug Users, Thailand, 1989-2003

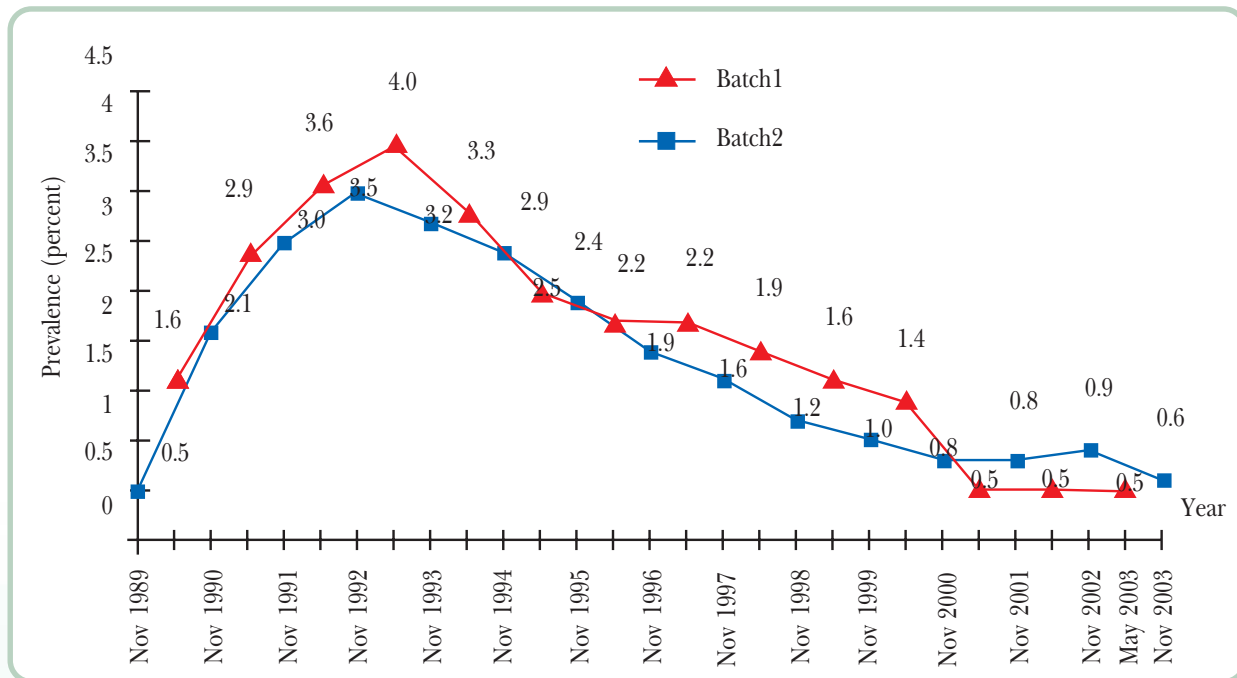


| Group | June 1989 | June 1990 | June 1991 | June 1992 | June 1993 | June 1994 | June 1995 | June 1996 | June 1997 | June 1998 | June 1999 | June 2000 | June 2001 | June 2002 | June 2003 |
|-------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |

Source: Bureau of Epidemiology, Department of Disease Control.

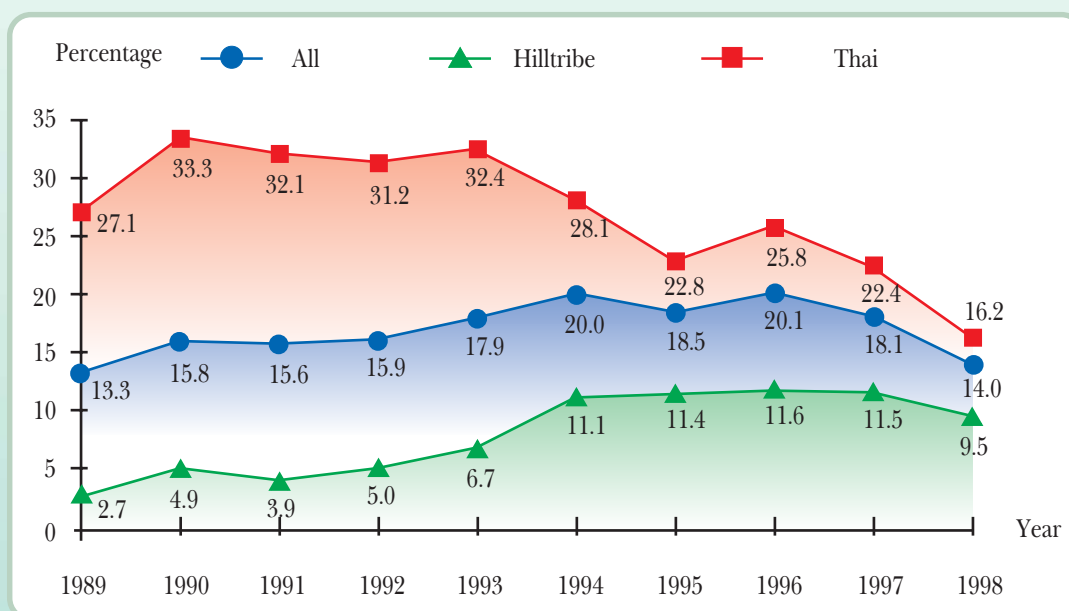
Note: ⁽¹⁾Data for December 1994.

Figure 5.27 Prevalence of HIV Infections in Thai Male Military Recruits, November 1989-May 2003



Sources: Armed Forces Research Institute of Medical Sciences, Royal Thai Army.
Institute of Pathology, Phra Mongkutklao Medical Centre, Royal Thai Army.

Figure 5.28 Prevalence of HIV Infections in Thai and Hilltribe Drug Addicts Undergoing Treatment at the Northern Regional Centre of Drug Dependence Treatment, 1989-1998



Source: Northern Regional Centre of Drug Dependence Treatment, Department of Medical Services.

(2) Prevalence of AIDS Cases

According to the report on the number of AIDS patients during 1984-2003 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 5.29).

Nonetheless, the number of reported cases still remains lower than actuality; as a matter of fact only 30-60%¹⁰ 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 5.30).

For 2003, cumulatively there were an estimated 1,055,000 HIV-infected persons, of whom 450,000 had died, 604,000 were still alive; and during the year there were 21,000 new HIV infections (including 3,500 children), 50,500 new AIDS cases and 52,000 deaths (Table 5.12).

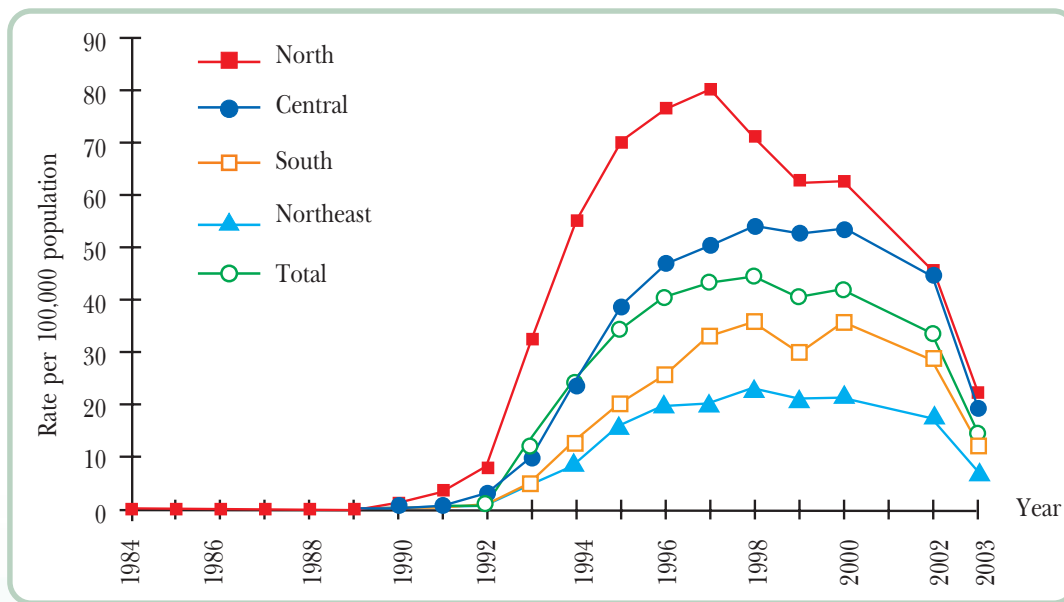
Table 5.12 Projection of the Numbers of HIV-Infected Persons, AIDS Cases and Deaths, 2000-2020

| 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.

¹⁰Division of Epidemiology, MoPH. Assessment of the Completeness of AIDS Patients Reporting, 2000.

Figure 5.29 Rates of Reported AIDS Cases by Region, Thailand, 1984-2003

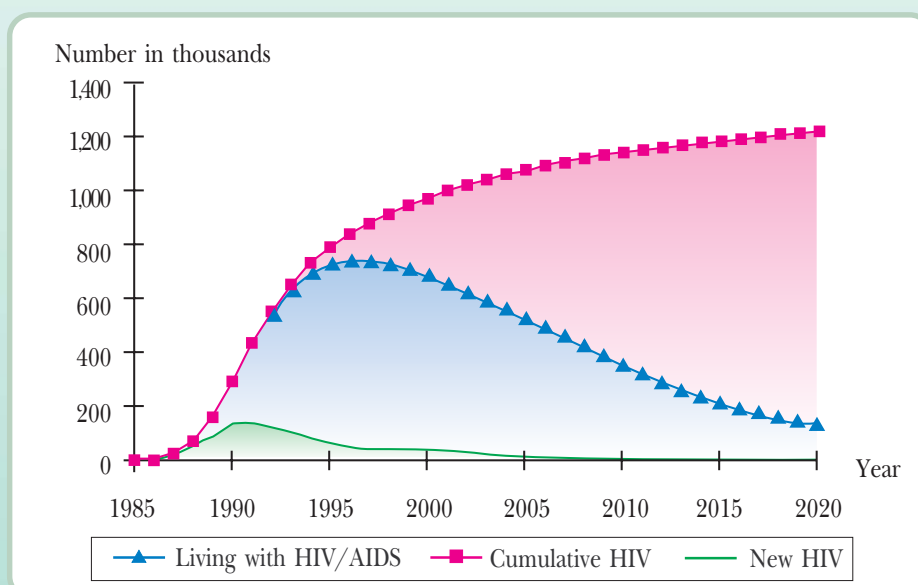


| Region | 1984 | 1986 | 1988 | 1990 | 1992 | 1994 | 1996 | 1998 | 2000 | 2002 | 2003 |
|--------------|------|------|-------------|-------------|-------------|--------------|--------------|--------------|--------------|--------------|--------------|
| North | - | - | 0.04 | 0.61 | 7.76 | 55.08 | 76.66 | 71.17 | 62.86 | 45.73 | 22.20 |
| Central | 0.01 | 0.01 | 0.03 | 0.40 | 2.85 | 23.97 | 47.15 | 54.22 | 53.65 | 44.83 | 19.60 |
| South | - | - | 0.01 | 0.07 | 1.35 | 12.46 | 25.81 | 36.06 | 35.98 | 29.15 | 12.12 |
| Northeast | - | - | 0.01 | 0.11 | 1.14 | 8.82 | 20.15 | 23.27 | 21.74 | 18.16 | 6.96 |
| Total | - | - | 0.02 | 0.30 | 3.06 | 23.49 | 40.89 | 44.66 | 42.06 | 33.71 | 14.75 |

Source: Bureau of Epidemiology, Department of Disease Control.

Note: The number of reported cases is about 30-60% of actuality.

Figure 5.30 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

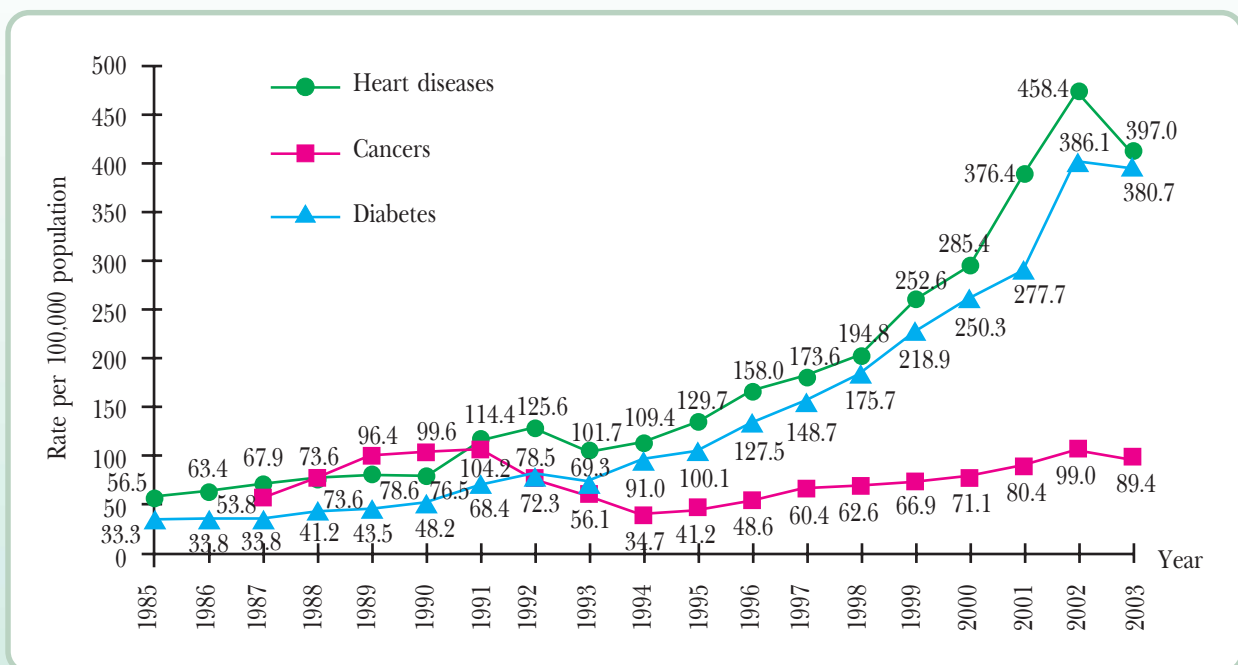
3.4.2 Chronic Diseases: Heart Diseases and Diabetes

Currently, non-communicable diseases, such as heart diseases and cancer, have become the leading causes of morbidity and mortality among the 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 397.0 in 2003.
- Cancer. The admission rate per 100,000 population has risen from 34.7 in 1994 to 89.4 in 2003.

Besides, diabetes also has a rising trend, i.e. from 33.3 per 100,000 population in 1985 to 91.0 in 1994 and 380.7 in 2003 (Figure 5.31).

Figure 5.31 Rate of Hospitalizations of Patients with Heart Diseases, Cancers and Diabetes, 1985-2003

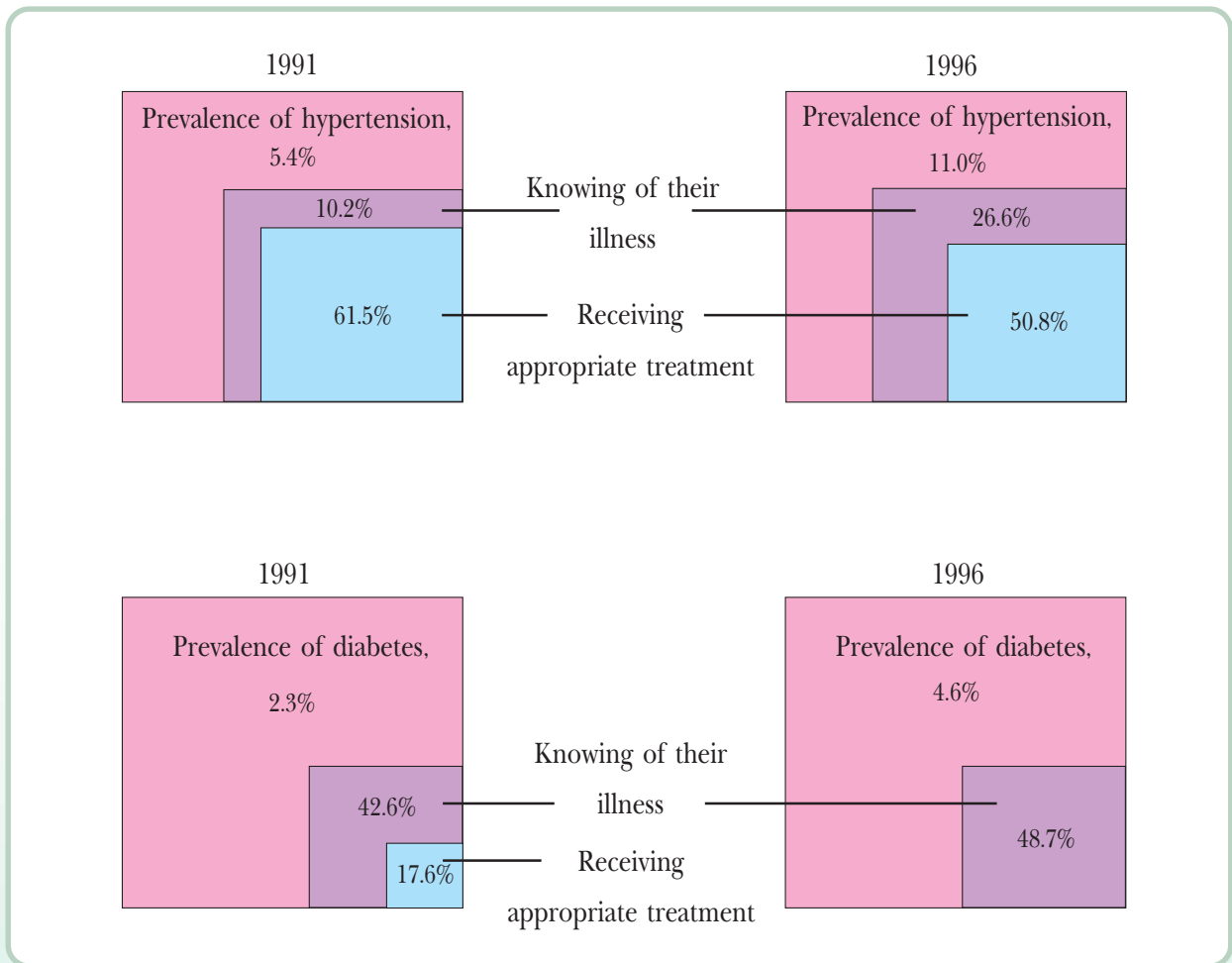


Source: Inpatients Report. Bureau of Policy and Strategy, Ministry of Public Health.

Note: The rate for cancers, since 1994, covers only liver, lung, cervical, and breast cancers.

The 1996 health examination survey revealed that, out of 2 million cases of diabetes nationwide, only half knew that they had diabetes and less than half had received appropriate treatment. And of 4 million hypertension patients, only a quarter had known of their hypertension status, and only half had received suitable treatment (Figure 5.32).

Figure 5.32 Prevalence of Diabetes and Hypertension as Well as Appropriate Treatment among Thai Population, 1991-1996



Source: National Health Foundation, 1998.

3.4.3 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 5.13) especially in Bangkok Metropolis (Figure 5.33). According to the cancer registry in 5 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 5.14). Classified by age, females aged 35 and older have a greater incidence rate of cervical and breast cancers than those aged under 35 (Table 5.15). 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 5.16 and 5.17). Besides, it was found that 80% of Thai female breast cancer patients were in the invasive stage.¹¹

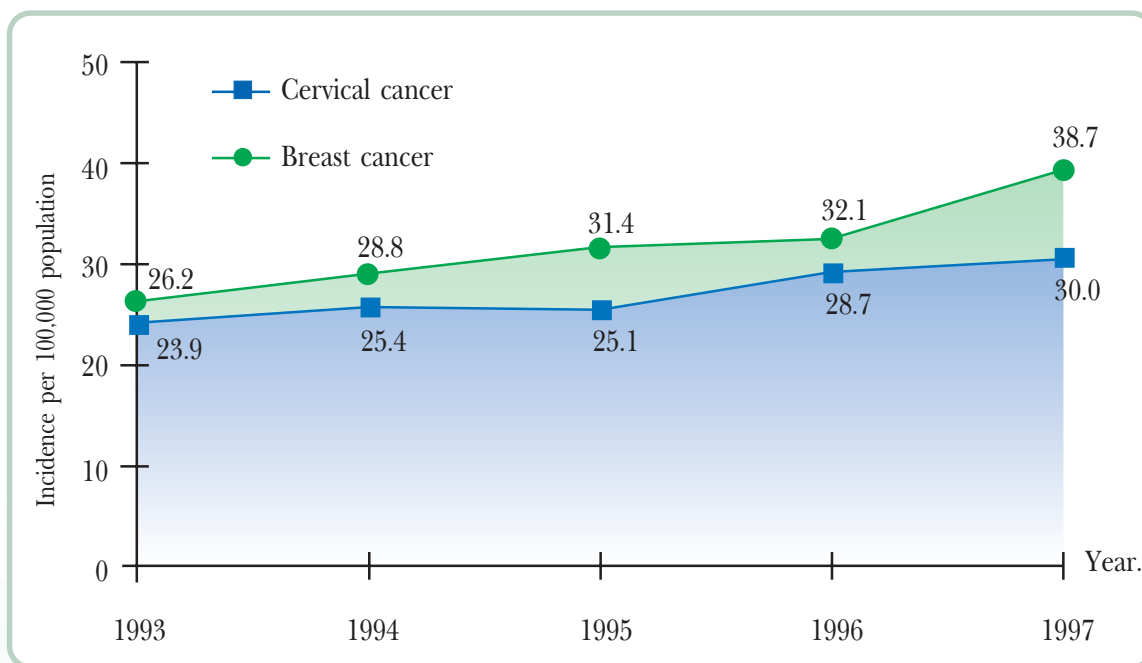
Table 5.13 Incidence of Cancers Commonly Found among Thai Females, 1990, 1993, 1996 and 1999

| Number | Type of cancer | Incidence rate per 100,000 population | | | |
|--------|-----------------|---------------------------------------|------|------|------|
| | | 1990 | 1993 | 1996 | 1999 |
| 1 | Cervical cancer | 23.4 | 20.9 | 19.5 | 19.8 |
| 2 | Breast cancer | 13.5 | 16.3 | 17.2 | 19.9 |
| 3 | Liver cancer | 16.3 | 15.5 | 16.0 | 14.3 |
| 4 | Lung cancer | 12.1 | 11.1 | 10.0 | 9.9 |
| 5 | Ovarian cancer | 4.5 | 4.7 | 5.2 | 6.2 |

Source: National Cancer Institute, Ministry of Public Health.

¹¹ Thammanit Angsusingh. Screening Mammography. Breast Cancer Treatment Centre, Siriraj Hospital.

Figure 5.33 Incidence of Cervical and Breast Cancers among Females in Bangkok, 1993-1997



Source: National Cancer Institute, Ministry of Public Health

Table 5.14 Percentage of Cancers of the Reproductive Organs Recorded at Provincial Cancer Registries, 1993, and 1995-1997

| Province | Cervical cancer | | Breast cancer | | Ovarian cancer | |
|------------|-----------------|-----------|---------------|-----------|----------------|-----------|
| | 1993 | 1995-1997 | 1993 | 1995-1997 | 1993 | 1995-1997 |
| Chiang Mai | 25.7 | 25.6 | 15.2 | 17.6 | 6.0 | 4.7 |
| Lampang | 23.1 | 23.6 | 15.0 | 16.4 | 4.4 | 3.7 |
| Khon Kaen | 18.0 | 15.0 | 8.6 | 11.6 | 4.5 | 5.6 |
| Bangkok | 18.5 | 20.7 | 20.6 | 25.4 | 4.2 | 5.9 |
| Songkhla | 15.8 | 16.1 | 11.5 | 12.1 | 3.1 | 4.6 |

Source: National Cancer Institute, Ministry of Public Health.

Table 5.15 Incidence of Cancers of the Reproductive Organs among Females Aged 15-59 Years by Organ and Age, 1996 and 1999

| Organ | Incidence per 100,000 population in various age groups (years) | | | | | | | | | | | | |
|---------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|
| | 15-19 | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 | 65-69 | 70-74 | 75+ |
| Breasts | | | | | | | | | | | | | |
| 1996 | 0.1 | 0.5 | 3.1 | 10.5 | 23.1 | 39.9 | 54.2 | 48.8 | 49.8 | 48.4 | 44.9 | 41.2 | 36.5 |
| 1999 | 0.1 | 0.7 | 3.9 | 15.2 | 25.5 | 43.0 | 57.6 | 57.0 | 57.1 | 62.8 | 53.1 | 46.1 | 46.5 |
| Cervix | | | | | | | | | | | | | |
| 1996 | 0.4 | 1.0 | 3.6 | 11.4 | 24.4 | 40.5 | 51.0 | 56.6 | 63.0 | 64.8 | 56.1 | 53.8 | 39.1 |
| 1999 | 0.0 | 1.1 | 4.2 | 11.9 | 26.2 | 41.1 | 48.2 | 56.8 | 65.0 | 68.0 | 51.3 | 56.5 | 45.2 |
| Uterine neck | | | | | | | | | | | | | |
| 1996 | 0.0 | 0.1 | 0.2 | 0.7 | 1.5 | 3.8 | 7.2 | 11.7 | 11.6 | 11.4 | 10.5 | 10.7 | 2.4 |
| 1999 | 0.0 | 0.1 | 0.4 | 0.9 | 2.0 | 4.9 | 6.9 | 11.0 | 15.6 | 13.9 | 14.4 | 9.3 | 3.9 |
| Ovaries | | | | | | | | | | | | | |
| 1996 | 1.3 | 2.0 | 2.5 | 4.6 | 5.5 | 7.6 | 12.6 | 14.6 | 17.6 | 15.7 | 13.2 | 13.8 | 6.0 |
| 1999 | 1.9 | 2.0 | 2.2 | 4.8 | 7.7 | 8.9 | 15.5 | 14.6 | 20.4 | 22.0 | 15.5 | 12.8 | 11.3 |
| Other reproductive organs | | | | | | | | | | | | | |
| 1996 | 0.0 | 0.0 | 0.2 | 0.2 | 0.6 | 0.5 | 1.4 | 1.2 | 2.2 | 3.3 | 5.6 | 4.2 | 6.4 |
| 1999 | 0.0 | 0.0 | 0.3 | 0.4 | 0.7 | 0.3 | 1.5 | 2.2 | 2.0 | 3.3 | 4.4 | 2.5 | 7.6 |

Source: Cancer in Thailand, 1999-2000.

Table 5.16 Estimates of the Number of Breast Cancer Patients in American Females by Age, 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 5.17 Ages of Thai Female Breast Cancer Patients, 1983-2004

| Age (years) | Surgery Department, Siriraj Hospital 1,353 cases (1983-1994) | | Breast Cancer Treatment Centre 5,994 cases (1995-2004) | |
|--------------|---|------------|---|------------|
| | Number of cases | Percent | Number of cases | Percent |
| < 40 | 311 | 23.0 | 996 | 16.6 |
| 40-49 | 437 | 32.3 | 2,487 | 41.5 |
| 50-59 | 353 | 26.1 | 1,721 | 28.7 |
| 60-69 | 162 | 12.0 | 597 | 10.0 |
| 70 and over | 90 | 6.6 | 193 | 3.2 |
| Total | 1,353 | 100 | 5,994 | 100 |

Source: Thammanit Angsusingh. Screening Mammography. Breast Cancer Treatment Centre, Siriraj Hospital.

3.4.4 Occupational Diseases

According to the epidemiological surveillance of occupational diseases, significant situations can be summarized as follows:

(1) Pesticide Poisoning

Based on the Department of Health's cholinesterase level examinations in farmers during 1992-2002, 13-29% of farmers had abnormal enzyme levels resulting from pesticide exposure. The trend is unlikely to decline and the rate of pesticide poisonings is between 4 and 6 per 100,000 population (Table 5.18).

An assessment of health risks of farmers from chemical pesticide use, conducted by the Food and Drug Administration in five provinces in 2004, revealed that as high as 42.2% of farmers had pesticide poisoning with abnormal enzyme levels.

Table 5.18 Cholinesterase Testings Results and Morbidity/Mortality Due to Pesticide Poisoning in Farmers, 1992-2002

| Year | Cholinesterase testing ⁽¹⁾ | | | Pesticide poisoning ⁽²⁾ | | |
|------|---------------------------------------|-------------------------------|---------|------------------------------------|-------------------|---------------------------------------|
| | Number tested (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 | 21,753 | 24.19 | 2,652 | 15 | 4.27 |
| 2002 | 115,105 | 33,858 | 29.4 | 2,571 | 14 | 4.11 |

Sources: ⁽¹⁾ Department of Health, Ministry of Public Health

⁽²⁾ Bureau of Epidemiology, Department of Disease Control.

(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 3.0% in 2003 (Table 4.10). This is because of industrial expansion in manufacture and services with inappropriate use of new technologies and ineffective law enforcement measures.

Besides, there have been studies showing the importance of some specific occupational diseases as follows:

(2.1) Silicosis. 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 had dropped to lower than 250. In Thailand, at present an estimated 211,796 workers in 7,845 worksites are 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. It was found that, based on X-ray examinations, 30 workers had **silicosis-an incidence of 9.19 per 1,000 at-risk population**.

(2.2) **Byssinosis** (Cotton dust disease). The 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 rate was found 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.

(2.3) **Lead poisoning**. According to the 1993 study of 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 included 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.

(2.4) **Risks from Organic Solvents**. According to a study of risks for chemical hazards by Dr. Nalinee Sripuang¹² in 1999 on workers in petrochemical, auto-making and electronics industries, the workers were at high risk for exposure to solvents in the aromatic hydrocarbon group. And it was found that female workers had a urine metabolite concentration higher 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

¹² Nalinee Sripuang. Risk Assessment of Chemical Hazards in Occupation Health Surveillance : A Case Study of Organic Solvents, 1999.

(of all the samples, 0.5% had a phenol content and 1.4% had a hippuric acid content higher than the maximum allowable levels).

(2.5) Hearing Loss. The Division of Occupational Health, MoPH, conducted a study in 1998¹³ on hearing capacity of workers who encountered loud noise in industries. The study demonstrated that 69.3% of the workers had hearing impairment.

3.4.5 Accidental Injuries

(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 accidents with 13,000 deaths or a mortality rate of 21 per 100,000 population. And there were approximately 70,000 injuries a year or an injury rate of 110.8 per 100,000 population (Figure 5.34).

It was found that those who died from accidents were mostly in the working-age group, (15-34 years old); the number for males being four or five times greater than for females (Table 5.20 and Figure 5.35).

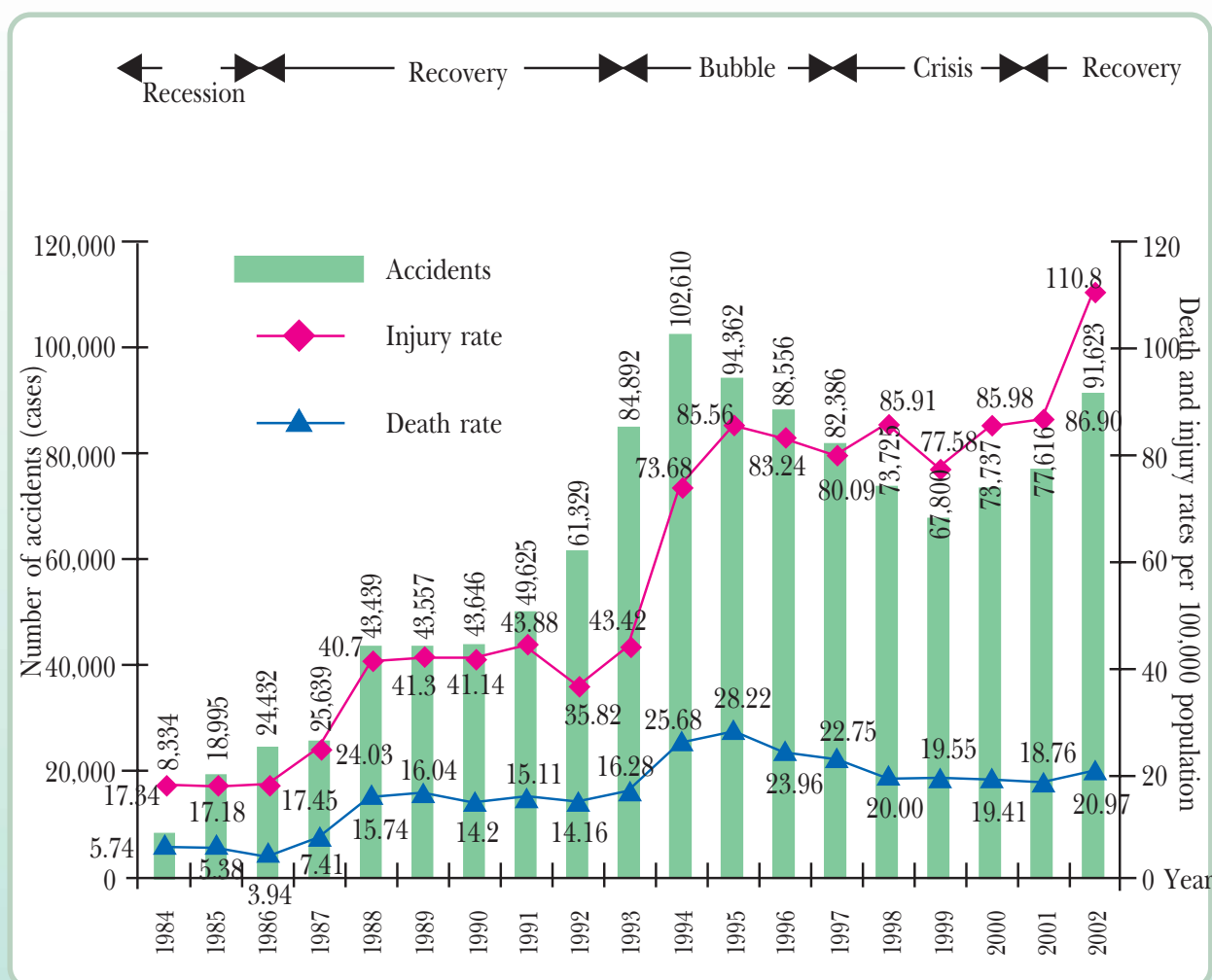
It is noteworthy that the numbers of accidents, injuries, and deaths from accident are higher compared to those in the previous year probably as a result of economic expansion,

¹³ 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.

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 ($r = 0.63$; Table 5.21).

This kind of situation caused a direct loss of property worth 1,494.9 million baht in 2002 (Table 5.19). But actually there are other incalculable losses including life losses, medical expenses, disabilities, etc. According to the 2000 study on economic losses from road traffic accidents, conducted by the Thailand Development Research Institute (TDRI), the economic loss is as high as 115,337 million baht or 2.3% of the gross domestic products¹⁴ (4,923,263 million baht; Table 5.22).

Figure 5.34 Death and Injury Rates from Road Traffic Accidents, Thailand, 1984-2002



Source: Police Information System Centre, Royal Thai Police.

¹⁴ 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.

Table 5.19 Numbers and Rates of Accidental Deaths and Injuries and Estimated Damages, 1984-2002

| 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 |

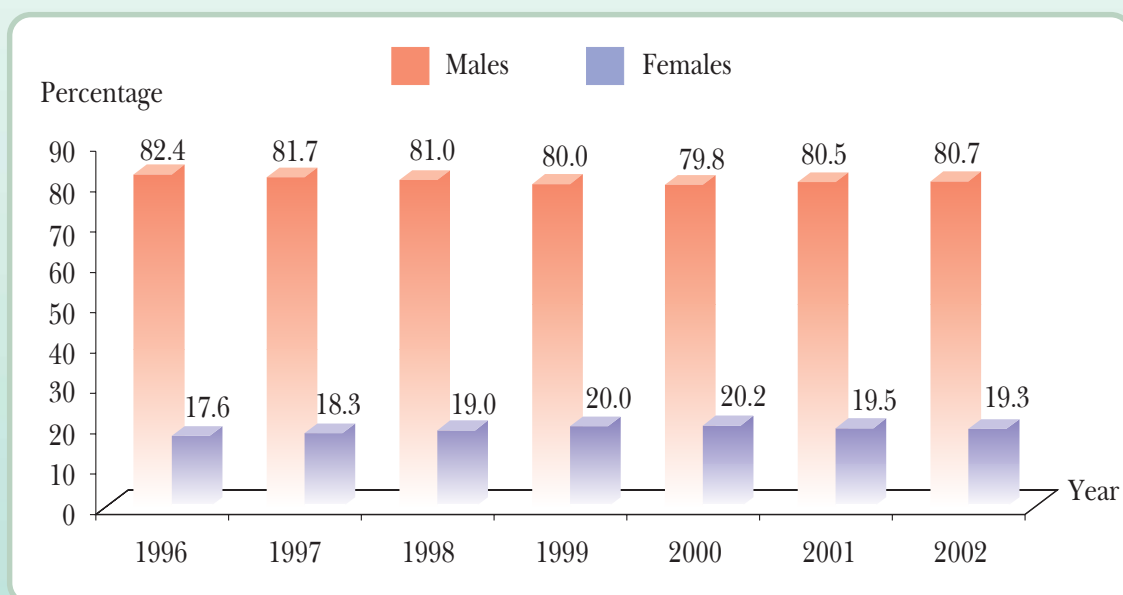
Source: Police Information System Centre, Royal Thai Police.

Table 5.20 Number and Percentage of Deaths from Transportation Accidents by Age Group, 1996-2002

| Age group (years) | 1996 | | 1997 | | 1998 | | 1999 | | 2000 | | 2001 | | 2002 | |
|----------------------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|--------|---------|
| | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent | Number | Percent |
| 0-4 | 29 | 1.7 | 175 | 1.3 | 210 | 2.6 | 254 | 2.2 | 287 | 2.2 | 243 | 1.9 | 205 | 1.5 |
| 5-9 | 389 | 2.3 | 227 | 1.8 | 146 | 1.8 | 261 | 2.2 | 287 | 2.2 | 256 | 2.0 | 214 | 1.6 |
| 10-14 | 599 | 3.6 | 392 | 3.0 | 237 | 3.0 | 300 | 2.6 | 387 | 2.9 | 356 | 2.7 | 428 | 3.2 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 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 |
| 45-49 | 870 | 5.2 | 750 | 5.8 | 488 | 6.1 | 785 | 6.8 | 884 | 6.7 | 912 | 7.0 | 903 | 6.7 |
| 50-54 | 594 | 3.6 | 484 | 3.7 | 329 | 4.1 | 561 | 4.8 | 638 | 4.8 | 650 | 5.0 | 697 | 5.2 |
| 55-59 | 546 | 3.3 | 468 | 3.6 | 320 | 4.0 | 444 | 3.8 | 507 | 3.8 | 463 | 3.6 | 488 | 3.6 |
| 60-64 | 421 | 2.5 | 371 | 2.9 | 287 | 3.6 | 392 | 3.4 | 448 | 3.4 | 450 | 3.5 | 408 | 3.0 |
| 65-69 | 304 | 1.8 | 209 | 1.6 | 205 | 2.6 | 283 | 2.4 | 352 | 2.7 | 341 | 2.6 | 355 | 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 |
| 75-79 | 112 | 0.6 | 67 | 0.5 | 66 | 0.8 | 83 | 0.7 | 135 | 1.0 | 124 | 1.0 | 139 | 1.0 |
| 80-84 | 39 | 0.2 | 37 | 0.3 | 22 | 0.3 | 56 | 0.5 | 59 | 0.5 | 65 | 0.5 | 56 | 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 |

Source: Bureau of Registration Administration, Department of Local Administration, Ministry of Interior.

Figure 5.35 Proportion of Deaths from Transportation Accidents by Sex, 1996-2002



Source: Bureau of Registration Administration, Department of Local Administration, Ministry of Interior.

Table 5.21 Correlation between the Number of Accidents and Overall Automobile Sales, 1990-2002

| Year | Number of accidents ⁽¹⁾ (cases) | Number of automobiles sold ⁽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% |

Note: Correlation coefficient = 0.630

Source: (1) Royal Thai Police.

(2) Krungthep Turakij (Bangkok Business Newspaper). Information compiled by Toyota Motors (Thailand) Co., Ltd.

Table 5.22 Estimates of Economic Losses Due to Road Traffic Accidents Undertaken by the Thailand Development Research Institute (TDRI), 1998-2000

| Year | Loss to the deceased (million baht) | Loss to the injured (million baht) | Loss to property (million baht) | Total loss (million baht) |
|------|--|---------------------------------------|------------------------------------|------------------------------|
| 1998 | 79,766 | 38,409 | 1,380 | 119,555 |
| 1999 | 78,501 | 36,580 | 1,346 | 116,427 |
| 2000 | 78,162 | 35,933 | 1,242 | 115,337 |

Source: Analysis of Causes of Road Traffic Accidents Project. Office of Transport and Traffic Policy and Planning, Ministry of Transport.

A study on road traffic accidents nationwide has revealed that motorcycles, pickups/vans, personal passenger cars and bicycles/tricycles are the leading causes of injuries and deaths, compared with other types of vehicles. In regard to accident severity, the major vehicle categories that caused fatal accidents in 2001-2002 were personal passenger cars, pickups/vans and motorcycles (Table 5.23).

Table 5.23 Numbers and Rates of Injuries and Deaths from Road Traffic Accidents by Type of Vehicles, 1997-2002

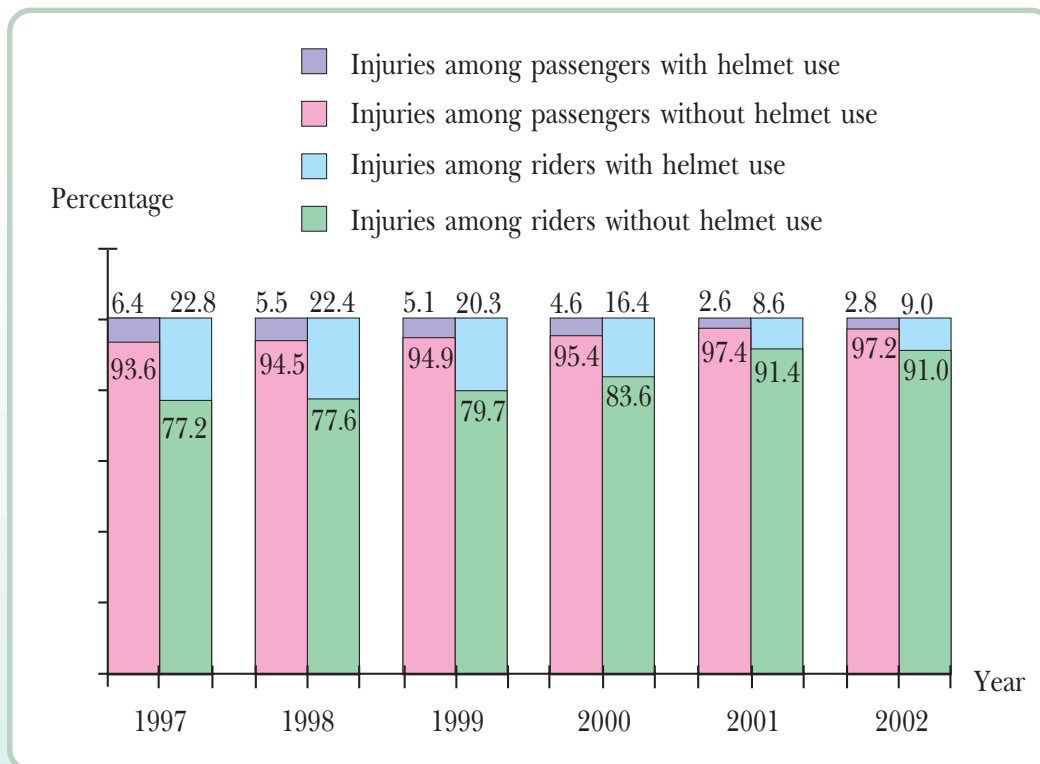
| Type of vehicles | 1997 | | | 1998 | | | 1999 | | | 2000 | | | 2001 | | | 2002 | | |
|------------------------------|---------------|--------------|----------------|---------------|--------------|----------------|---------------|--------------|----------------|----------------|--------------|----------------|---------------|--------------|----------------|---------------|--------------|----------------|
| | 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 |
| 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 |
| Three-wheeled 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 |
| Personal 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 |
| 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 |
| Trucks (6 wheels 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 |
| 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 |
| Transport pickups | 497 | 20 | 4.6 | 317 | 8 | 2.5 | 411 | 13 | 3.2 | 738 | 19 | 2.6 | 186 | 9 | 4.8 | 270 | 20 | 7.4 |
| 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 |
| 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 |
| Thai 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 |
| 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 |

Source: Report on Injury Surveillance in Thailand. Bureau of Epidemiology, Department of Disease Control.

Note: Data for 2001-2002 include only severely injured cases (injuries/deaths before reaching hospital, deaths in emergency rooms, and injuries cases admitted/hospitalized for observation or treatment only).

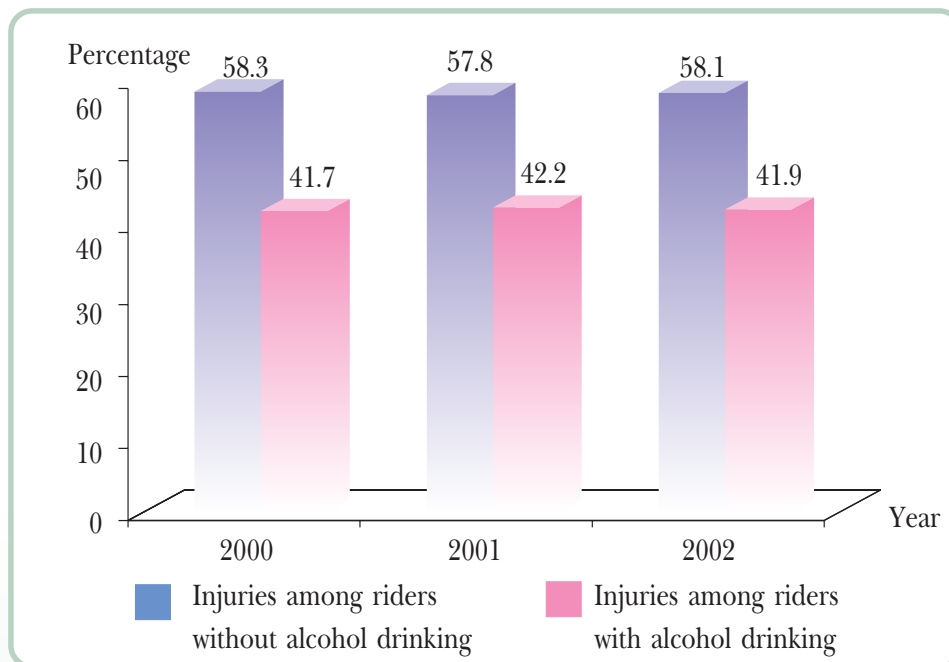
Even though the Royal Decree on Anti-crash Helmets has been in effect in all provinces throughout the country since 1 January 1996, the data from the injury surveillance system have shown that motorcycle riders/passengers who do not wear helmets are 90% more likely to have accident injuries than those who wear helmets (Figure 5.36); and nearly half of those accident victims have drunk alcohol before riding (Figure 5.37).

Figure 5.36 Proportion of Injuries among Motorcycle Riders and Passengers with and without Helmet Use, 1997-2002



Source: Report on Injury Surveillance in Thailand. Bureau of Epidemiology, Department of Disease Control.

Figure 5.37 Proportion of Severe Injuries among Motorcycle Riders with and without Alcohol Drinking, 2000-2002

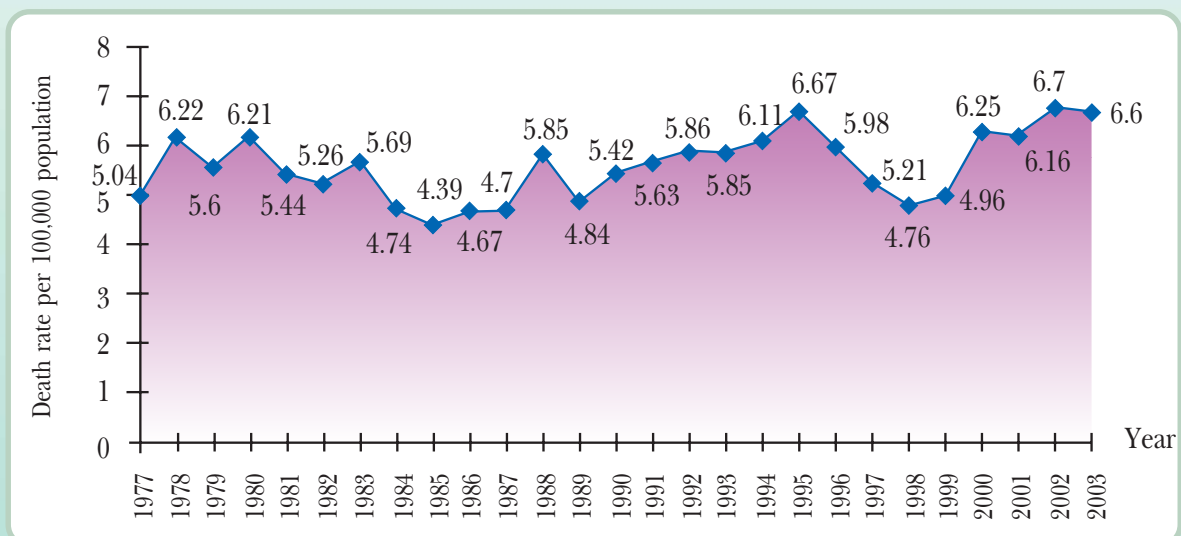


Source: Report on Injury Surveillance in Thailand. Bureau of Epidemiology, Department of Disease Control.

(2) Water-Related Accidents: Drowning and Falling into the Water

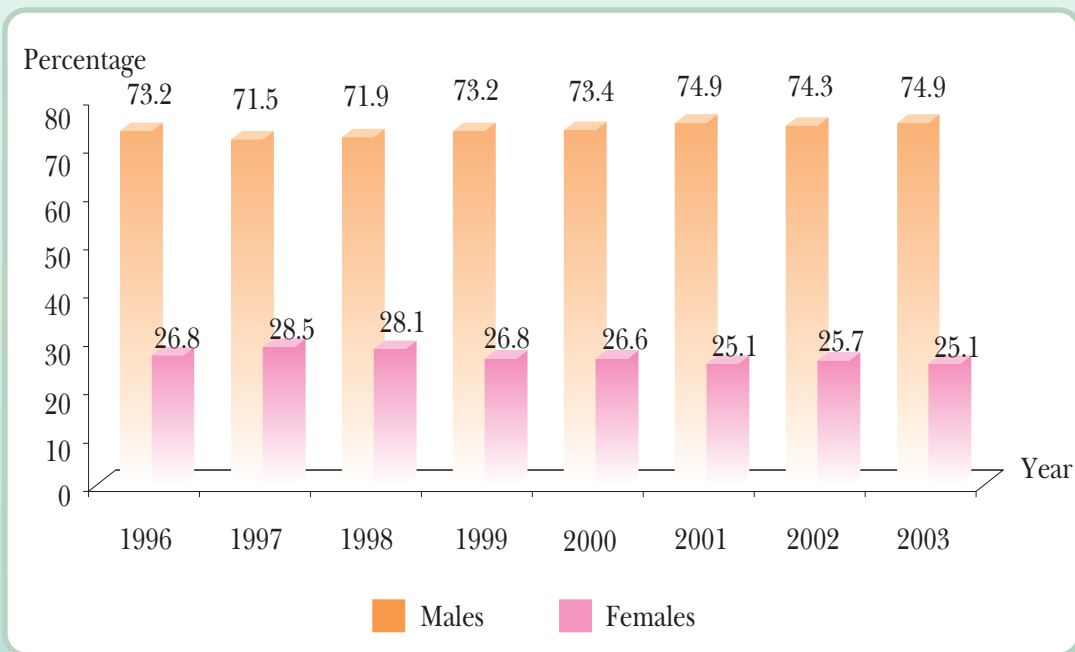
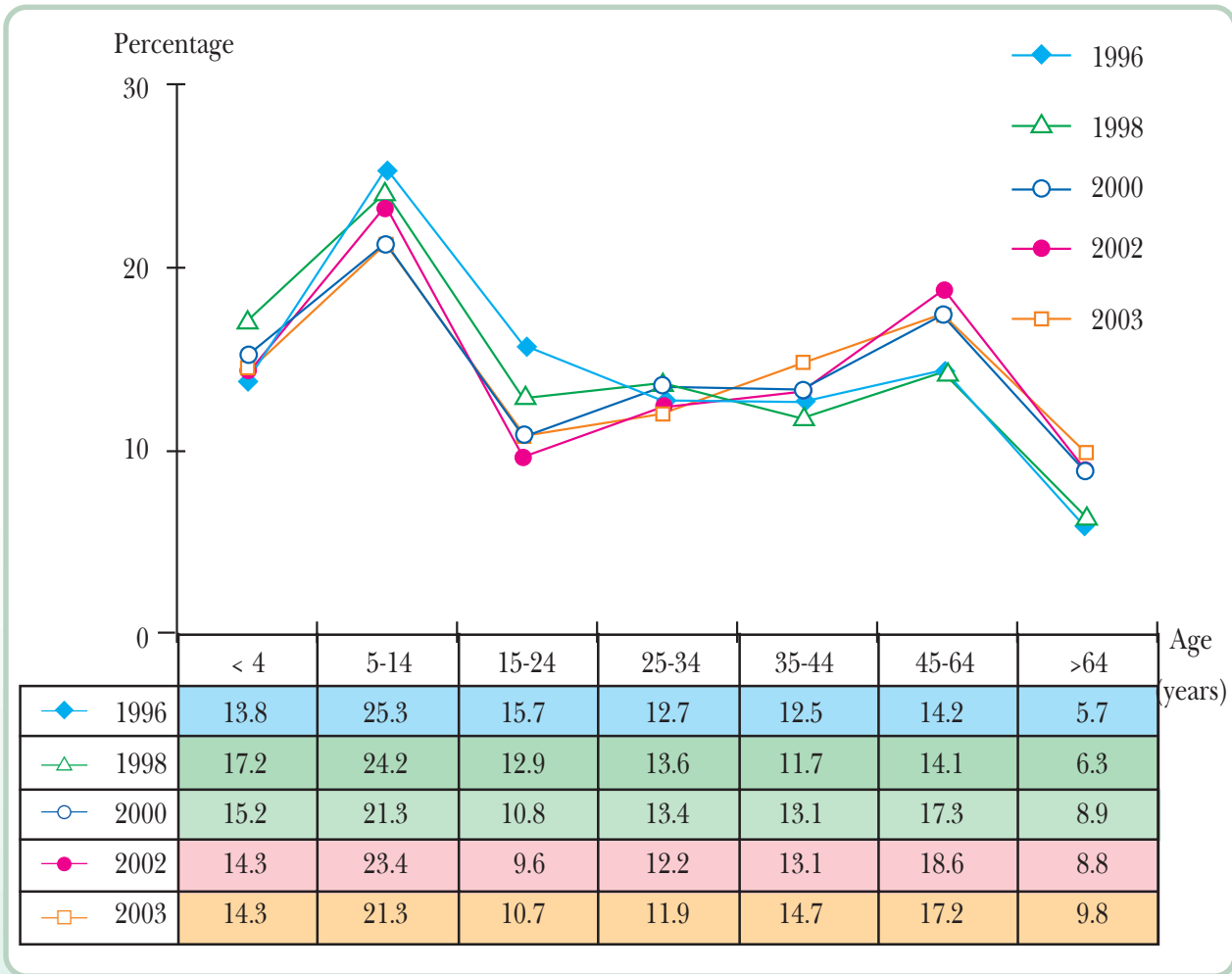
Water-related accidents are an important problem that has not received adequate attention as expected, compared to the problem of road traffic accidents. During 1977-2003, the rate of deaths from drowning and falling into the water was 4.4-6.7 cases per 100,000 population (Figure 5.38). An epidemiological analysis of water-related accidents in Thailand during the period 1996-2003 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 5.39). This might result from their lack of experience in playing safely in the water and thus being less capable of helping themselves.

Figure 5.38 Rate of Deaths from Accidental Drowning in Thailand, 1977-2003



Source: Bureau of Policy and Strategy, Ministry of Public Health

Figure 5.39 Number and Percentage of Reported Deaths from Accidental Drowning by Age and Gender in Thailand, 1996-2003



Source: Mortality Report. Bureau of Policy and Strategy, Ministry of Public Health.

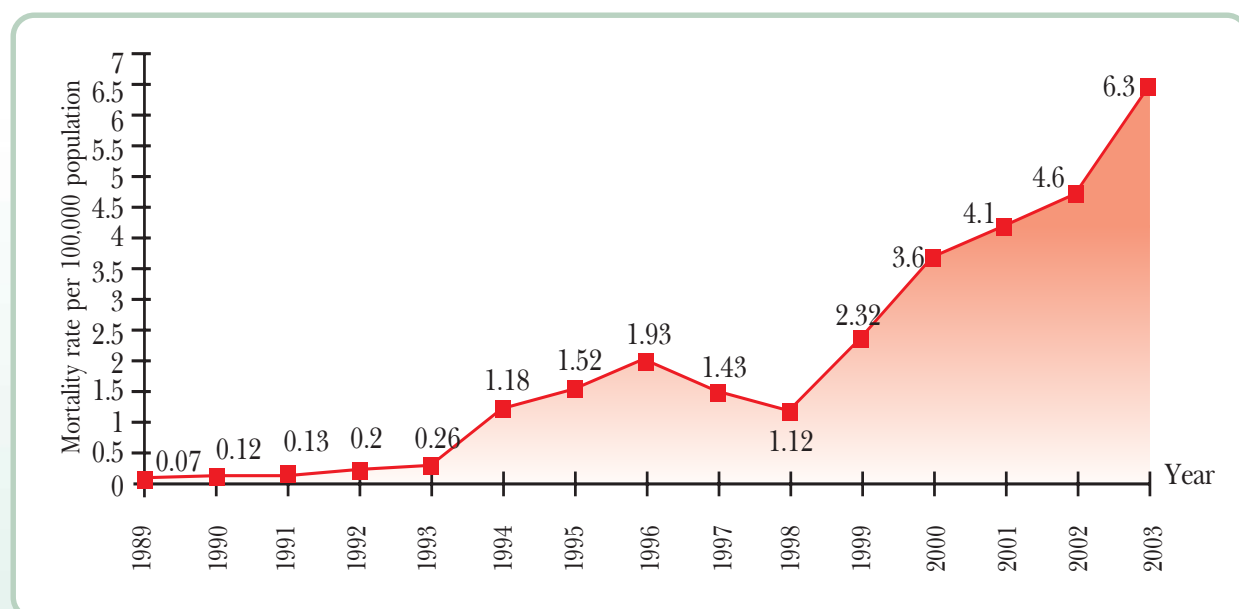
3.4.6 Diseases Associated with Behaviours and Lifestyles

(1) Tobacco Use

There has been a rising trend in the prevalence of diseases evidently caused by smoking, including emphysema, coronary atherosclerosis, chronic obstructive pulmonary disease, and lung cancer, as follows.

(1.1) Emphysema. The prevalence of emphysema has risen from 0.07% in 1989 to 6.3% in 2003 (Figure 5.40).

Figure 5.40 Rate of Mortality Due to Emphysema, 1989-2003



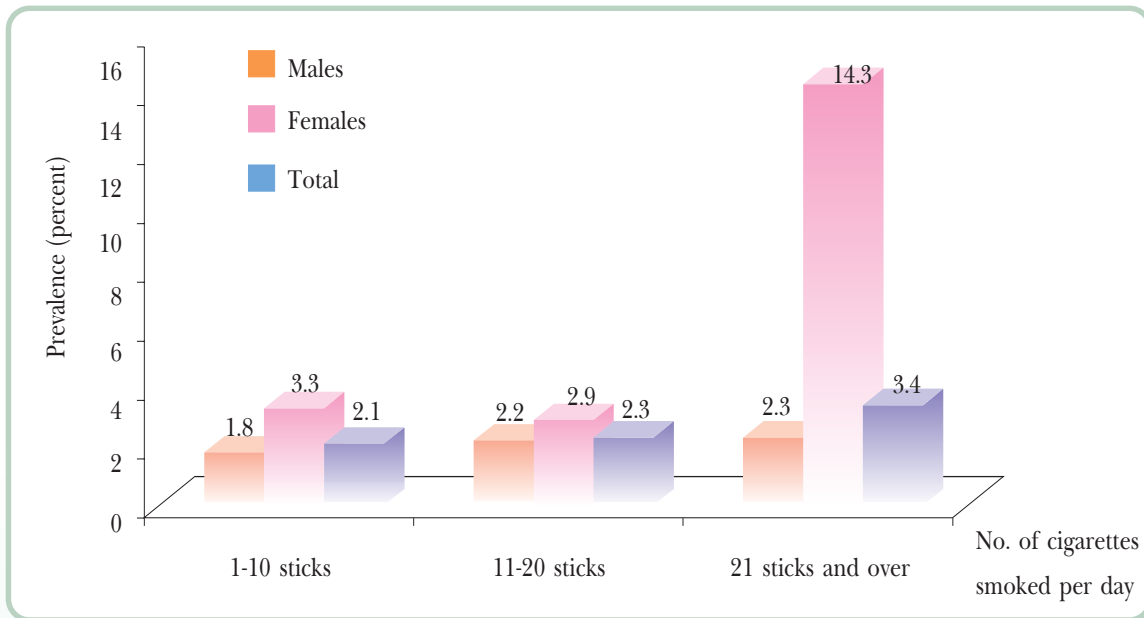
Source: Bureau of Policy and Strategy, Ministry of Public Health.

(1.2) 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 5.41). By 2010, it has been estimated that the prevalence of COPD would be 7,035 per 100,000 population¹⁵ (Figure 5.42).

A projection of the number of COPD patients showed that 1.5% of the population aged over 15 were COPD identified. In brief, the longer the time of tobacco exposure, the greater the likelihood of COPD to develop (Figure 5.44). There is a great deal of evidence reporting such an association. In 2010, tobacco consumption is projected to result in a COPD prevalence of 7,035 per 100,000 population in Thailand¹⁵ (Figure 5.45).

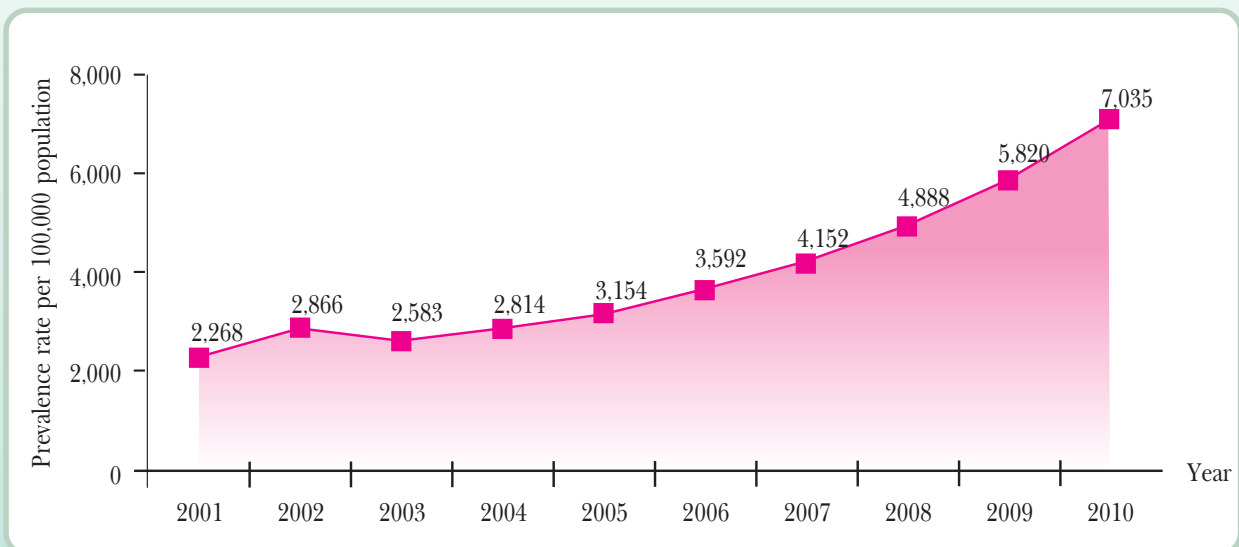
¹⁵ The projection was based on the assumption that in the next 10 years the smoking rate will decrease each year by 0.42% among males and 0.16% among females.

Figure 5.41 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 and 2nd round in 1996.

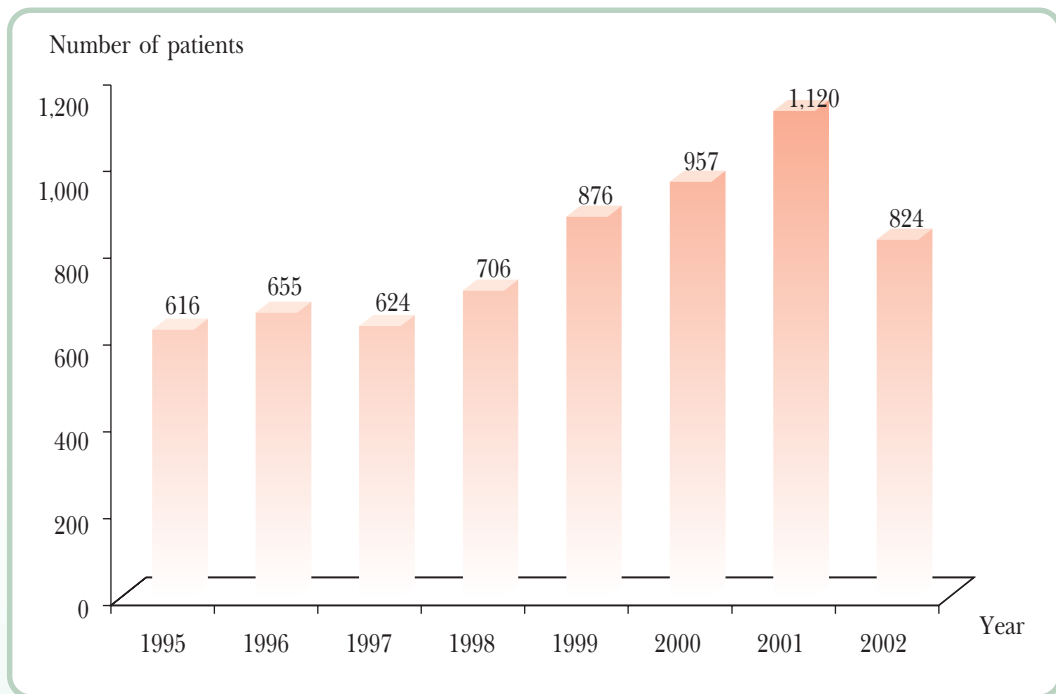
Figure 5.42 Projection of Chronic Obstructive Pulmonary Disease Prevalence, Thailand, 2001- 2010



Source: Sawang Saenghiranwattana. Chronic Obstructive Pulmonary Disease: Current Situation and Trends, 1999.

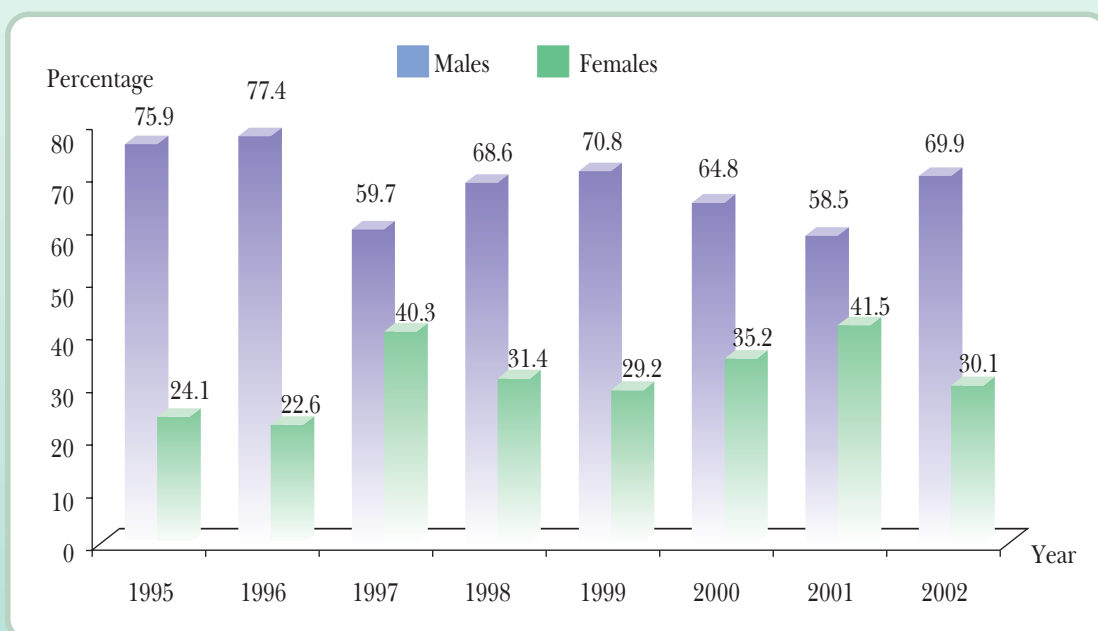
(1.3) Coronary atherosclerosis. This disease has a rising trend, trend, especially among females (Figures 5.43 and 5.44). In addition to tobacco use, such a disease results from physical inactivity, hyperlipidaemia and overweight.

Figure 5.43 Number of Patients with Coronary Atherosclerosis Treated at the Cardiology Institute, 1995-2002



Source: Institute of Cardiology, Ministry of Public Health.

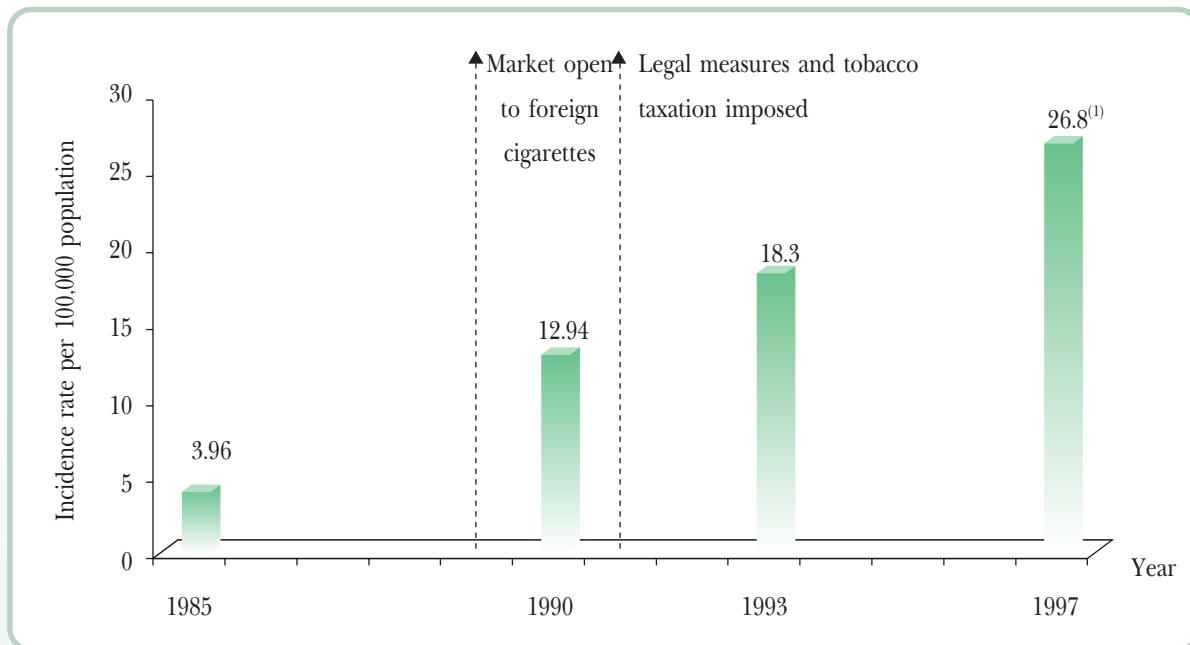
Figure 5.44 Proportion of Patients with Coronary Atherosclerosis Undergoing Surgery at the Cardiology Institute by Sex, 1995-2002



Source: Institute of Cardiology, Ministry of Public Health.

(1.4) Lung cancer. Between 1985 and 1997 the prevalence of lung cancer increased sevenfold, i.e. from 3.96 to 26.8 per 100,000 population. The rise is expected to be associated with tobacco consumption and air pollution (Figure 5.45).

Figure 5.45 Incidence Rate of Lung Cancer, Thailand, 1985-1997

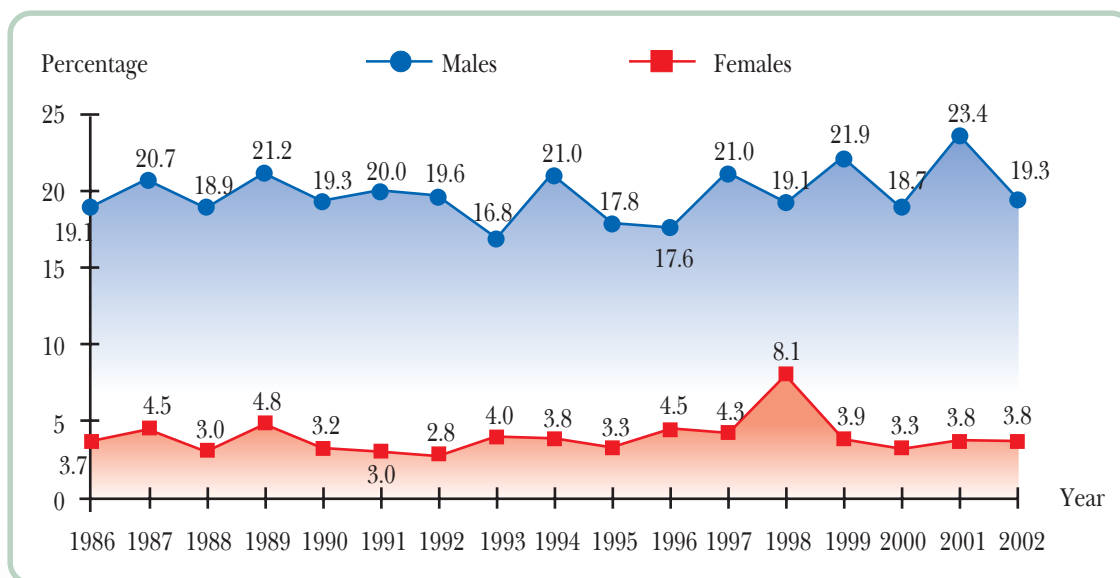


Source: National Cancer Institute, Ministry of Public Health.

Note: ⁽¹⁾ Lung cancer in males.

A report on lung cancer patients treated at the National Cancer Institute during 1986-2002 revealed that 16-23% were males, 3-8 times higher than in females (Figure 5.46).

Figure 5.46 Percentage of Lung Cancer Patients Treated at the National Cancer Institute, 1986-2002



Source: National Cancer Institute, Ministry of Public Health.

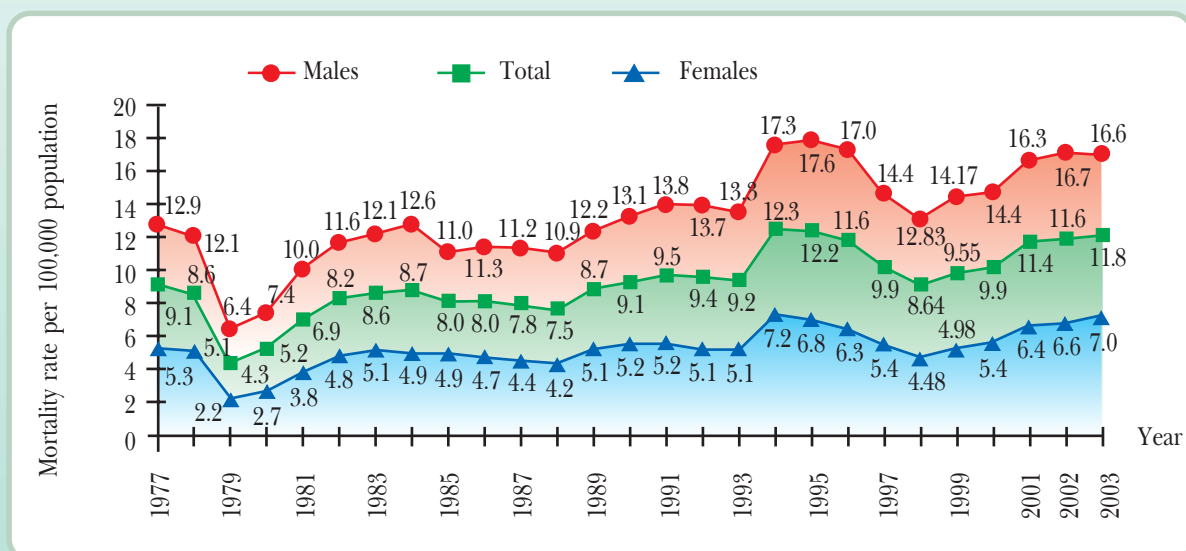
Note: As percentage of all cancer patients.

(2) Alcohol Consumption

Major health hazards caused by or associated with alcohol drinking (alcohol use disorders) are cirrhosis and accidents.

Consumption of alcohol for a long time negatively affects the liver as it has been found that, between 1977 and 2003, the mortality rates of liver disease and chronic cirrhosis were reported at 4.3-12.3 per 100,000 population, the rates being 6-18 in males and 2-7 in females, i.e. 2-3 times higher in males than in females (Figure 5.47). However, the trend in cirrhosis resulting from hepatitis B virus is declining (Figure 5.15).

Figure 5.47 Mortality Rate of Liver Disease and Cirrhosis, Thailand, 1977-2003



Source: Bureau of Policy and Strategy, Ministry of Public Health.

(3) Food and Drug Consumption

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, particularly diarrhoea whose incidence tends to be rising (Figure 5.21). Eating of improperly heated food, especially fresh-water fish, might cause opisthorchiasis or liver fluke disease (Figure 5.10) which is a major cause of liver cancer (Table 5.24). It has been noted that Thailand has the highest incidence of liver cancer in the world.¹⁶

Table 5.24 Incidence of Liver Cancer Thailand, 1993, 1996 and 1999

| Year | Incidence per 100,000 population | |
|------|----------------------------------|---------|
| | Males | Females |
| 1993 | 37.4 | 15.5 |
| 1996 | 40.5 | 16.0 |
| 1999 | 38.6 | 14.3 |

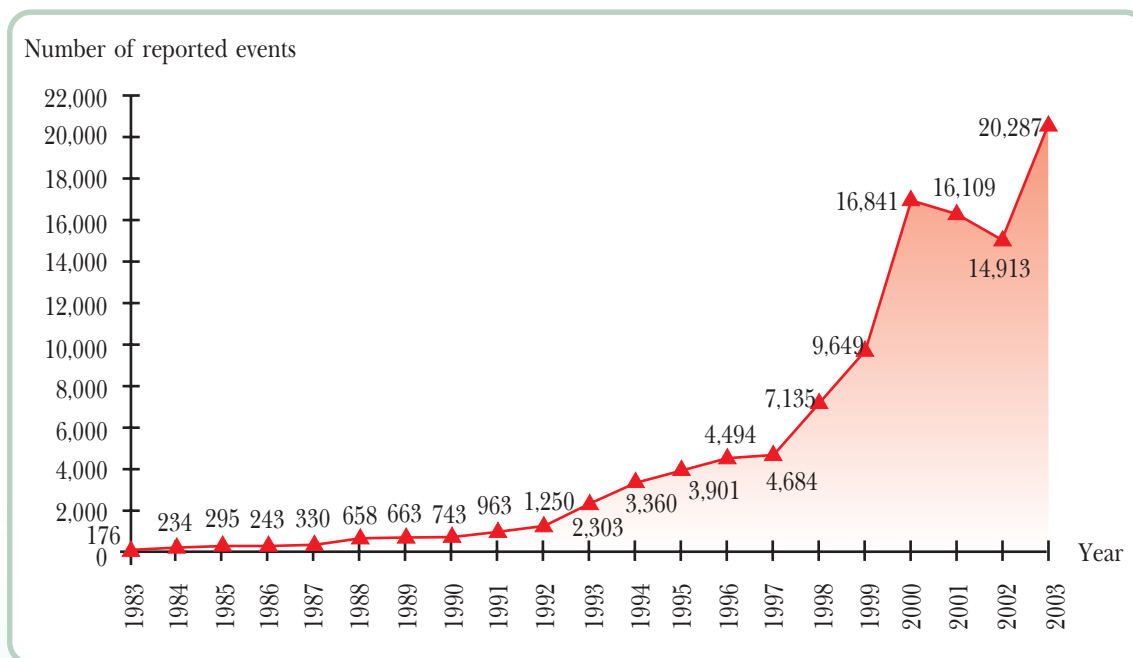
Source: Cancer in Thailand, 1995-2000.

Regarding drug consumption, irrational use, over-use or use without sufficient knowledge seems to be rising, resulting in adverse toxic or allergic reactions directly or indirectly. This is evidenced from the number of reported adverse events from drug use which has risen from 176 in 1983 to 4,684 in 1997 and 20,287 in 2003 (Figure 5.48). Besides, it has been found that each year 18-30 % of all patients have to be hospitalized due to problems related to drug use which tends to be rising.¹⁷

¹⁶ Vatanasapt, V., and Sriamporn, S. (1999). Cancer in Thailand 1992-1994. (IARC Technical Report No. 34), Lyon, IARC.

¹⁷ Suwit Wibulpolprasert, Vichai Chokevivat and Sripen Tantives (editors). Drug System in Thailand, 2002.

Figure 5.48 Number of Reported Adverse Events from Drug Use, 1983-2003



Source: Division of Planning and Technical Administration, Food and Drug Administration.

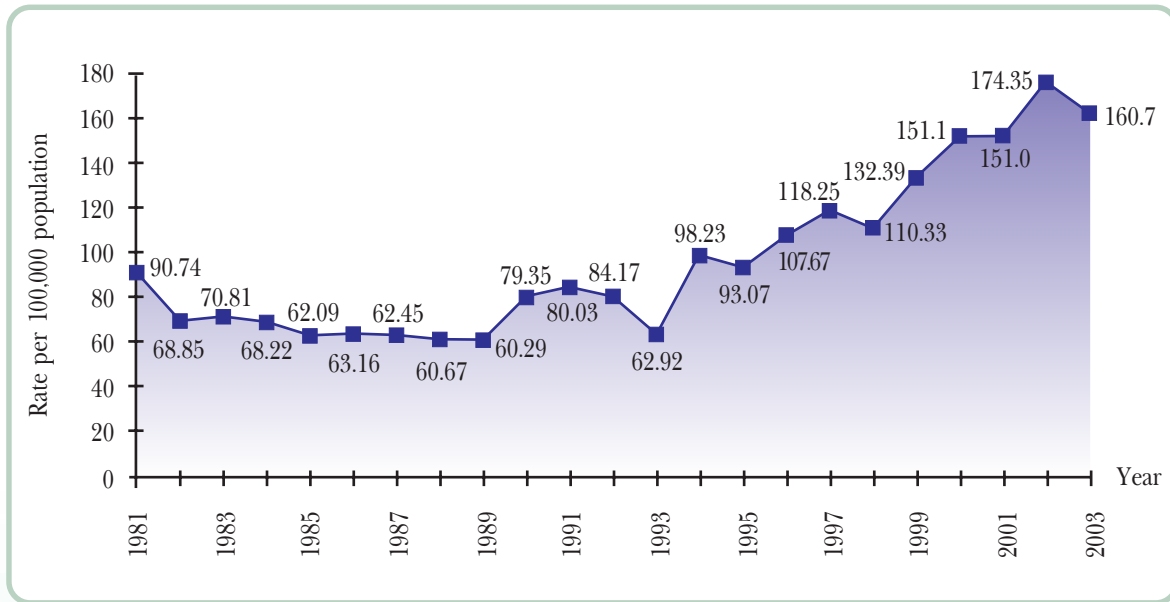
(4) Diseases Associated with Unsafe Sex Behaviours

As a result of systematic and intensive efforts for the prevention and control of STIs and HIV/AIDS, people's sexual behaviours have changed considerably. Sexual promiscuity has declined and condom use has risen, resulting in a significant drop in the STI incidence (Figure 5.20).

3.4.7 Mental Health Disorders

Rapid changes in economic, social and cultural situations have led to a rising incidence of psychoneurosis, particularly a rise in the number of institutionalized cases of mental/behavioural disorders during the period 1996-2003 (Figure 5.49). This might result from the struggling with the economic crisis; a lot of people suffering from insufficient income and unemployment (Figure 5.49).

Figure 5.49 Admission Rate with Phychosis and Mental Disorders, Thailand, 1981-2003



Source Inpatients Report. Bureau of Policy and Strategy, Ministry of Public Health.

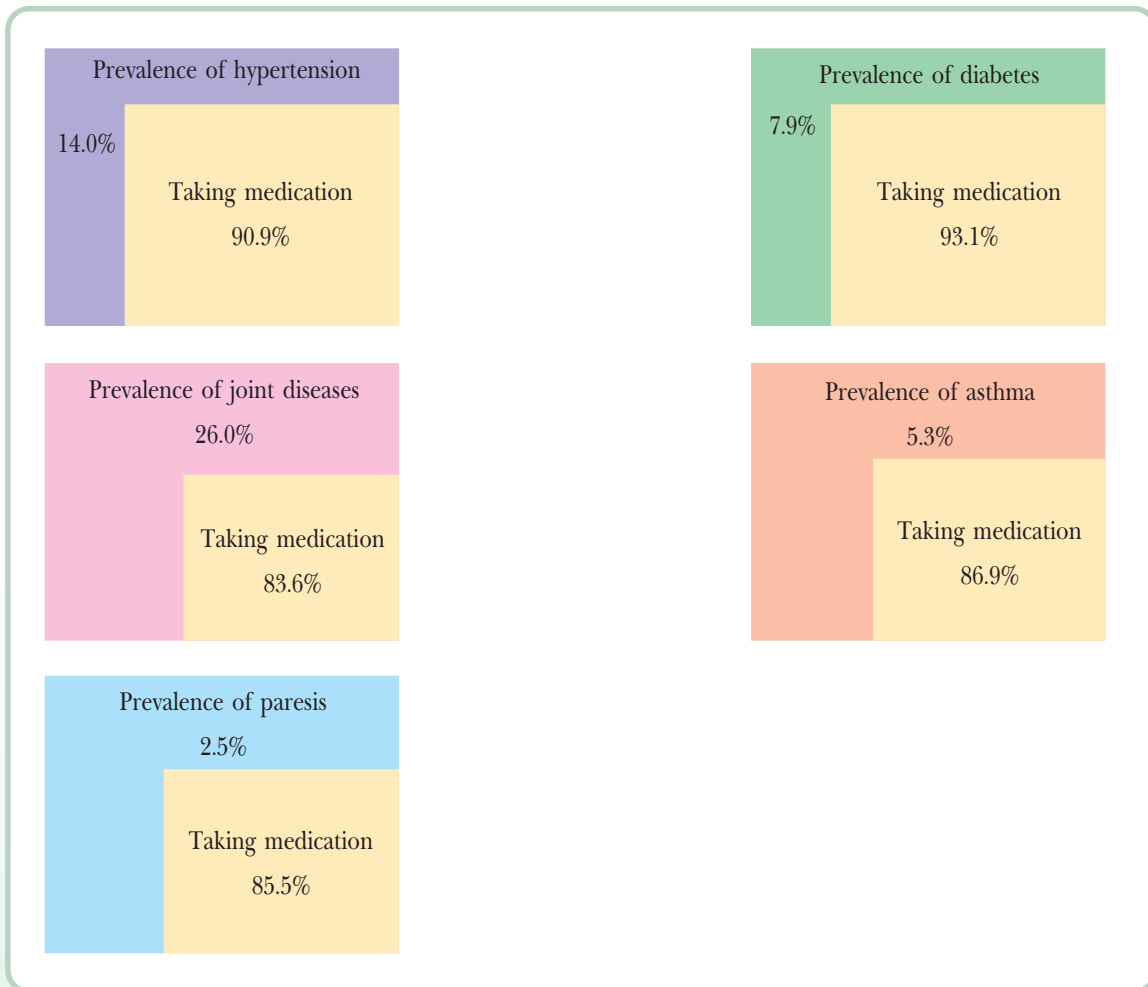
3.4.8 Health Problems of the Elderly

(1) Diseases and Disabilities 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 5.50).

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 5.25), and the prevalence is higher in females than in males (Table 5.26).

Figure 5.50 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 5.25 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 (degeneration) | 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 5.26 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 (degeneration) | 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) Rising Trends in Health Problems of the Elderly

The diseases that are health problems with rising trends are the following:

(2.1) Hypertension is a major health problem of the elderly that has a rising trend (Table 5.27) 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 losses in non-fatal health status.

Table 5.27 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:

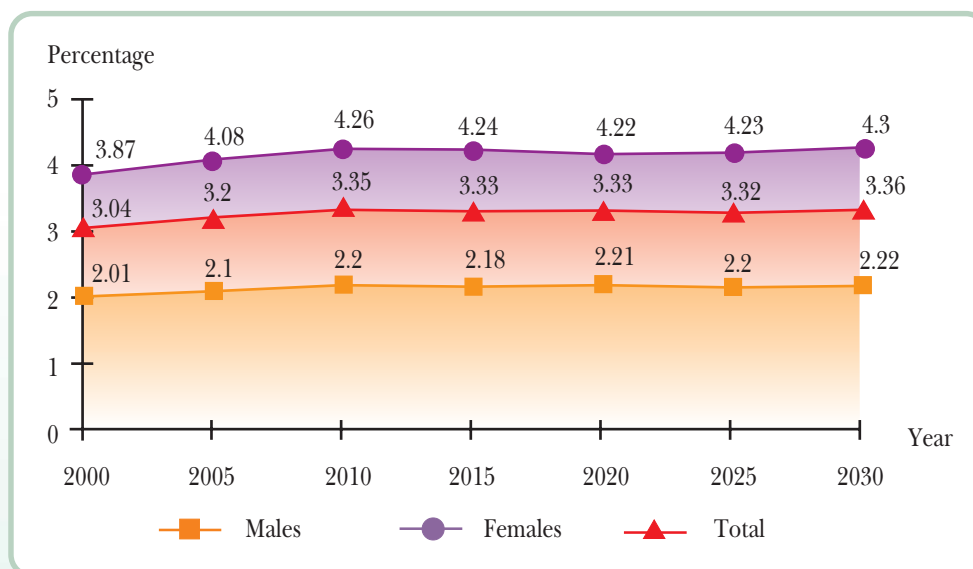
A Hypothesis Based on the Data from Studies on the Elderly, 2000.

Notes: * Criteria used only for hypertension + Age 65+ yrs.

** Criteria used only for history taking # Nationwide survey

(2.2) 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 percent in 2030. (the female to male ratio being 2:1) (Figure 5.51). Besides, the prevalence of dementia is rising with age. 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 increase rates are comparable (Table 5.28).

Figure 5.51 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 the Thai Elderly, 1998.

Table 5.28 Comparison of Dementia Prevalence among Thai and American Elders

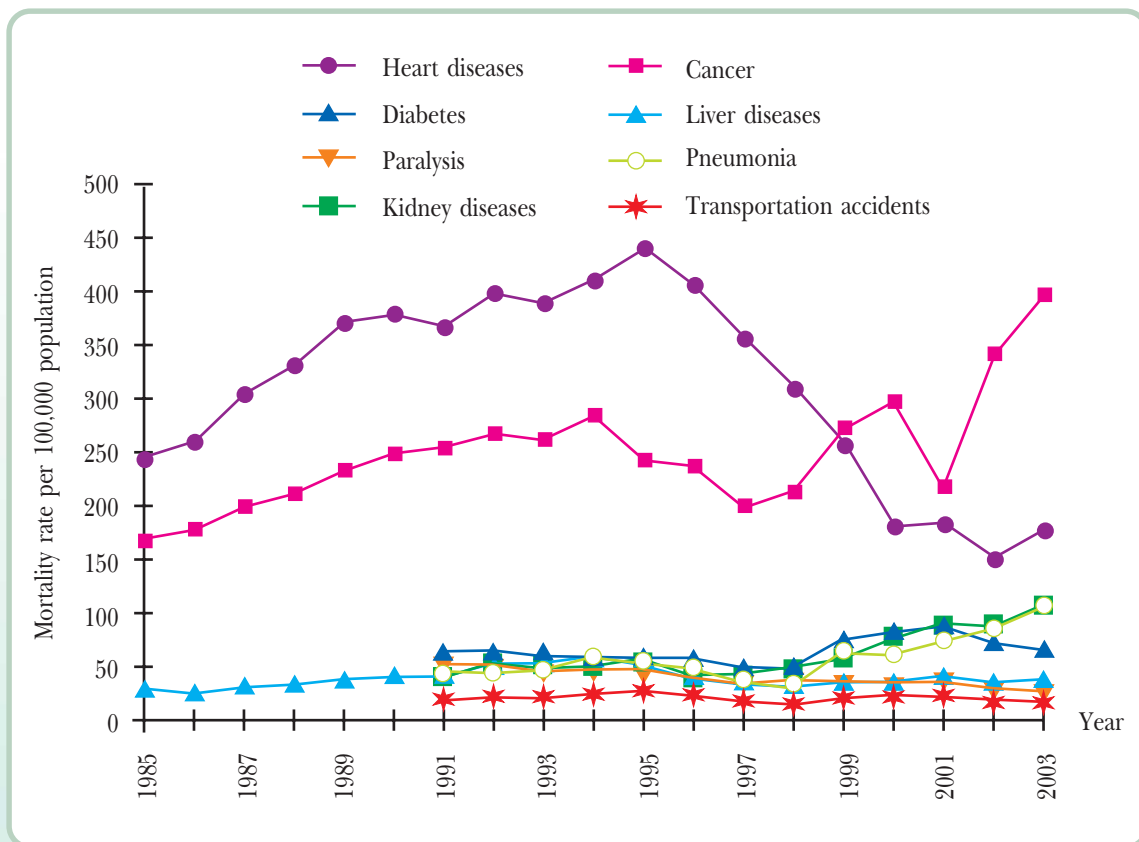
| Age (years) | Prevalence | |
|-------------|-------------|-----------------|
| | Thai elders | American elders |
| 60 - 64 | 1.0% | - |
| 65 - 69 | 2.0% | 2.5% |
| 70 - 74 | 3.0% | 5.0% |
| 75 - 79 | 5.0% | 10.0% |
| 80 - 84 | 7.5% | 15.0% |
| 85 - 89 | 12.5% | 30.0% |
| 90+ | 30.0% | - |

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, heart diseases, cancer, diabetes, liver diseases, kidney diseases, paralysis, pneumonia, and transportation accidents. The mortality rate per 100,000 population from cancer has risen from 169.1 in 1985 to 399.5 in 2003. The rates of mortality have also risen for diabetes from 28.8 to 66.7 for the same period and for kidney diseases from 38.3 in 1991 to 108.0 in 2003 (Figure 5.52 and Table 5.29).

Figure 5.52 Mortality Rates from Major Causes of Death in the Elderly, 1985-2003



Source: Bureau of Policy and Strategy, Ministry of Public Health.

Table 5.29 Mortality Rates of Diabetes, Heart Diseases, Cancer, Paralysis, Liver Diseases, Kidney Diseases, Pneumonia, and Transportation Accidents/among the Elderly, 1985-2003

| Year | Mortality rate per 100,000 population among the elderly | | | | | | | |
|------|---|----------------|--------|----------------|-----------------|-----------|-----------|--------------------------|
| | Diabetes | Heart diseases | Cancer | Liver diseases | Kidney diseases | Paralysis | Pneumonia | Transportation accidents |
| 1985 | 28.8 | 245.0 | 169.1 | 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. |
| 1987 | 30.3 | 304.3 | 199.1 | 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. |
| 1989 | 37.2 | 372.3 | 231.9 | 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. |
| 1991 | 39.9 | 386.7 | 253.9 | 62.6 | 38.3 | 49.5 | 42.0 | 16.9 |
| 1992 | 49.5 | 400.3 | 266.8 | 63.4 | 48.0 | 51.5 | 42.3 | 20.1 |
| 1993 | 50.8 | 389.7 | 262.9 | 57.1 | 45.9 | 42.4 | 45.3 | 19.5 |
| 1994 | 57.2 | 412.2 | 283.9 | 56.3 | 47.5 | 44.9 | 56.0 | 24.1 |
| 1995 | 56.2 | 440.7 | 242.1 | 52.2 | 55.3 | 45.5 | 51.0 | 26.3 |
| 1996 | 57.4 | 407.5 | 236.2 | 41.4 | 38.2 | 37.4 | 46.8 | 22.4 |
| 1997 | 48.5 | 356.1 | 199.4 | 33.1 | 40.5 | 32.0 | 33.7 | 17.1 |
| 1998 | 47.7 | 310.0 | 213.0 | 34.4 | 46.7 | 31.3 | 28.9 | 13.3 |
| 1999 | 74.8 | 257.7 | 273.7 | 34.0 | 56.1 | 32.3 | 61.1 | 18.5 |
| 2000 | 82.1 | 179.9 | 297.6 | 34.0 | 75.5 | 33.9 | 59.9 | 22.6 |
| 2001 | 88.4 | 182.2 | 218.2 | 40.6 | 89.6 | 34.8 | 73.0 | 21.5 |
| 2002 | 72.1 | 149.4 | 342.6 | 35.5 | 87.2 | 29.2 | 85.5 | 18.9 |
| 2003 | 66.7 | 177.1 | 399.5 | 38.3 | 108.0 | 26.8 | 107.4 | 16.7 |

Source: Bureau of Policy and Strategy, Ministry of Public Health.

Note: n.a. = Data not available

3.4.9 Problems of the Disabled

A survey conducted by the National Statistical Office (NSO) revealed that the proportion of people with disability was rising from 0.5% in 1974 to 1.7% in 2002 (Table 5.30). 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 prevalence¹⁸ (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.

¹⁸ 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.

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 epidemiological transition.¹⁹ 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 5.53).

Table 5.30 Number and Percentage of Thai People with Disabilities, 1974-2002

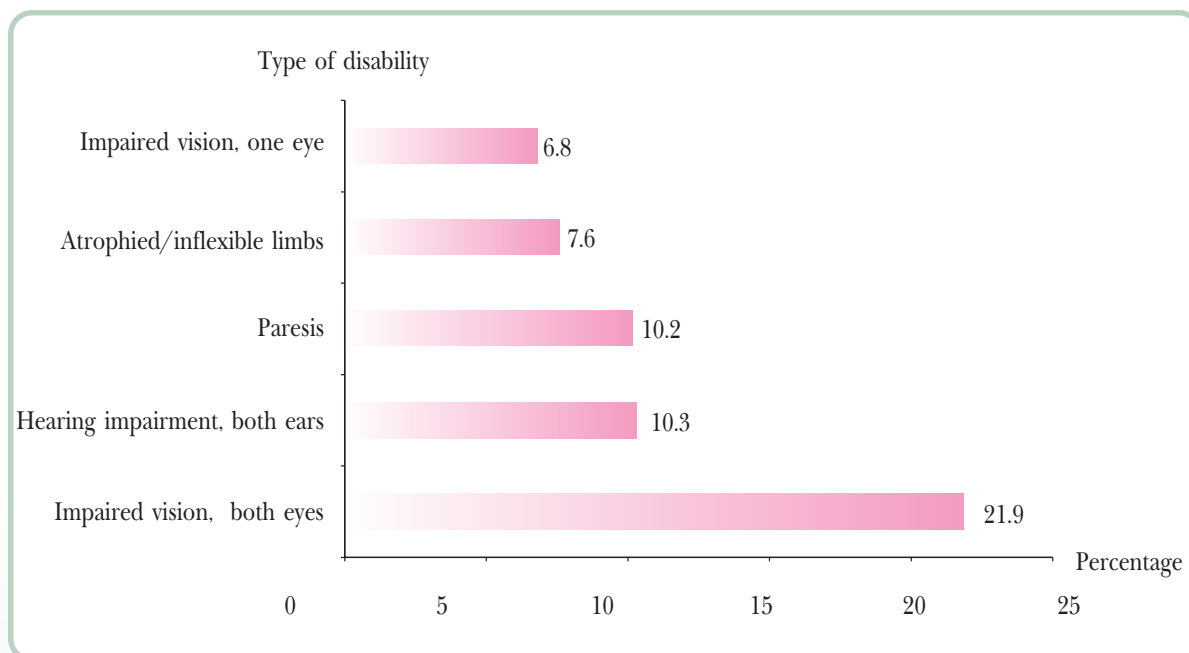
Unit: Thousands

| Year of survey | Population | People with disabilities | 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.

¹⁹ Suwit Wibulpolprasert et al. Medical Rehabilitation Service System for the Disabled, 1997.

Figure 5.53 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 coronary-artery disease was most common (22.2%), followed by diseases of the musculo-skeletal system (19.4%), diseases of the respiratory system (14.8%), and neuro-psychiatric disorders (11.8%). It is noteworthy that coronaryartery and neuro-psychiatric disorders were more common in males, whereas the diseases of the musculo-skeletal system were more common in females (Table 5.31).

Table 5.31 Proportion (Percentage) of Disabled Persons with Common Diseases or Symptoms by Sex, 2001

| Disease/symptom | Total | Males | Females |
|---------------------------------------|-------|-------|---------|
| - Coronary artery disease | 22.2 | 25.6 | 18.3 |
| - Diseases of musculo-skeletal system | 19.4 | 17.6 | 21.6 |
| - Diseases of respiratory system | 14.8 | 14.6 | 14.9 |
| - Neuro-psychiatric disorders | 11.8 | 14.1 | 9.0 |

Source: Report on Disabilities Survey, 2001, National Statistical Office.

3.5 Re-emerging Health Problems

The re-emerging public health problems include tuberculosis whose incidence is rising with HIV/AIDS, filariasis coming in with migrant workers from Myanmar, and leptospirosis.

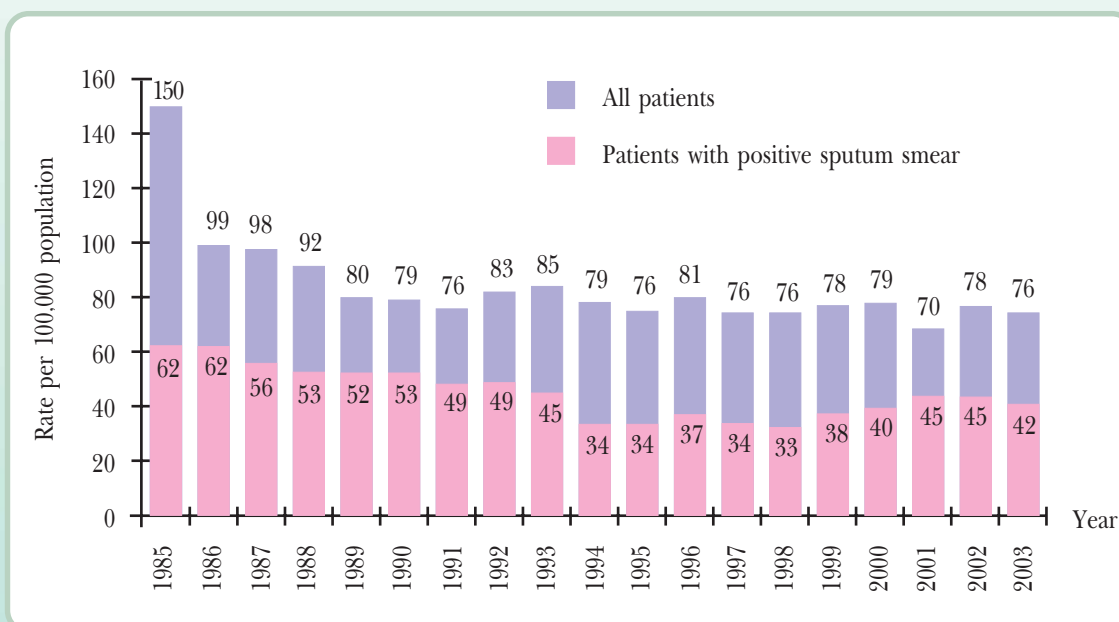
3.5.1 Tuberculosis

The tuberculosis prevalence (per 100,000 population) was actually declining between 1985 and 1989 from 150 to 80; but between 1990 and 2003 it did not decrease, rather it increased slightly (Figure 5.54).

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 3.0% in 1991 to 27.0% in 2003. Overall, for the entire country for over 10 years, the coinfection prevalence has increased from 16.4% in 1989 to 32.1% in 2003 (Figure 5.55).

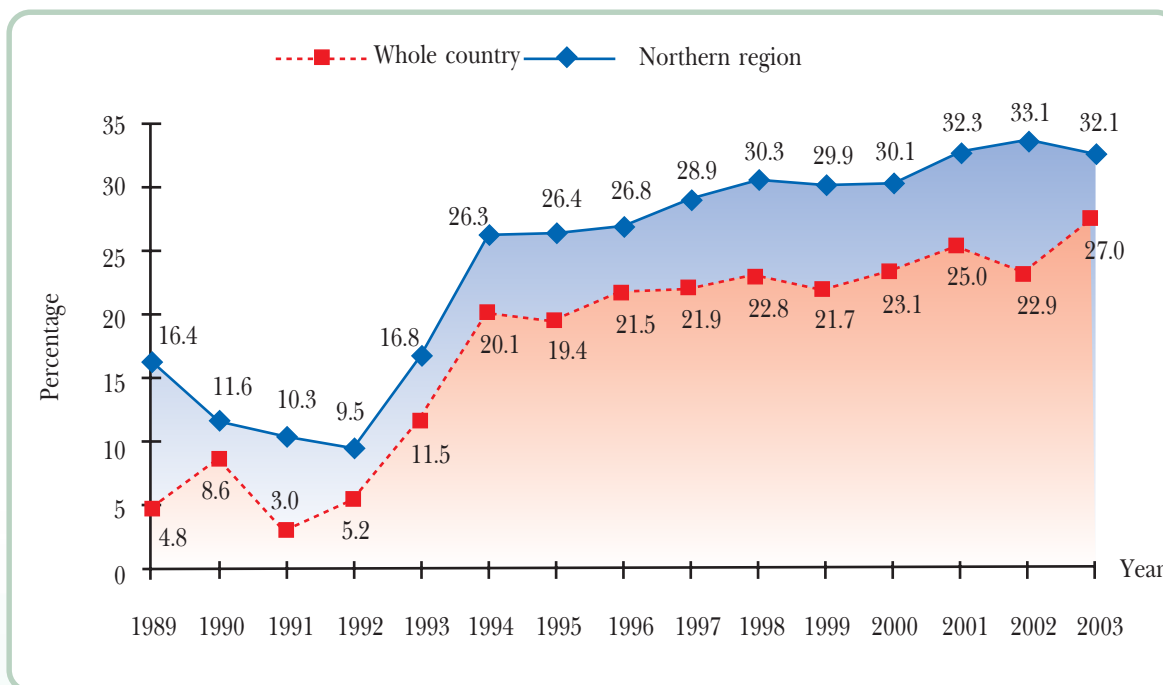
According to WHO's projections, HIV/AIDS has resulted in an annual increase of 4% of tuberculosis cases. In actuality, in Thailand the tuberculosis prevalence has risen by 3% each year during the past 5 years. And multidrug-resistant tuberculosis has dropped from 2.02% in 1997-1998 to 1.06% in 2002, which 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 5.54 Rate of Newly Registered Tuberculosis Patients in Thailand, 1985-2003



Source: Department of Disease Control, Ministry of Public Health.

Figure 5.55 Percentage of Tuberculosis Infection in HIV/AIDS Patients in Thailand, 1989-2003



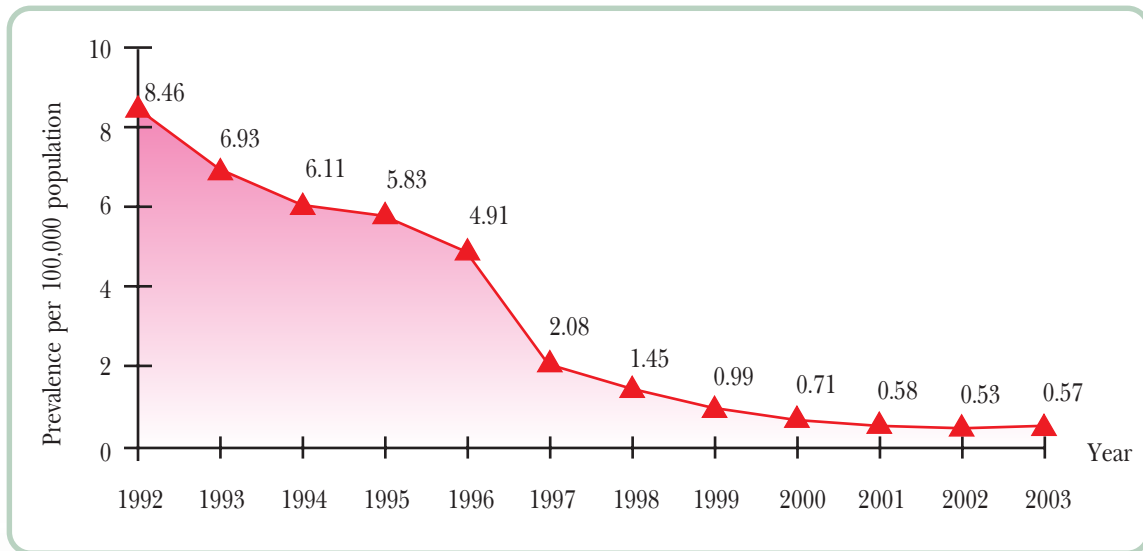
Source: Bureau of Epidemiology, Department of Disease Control.

Note: The Bureau of Epidemiology adjusted all the data for 1989-2003.

3.5.2 Filariasis

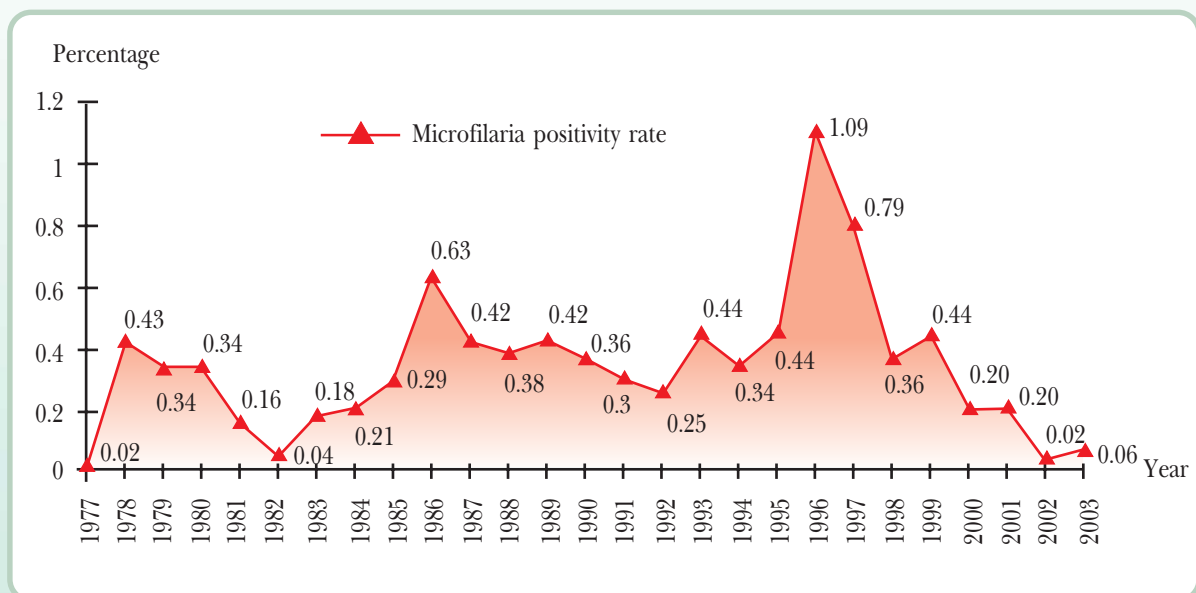
Overall, the filariasis control efforts have been able to reduce the prevalence rate (per 100,000 population) from 8.46 in 1992 to 0.57 in 2003 (Figure 5.56) and reduce the microfilaria positivity rate in alien workers to less than 1% over the past 20 years, except that in 1996 the rate was greater than 1% as a result of intensive health check-ups for foreign workers (Figure 5.57). 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 from Myanmar cross over to find jobs.

Figure 5.56 Prevalence Rate of Filariasis, Thailand, 1992-2003



Source: Department of Disease Control, Ministry of Public Health.

Figure 5.57 Microfilaria Positivity Rate in Alien Workers, 1977-2003

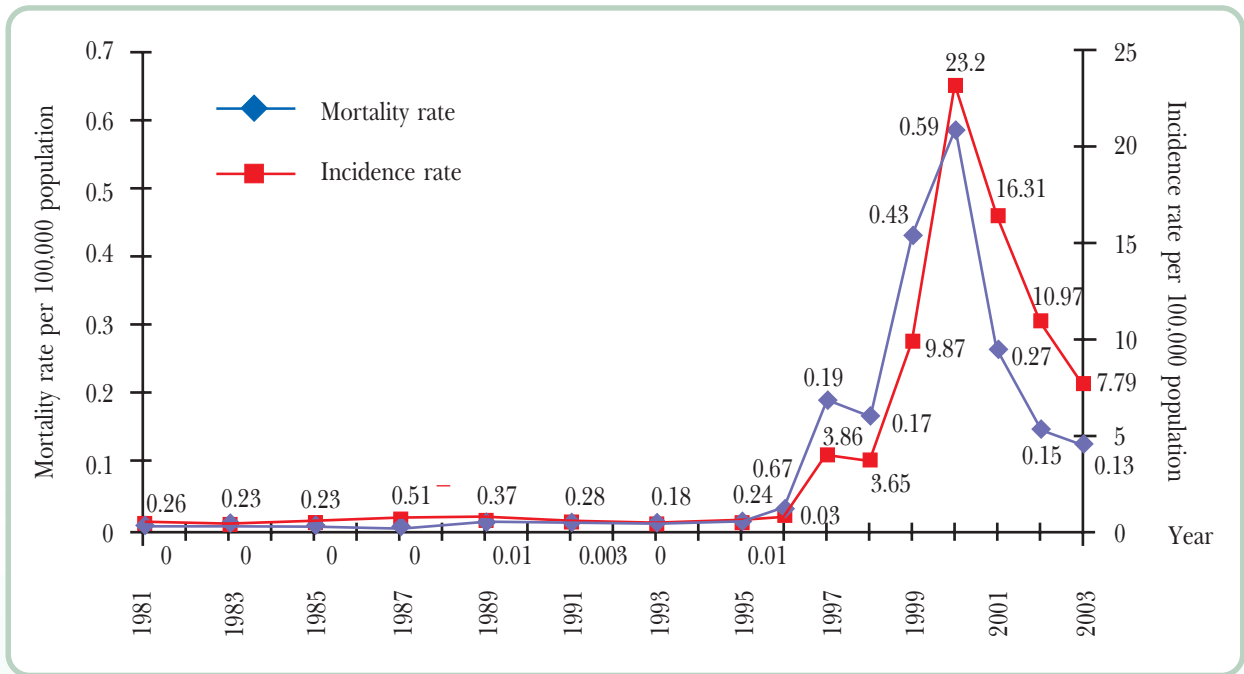


Source: Department of Disease Control, Ministry of Public Health.

3.5.3 Leptospirosis

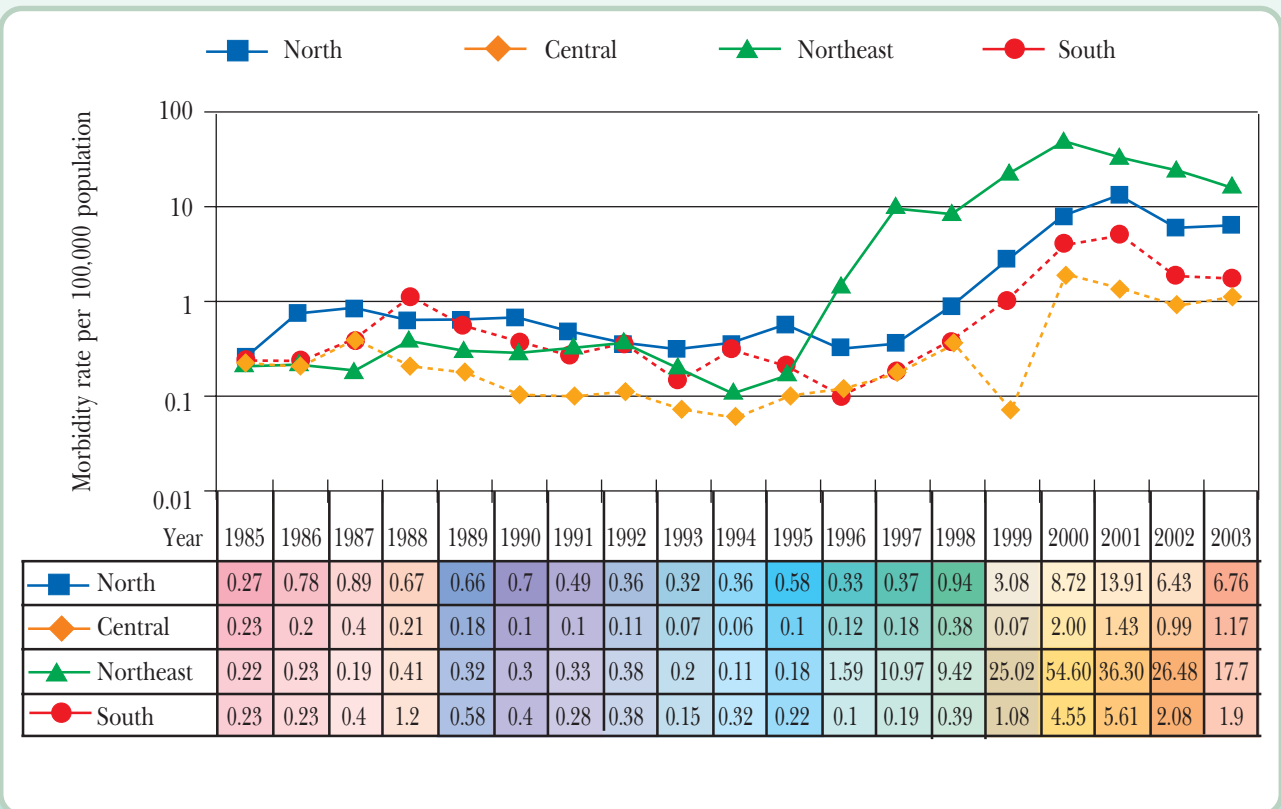
Leptospirosis is a re-emerging infectious disease having an incidence rate between 0.2 and 0.7 per 100,000 population during the period 1981-1996. But for the past four years, the incidence and mortality rates have been on the rise, i.e. the incidence per 100,000 population rising from 0.67 in 1996 to 23.2 in 2000 and the mortality rate per 100,000 population rising from 0.03 to 0.59 during the same period (Figure 5.58). Over 90% of the patients live in the Northeastern region of the country (Figure 5.59). However, for the period 2001-2003, both the incidence and mortality rates were declining.

Figure 5.58 Incidence and Mortality Rates of Leptospirosis in Thailand, 1981-2003



Source: Bureau of Epidemiology, Department of Disease Control.

Figure 5.59 Morbidity Rate of Leptospirosis by Region in Thailand, 1985-2003



Source: Bureau of Epidemiology, Department of Disease Control.

3.6 Problems of Emerging Diseases

3.6.1 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 Peoples 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.

3.6.2 Hand-Foot-Mouth Disease

Hand-foot-mouth disease is an emerging disease. Its outbreak was reported in 1977 in Malaysia, with 2,140 cases and 31 deaths; a case-fatality rate of 1.4%.

For Thailand, the first case was reported in 2000. In 2001, there were 1,548 reported cases and 3 deaths (a morbidity rate of 2.49 per 100,000 population); and in 2002, there were 3,533 cases and 2 deaths (a morbidity rate of 5.65 per 100,000 population).

Laboratory testing for enterovirus 71 conducted by the National Institute of Health of the Department of Medical Sciences in 1998-2002 revealed that enterovirus 71 could be detected in the hands and mouth of the patients. The enterovirus 71 positivity rate rose from 8% in 1998 to 14.7% in 2002. No deaths were reported (Table 5.32).

Table 5.32 Results of Enterovirus 71 Testing, 1998-2002

| Year | Enterovirus 71 testing | | |
|------|------------------------|------------------|---------|
| | Number tested (cases) | Positive (cases) | Percent |
| 1998 | 25 | 2 | 8.0 |
| 1999 | 36 | 3 | 8.3 |
| 2000 | 168 | 10 | 14.7 |
| 2001 | 397 | 81 | 20.4 |
| 2002 | 122 | 18 | 14.7 |

Source: National Institute of Health, Department of Medical Sciences, Ministry of Public Health.

3.6.3 Avian Influenza

Avian influenza has been reported in animals for over 100 years. Its outbreak occurred periodically; the last one in late 2003 though 2004 was reported in poultry in Hong Kong, South Korea, Japan, Vietnam, Cambodia, Indonesia and Thailand. The disease normally occurs in poultry, particularly chickens, and can be transmitted to humans, which can become ill and fatal. The first outbreak was reported in Hong Kong with 18 cases, 6 of whom died; then in 2003 the Netherlands reported another 83 cases and 1 death and in 2004 an outbreak was reported in Vietnam with 18 cases and 5 deaths. At present, there has been no report of human-to-human transmission of avian influenza.

In Thailand, there has never been any report on avian influenza in humans. However, it has been reported that large numbers of chickens have died in several provinces of the country. Between 21 December 2003 and 10 April 2004, cases of avian influenza were reported in several countries as shown in Table 5.33.

Table 5.33 Characteristics and Risk History of Confirmed, Suspect, Excluded, and Unidentified-Subtype Cases of Avian Influenza

| Characteristic | Confirmed cases | Suspect cases | Excluded cases | Influenza A cases, subtype unidentified |
|---|-----------------|---------------|----------------|---|
| No. of deaths (case-fatality rate) | 12/8 (67%) | 21/8 (38%) | 546/20 (4%) | 31/2 (6%) |
| Age (median, years) | 12 (2-58) | 33 (1-67) | 12 (0.5-84) | 28 (0.5-92) |
| Sex: male (%) | 8 (67%) | 15 (71%) | 321 (59%) | 21 (67%) |
| History of direct contact with poultry suspected of or dying from avian influenza | 7/12 (58%) | 11/21 (52%) | 205/423 (48%) | 14/29 (48%) |
| Residing in the area with poultry dying of unusual causes over the past 14 days | 21/21 (100%) | 18/21 (86%) | 274/404 (68%) | 18/28 (64%) |

Source: Bureau of Epidemiology, Department of Disease Control.