

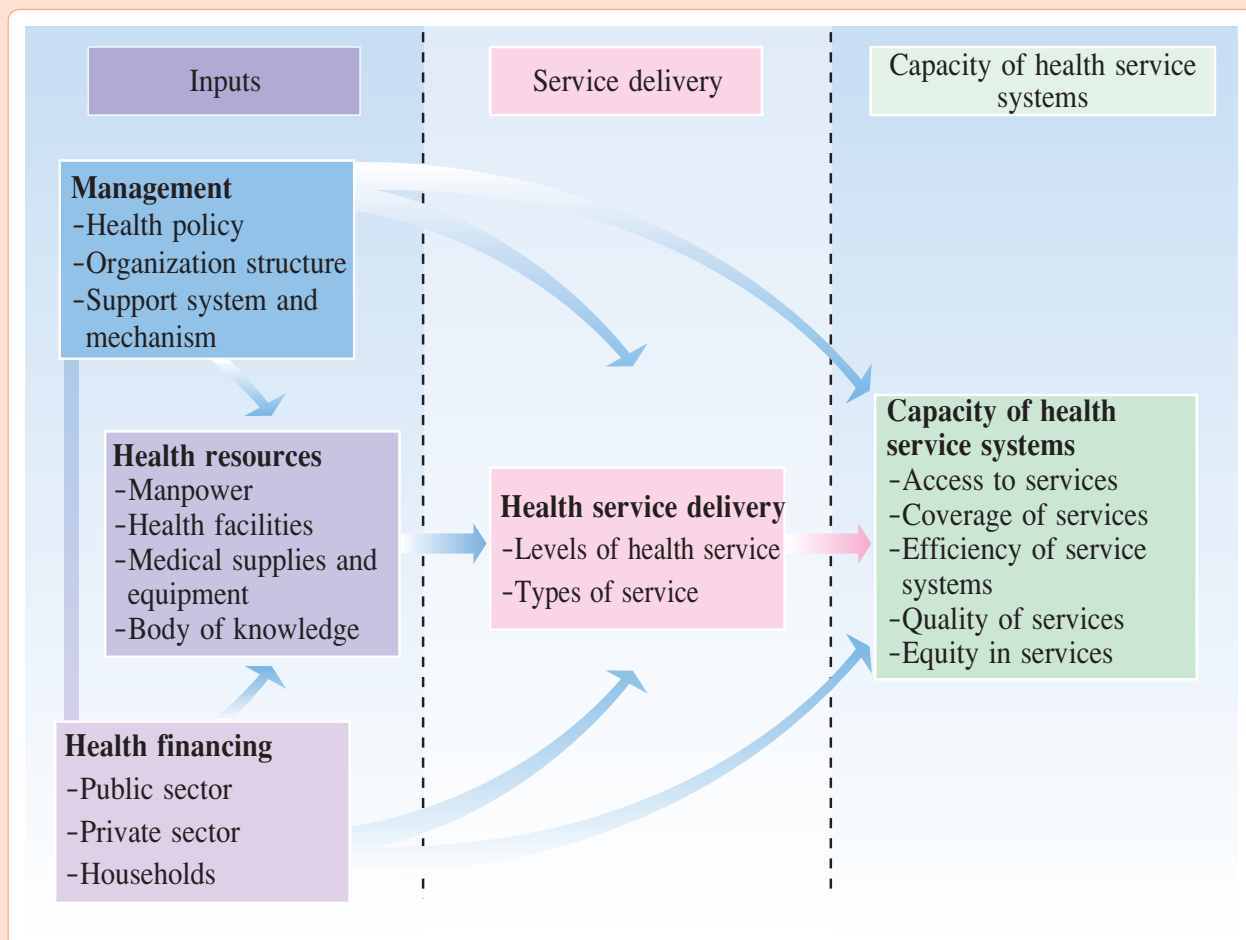


## CHAPTER 6

# HEALTH SERVICE SYSTEMS IN THAILAND

The health service systems in Thailand have continuously developed in terms of capacity building for health services, particularly the increases in health resources, including human resources for health, expansion of healthcare facilities, medical technology and equipment, and health financing. There are three major components of health service systems, namely: (1) inputs of health service systems, (2) health services delivery and (3) capacity of health service systems, which are the outputs of health service systems. The inputs include management mechanism, health resources, and health financing, which affect health service delivery and capacity of health service systems as shown in Figure 6.1

**Figure 6.1** Relationships of inputs, health service delivery and capacity of health service systems



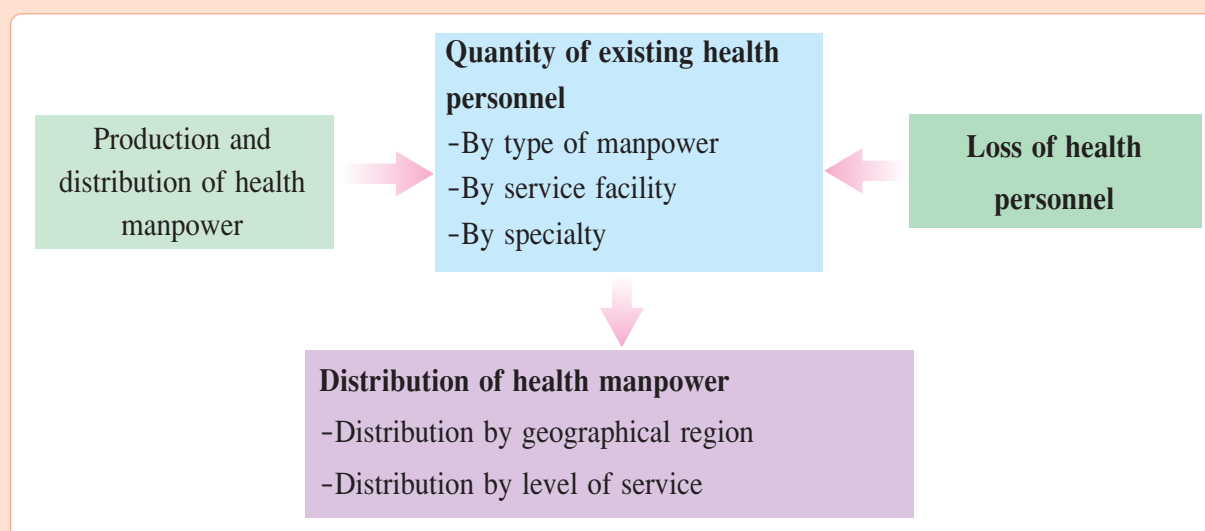
Chapter 6 deals with the information about health resources, health financing and capacity of health service systems in seven parts, i.e. (1) health manpower, (2) health facilities, (3) health technology, (4) health expenditure, (5) accessibility to health services, (6) efficiency and quality of health services delivery, and (7) equity in health services, as detailed below:

## 1. Health Manpower

Health manpower is an input that is extremely important for health service systems. The production of health personnel has been undertaken continuously, resulting in an increase in the number of health personnel and their distribution to various health facilities within and outside the MoPH. However, there are some problems in this regard, particularly the inadequacy of health personnel, compared with the suitable standard, the problem of distribution to cover all geographical areas, and the quality of personnel, which might be associated with personnel's workloads.

In analyzing the manpower situation, the following aspects are taken into consideration: quantity of existing personnel, production situation, loss situation and distribution situation, as shown in Figure 6.2.

**Figure 6.2** Aspects in the analysis of health manpower situation



### 1.1 Situation and Trends in Quantity of Health Manpower

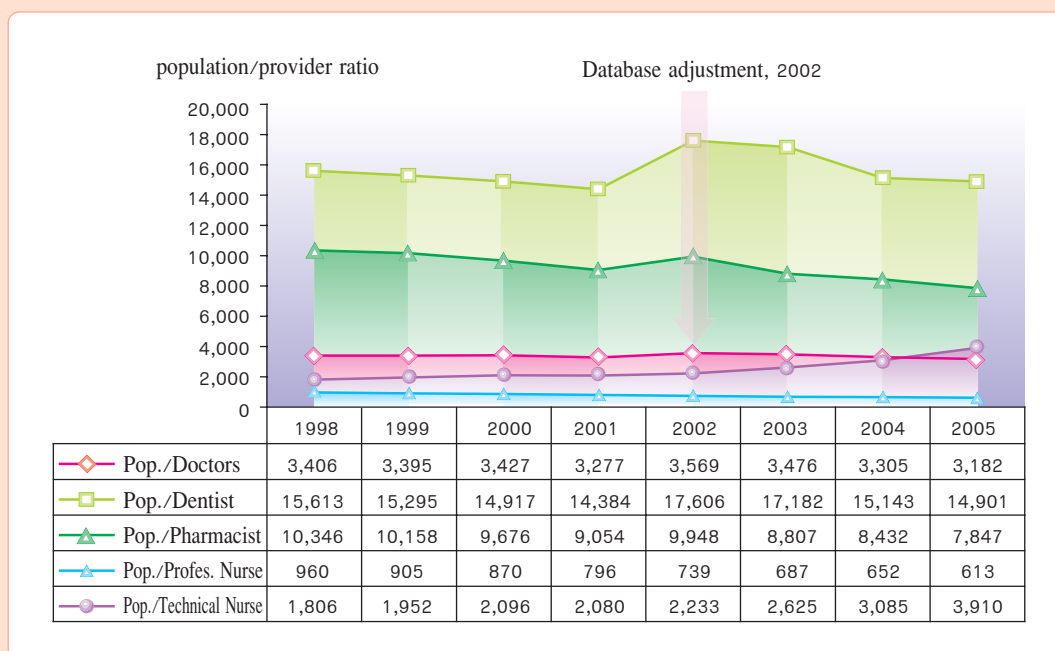
#### 1.1.1 Trends in Ratio of Population to Health Manpower by Type of Personnel

The overall situation of health manpower during the past period, using the ratio of population to healthcare provider (manpower), it was found that the trends in quantities had been improving steadily. But if considered for a short period of time from 1998 to 2005, not much change did occur (Figure 6.3).



The ratio of population to professional nurse declined while the ratio of population to technical nurse increased, partly due to changes in their status from technical nurses to professional nurses. However, some change in such trends occurred in 2002 when the population/provider ratio increased as a result of the MoPH database adjustment.

**Figure 6.3** Ratios of population to healthcare provider, 1998-2005

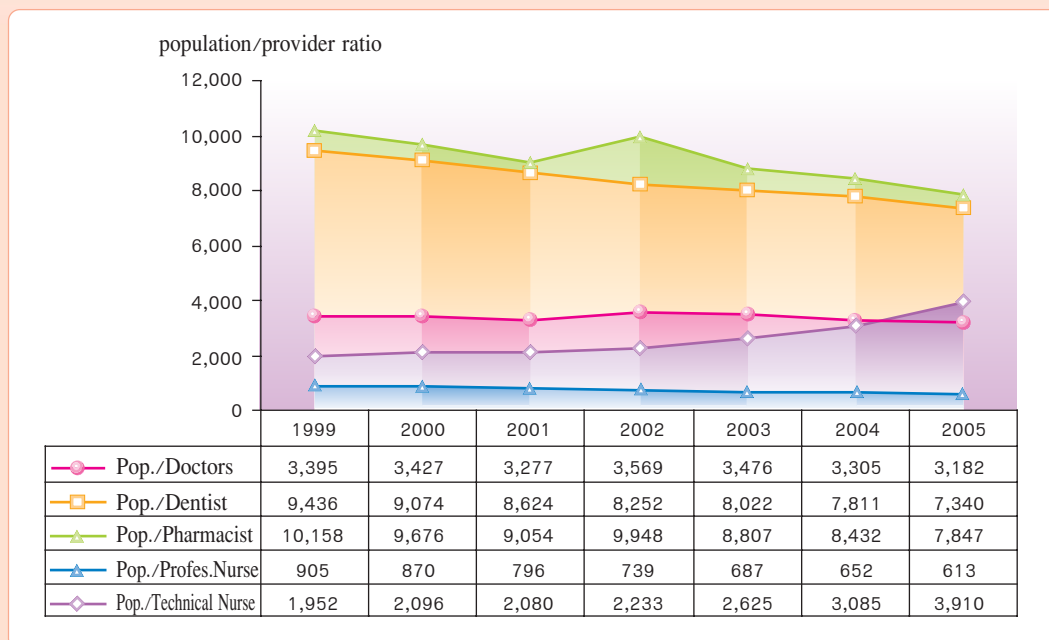


**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Data from the MoPH health resources survey might be inaccurate due to incompleteness of data obtained, especially for dentists. According to the report on dental health personnel of the Department of Health, the population/dentist ratio was close to the population/pharmacist ratio, which tends to be improving steadily (Figure 6.4).



**Figure 6.4** Ratios of population to health manpower, 1999-2005



**Sources:** - Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.  
 - Report on Dental Health Personnel, 1999-2005, Department of Health, MoPH.

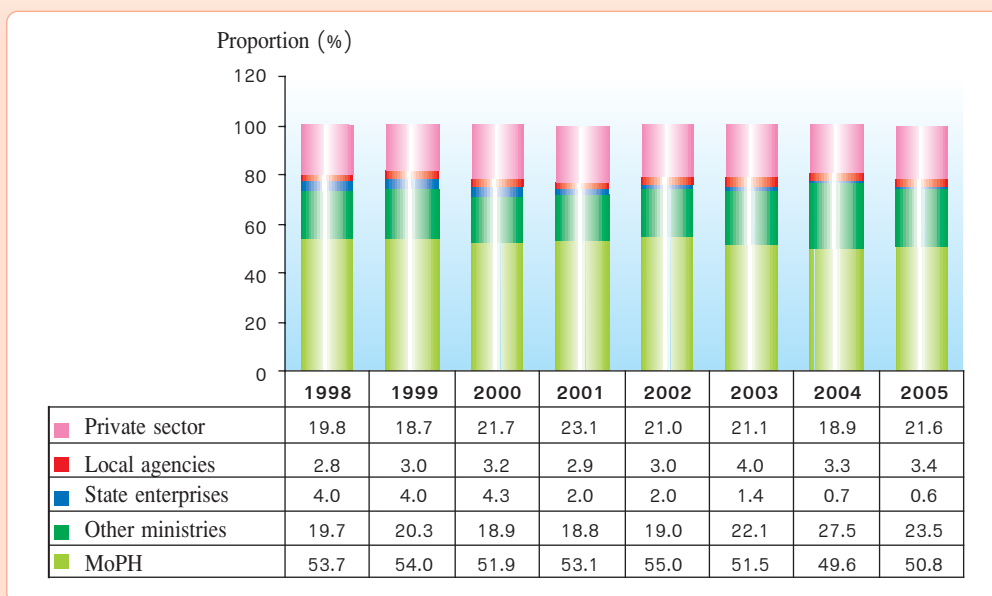
### 1.1.2 Health Manpower by Agency

#### 1) Doctors

During the 1998-2005 period, the proportion of doctors by agency had a tendency to change slightly, particularly that for the MoPH which was declining, but that in other ministries was rising, and that in the private sector rose slightly (Figure 6.5). Most of the doctors in Bangkok are in the MoPH followed by the private sector, while in other regions they are mostly under the MoPH (Figure 6.6).

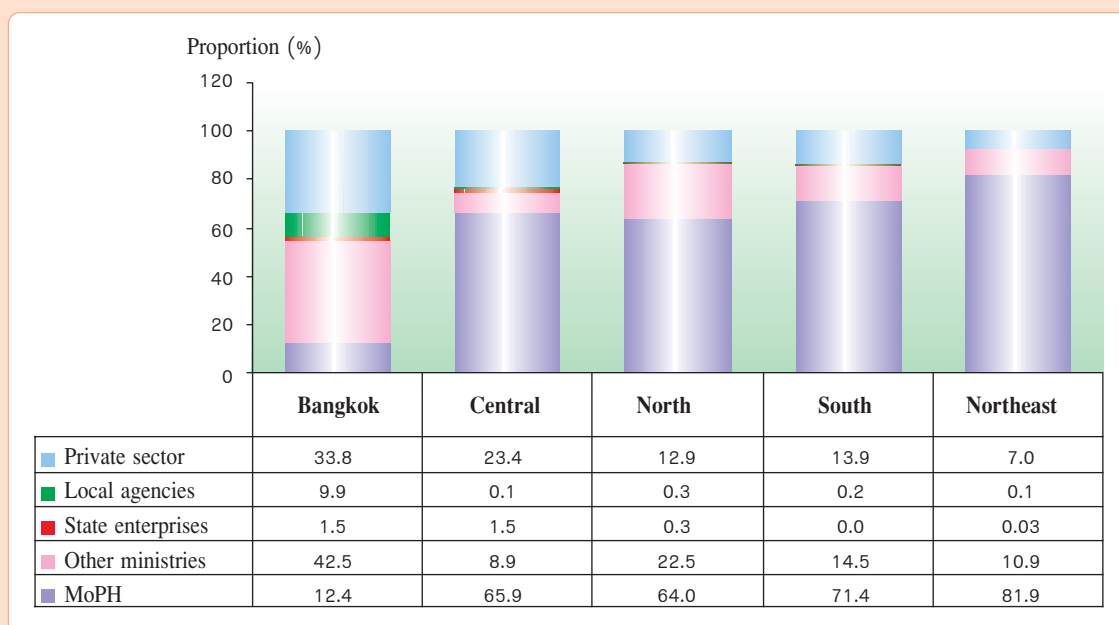


**Figure 6.5** Proportions of doctor by agency, 1998-2005



**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

**Figure 6.6** Proportions of doctors by region, 2005



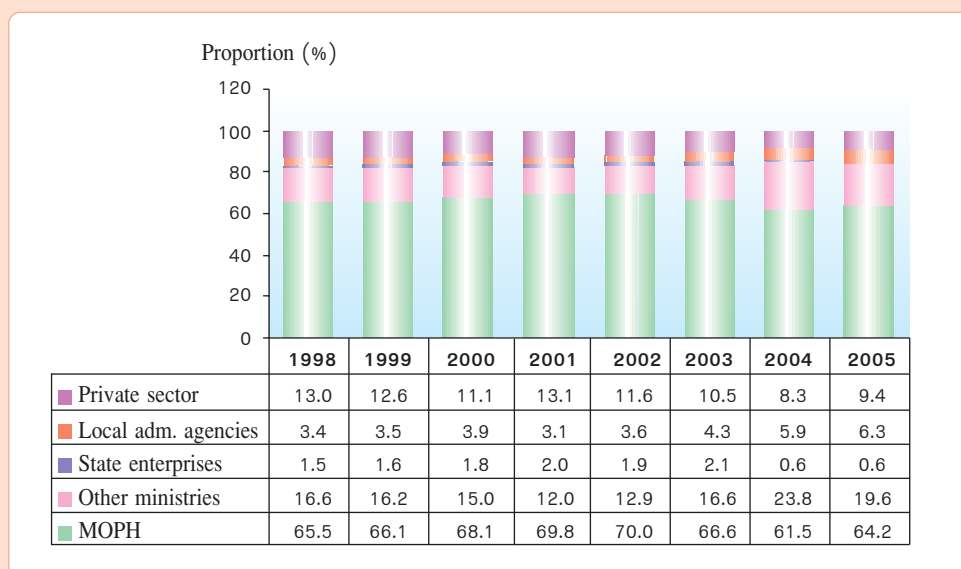
**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.



## 2) Dentists

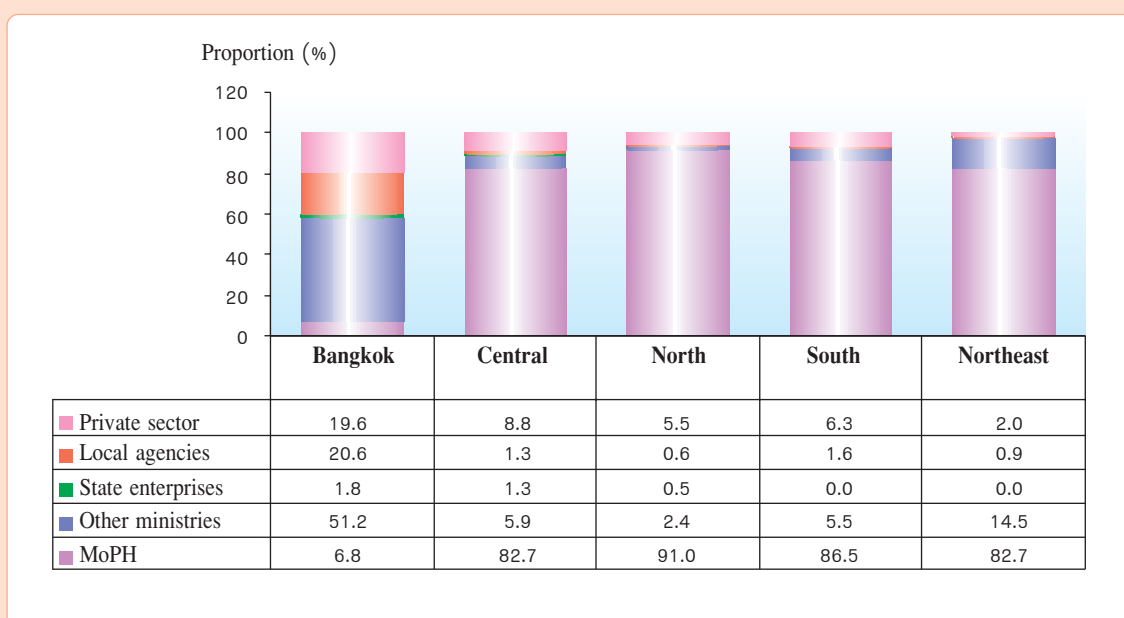
During the 1998-2005 period, the proportion of dentists by agency also had a tendency to change slightly. The dentist proportion in the MoPH did not change much while those in other ministries had a rising trend and that in the private sector declined (Figure 6.7). However, during the last eight years, the dentist proportion by agency had an unstable change. In Bangkok, most of the dentists are in other ministries, followed by local administrative agency (Bangkok Metropolitan Administration) and the private sector; in other regions, most of them are under the MoPH (Figure 6.8).

**Figure 6.7** Proportions of dentists by agency, 1998-2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

**Figure 6.8** Proportions of dentists by region, 2005

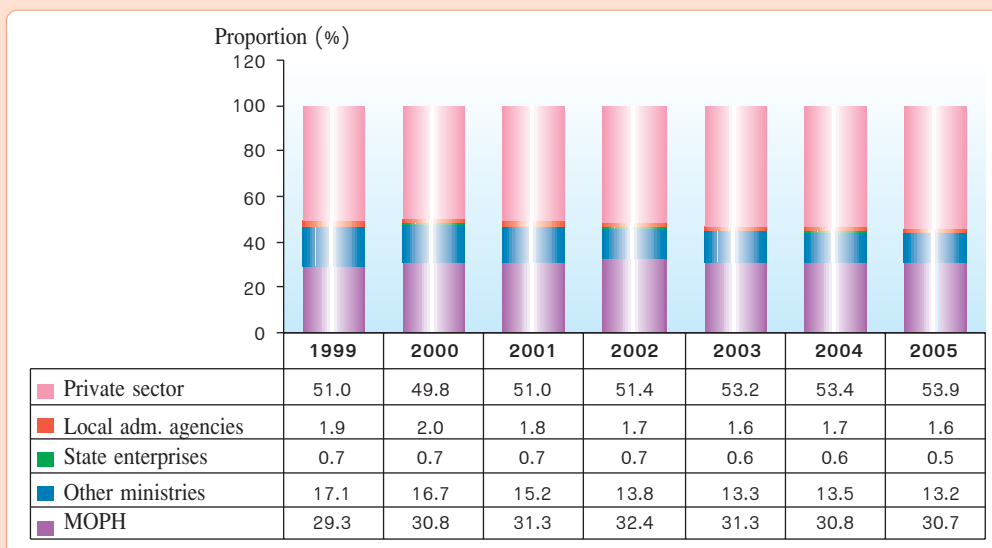


Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.



However, according to other data sources, such as that for dental health personnel of the Department of Health, most of dentists are in the private sector, while only 30.7% are under the MoPH, in which the dentist proportion by agency does not change much (Figure 6.9).

**Figure 6.9** Proportions of dentists by agency, 1999-2005 (according to DoH database)

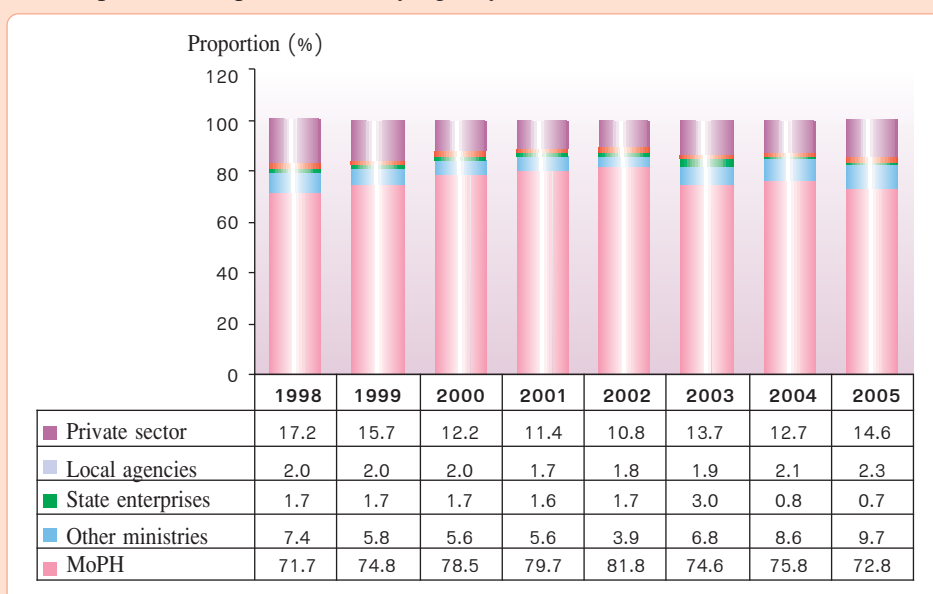


Source: Report on Dental Health Personnel, 1999-2005. Department of Health, MoPH.

### 3) Pharmacists

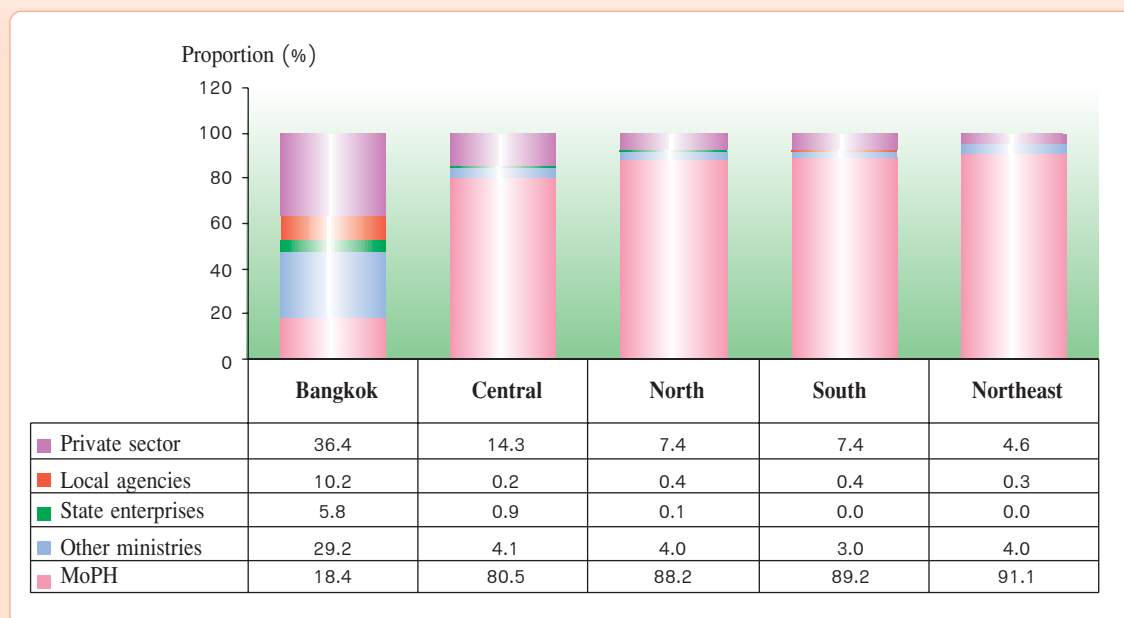
There is a small increase in the proportion of pharmacists in the MoPH, with a declining trend in the private sector. Since 2002, however, the pharmacist proportion in the private sector has been rising (Figure 6.10). In Bangkok, most pharmacists are in the private sector in the proportion close to that in other ministries; in other regions, they are mostly under the MoPH (Figure 6.11).

**Figure 6.10** Proportions of pharmacists by agency, 1998-2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

**Figure 6.11** Proportions of pharmacists by region, 2005

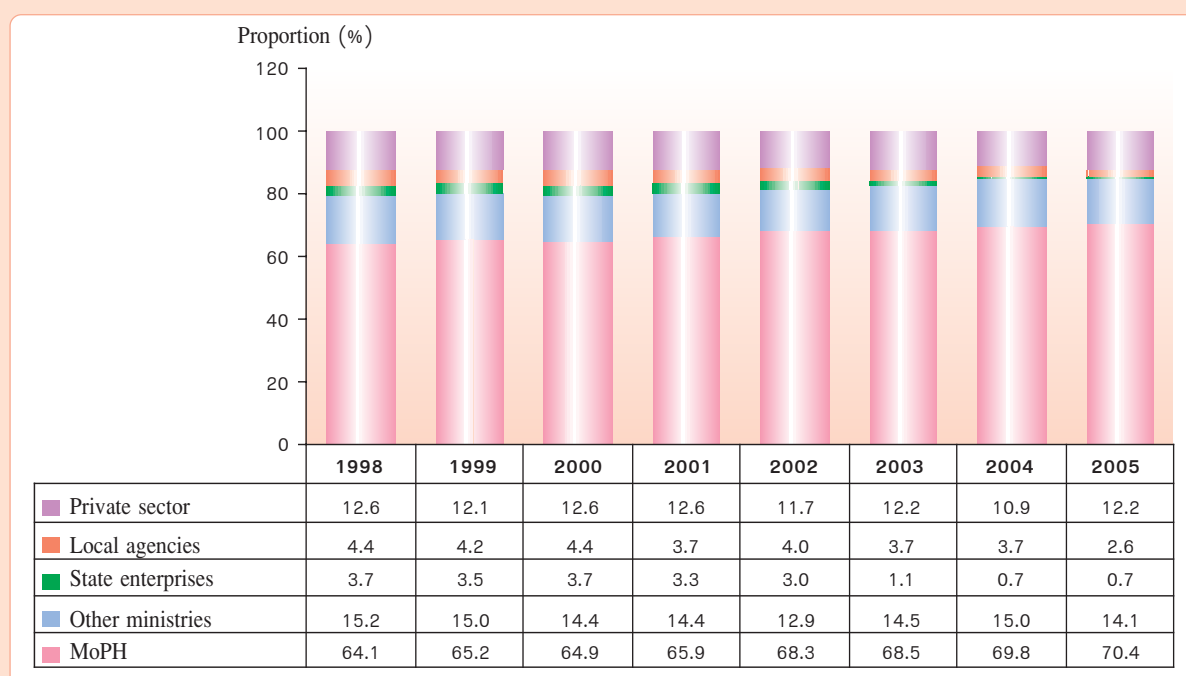


**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

#### 4) Professional Nurses

There has been a rising trend in the proportion of professional nurses in the MoPH, while that in other ministries declines slightly. Similarly, in the private sector, the changes have been in a narrow range (Figure 6.12). In Bangkok, most of the professional nurses are in other ministries, followed by in the private sector; while in other regions, most of them are under the MoPH (Figure 6.13).

**Figure 6.12** Proportions of professional nurses by agency, 1998-2005

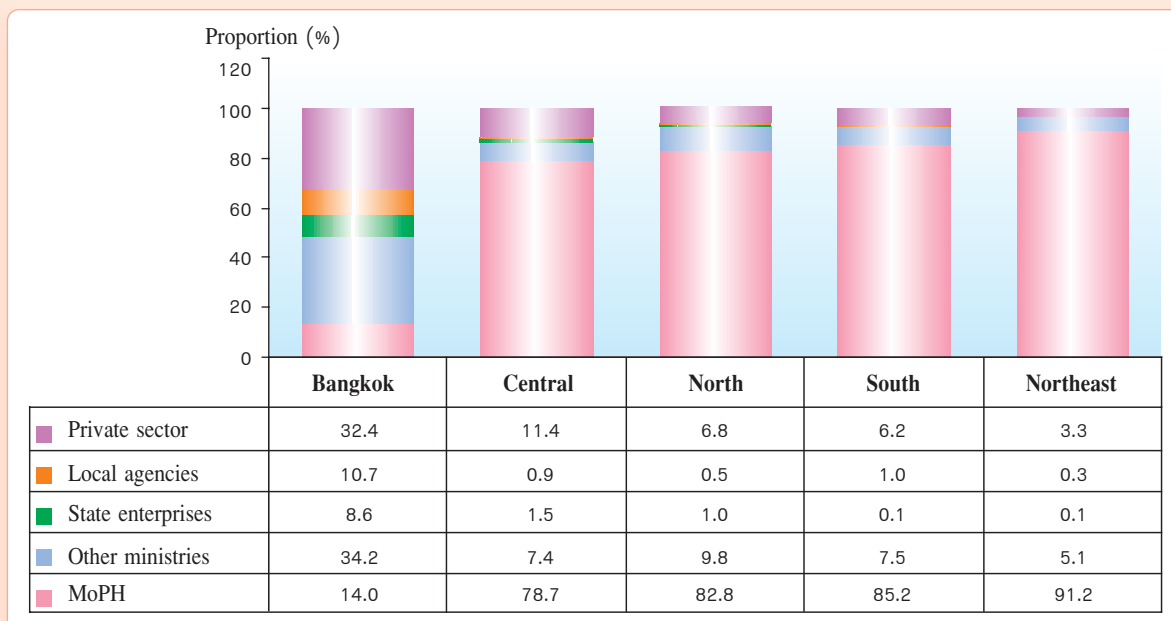


**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.





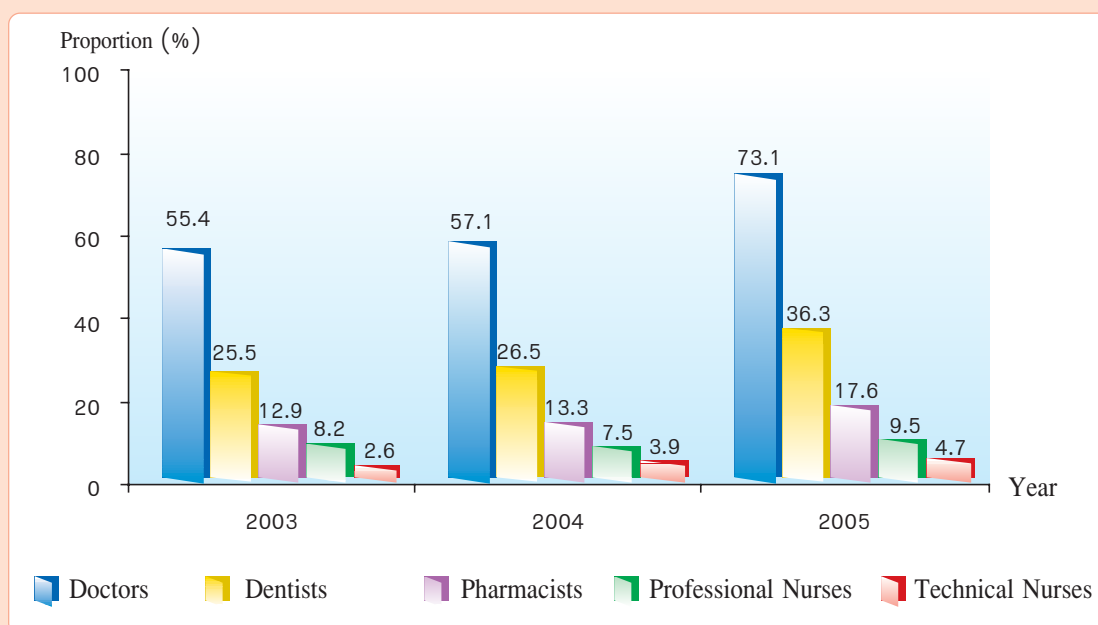
**Figure 6.13** Proportions of professional nurses by region, 2005



**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Another important aspect in the management of health manpower is their part-time work in the private sector while working in the public sector. The proportion of part-time doctors mostly in the private sector was as high as 55.4% in 2003 and rose to 73.1% in 2005, while the proportions for part-time dentists, pharmacists, professional nurses and technical nurses were lower proportionately, but with a rising trend (Figure 6.14).

**Figure 6.14** Proportions of part-time healthcare providers in the private sector, 2003-2005

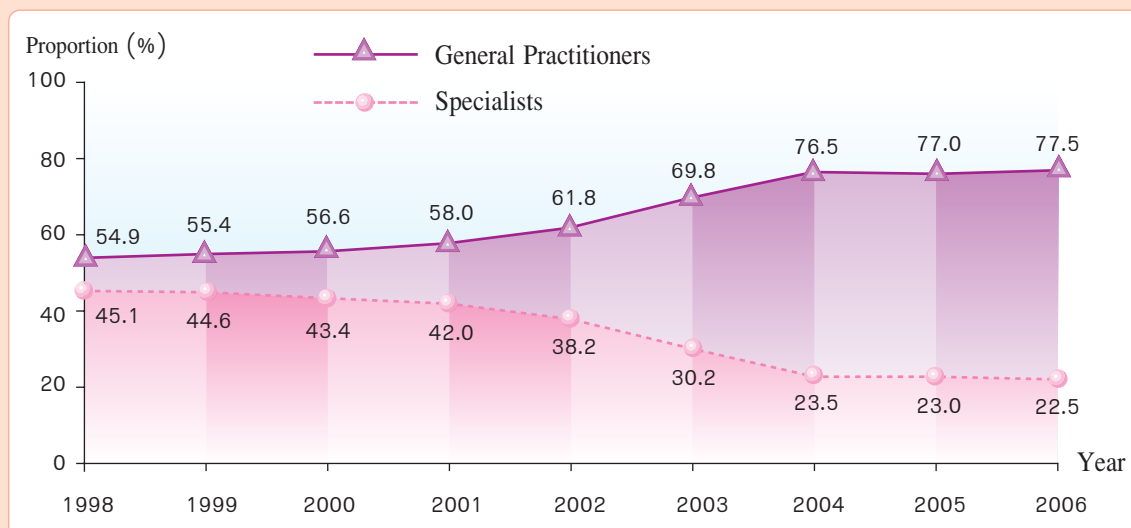


**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

### 1.1.3 Specialties of Health Manpower

Specialties of healthcare providers reflect the direction towards specialized care rather than integrated services. There has been a rising trend for doctors in Thailand to undertake specialty training. In 2006, the proportion of doctors with specialty certification was as high as 77.5% of all medical doctors (Figure 6.15).

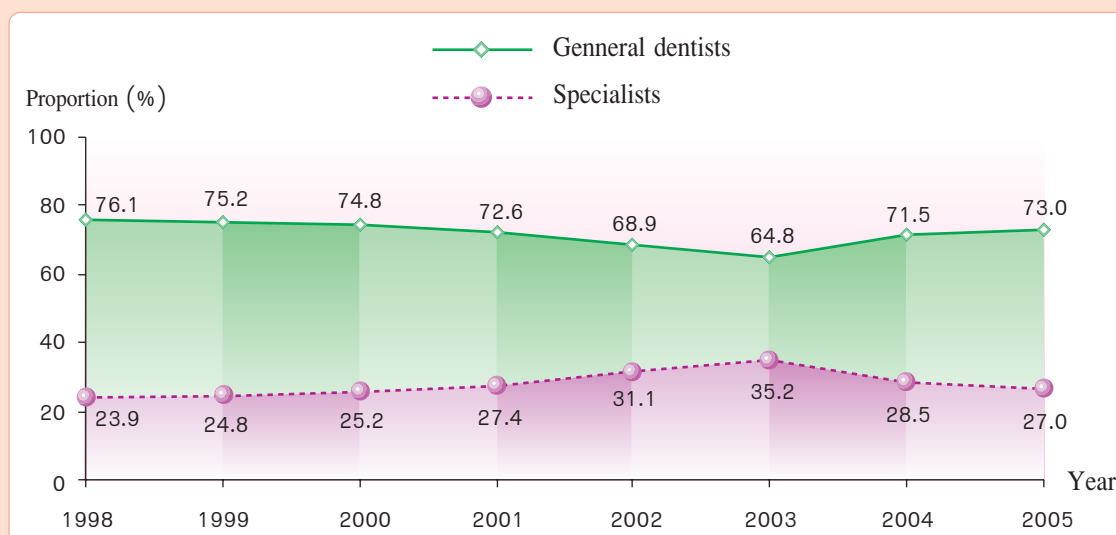
**Figure 6.15** Proportions of medical general practitioners and specialists, 1998-2006



**Source:** Office of the Secretary-General, Medical Council of Thailand.

Similarly, for dentists in Thailand, there has been a rising trend for them to undertake specialty training. In 2005, the proportion of dentists with specialty certification was as high as 27.0% of all dentists (Figure 6.16).

**Figure 6.16** Proportions of general and specialized dentists, 1998-2005



**Source:** Dental Health Division, Department of Health, MoPH, September 2006.



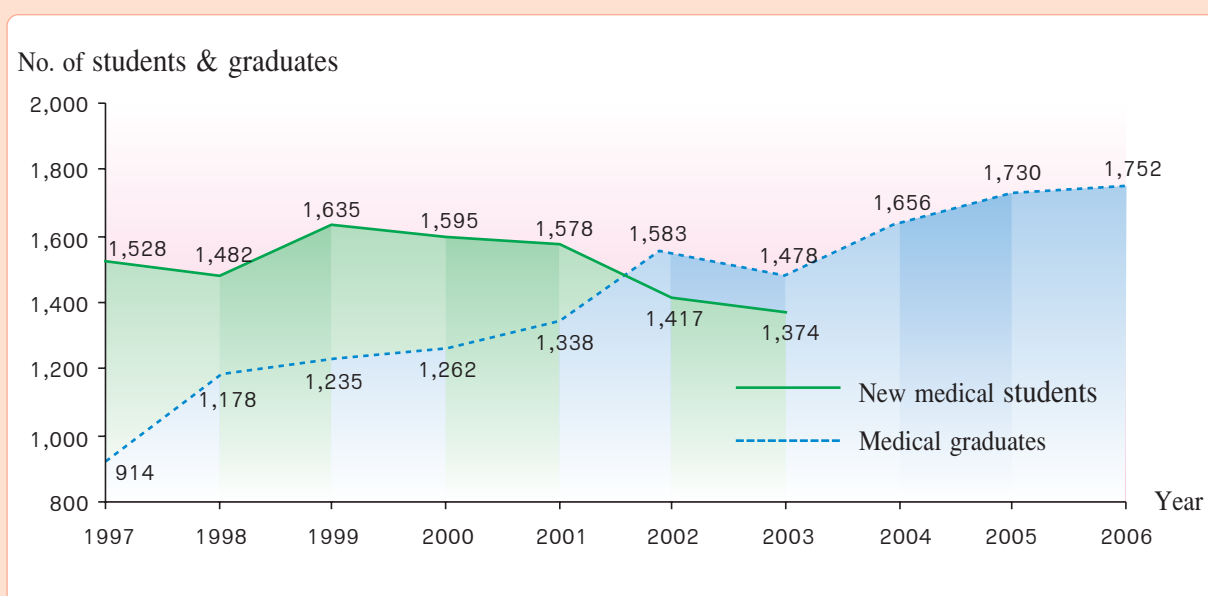
## 1.2 Production and Distribution of Health Manpower

### 1.2.1 Production of Doctors

At present, there are 14 medical schools in Thailand: 13 public and 1 private. Beginning in 2007, there will be another four state-run universities that will be producing medical graduates: Burapha, Princess of Naradhiwas, Walailak and Kasetsart universities.

Regarding the admission of medical students and the number of newly graduated doctors each year, there has been a rising trend. Between 1999 and 2001, there was a significant increase in the number of medical student admissions, as a result of the Project on Increased Production of Medical Doctors for Rural People, to approximately 1,600 students each year. And the number of newly graduated doctors has risen since 2002 to more than 1,500 each year. However, recently the number of student admissions has a declining trend to only around 1,400 each year (Figure 6.17).

**Figure 6.17** Numbers of medical student admissions and newly graduated doctors, 1997-2006



**Sources:** Student admissions data, from the Bureau of Policy and Planning, Office of the Higher Education Commission (HEC).

**Notes:** Number of medical students actually admitted.

**Medical graduates data,** from the Medical Council of Thailand and the Project on Increased Production of Medical Doctors for Rural People, MoPH.

**Notes:** Number of medical graduates registered with the Medical Council of Thailand.

When considering by the medical training institution, it was noted that the number of student admissions under the Office of Higher Education Commission tended to decline in 2002 and 2003, while the trend under other agencies seemed to be steady. In connection with the number of medical graduates, there was a rising trend before 2002 in all institutions, but since then it seems to be steady (Tables 6.1 and 6.2).

**Table 6.1** Number of medical students admitted in Thailand, academic years 1997-2003

Institution	No. of new students							
	1997	1998	1999	2000	2001	2002	2003	Total
<b>1. Public sector</b>	<b>1,426</b>	<b>1,382</b>	<b>1,539</b>	<b>1,498</b>	<b>1,501</b>	<b>1,315</b>	<b>1,274</b>	<b>9,935</b>
1.1 HEC	1,152	1,147	1,169	1,132	1,130	959	911	7,600
1.2 MoPH & HEC	150	143	277	272	276	293	301	1,712
1.3 Other agencies	124	92	93	94	95	63	62	623
<b>2. Private sector</b>	<b>102</b>	<b>100</b>	<b>96</b>	<b>97</b>	<b>77</b>	<b>102</b>	<b>100</b>	<b>674</b>
<b>Total</b>	<b>1,528</b>	<b>1,482</b>	<b>1,635</b>	<b>1,595</b>	<b>1,578</b>	<b>1,417</b>	<b>1,374</b>	<b>10,609</b>

**Source:** Bureau of Policy and Planning, Office of the Higher Education Commission.

**Notes:** 1. Number of medical students actually admitted.

2. Other agencies include the Phramongkutklao College of Medicine, and the BMA Medical College at Vajira Hospital.

**Table 6.2** Number of medical graduates, academic years 1997-2006

Production agency	No. of graduates										
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
<b>1. Public sector</b>	<b>877</b>	<b>1,148</b>	<b>1,177</b>	<b>1,222</b>	<b>1,272</b>	<b>1,504</b>	<b>1,422</b>	<b>1,575</b>	<b>1,659</b>	<b>1,677</b>	<b>13,533</b>
1.1 HEC	852	1,073	1,089	1,124	1,140	1,250	1,206	1,231	1,296	1,291	11,552
1.2 MoPH & HEC	-	-	-	8	31	134	137	249	255	292	1,106
1.3 Other agencies	25	75	88	90	101	120	79	95	108	94	875
<b>2. Private sector</b>	<b>37</b>	<b>30</b>	<b>58</b>	<b>40</b>	<b>66</b>	<b>79</b>	<b>56</b>	<b>81</b>	<b>71</b>	<b>75</b>	<b>593</b>
<b>Total</b>	<b>914</b>	<b>1,178</b>	<b>1,235</b>	<b>1,262</b>	<b>1,338</b>	<b>1,583</b>	<b>1,478</b>	<b>1,656</b>	<b>1,730</b>	<b>1,752</b>	<b>14,126</b>

**Source:** Medical Council of Thailand and the Project on Increased Production of Medical Doctors for Rural People, MoPH.

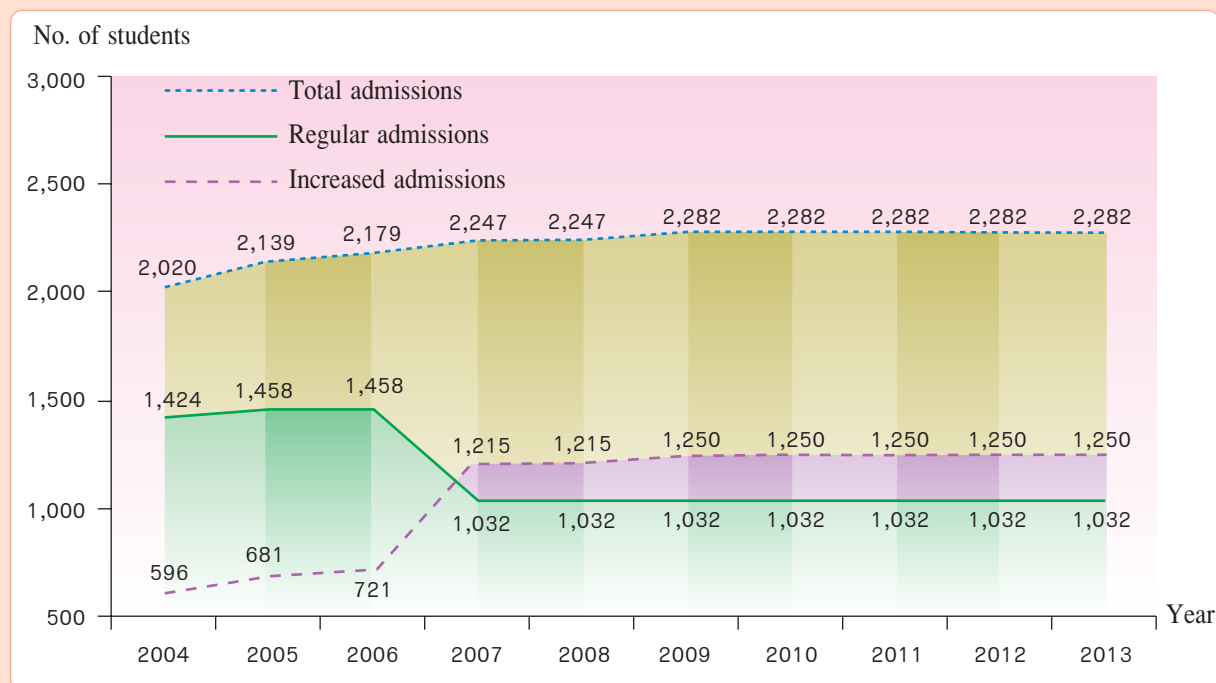
**Notes:** 1. For academic years 1997-2006, numbers of graduates registered with the Medical Council of Thailand.

2. Other agencies include the Phramongkutklao College of Medicine, the BMA Medical College at Vajira Hospital, and foreign institutions.



Between 1997 and 2003, Thailand could produce 1,300-1,500 medical graduates each year. It is expected that during the ten-year period of 2004-2013 the production of doctors will be accelerated to meet the needs of the country; each year there will be 1,000-1,400 students admitted under the regular programme and an additional 600 students under the accelerated production programme (Figure 6.18).

**Figure 6.18** Planned admissions of medical students in Thailand, 2004-2013



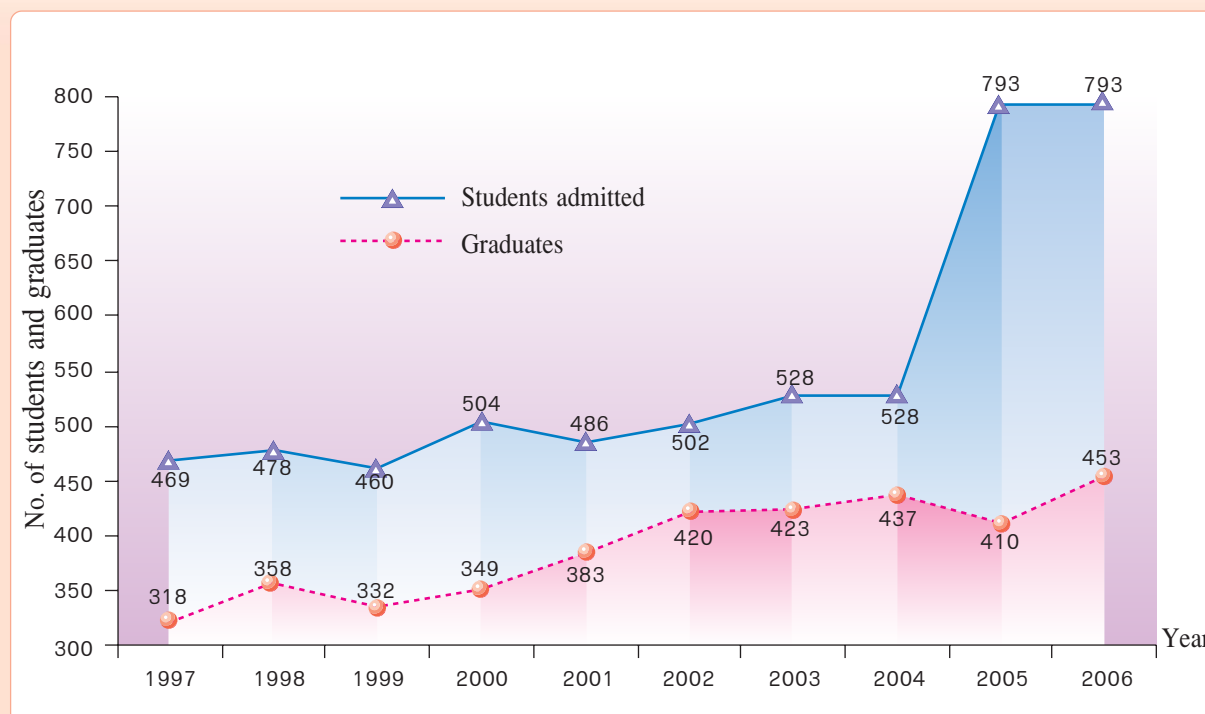
**Source:** Bureau of Policy and Planning, Office of the Higher Education Commission.

### 1.2.2 Production of Dentists

At present, the production of dentists in Thailand is undertaken by ten public and private institutions (nine public and one private); the private one is Rangsit University, starting the production in 2005.

The production output in 2005 was approximately 500; since 2005 the annual student intake has been increased by 200. The only private institution has enrolled another 80 dentists annually. The numbers of dental students admitted and dental graduates are shown in Figure 6.19.

**Figure 6.19** Numbers of dental students admitted and dental graduates, 1997-2006



**Sources:** **Student admissions data**, from the Bureau of Policy and Planning, Office of the Higher Education Commission.

**Note:** Number of dental students actually admitted.

**Dental graduate data**, from the Dental Council of Thailand.

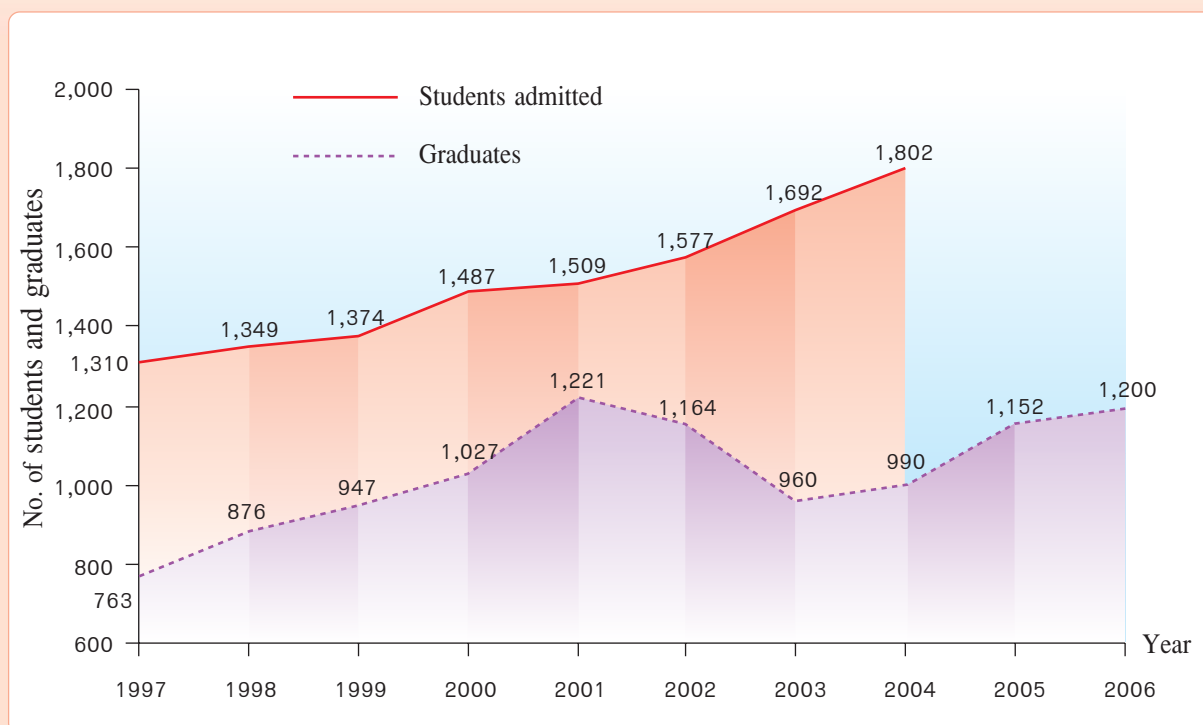
**Note:** Number of new dental graduates registered with the Dental Council of Thailand.

### 1.2.3 Production of Pharmacists

At present, Thailand has 13 schools of pharmacy: 11 public and 3 private. Between 1997 and 2006, the production capacity in the public sector increased slightly, but tended to decrease in the private sector, from 2003 onward from 300 graduates to 220 graduates annually. The numbers of pharmacy students admitted and graduates are shown in Figure 6.20.



**Figure 6.20** Numbers of pharmacy students admitted and graduates, 1997-2006



**Sources:** **Student admissions data**, from the Bureau of Policy and Planning, Office of the Higher Education Commission.

**Note:** 1. For academic years 1997-2002, number of students actually admitted.

2. For academic years 2003-2006, data were derived from the pharmacy student admission plan.

**Data on graduate**, from the Pharmacy Council of Thailand.

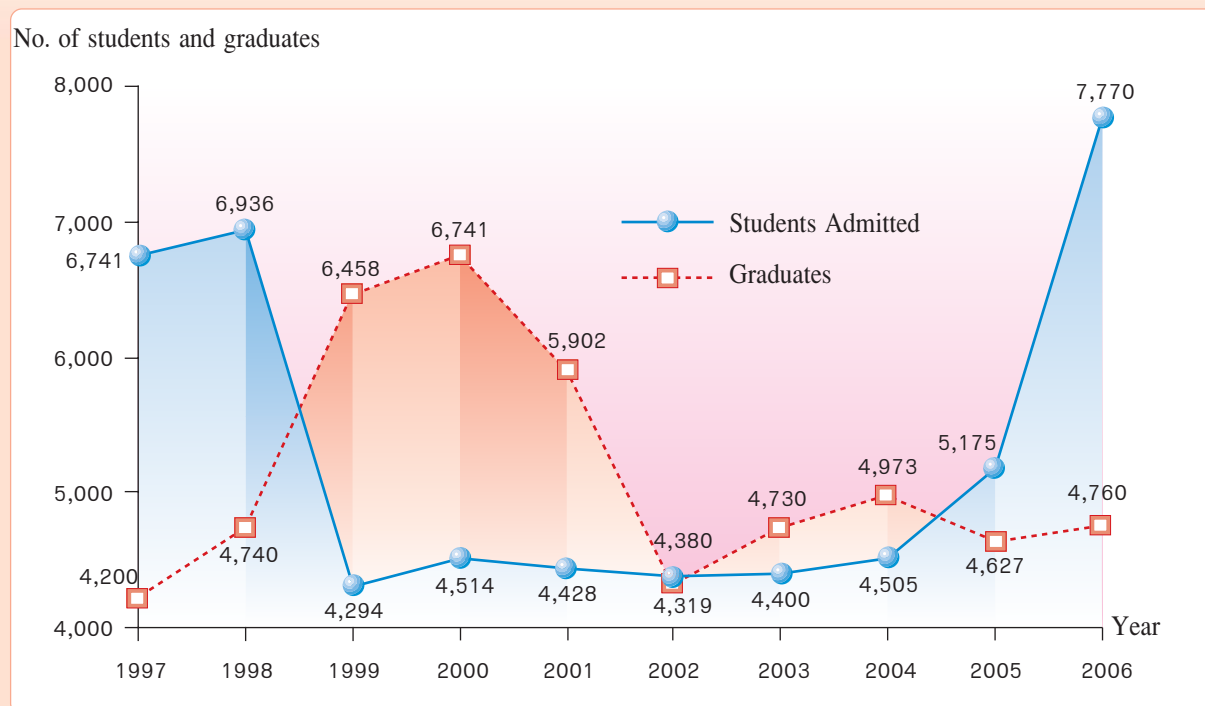
**Note:** For academic years 1997-2006, number of pharmacy graduates registered with the Pharmacy Council of Thailand.

#### 1.2.4 Professional Nurses

At present, Thailand has 74 nursing colleges/institutions: 64 public and 10 private. Since 2004, another two public institutions (Kasetsart and Suranaree Technology Universities) have offered their nursing training programmes.

In the production of professional nurses, since 2005, the public sector, especially the MoPH, has had a tendency to increase its production capacity by 1,000 nurses from 1,500 nurses each year as the previously planned number did not meet the rising requirements. The numbers of nursing students admitted and graduates are as shown in Figure 6.21.

**Figure 6.21** Numbers of nursing students admitted and graduates, 1997-2006



**Sources:** Student admissions data, from the Bureau of Policy and Planning, Office of the Higher Education Commission.

**Data on graduates,** from the Nursing Council of Thailand and Praboromrajchanok Institute, MoPH.

**Note:** For academic years 1997-2006, number of nursing graduates registered with the Nursing Council of Thailand.



### 1.3 Losses of Health Manpower

This section mainly focuses on the issue of resignation from civil service which reflects the change in the type of agency for which healthcare providers work, especially shifting from the public sector to the private sector or to other occupations. Even though shifting to the private sector does not mean a loss in the entire system, the impact is not minimal as most rural residents rely on public services. In the MoPH, the significant problem is the resignation of medical doctors; the net loss is on the rising trend, the peak being during the economic booming period (1996, before the economic crisis). During that time period, as many as 21 community hospitals had no doctors at all (Table 6.3).

After the 1997 economic crisis, the situation improved considerably, possibly due to the downturn in the private sector. Until the economic recovery period of 2001-2003, the resignation of doctors from the MoPH became a serious issue again (Figure 6.22). However, the loss declined in 2004, but rose again in 2005 and 2006, most likely due to the recovery in the private sector.



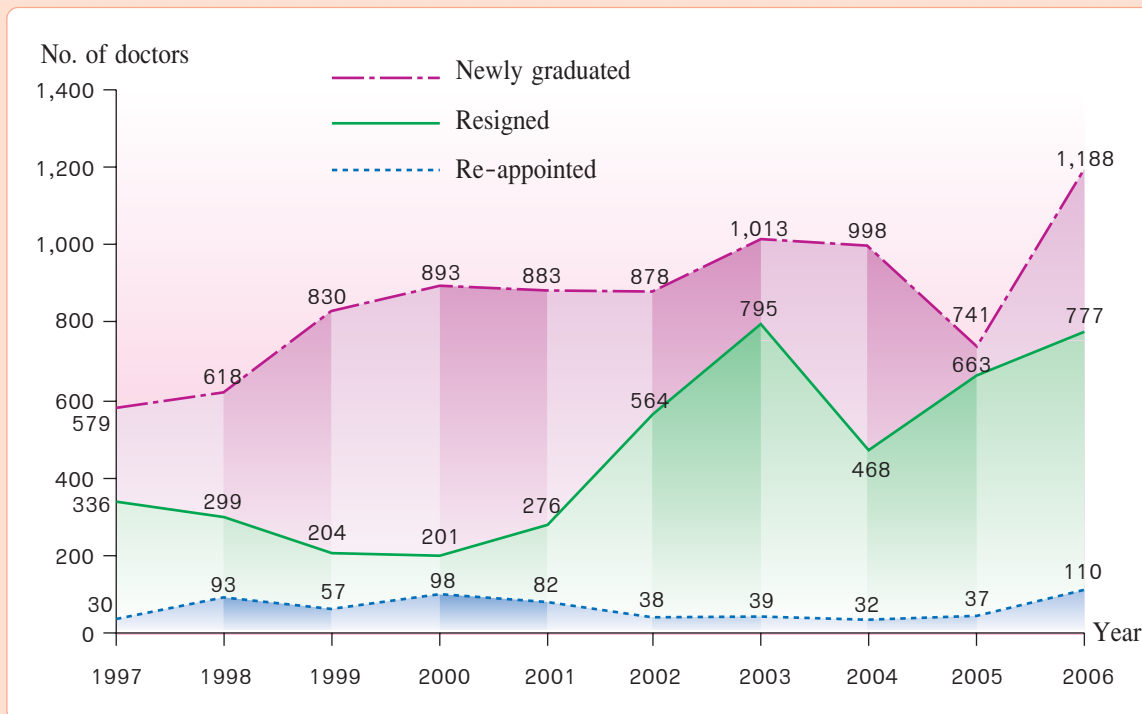
**Table 6.3** Number and proportion of doctors loss in relation to newly appointed doctors, Office of the Permanent Secretary for Public Health, 1994-2006

Fiscal year	No. of doctors						Net loss No. (percent)
	Increase			Decrease (resigned)			
	Newly Graduated	Re- appointed	Total	Civil servants	State employees	Total	
1994	526	-	526	42	-	42	42 / 8.0
1995	576	-	576	260	-	260	260 / 45.1
1996	568	-	568	344	-	344	344 / 60.6
1997	579	30	609	336	-	336	306 / 52.8
1998	618	93	711	299	-	299	206 / 33.3
1999	830	57	887	204	-	204	147 / 17.7
2000	893	98	991	201	-	201	103 / 11.5
2001	883	82	952	193	83	276	194 / 22.0
2002	878	38	916	401	163	564	526 / 59.9
2003	1,013	39	1,052	287	508	795	756 / 74.6
2004	998	32	1,030	468	-	468	436 / 43.7
2005	741	37	778	663	-	663	626 / 84.5
2006	1,188	110	1,298	777	-	777	667 /56.1

**Source:** Bureau of Central Administration, Office of the Permanent Secretary for Public Health.

- Notes:**
1. Parent agencies adjusted their own data for fiscal years 1995-2003.
  2. According to the cabinet resolution, since 1999 MoPH has been required to accept the graduates who have been awarded scholarships as state employees under the MoPH, rather than as civil servants.
  3. In 2004, MoPH appointed all state employees as civil servants.

**Figure 6.22** Numbers of doctors who were newly graduated, re-appointed as civil servants and resigned, 1997-2006



**Source:** Bureau of Central Administration, Office of the Permanent Secretary for Public Health.

## **1.4 Distribution of Health Manpower**

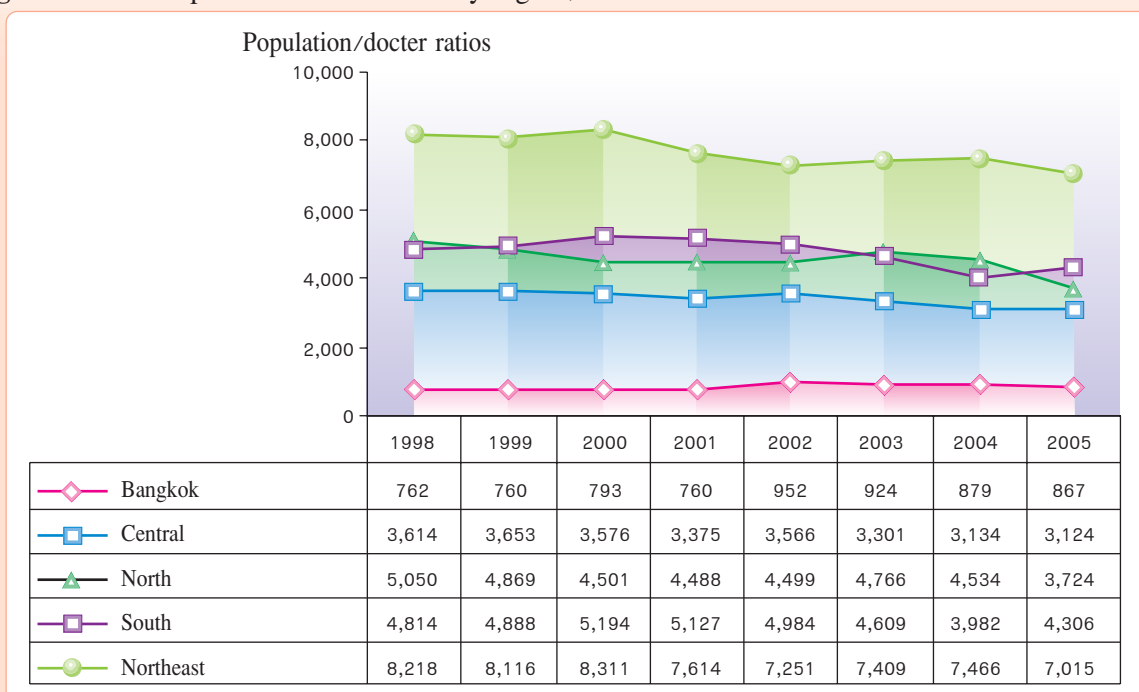
### **1.4.1 Distribution of Health Manpower by Geographical Region**

#### **1) Ratio of Population to Healthcare Provider by Region**

Between 1998 and 2005, a regional comparison of the ratio of population to doctor (population per doctor ratio) revealed that the ratio for the Northeast has steadily declined, but still higher than those in other regions; the North, South and Central having a comparable ratio (Figure 6.23).



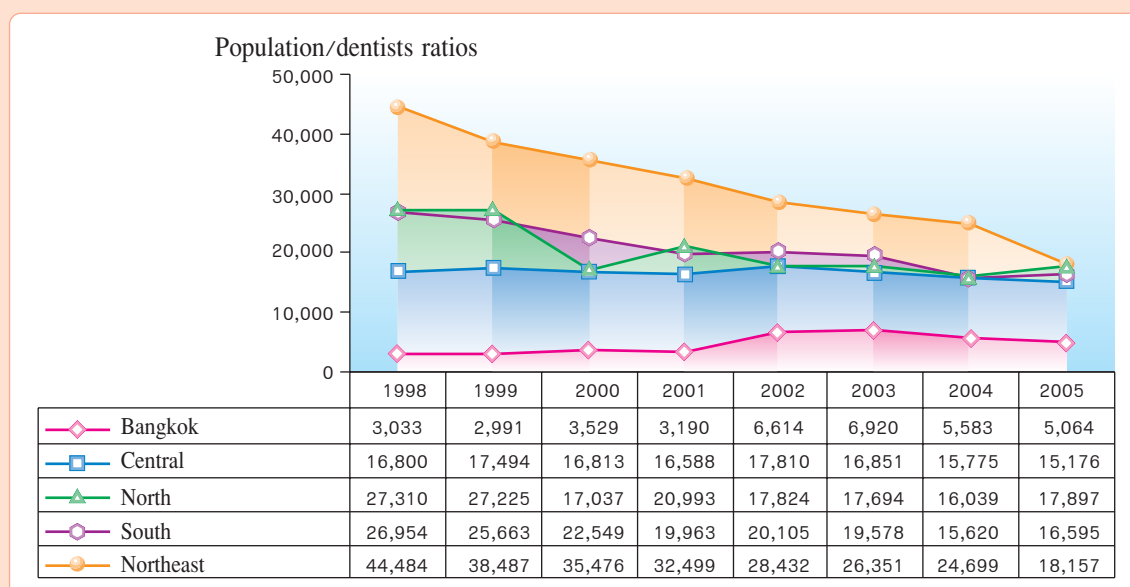
**Figure 6.23** Population/doctor ratios by region, 1998-2005



**Source:** Report on Health Resources, Bureau of Policy and Strategy, MoPH.

Similarly, the population/dentist ratio in the Northeast has steadily declined, until 2005 it became close to those for the North, South and Central (Figure 6.24).

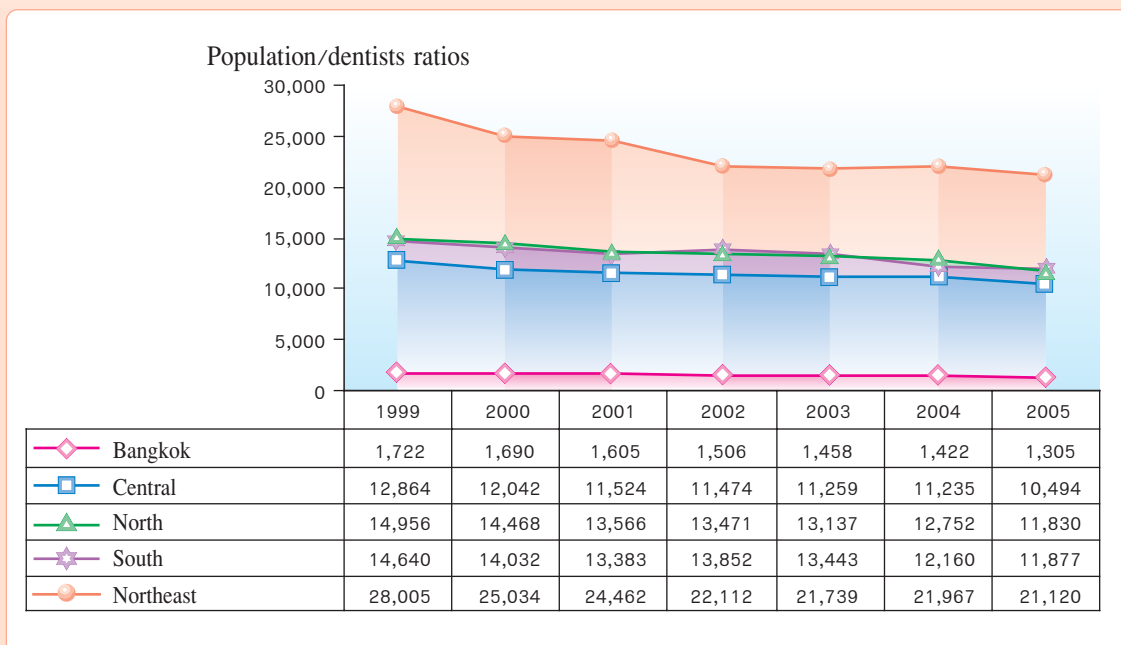
**Figure 6.24** Population/dentist ratios by region, 1998-2005



**Source:** Report on Health Resources, Bureau of Policy and Strategy, MoPH.

However, according to other data sources especially the report on dental health personnel of the Department of Health, the population/dentist ratios are lower (larger number of dentists). The ratio for the Northeast was higher than those for other regions in 2005 (Figure 6.25).

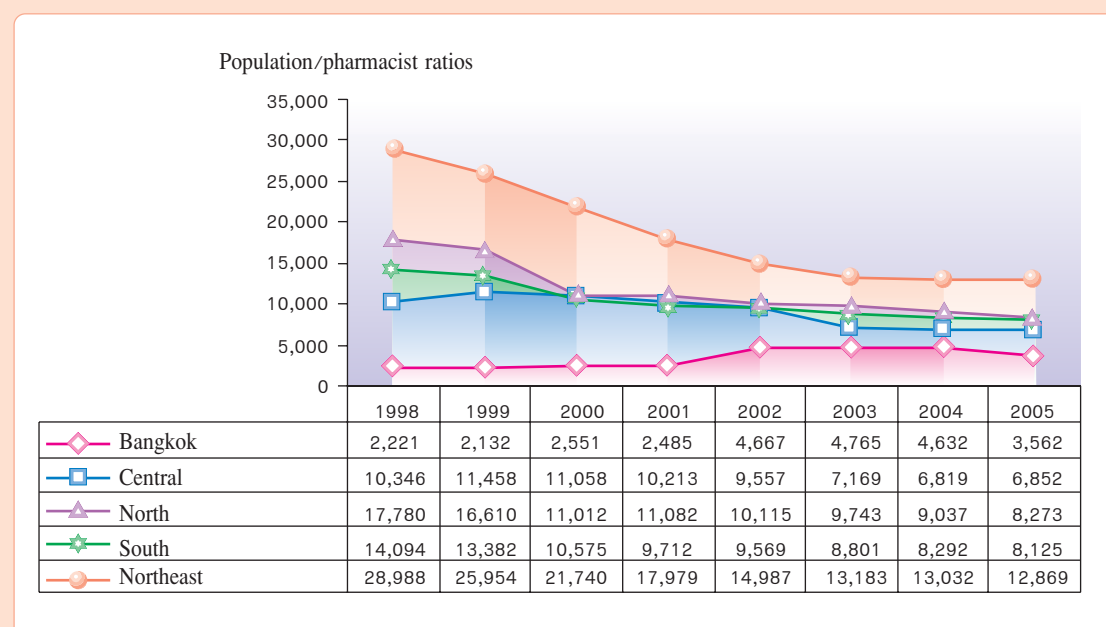
**Figure 6.25** Population/dentist ratios by region, 1999-2005



**Source:** Report on Dental Health Personnel, 1999-2005, Department of Health, MoPH.

Regarding pharmacists, the Northeast has a steady decline in the population/pharmacist ratio; and the ratios are comparable for the North, South and Central (Figure 6.26).

**Figure 6.26** Population/pharmacist ratios by region, 1998-2005

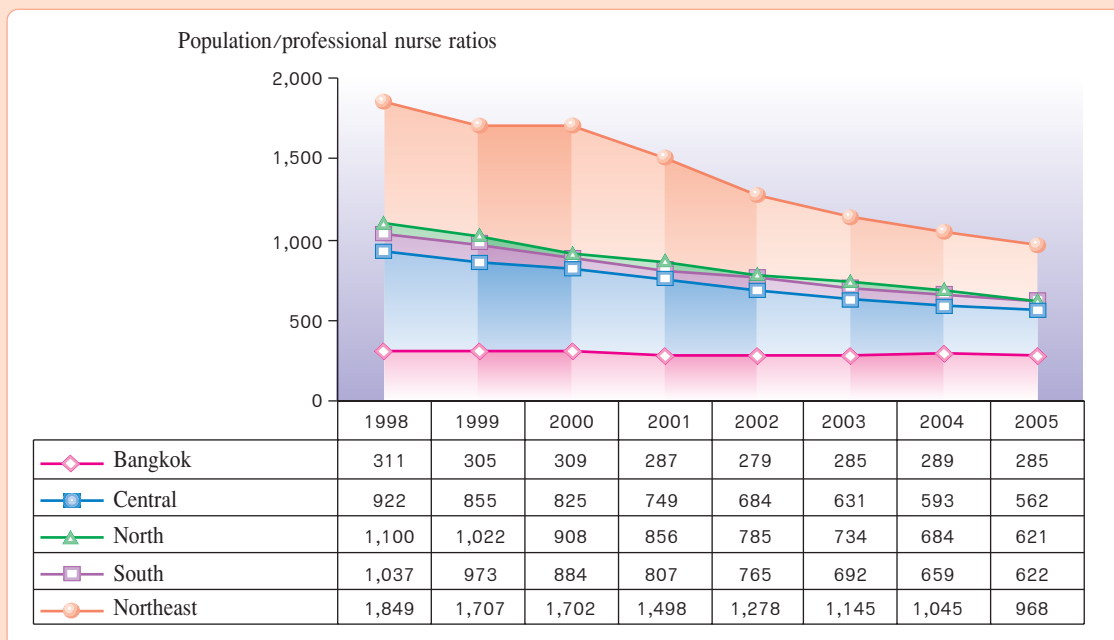


**Source:** Report on Health Resources, Bureau of Policy and Strategy, MoPH.



The population/professional nurse ratio has also been declining; the Northeast has the ratio closer to those for other regions (Figure 6.27).

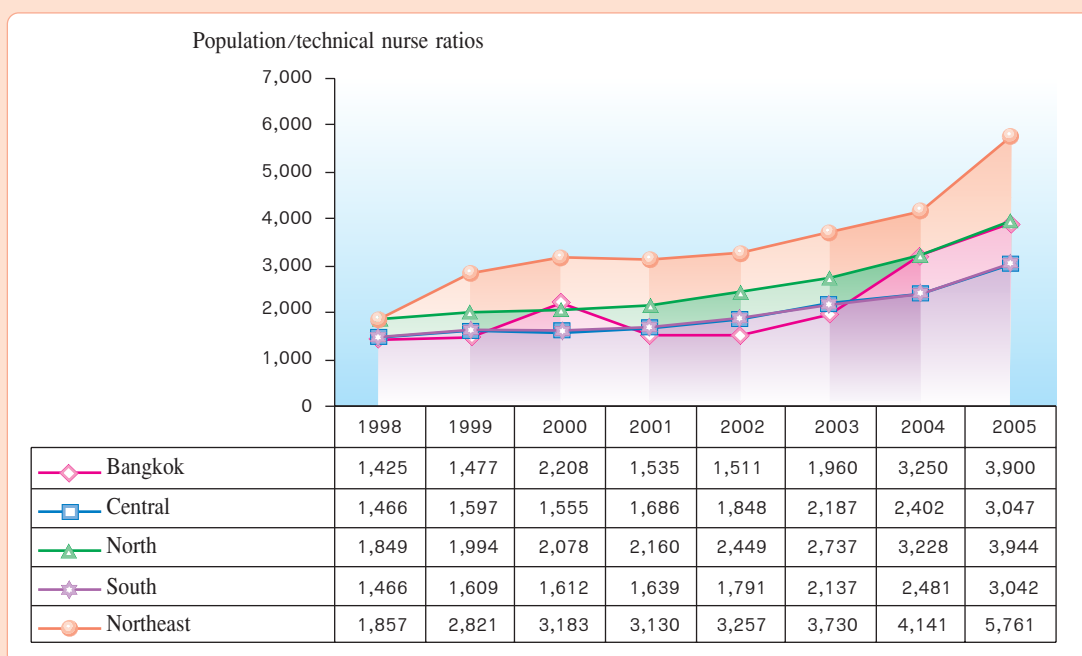
**Figure 6.27** Population/professional nurse ratios by region, 1998-2005



**Source:** Report on Health Resources, Bureau of Policy and Strategy, MoPH.

In connection with population/technical nurse ratio, the trend is rising in all regions due to the change in their status to professional nurses. The Northeast has the highest ratio, while the Central and South have the lowest (Figure 6.28).

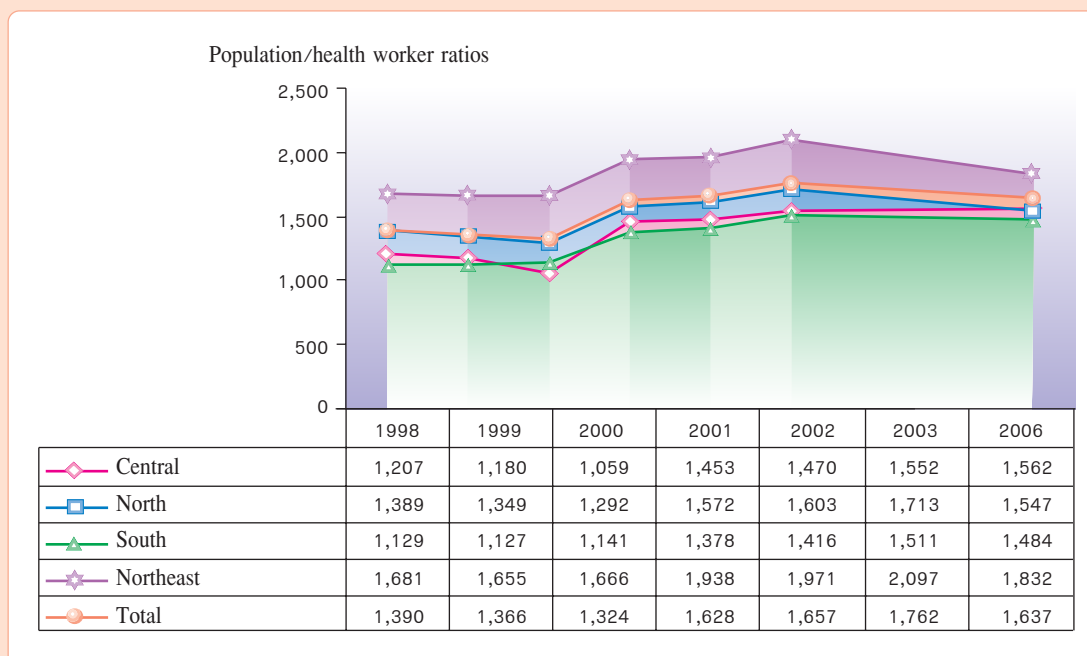
**Figure 6.28** Population/technical nurse ratios by region, 1998-2005



**Source:** Report on Health Resources, Bureau of Policy and Strategy, MoPH.

For health personnel at subdistrict health centres, the overall population/ health worker ratio had a declining tend in 2006. The highest ratio is noted for the Northeast and lowest for the South (Figure 6.29). Overall, the regional disparities have also declined.

**Figure 6.29** Population/health worker ratios (at subdistrict health centres) by region, 1998-2006



Source: Table 6.4.





**Table 6.4** Health personnel at subdistrict health centres by regions, 1987–2003 and 2006

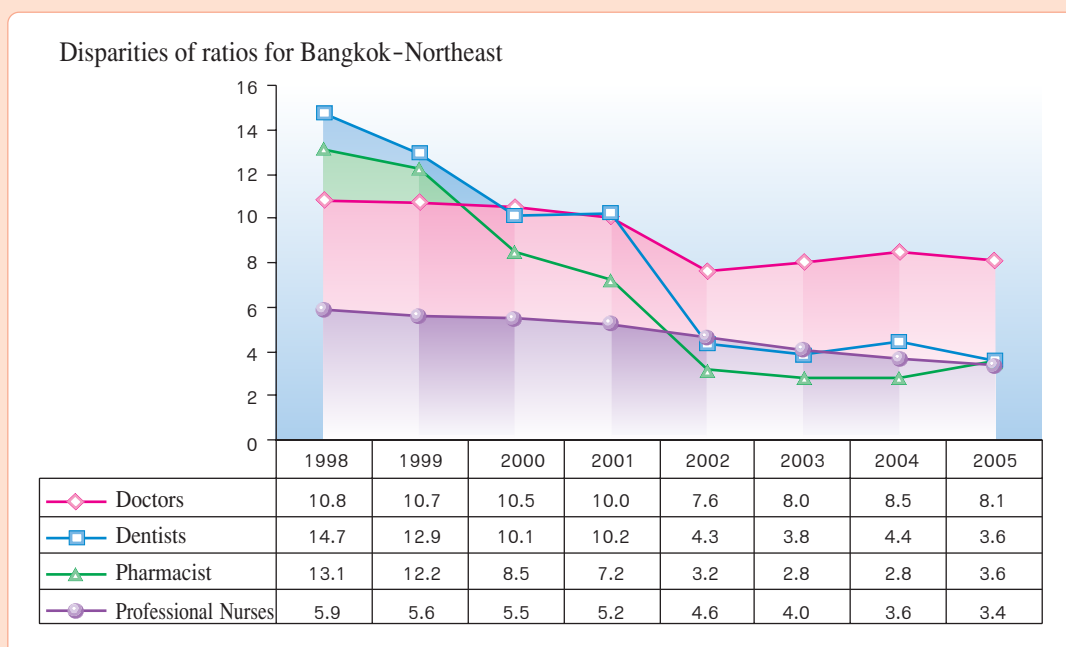
Region	No. of health workers									
	1987	1996	1997	1998	1999	2000	2001	2002	2003	2006
Central	4,217	7,724	7,917	8,928	9,017	8,769	8,150	8,027	7,604	8,502
North	3,233	5,734	6,826	6,970	7,167	7,068	6,558	6,456	6,043	6,823
South	2,318	4,628	5,038	5,152	5,264	5,146	4,843	4,761	4,463	4,837
Northeast	4,573	9,114	10,430	10,236	10,569	10,248	9,693	9,591	9,015	10,279
Disparity between population/worker ratios of the Central and Northeast	1:1.73	1:1.59	1:1.43	1:1.39	1:1.40	1:1.57	1:1.3	1:1.3	1:1.4	1: 1.2
<b>Total</b>	<b>14,341</b>	<b>27,200</b>	<b>30,211</b>	<b>31,286</b>	<b>32,017</b>	<b>31,231</b>	<b>29,244</b>	<b>28,835</b>	<b>27,125</b>	<b>30,441</b>

**Sources:** 1. For 1987–2000, data were derived from the Bureau of Health Service System Development, Department of Health Service Support, MoPH.  
 2. For 2001–2003 and 2006, data were derived from the Bureau of Central Administration, Office of the Permanent Secretary, MoPH.

**Notes:** 1. The figure in ( ) is the ratio of health personnel to population outside municipal areas and Sanitary districts.  
 2. From FY 1999 onwards, data were derived from the payrolls (Jor 18) of health centre personnel of the Central Administration Bureau, Office of the Permanent Secretary, MoPH.  
 3. Data on population outside municipal areas for 2001 are as of 31 Dec 2001; and for 2002–2003, are as of 1 Jan 2003; for 2006, as of 31 Dec 2006 from the Registration Administration, analyzed by Rujira Taverat of the Bureau of Policy and Strategy, MoPH.

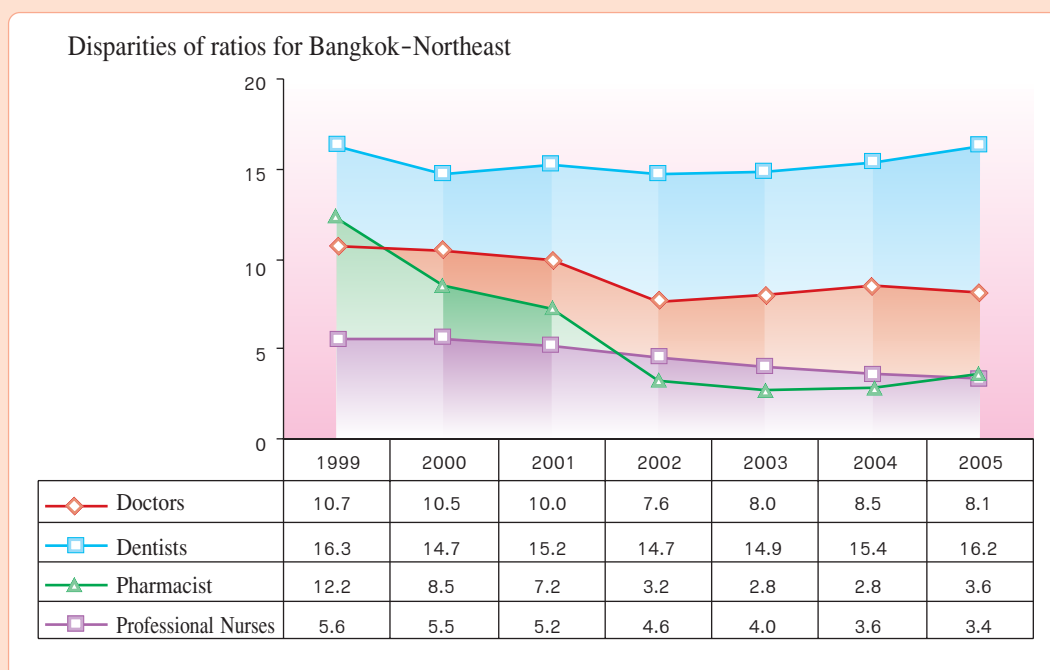
A comparison of population/healthcare provider ratios for Bangkok and the Northeast reveals that the disparities have declined steadily, especially for dentists and pharmacists for whom the disparities dropped from 13- to 14-fold in 1998 to 3.5-fold in 2005. However, the disparities were about 8-fold for doctors and 3.4-fold for professional nurses in 2005 (Figure 6.30). But with another source of data for dentists, from the Department of Health, the disparity was 15-fold for 2005 (Figure 6.31).

**Figure 6.30** Disparities of population/healthcare provider ratios for Bangkok and the Northeast



Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

**Figure 6.31** Disparities of population/healthcare provider ratios for Bangkok and the Northeast  
(Database of the Department of Health)



Sources: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

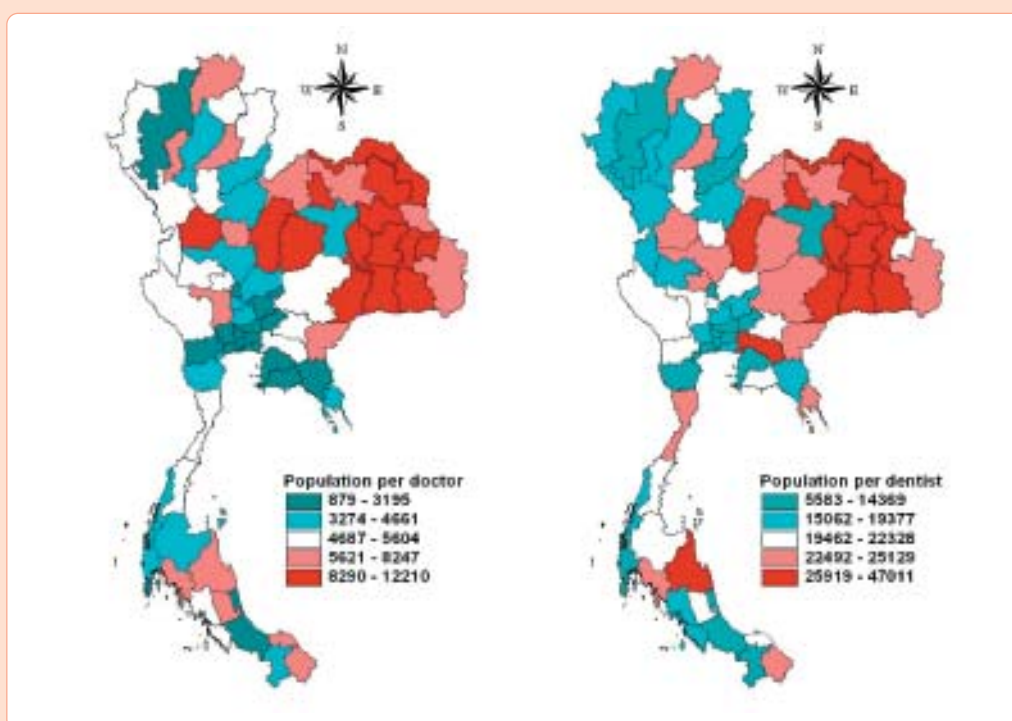
Report on Dental Health Personnel, 1999-2005. Department of Health, MoPH.



## 2) Ratios of Population to Healthcare Provider by Province

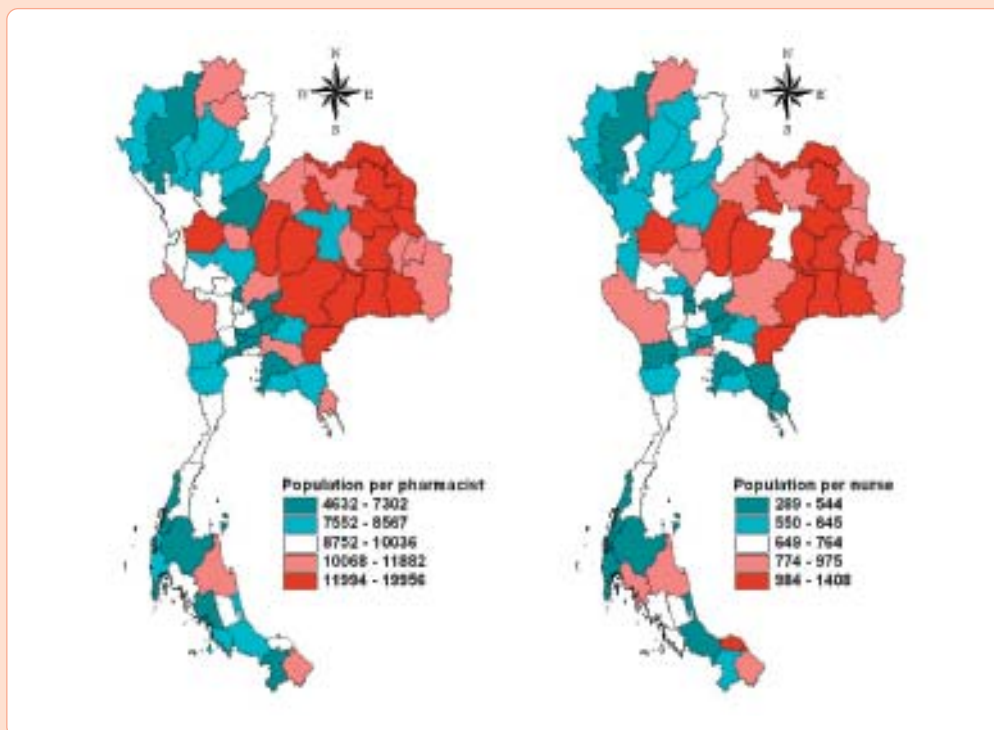
A comparison of population/healthcare provider ratios for all 76 provinces grouped in five quintiles and shown in different colours for each quintile on a shaded area map (Figures 6.32 and 6.33) reveals that most provinces in the Northeast have a higher ratio, compared with those in other regions, except for provinces with a university hospital. The provinces near Bangkok and in the East as well as those in the upper South, such as Phuket, have more health personnel than other provinces.

**Figure 6.32** Geographical distribution of doctors and dentists: population/doctor and population/dentist ratios, 2004



**Source:** Report on Health Resources, Bureau of Policy and Strategy, MoPH.

**Figure 6.33** Geographical distribution of pharmacists and professional nurses: population/ pharmacist and population/nurse ratios, 2004



**Source:** Report on Health Resources, Bureau of Policy and Strategy, MoPH.

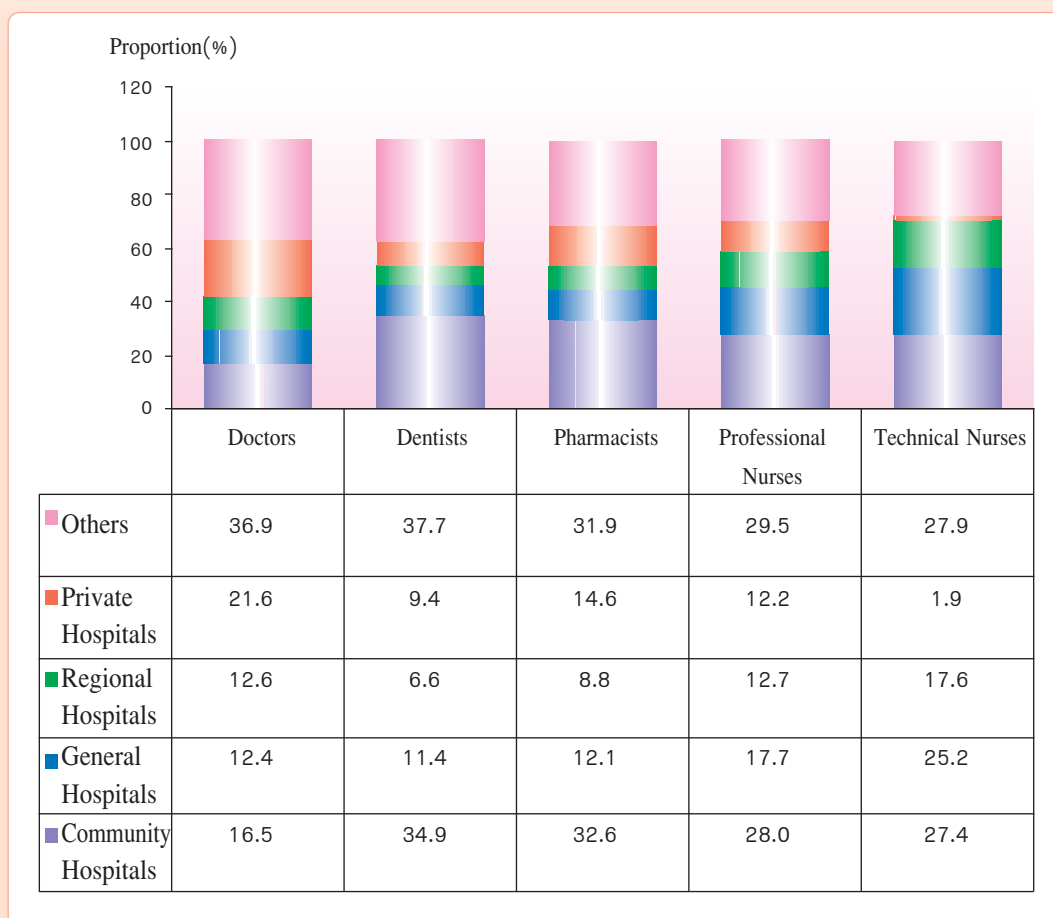
## 1.4.2 Distribution of Health Manpower by Level of Services and Workload

### 1) Proportion of Health Manpower by Level of Services

Based on the level and type of health facilities, the proportion of doctors working in private hospitals is higher than those of other professionals, and the proportion in community hospitals is lower than other professionals. But for dentists, pharmacists, professional nurses and technical nurses, most of them work in community hospitals (Figure 6.34).



**Figure 6.34** Proportion of health manpower by type of hospitals, 2005

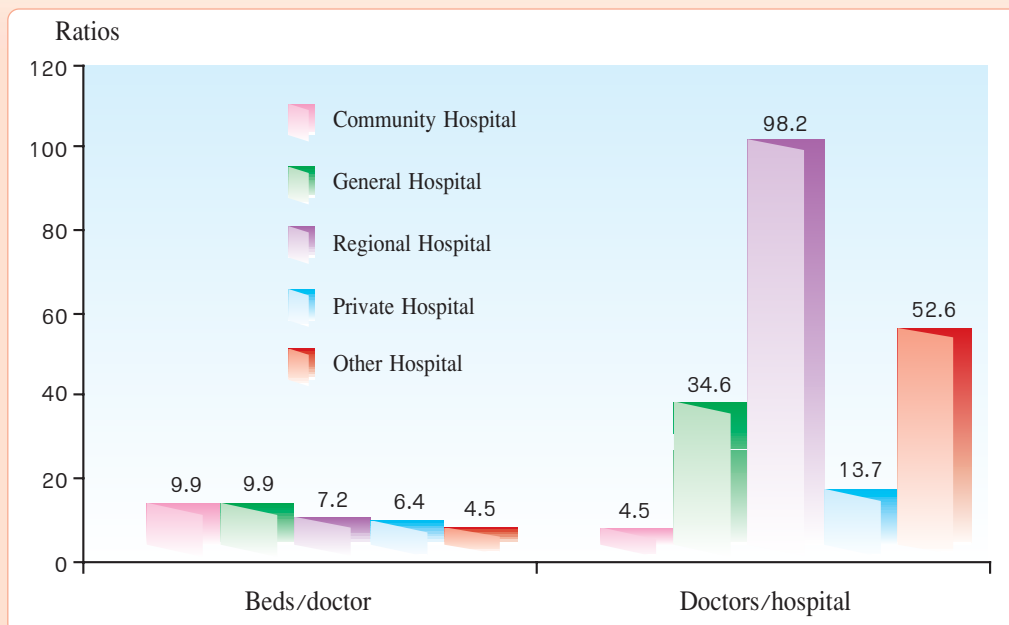


**Source:** Report on Health Resources, Bureau of Policy and Strategy, MoPH.

An analysis of beds-to-doctor ratio and the average number of doctors per hospital will reflect the existence of doctors in comparison with the size of hospital. In 2005, it was found that community hospitals had the highest beds/doctor ratio, close to that for general hospitals, followed by regional hospitals and private hospitals. For the doctors per hospital comparison, on average, a hospital will have 4.5 doctors; a general hospital, 35 doctors; a regional hospital, 98 doctors; and a private hospital, 14 doctors (Figure 6.35).

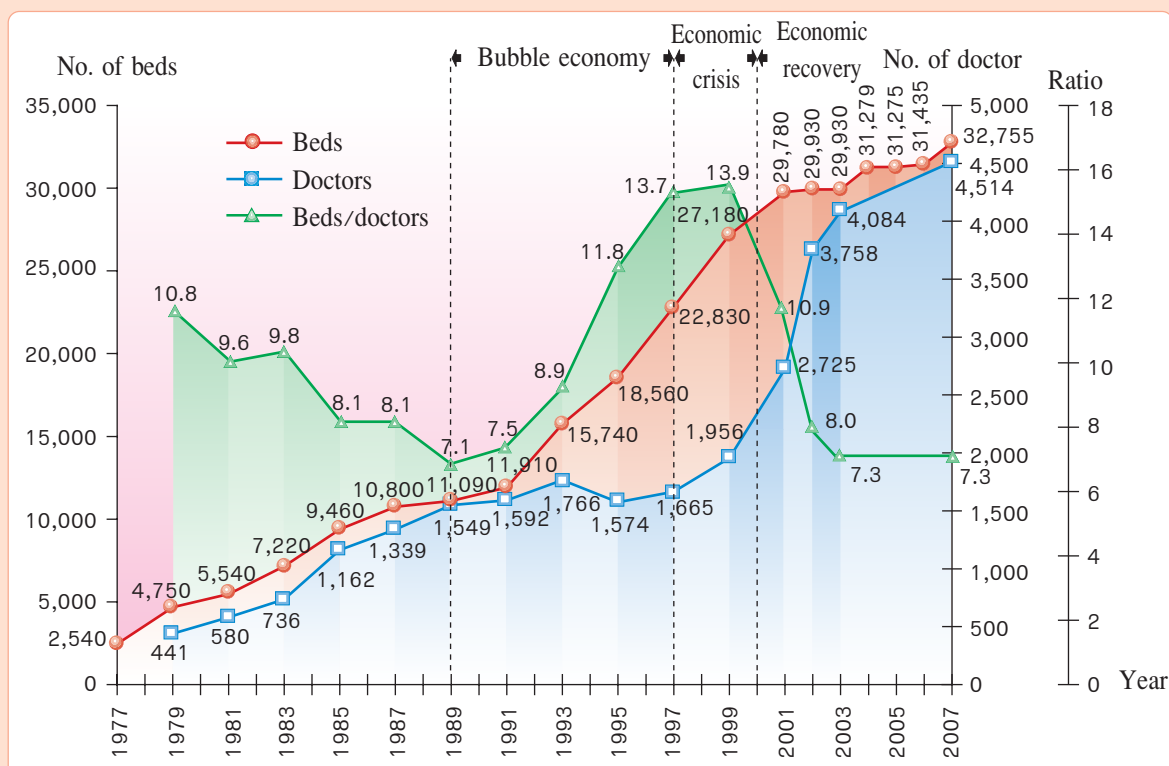
However, when considering the trends in beds-to-doctor ratios of community hospitals, using data from the Department of Health Service Support, before the economic crisis the ratio for private hospitals increased markedly, reflecting the shortages of doctors during that period. But after the crisis, the ratio began to decline due to increasing numbers of doctors (Figure 6.36).

**Figure 6.35** Beds/doctor ratios and average number of doctors per hospital by type of hospital, 2005



**Source:** Report on Health Resources, Bureau of Policy and Strategy, MoPH.

**Figure 6.36** Numbers of beds and doctors, beds-to-doctor ratios at community hospitals, 1977-2007



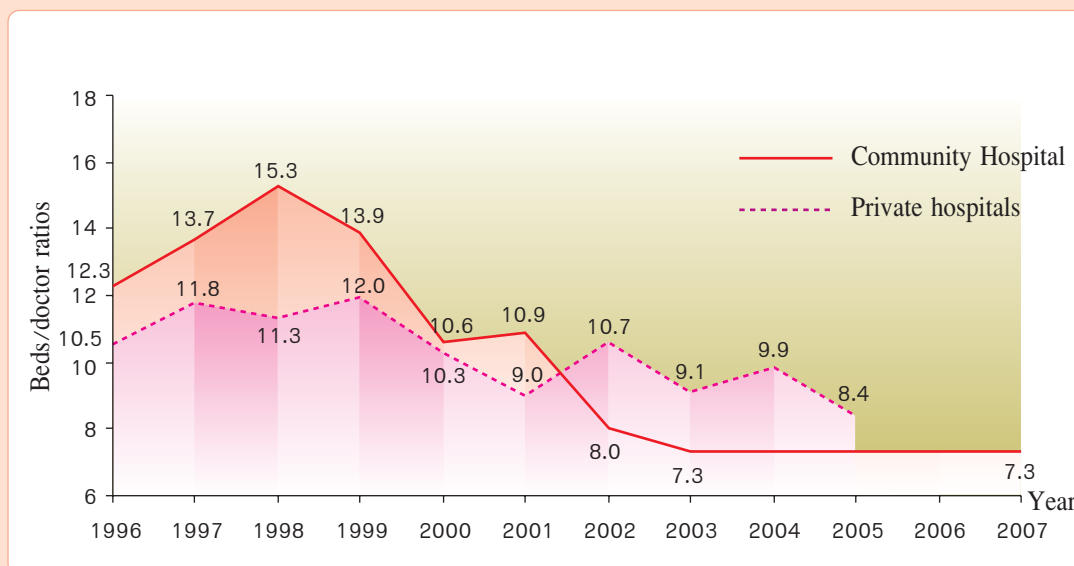
**Sources:** Bureau of Health Service System Development, Department of Health Service Support, MoPH. Bureau of Central Administration, Office of the Permanent Secretary, MoPH (for doctors at community hospitals in 2001 onwards).

**Note:** For 2001-2007. There was no survey on doctors actually working at community hospitals; so data from official payrolls (Jor 18) were used; such limitation resulted in the numbers being higher than actuality.



A comparison between community and private hospitals revealed that, between 1996 and 2001, the beds/doctor ratio for community hospitals was higher than that for private hospitals; but after that the ratio for community hospitals was lower (Figure 6.37). The average number of doctors per hospital for private hospitals was higher than that for community hospitals (Figure 6.38).

**Figure 6.37** Beds/doctor ratios in community and private hospitals, 1996-2007

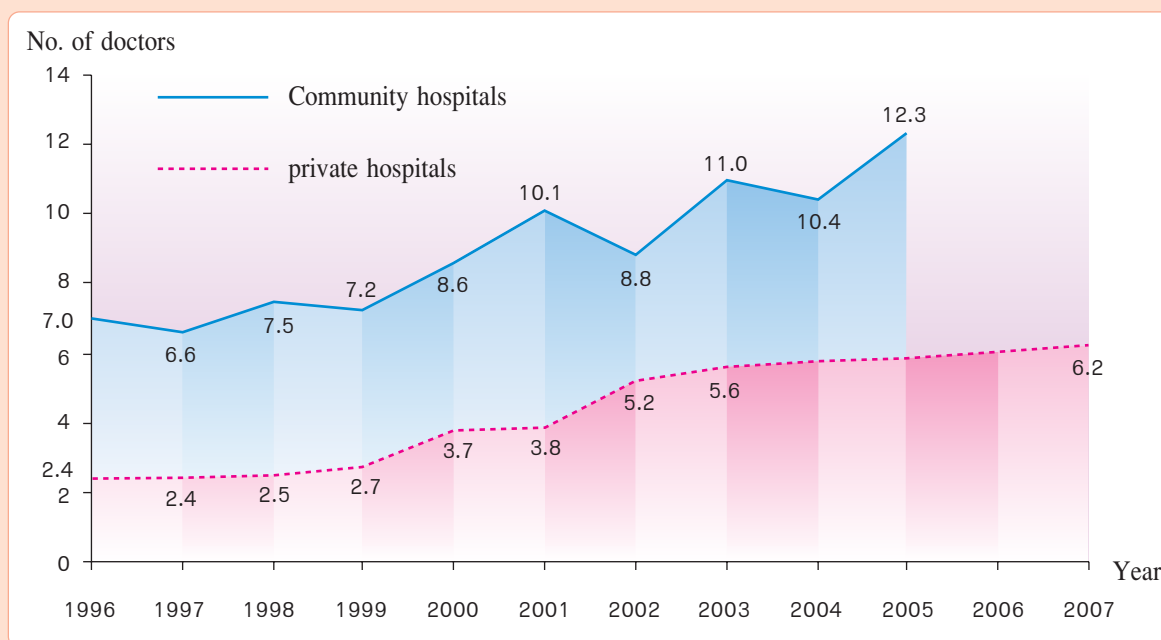


**Sources:** Bureau of Health Service System Development, Department of Health Service Support.  
Bureau of Central Administration, Office of the Permanent Secretary for Public Health.  
Medical Registration Division, Department of Health Service Support.





**Figure 6.38** Average numbers of doctors per hospital in community and private hospitals, 1996-2007



**Sources:** - Bureau of Health Service System Development, Department of Health Service Support, MoPH.

- Bureau of Central Administration, Office of the Permanent Secretary, MoPH.
- Medical Registration Division, Department of Health Service Support, MoPH.
- Bureau of Policy and Strategy, Office of the Permanent Secretary, MoPH.

- Notes**
1. Data on doctors in community hospitals in 1977-2001 were derived from a survey conducted by the Bureau of Health Service System Development, Department of Health Service Support, MoPH.
  2. Data on doctors in community hospitals from 2002 onwards were derived from the Bureau of Central Administration, Office of the Permanent Secretary, MoPH, based on the numbers of civil servants and state employees in the payrolls (Jor 18), which had some limitation, resulting in the numbers being higher than reality.
  3. The number of beds in private hospitals was based on their permit records; in actuality, the number would be lower; and the bed-occupancy rate was less than 50%.
  4. For 2002, data were obtained from a survey on 77.3% of private hospitals.





## 2) Workload of Health Manpower by Level of Services

An analysis of doctors' workloads in various levels of health facilities reflects the workloads of doctors in hospitals at each level. However, the computation of the workload might not be so accurate due to the complexity of patients which could be different at each level. A patient with a complex illness might cause a greater burden to the doctor than other patients in general.

The 2005 health resources survey revealed that doctors at community hospitals had the highest workload, followed by those at general hospitals, while those at university hospitals had the lowest; and doctors at private hospitals had a workload close to that for doctors at regional hospitals; based on the assumption that the multiplier for inpatients in the case of general, regional and university hospitals being equal, for community and private hospitals being equal, and for outpatients at all levels of hospitals being equal (Table 6.5).

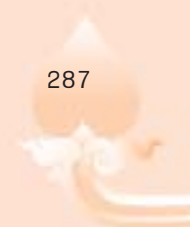
**Table 6.5** Workloads of doctors, 2005

Health facility	Outpatients (visits) (1)	Inpatients (cases) (2)	Inpatients, adjusted* (3)	Total workloads (1) + (3)	Doctors (cases) (4)	Workloads per doctor (1)+(3)/(4)	Com- parison index
Community hospitals	54,005,596	3,061,014	42,854,196	96,859,792	3,229	29,997	1.9
General hospitals	15,623,960	1,552,186	27,939,348	43,563,308	2,422	17,987	1.14
Regional hospitals	10,954,499	1,171,450	21,086,100	32,040,599	2,456	13,046	0.83
University hospitals	6,396,731	317,878	5,721,804	12,118,535	3,179	3,812	0.24
Private hospitals	35,299,555	1,790,142	25,061,988	60,361,543	4,229	14,273	0.9
<b>Total</b>	<b>122,280,341</b>	<b>7,892,670</b>	<b>122,663,436</b>	<b>244,943,777</b>	<b>15,515</b>	<b>15,788</b>	<b>1</b>

**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

**Notes:** \* In order that the inpatient workloads for each type of hospitals is in the same output, the number of inpatients is adjusted as follows:

1. For community and private hospitals = no. of inpatients X 14
2. For regional/general, university and BMA hospitals = no. of inpatients X 18



## 2. Health Facilities

### 2.1 Situation and Trends of Health Facilities

Health facilities, both public and private, have the following trends:

#### 2.1.1 Health Facilities in the Public Sector

Public sector health facilities play a crucial role in the health service system as they provide health services to the people in all localities with good accessibility and coverage, particularly in remote areas. State services include those provided by the MoPH at specialized hospitals, regional hospitals, general hospitals, community hospitals, and subdistrict health centres, and by other ministries such as the Ministry of Education (medical schools), the Ministry of Defence, the Ministry of Interior, state enterprises, local administrative organizations (including Bangkok Metropolitan Administration), and community primary health care centres, which can be divided according to the administrative level as follows (Table 6.6).

**In Bangkok Metropolis, there are five medical school hospitals,** 26 general hospitals, 14 specialized hospitals/institutions, and 68 public health centres (with 77 branches) in all BMA districts.

**Region level.** There are six medical school hospitals, 25 regional hospitals, and 47 specialized hospitals.

**Provincial level.** There are 70 general hospitals covering all provincial areas (previously there were 67 general hospitals; and now Hua Hin Community Hospital has been upgraded as a general hospital, two other hospitals have been transferred to MoPH. i.e. Chonprathan Hospital of the Agriculture Ministry and the Northeastern Region Infectious Disease Hospital of the MoPH Disease Control Department) and 59 hospitals under various military bases and combat units of the Ministry of Defence.

**District level.** There are 730 community hospitals, covering 91.7% of all districts, one extended OPD or branch hospital, and 214 municipal health centres.

**Tambon (subdistrict) level.** There are 9,762 health centres, covering all Tambons; several Tambons have more than one health centre.

**Village level.** There are 311 community health posts, 66,223 rural community primary health care centres, and 3,108 urban community primary health care centres.

**Table 6.6** Health facilities in the public sector, 2007

Administrative level	Health facility	Number	Coverage
<b>Bangkok Metropolis</b>	Medical school hospitals	5	
	General hospitals	26	
	MoPH	4	
	Royal Thai Police	1	
	Ministry of Justice	4	
	Ministry of Defence	5	
	BMA	8	
	State enterprises	4	
	Specialized hospitals/institutions	14	
	Public health centres/branches	68/77	
<b>Regional level and branches</b>	Medical school hospitals	6	All districts under BMA
	Regional hospitals	25	
	Specialized hospitals:	47	
	Health promotion hospitals	12	
	Psychiatric hospitals	13	
	Neurological hospital	1	
	Rajprachasamasai Institute	1	
	Bamrasnaradura Institute	1	
	Chest Disease Institute	1	
	Cancer prevention & control centres	6	
	Drug dependence treatment centres	5	
	Metta Pracharak Hospital	1	
	Centre for elderly care	1	
	Dermatology Centre	1	
	Dental Institute	1	
	Sirindhorn National Medical Rehabilitation Centre	1	
	Thanyarak Institute	1	
	Maha Vajiralongkorn Centre at Thanyaburi	1	
<b>Provincial level (75 provinces)</b>	General hospitals, under MoPH	70	100%
	Military hospitals under the Ministry of Defence	59	
	Hospital under the Royal Thai Police	1	
<b>796 districts</b>	Community hospitals (Mar, 2007)	730	91.7%

Administrative level	Health facility	Number	Coverage
81 minor districts	Branch hospital	1	100%
	Municipal health centres (Oct, 2003)	214	
7,255 subdistricts	Health centres (2006)	9,762	
74,435 villages	Community health posts	311	89.0%
	Community PHC centres (2003)		
	Rural	66,223	
	Urban	3,108	

**Sources:** 1. Bureau of Policy and Strategy, MoPH.

2. Bureau of Health Service System Development, Department of Health Service Support, MoPH.

3. Primary Health Care Division, Department of Health Service Support, MoPH.

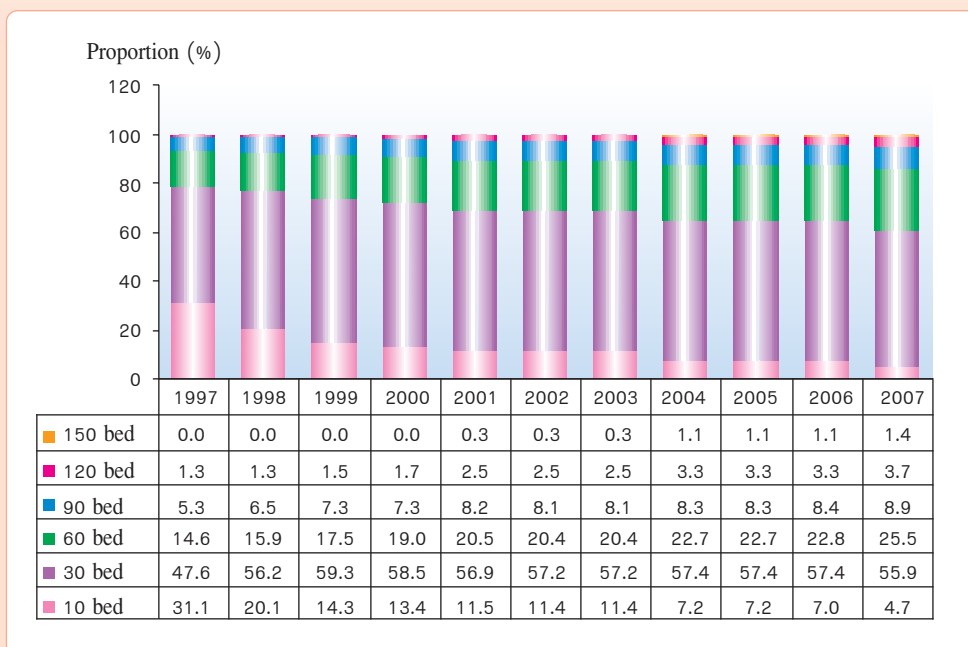
4. Department of Provincial Administration, Ministry of Interior.

5. Department of Health, Bangkok Metropolitan Administration (BMA).

District-level hospitals are community hospitals, each with 10 to 150 beds, and located in all district towns across the country. For the past several years, community hospitals have been expanded steadily, particularly from 10 beds to 30 beds. In 2007, there are only 34 10-bed hospitals while there are as many as 408 30-bed hospitals among 730 community hospitals. The proportion of 10-bed hospitals is only 4.7% in 2007, while that for 30-bed hospitals has increased to 55.9% and the proportions of 60-bed, 90-bed, 120-bed, and 150-bed hospitals have also risen (Figure 6.39).



**Figure 6.39** Proportions of community hospitals by size, 1997-2007



**Source:** Bureau of Health Service System Development, Department of Health Service Support, MoPH.

### 2.1.2 Health Facilities in the Private Sector

Private health facilities play a significant role in providing health services in urban areas, especially those with a good economic status. With people's high purchasing power, there are investments in providing health services to the people in the locality. However, private health facilities are not only located in Bangkok, but they are also located in provincial areas, both in Mueang and nearby districts, particularly drugstores and private clinics (health facilities with no inpatient beds). In 2006, private health facilities are divided into three categories (Table 6.7). as follows:

- (1) Pharmacies or drugstores: 8,801 modern pharmacies, 4,528 pharmacies selling only packaged drugs, and 2,096 traditional medicine drugstores.
- (2) Clinics: 16,800 clinics without inpatient beds.
- (3) Hospitals: 344 private hospitals with inpatient beds.



**Table 6.7** Private health facilities, 2006

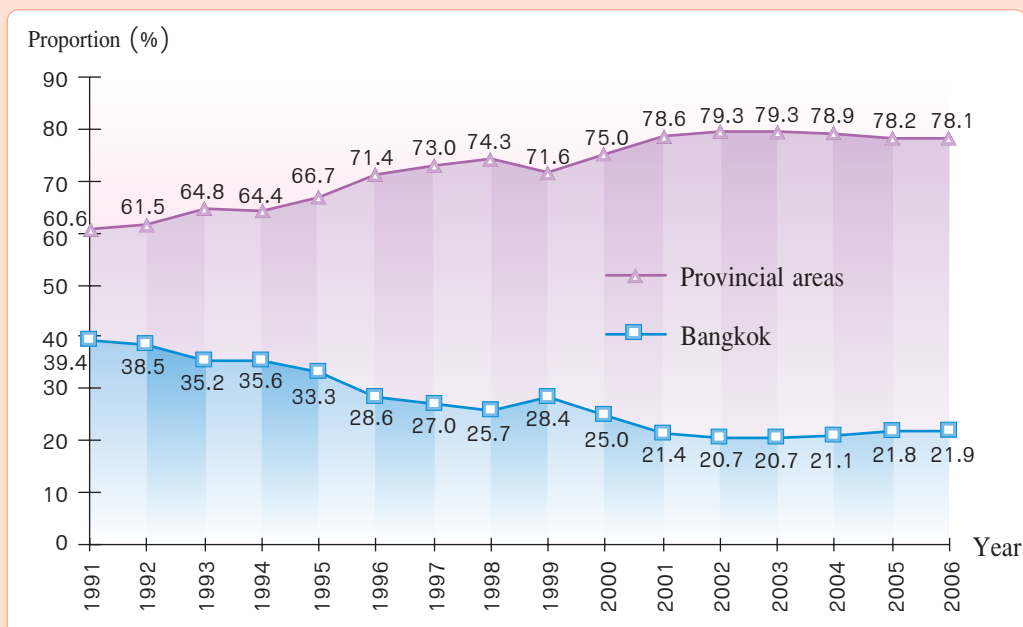
Health facility	Bangkok		Provincial areas		Total
	No.	Percent	No.	Percent	
1. Pharmacies					
1.1 Modern pharmacies	3,615	41.1	5,186	58.9	8,801
1.2 Modern pharmacies selling only packaged drugs	497	11.0	4,031	89.0	4,528
1.3 Traditional medicine drugstores	400	19.1	1,696	80.9	2,096
Total	4,512	29.2	10,913	70.8	15,425
2. Medical premises without inpatient beds (clinics)	3,687	21.9	13,113	78.1	16,800
3. Medical premises with inpatient beds (private hospitals)	3,603	21.8	12,944	78.2	16,547
- No. of hospitals	102	29.7	242	70.3	344
- No. of beds	15,500	43.3	20,306	56.7	35,806

**Sources:** 1. Drug Control Division, Food and Drug Administration, MoPH.

2. Medical Registration Division, Department of Health Service Support, MoPH.

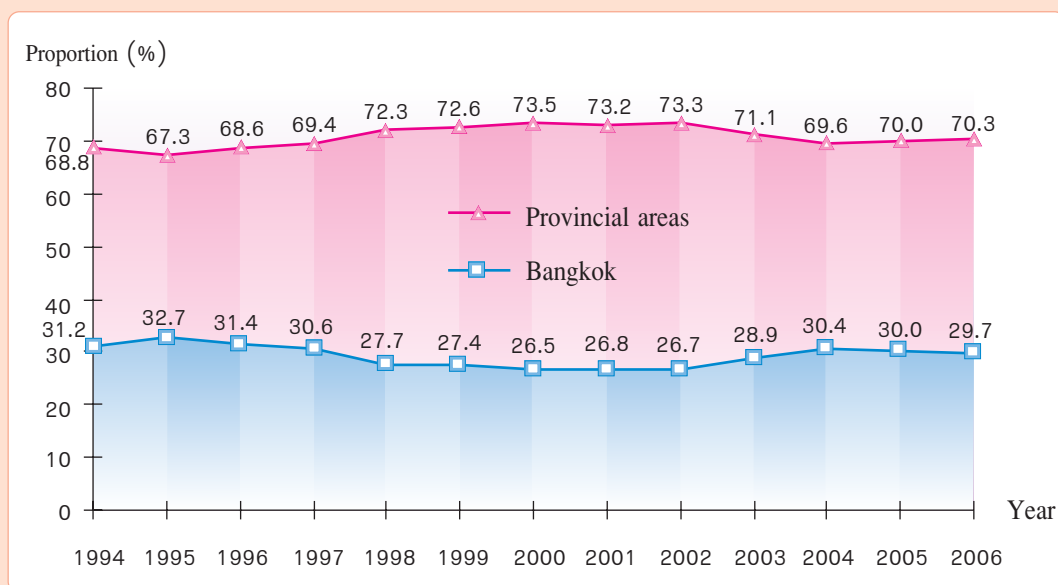
In analyzing the proportions of private clinics in Bangkok and provincial areas, it is noted that most clinics (78%) are located in provincial areas and only 22% in Bangkok (Figure 6.40). Similarly, most private hospitals (70%) are located in provincial areas and the rest (30%) in Bangkok (Figure 6.41).

**Figure 6.40** Proportions of clinics in Bangkok and provincial areas, 1991-2006



Source: Medical Registration Division, Department of Health Service Support, MoPH.

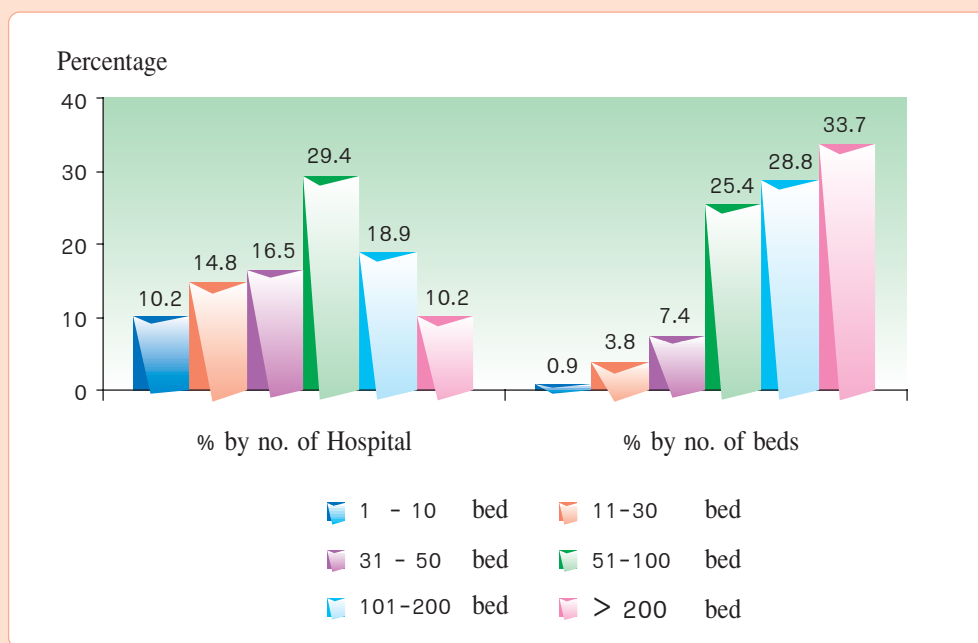
**Figure 6.41** Proportions of private hospitals in Bangkok and provincial areas, 1994-2006



Source: Medical Registration Division, Department of Health Service Support, MoPH.

For private hospitals, in 2006 most of them were medium-sized hospitals with 51-100 beds, but if the number of all beds was considered, most of the beds were in large hospitals (each with more than 200 beds), see Figure 6.42.

**Figure 6.42** Proportion of private hospitals by size, 2006



**Source:** Medical Registration Division, Department of Health Service Support, MoPH.

If the numbers of hospitals and beds were classified by hospital size and by region, it was noted that in 2006, most of large hospitals with over 200 beds were located in Bangkok (25 out of 35) (Table 6.8).

**Table 6.8** Number of private hospitals by number of beds and region, 2006

Region	1-10 beds		11-30 beds		31- 50 beds		51-100 beds		101-200 beds		>200 beds		Total	
	Hos-pitals	Beds	Hos-pitals	Beds	Hos-pitals	Beds	Hos-pitals	Beds	Hos-pitals	Beds	Hos-pitals	Beds	Hos-pitals	Beds
Bangkok	5	57	16	412	15	673	21	1,912	20	3,318	25	9,128	102	15,500
Central	14	136	20	516	11	488	38	3,499	24	3,910	7	2,108	114	10,657
Northeast	4	39	4	112	15	716	16	1,440	4	560	1	214	44	3,081
North	6	60	6	168	7	336	21	1,798	9	1,224	2	620	51	4,206
South	6	47	5	136	9	432	5	448	8	1,299	-	-	33	2,362
<b>Total</b>	<b>35</b>	<b>339</b>	<b>51</b>	<b>1,344</b>	<b>57</b>	<b>2,645</b>	<b>101</b>	<b>9,097</b>	<b>65</b>	<b>10,311</b>	<b>35</b>	<b>12,070</b>	<b>344</b>	<b>35,806</b>

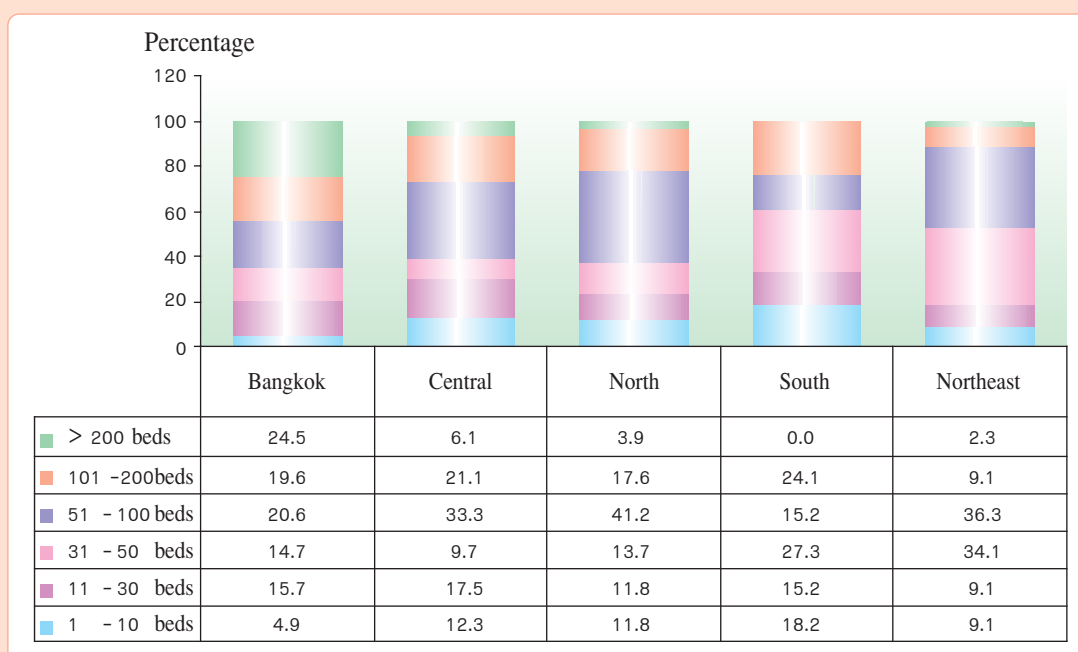
**Source:** Medical Registration Division, Department of Health Service Support, MoPH.





If the proportion of hospitals was computed according to hospital size for each region, it was found that one-fourth of private hospitals in Bangkok had more than 200 beds each, only 5% of them had 10 beds or less. In the central region, one-third of private hospitals had 51-100 beds each, while 41% in the North had 51-100 beds each. For the South, most of them had 31-50 beds each, followed by those with 101-200 beds, whereas in the Northeast only 11% had 101 beds or more (Figure 6.43).

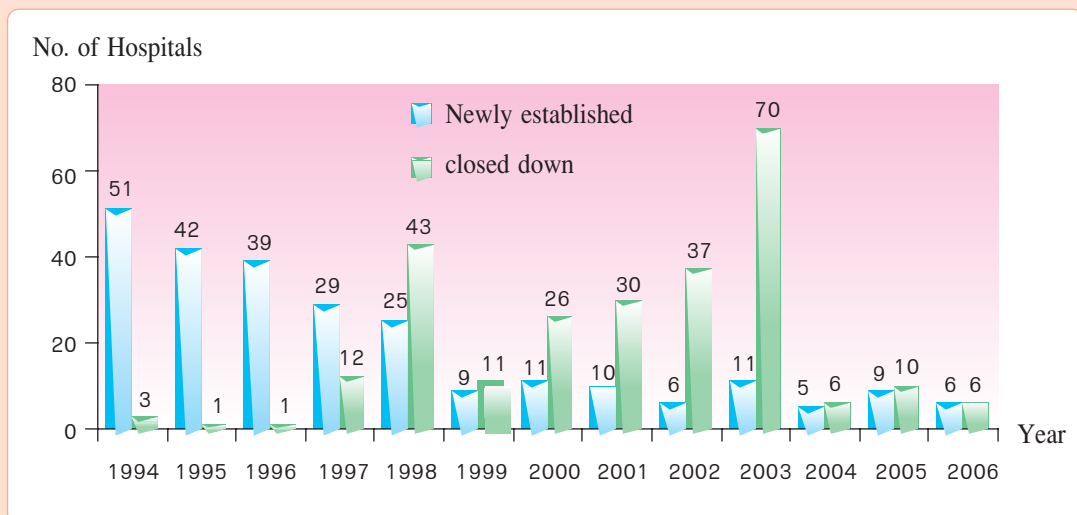
**Figure 6.43** Proportions of private hospitals by number of beds and by region, 2006



**Source:** Medical Registration Division, Department of Health Service Support, MoPH.

Regarding the expansion and closure of private health facilities which are also important issues, based on the data on applications for establishing new facilities (medical premises with inpatient beds), it was found that the trends were declining while the number of closures were rising during the period 1998-2003, when as many as 70 hospitals were shut down in one year. After that period, the number of hospitals closing down was declining to about the same level as that applying for setting up new ones (Figure 6.44), reflecting the economic recovery to the balanced condition.

**Figure 6.44** Numbers of private hospitals newly established and closed down, 1994-2006

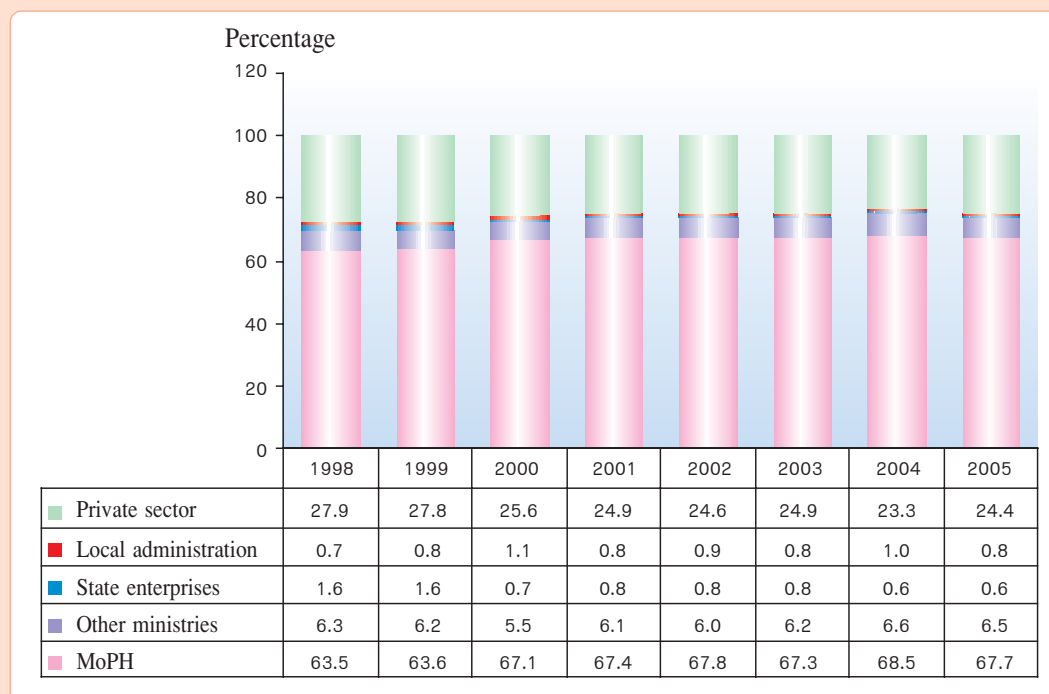


Source: Medical Registration Division, Department of Health Service Support, MoPH.

### 3) Proportions of Health Facilities by Agency

There was a rising trend for hospitals under the MoPH, while that for private hospitals was falling; the same was true for the proportions of hospital beds (Figures 6.45 and 6.46).

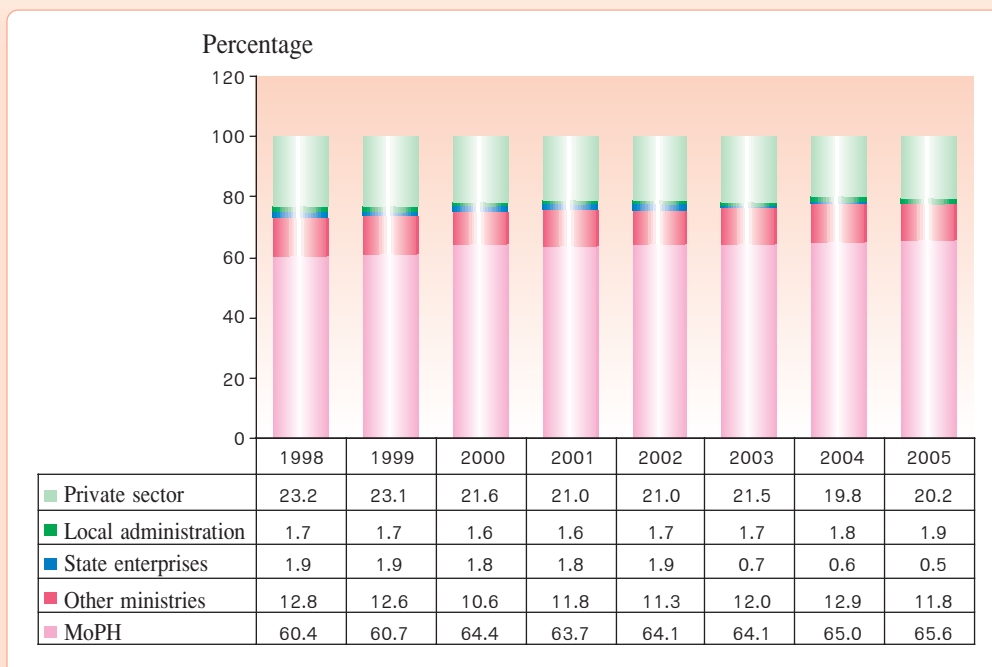
**Figure 6.45** Proportions of hospitals by agency, 1998-2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.



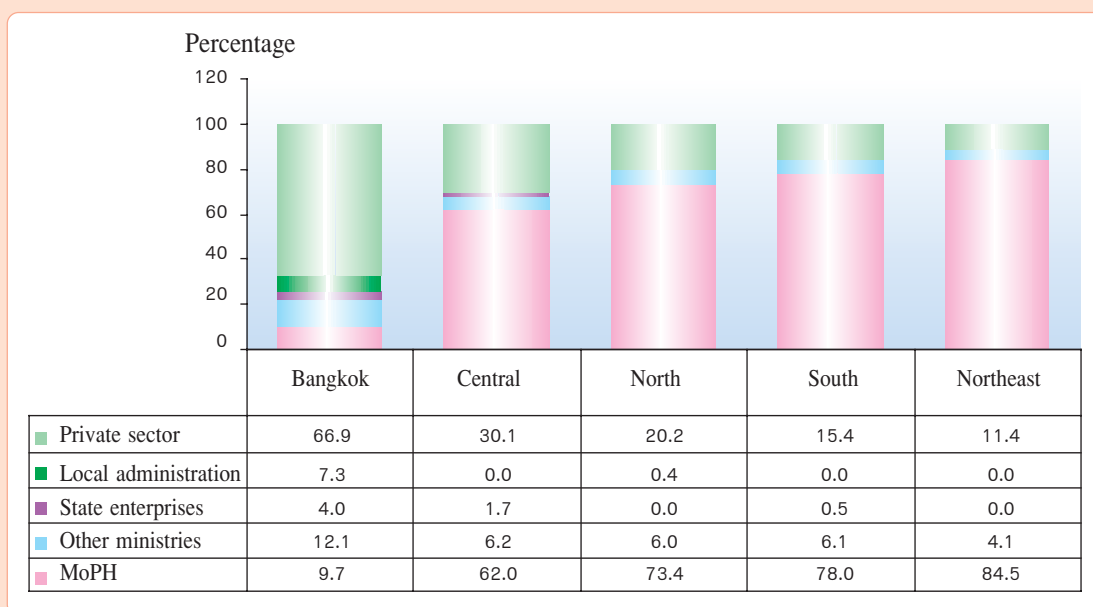
**Figure 6.46** Proportions of hospital beds by agency, 1998-2005



**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

A regional comparison revealed that most hospitals in Bangkok are private hospitals, followed by those under other ministries, where as in provincial areas, most of them are under the MoPH (Figure 6.47). Regarding the proportions of hospital beds by region, they were actually similar to those for hospitals, but hospitals under other ministries have the highest proportion of hospital beds close to that for private hospitals (Figure 6.48), reflecting the fact that hospital under other ministries are large hospitals.

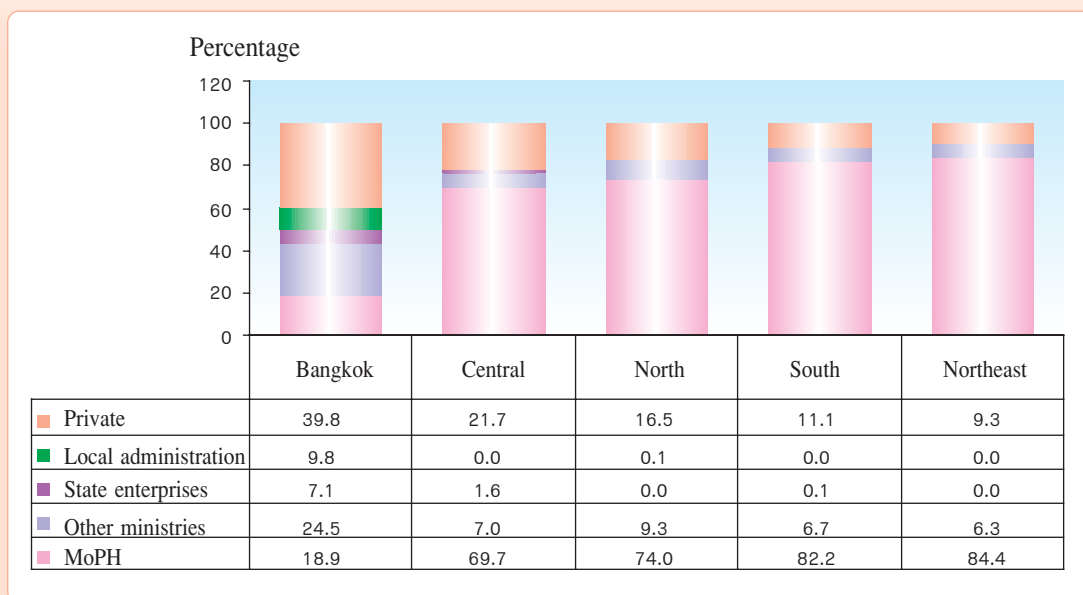
**Figure 6.47** Proportions of hospitals by agency and region, 2005



**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.



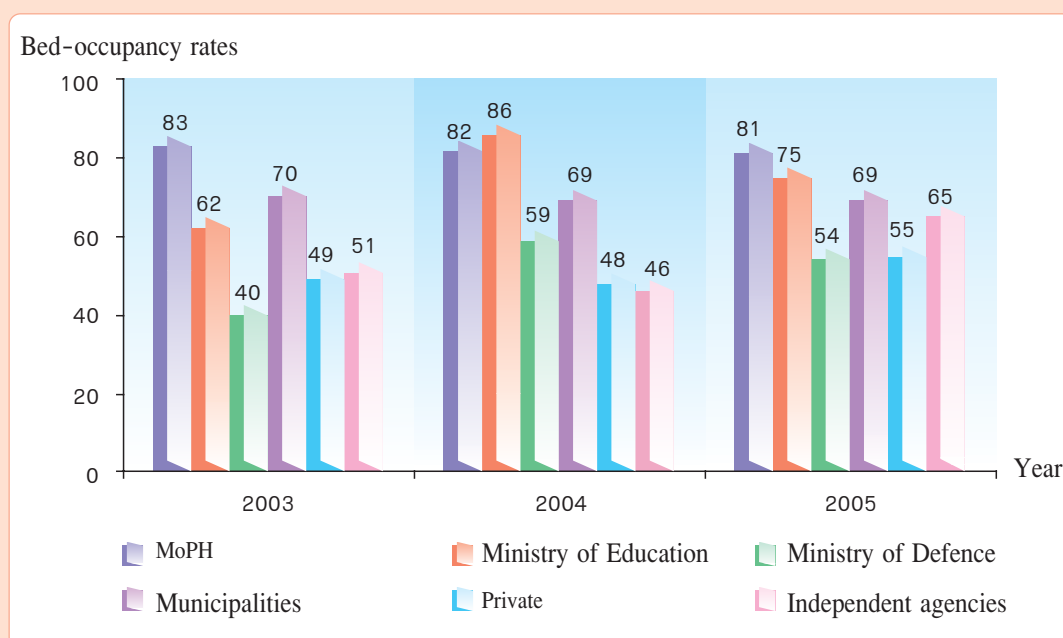
**Figure 6.48** Proportions of hospital beds by agency and region, 2005



**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

An analysis of bed-occupancy rates will reflect the efficiency in the use of existing beds and the burden the hospital has to take when admitting inpatients. Based on the 2005 data, MoPH hospitals had the highest bed-occupancy rate, followed by those under the Ministry of Education; while private hospitals and those under the Ministry of Defence had the lowest rates (Figure 6.49).

**Figure 6.49** Bed-occupancy rates by agency, 2003-2005



**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

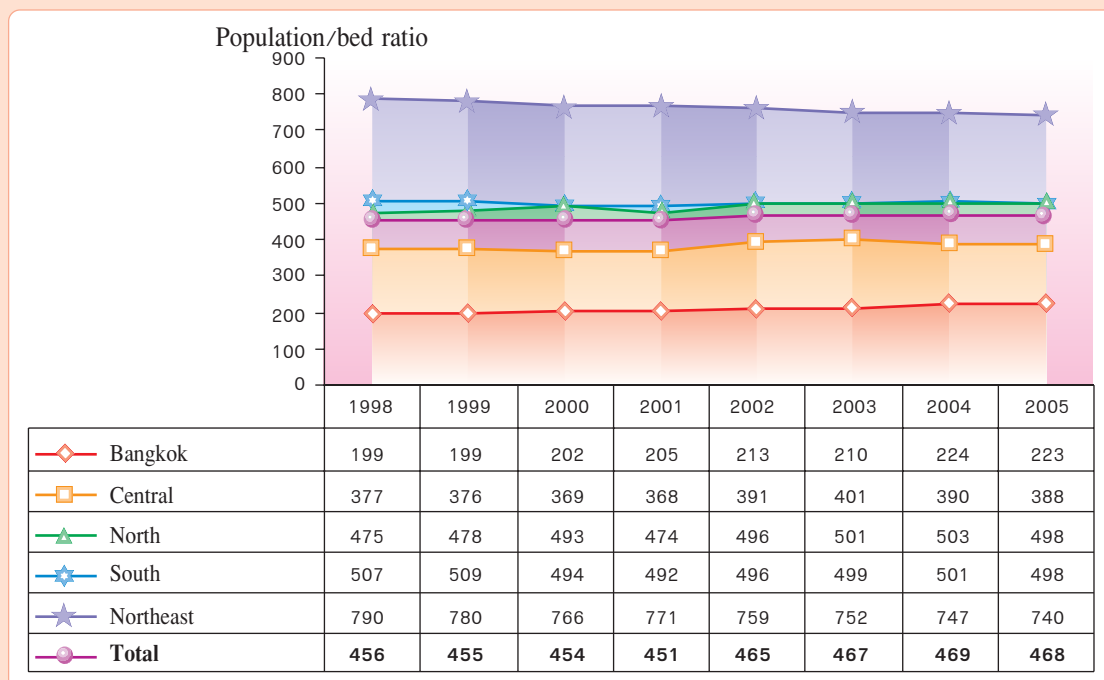


## 2.2 Distribution of Health Facilities

### 2.2.1 Geographical Distribution of Hospitals

Trends in population to hospital bed ratio during the 1998-2005 period fell slightly in the Northeast (with more beds), while those for other regions including Bangkok seemed to be stable or rising slightly (Figure 6.50).

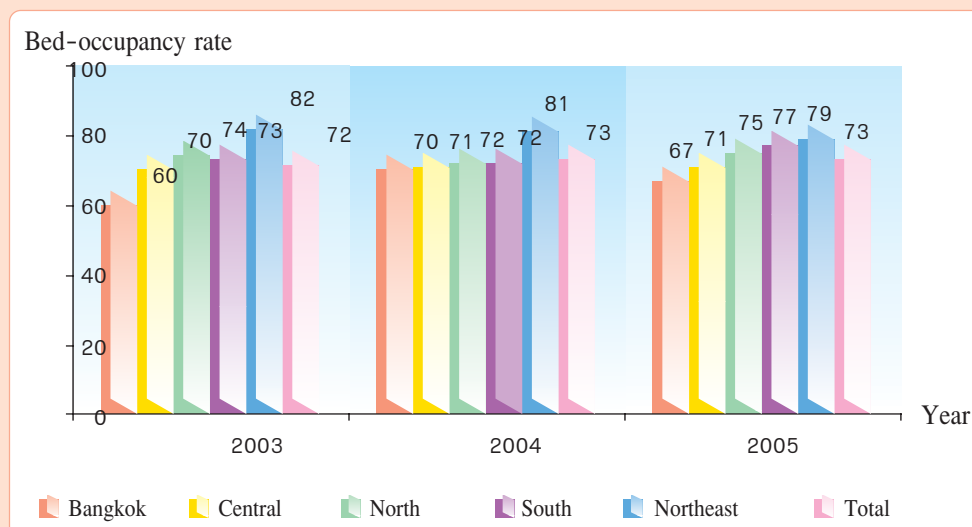
**Figure 6.50** Population/bed ratios by region, 1998-2005



**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

In addition, the Northeast had the highest bed occupancy rate (Figure 6.51), reflecting a higher burden of the hospitals in that region, compared with other regions.

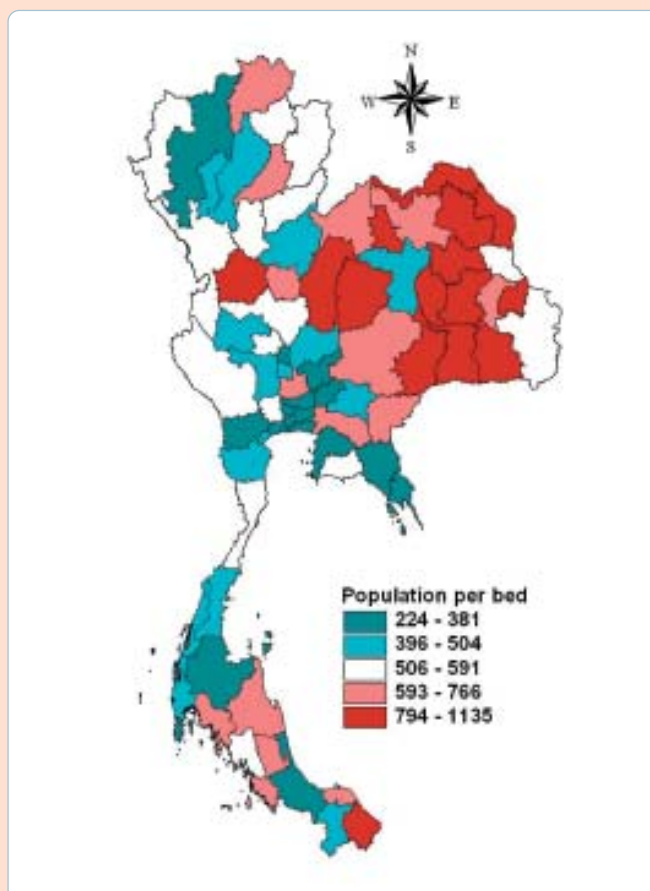
**Figure 6.51** Bed-occupancy rates by region, 2003-2005



**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

An analysis of bed distribution by province revealed that most provinces in the Northeast had a higher population/bed ratio, compared with that in other provinces in other regions the distribution of beds was similar to that for healthcare providers (Figure 6.52).

**Figure 6.52** Geographical distribution of population/bed ratios by province, 2004



**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

### 2.2.2 Geographical Distribution of Health Centres

Health centres have been built and distributed to cover all subdistricts (tambons) across the country since the last decade. In 2006, there were 9,762 health centres nationwide.

The health centre to population ratio rising in the last decade had a rising trend in all regions of the country, from 1:10,064 in 1979 to 1:5,106 in 2006. Although health centres are mostly clustered in the Central Region, the regional disparities have actually decreased as shown in Table 6.9 and Figure 6.53.



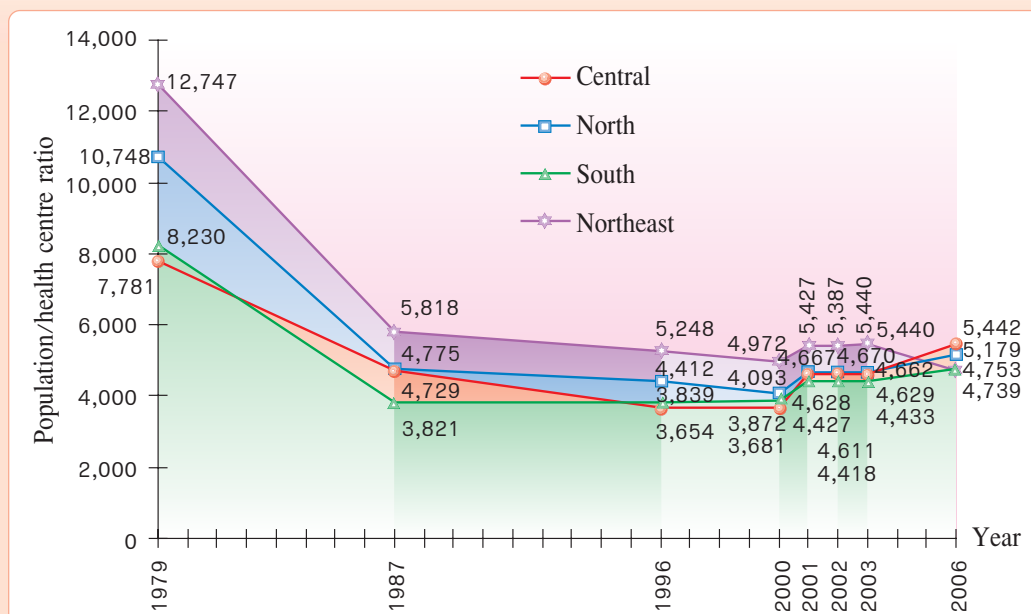
**Table 6.9** Distribution of health centres by region in 1979, 1987, 1996–2003, and 2006

Region	No. of health centres and health centre/population ratio										
	1979	1987	1996	1997	1998	1999	2000	2001	2002	2003	2006
Central	1,219 (1:7,781)	1,635 (1:4,729)	2,377 (1:3,654)	2,471 (1:3,554)	2,508 (1:4,298)	2,523 (1:4,219)	2,524 (1:3,681)	2,559 (1:4,628)	2,559 (1:4,611)	2,549 (1:4,629)	2,564 (1:5,179)
North	914 (1:10,748)	1,616 (1:4,775)	1,965 (1:4,412)	2,151 (1:4,103)	2,203 (1:4,393)	2,225 (1:4,345)	2,231 (1:4,093)	2,210 (1:4,667)	2,216 (1:4,670)	2,220 (1:4,662)	2,227 (1:4,739)
South	688 (1:8,230)	1,252 (1:3,821)	1,400 (1:3,839)	1,488 (1:3,653)	1,505 (1:3,864)	1,513 (1:3,922)	1,516 (1:3,872)	1,507 (1:4,427)	1,526 (1:4,418)	1,521 (1:4,433)	1,510 (1:4,753)
Northeast	1,277 (1:12,747)	2,489 (1:5,818)	3,100 (1:5,248)	3,367 (1:4,900)	3,398 (1:5,063)	3,428 (1:5,102)	3,433 (1:4,972)	3,462 (1:5,427)	3,509 (1:5,387)	3,475 (1:5,440)	3,461 (1:5,442)
Disparity between Central's and Northeast's ratios	1:1.64	1:1.23	1:1.44	1:1.38	1:1.18	1:1.21	1:1.21	1:1.17	1:1.17	1:1.18	1:1.05
Total	4,088 (1:10,064)	6,992 (1:4,964)	8,842 (1:4,411)	9,477 (1:4,173)	9,614 (1:4,522)	9,689 (1:4,514)	9,704 (1:4,262)	9,738 (1:4,890)	9,810 (1:4,872)	9,765 (1:4,895)	9,762 (1:5,106)

**Source:** The Bureau of Central Administration, Office of the Permanent Secretary, MoPH, recalculated by Rujira Taverat, Bureau of Policy and Strategy, MoPH.

- Notes:**
1. The figure in ( ) is the ratio of health centre to population outside municipal areas and sanitary districts.
  2. Data on population outside municipal areas for 2001, 2002 and 2006 were derived from the Bureau of Registration Administration, Department of Provincial Administration, Ministry of Interior, and recalculated by Rujira Taverat, Bureau of Policy and Strategy, MoPH.
  3. For 2003, data on population in 2002 outside municipal areas were derived from the Bureau of Registration Administration, Department of Provincial Administration.

**Figure 6.53** Population to health centre ratios by region, 1979-2006



**Sources:** - Bureau of Health Service System Development, Department of Health Service Support, MoPH.

- Bureau of Central Administration, Office of the Permanent Secretary, MoPH.

### 2.2.3 Geographical Distribution of Pharmacies

The ratio of pharmacy to population has an improved trend for the past decade, from 1: 4,931 in 1996 to 1: 4,032 in 2005. Most pharmacies or drugstores are located in Bangkok and the Central Region (Table 6.10).





**Table 6.10** Distribution of drugstores by region, 1996-2005

Region	No. of drugstores and drugstore/population ratio									
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Central	6,644 (1:2,908)	6,690 (1:2,925)	6,904 (1:2,869)	7,465 (1:2,675)	7,534 (1:2,665)	7,826 (1:2,590)	7,895 (1:2,547)	8,821 (1:2,350)	8,696 (1:2,373)	8,960 (1:2,295)
North	1,989 (1:6,004)	1,958 (1:6,149)	2,029 (1:5,976)	2,029 (1:5,984)	2,045 (1:5,923)	1,982 (1:6,111)	1,964 (1:6,180)	2,087 (1:5,808)	2,103 (1:5,690)	2,179 (1:5,444)
South	1,189 (1:6,534)	1,152 (1:6,837)	1,237 (1:6,472)	1,243 (1:6,524)	1,273 (1:6,430)	1,354 (1:6,104)	1,398 (1:5,983)	1,510 (1:5,601)	1,507 (1:5,618)	1,535 (1:5,521)
Northeast	2,303 (1:9,019)	2,396 (1:8,759)	2,378 (1:8,923)	2,536 (1:8,423)	2,253 (1:9,445)	2,148 (1:9,986)	2,166 (1:9,950)	2,566 (1:8,431)	2,574 (1:8,339)	2,751 (1:7,742)
Total	12,125 (1:4,931)	12,196 (1:4,958)	12,548 (1:4,874)	13,273 (1:4,639)	13,105 (1:4,713)	13,310 (1:4,665)	13,423 (1:4,660)	14,984 (1:4,200)	14,880 (1:4,202)	15,425 (1:4,032)

**Source:** Food and Drug Administration, MoPH.

**Note:** 1. Figures in ( ) are drugstore/population ratios.

2. A drugstore means a modern drugstore, a modern drugstore selling only packaged medicines, or a traditional medicine drugstore.

3. The Central Region includes Bangkok.

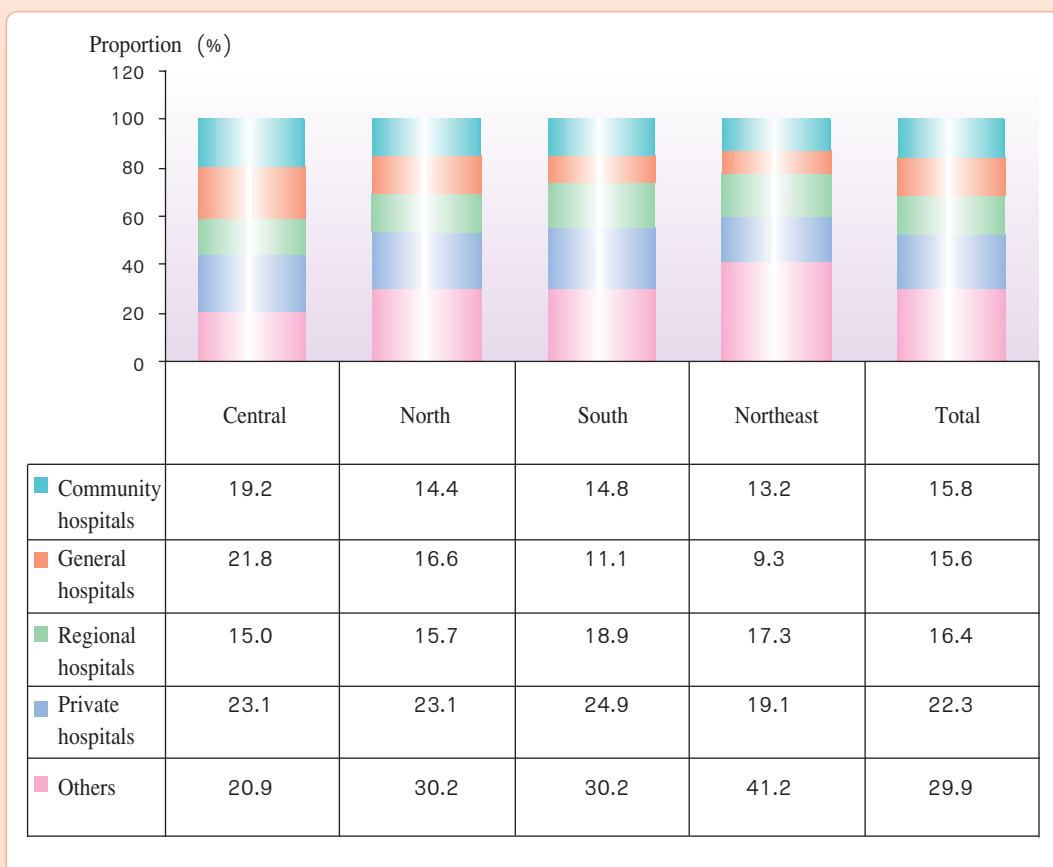


### **2.3 Distribution of Hospitals by Level of Hospitals**

An analysis of hospital bed proportions by the level of hospitals will help reflect the distribution of hospitals by their capacity. It was found that the Northeast had the highest proportion of beds in community hospitals, while the proportion of beds among private hospitals was highest in the Central Region (Figure 6.54). For private hospitals, the bed proportions by province in the Central region, large provinces in the North as well as some provinces in the East and South were higher than those in other provinces (Figure 6.55).



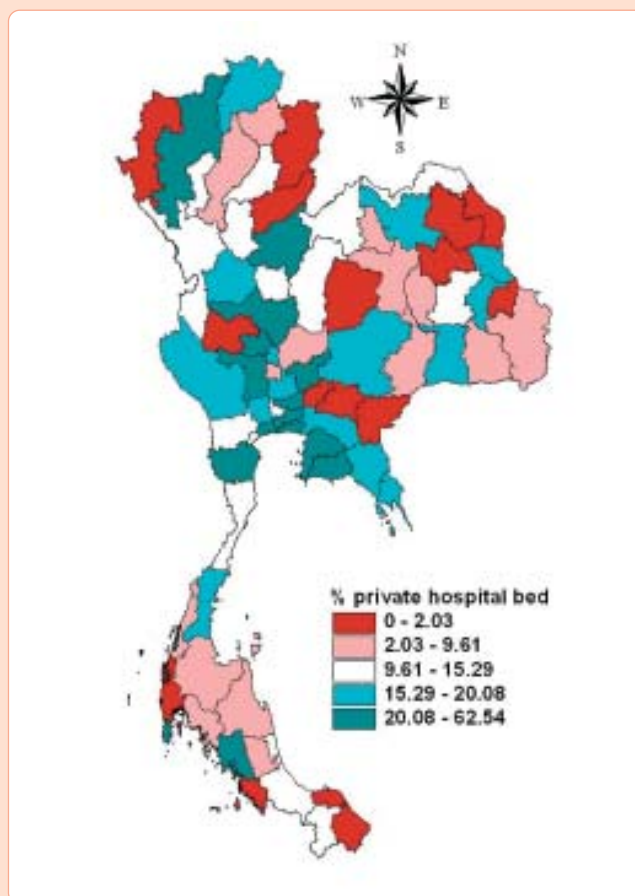
**Figure 6.54** Bed proportions by level of hospitals and region, 2005



**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.



**Figure 6.55** Geographical distribution of bed proportions in private hospitals in relation to all beds by province, 2005



**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.



### 3. Health Technologies

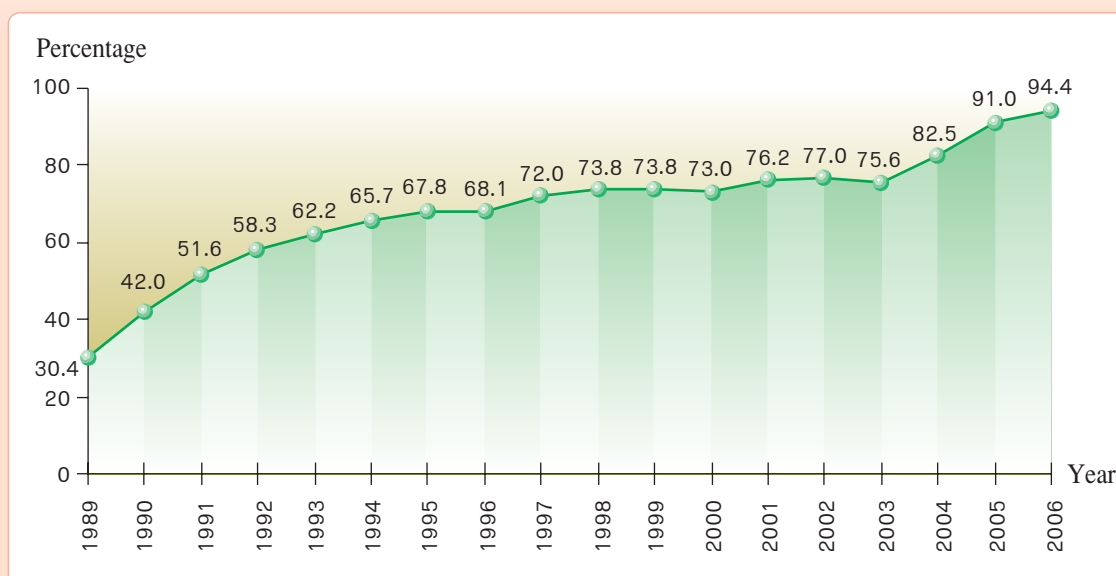
Major health technologies are drugs and medical supplies as well as medical and health technologies for use in the treatment of illnesses.

#### 3.1 Drug and Medical Supplies

The quality of domestically produced drugs has much improved as a result, in part, of the promotion of Good Manufacturing Practices (GMP). In 2003, the MoPH issued a rule requiring that all pharmaceutical manufacturers have a GMP certification. In 2006, 94.4% of the manufacturers were GMP-certified.



**Figure 6.56** Percentage of GMP-certified drug manufacturers, 1989-2006



**Source:** Drug Control Division, Food and Drug Administration, MoPH.

During the economic booming period 1988-1996, with the monopolies of new drugs, the proportion of imported drugs had a rising trend. Even after the economic crisis, since 2002, the import trend had been rising steadily, up to 56.3% in 2005 (Table 6.11 and Figure 6.57).

When considering the values of local production and drug imports, the trends rose steadily, except for a slightly downward trend for production in 2005, while the import values rose and surpassed the production values for the same year, the difference being approximately nine billion baht (Figure 6.58).

In addition to production and dispensing of drugs for domestic consumption, some drugs are exported to other countries, the export values rising from 480.8 million baht in 1989 to 6,958.3 million baht in 2006 (Figure 6.59).



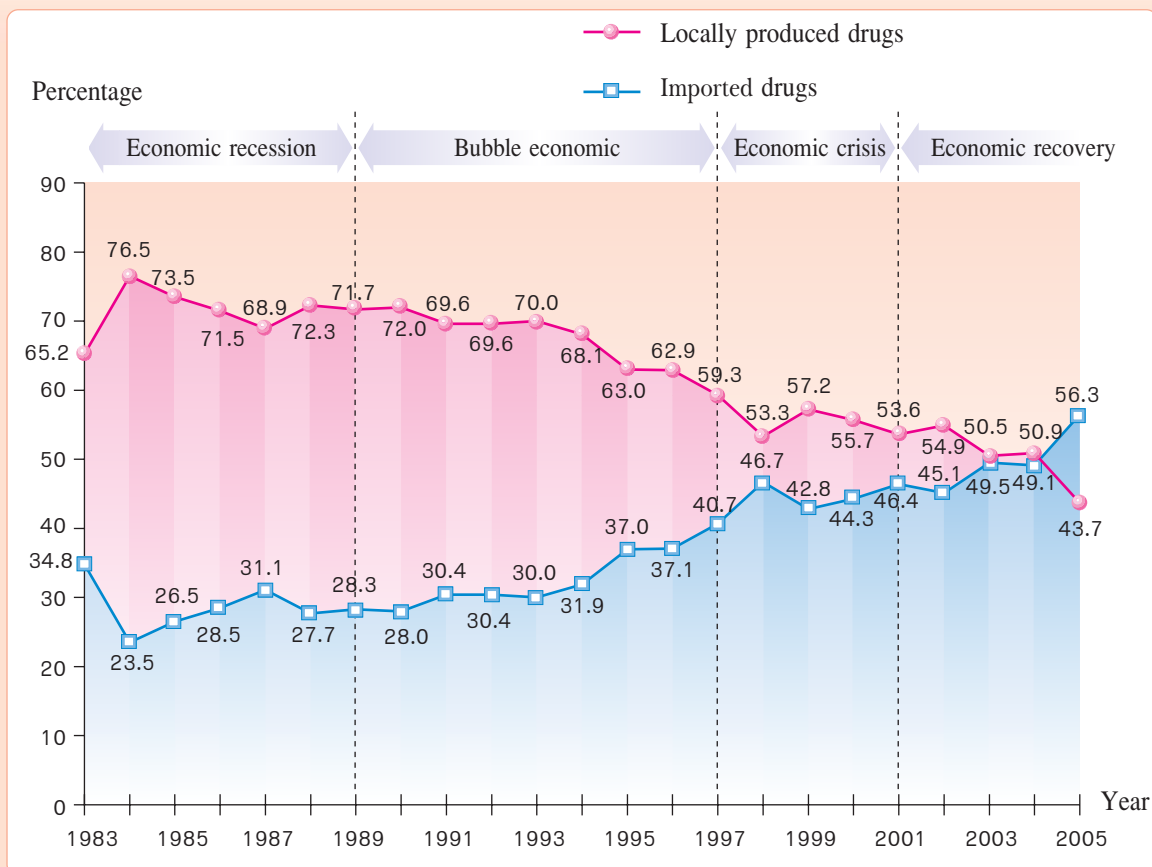
**Table 6.11** Values of locally produced and imported drugs (for human use) 1983-2005

Year	Wholesale values as reported (current prices)							Estimates of retail prices Country x 1.8	Estimates consumption values 2005		Change (%)		Total retail prices value as a percentage of health expenditure
	Values	Percent	Values	Percent	Total (million baht)	Values of exports (million baht)	Values of domestic consumption <sup>(1)</sup> (million baht)		Wholesale prices	Retail prices	Current prices	Constant prices	
							Estimates values of domestic consumption <sup>(2)</sup> X 1.675						
1983	3,777.9	65.2	2,012.0	34.8	5,789.9	255.6	5,534.3	9,270.0	16,686.0	20,131.02	36,236.01	-	40.52
1984	5,453.0	76.5	1,673.0	23.5	7,126.0	284.0	6,842.0	11,460.4	20,628.7	24,703.42	44,466.31	+23.6	39.49
1985	6,651.2	73.5	2,393.1	26.5	9,044.3	315.5	8,728.8	14,620.7	26,317.3	30,741.58	55,334.85	+27.6	44.41
1986	4,678.0	71.5	1,864.5	28.5	6,542.5	350.5	6,192.0	10,371.6	18,668.9	21,405.22	38,529.39	-29.1	28.26
1987	5,145.8	68.9	2,325.4	31.1	7,471.2	389.4	7,081.8	11,862.0	21,351.6	23,904.75	43,028.56	+14.4	28.73
1988	6,708.8	72.3	2,571.0	27.7	9,279.8	432.7	8,847.1	14,818.9	26,674.0	28,748.65	51,747.57	+24.9	29.65
1989	8,372.9	71.7	3,307.6	28.3	11,680.5	480.8	11,199.7	18,759.5	33,763.1	34,550.72	62,191.30	+26.6	32.13
1990	8,886.0	72.0	3,449.1	28.0	12,335.1	604.1	11,731.0	19,649.4	35,368.9	34,157.60	61,483.68	+4.8	28.23
1991	9,657.6	69.6	4,216.4	30.4	13,874.0	784.8	13,089.2	21,924.4	39,463.9	36,045.22	64,881.39	+11.6	28.43
1992	10,696.6	69.6	4,682.6	30.4	15,379.2	1,193.5	14,185.7	23,761.0	42,769.8	37,537.81	67,568.06	+8.4	27.08
1993	11,831.0	70.0	5,075.3	30.0	16,906.3	2,855.3	14,051.0	23,535.4	42,363.7	35,970.63	64,747.14	-0.9	23.02
1994	12,969.7	68.1	6,086.6	31.9	19,056.3	1,536.2	17,520.1	29,346.2	52,823.2	42,698.67	76,857.61	+24.7	26.41
1995	15,820.9	63.0	9,276.4	37.0	25,097.3	2,398.5	22,698.8	38,020.5	68,436.9	52,287.16	94,116.88	+29.6	30.08
1996	18,120.4	62.9	10,676.0	37.1	28,796.4	1,784.9	27,011.5	45,244.3	81,439.7	58,777.14	105,798.86	+19.0	31.63
1997	19,608.0	59.3	13,467.1	40.7	33,075.1	2,319.7	30,755.4	51,515.3	92,727.5	63,413.50	114,144.30	+13.9	32.88
1998	16,127.7	53.3	14,146.5	46.7	30,274.2	2,782.3	27,491.9	46,048.9	82,888.1	52,426.60	94,367.88	-10.6	30.02
1999	19,033.9	57.2	14,232.3	42.8	33,266.2	3,014.9	30,251.3	50,670.9	91,207.7	57,508.74	103,515.72	+10.0	32.09
2000	20,995.9	55.7	16,700.4	44.3	37,696.3	3,732.7	33,963.6	56,889.0	102,400.2	63,574.15	114,433.40	+12.3	34.16
2001	23,087.9	53.6	19,967.6	46.4	43,055.5	4,326.9	38,728.6	64,870.4	116,766.7	71,342.74	128,416.89	+14.0	36.35
2002	24,144.6	54.9	19,867.9	45.1	44,012.5	4,115.5	39,897.0	66,827.5	120,289.5	72,998.48	131,397.31	+3.0	36.04
2003	26,586.1	50.5	26,024.9	49.5	52,611.0	4,821.5	47,789.5	80,047.4	144,085.3	85,891.53	154,604.75	+19.8	38.92
2004	31,707.6	50.9	30,545.5	49.1	62,253.1	4,961.6	57,291.5	95,963.3	172,734.0	100,234.49	180,422.08	+19.9	43.97
2005	29,704.8	43.7	38,293.4	56.3	67,998.2	6,196.9	61,801.3	103,517.4	186,330.8	103,517.13	186,330.83	+7.9	42.84
										Avg 18 yrs		12.8	8.5
													-

**Source:** Drug Control Division, Food and Drug Administration, MoPH.

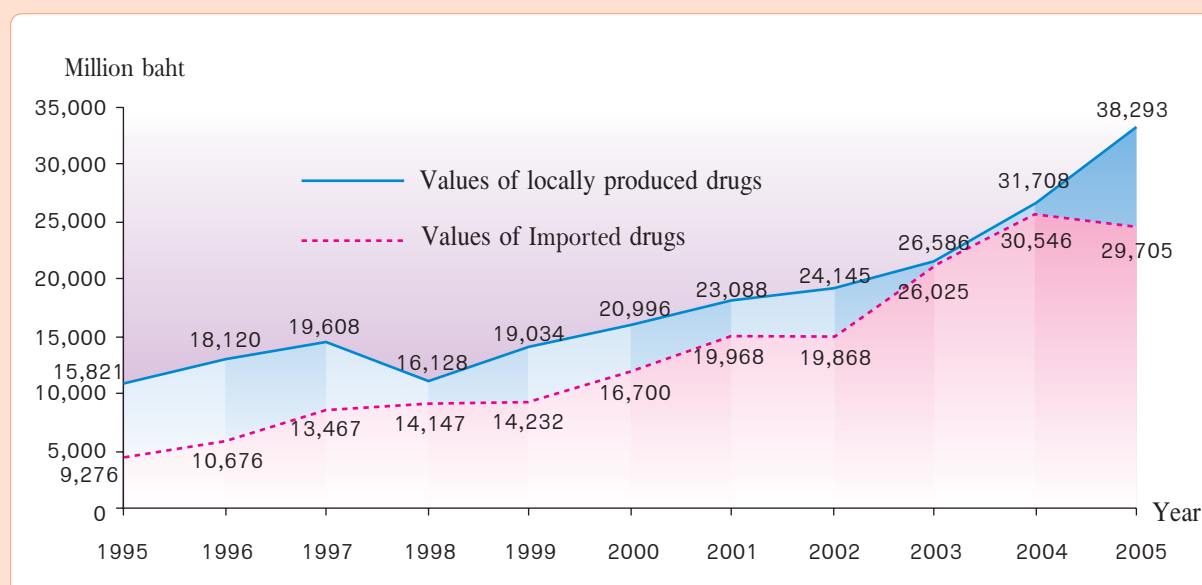
1. The estimates are to be deducted by export values
2. The reported figures are about 67.5% lower than actuality (48% underreported; and the reports do not include drugs from GPO, narcotics and psychoactive drugs)
3. Retail prices are about 1.8 times of wholesale prices.

**Figure 6.57** Percentage of locally produced and imported drugs(for human use) 1983-2005



Source: Drug Control Division, Food and Drug Administration, MoPH.

**Figure 6.58** Values of locally produced and imported drugs, 1995-2005

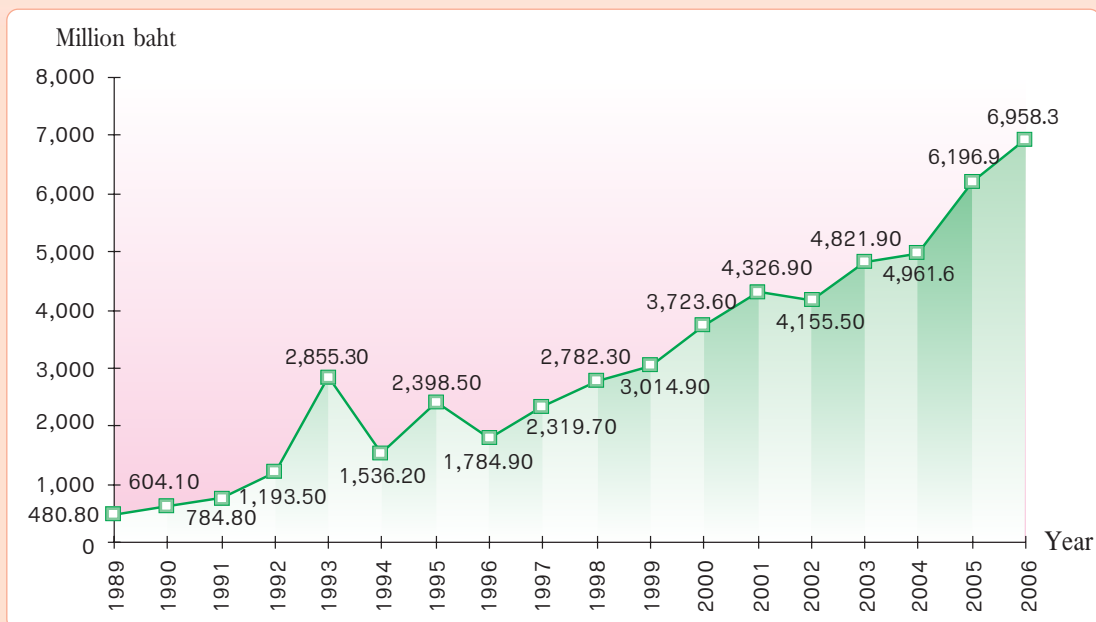


Source: Drug Control Division, Food and Drug Administration, MoPH.





**Figure 6.59** Values of drugs exported from Thailand (current prices), 1989-2006



**Source:** Food and Drug Administration, MoPH.

**Note:** Data for 1989-2006 were derived from the Customs Department, Ministry of Finance.



### **3.2 Medical and Health Technologies**

High-technology medical devices are on a rising trend, but mostly clustered in large cities and in the private sector rather than the public sector, except that extracorporeal shortwave lithotripters (ESWL) and ultrasound devices are more abundant in the public sector than in the private sector (Table 6.12).

**Table 6.12** Number and distribution of important medical devices

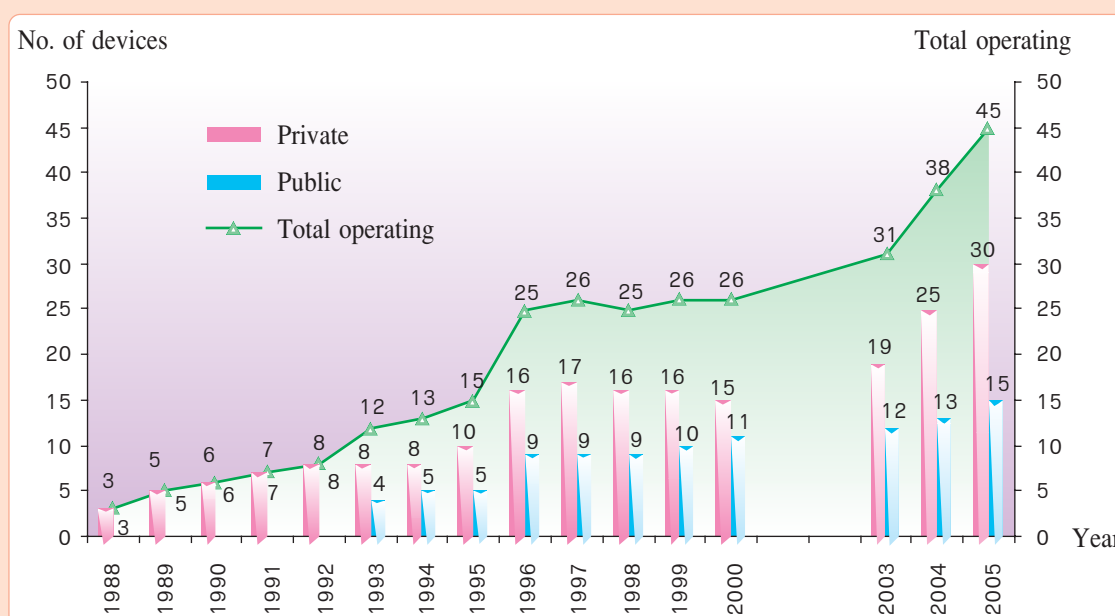
Device	No. of devices			Total by sector		Remarks
	Total	In Bangkok: No. (%)	In provinces: No. (%)	Public	Private	
1. CT scanners <sup>(1)</sup>	343	115 (33.5)	228 (66.5)	61 (17.8)	282 (82.2)	2006
2. Magnetic resonance imaging (MRI) <sup>(1)</sup>	45	30 (64.5)	15 (35.5)	15 (33.3)	30 (66.7)	2005
3. Lithotripters <sup>(2)</sup>	76	22 (29.3)	54 (70.7)	55 (72.4)	21 (27.6)	2005
4. Mammogram <sup>(1)</sup>	152	80 (54.9)	72 (45.1)	46 (30.3)	106 (69.7)	2006
5. Ultrasound <sup>(2)</sup>	1,987	399 (16.4)	1,588 (83.6)	1,501 (75.5)	486 (24.5)	2005

**Sources:** <sup>(1)</sup> Division of Radiology and Medical Devices, Department of Medical Services, 2006.

<sup>(2)</sup> Report on Health Resources. Bureau of Policy and Strategy, MoPH, 2007.

**Note:** Figures in ( ) are percentages.

**Figure 6.60** Number of MRI devices in the private and public sectors in Thailand



**Sources:** Data for 1988-1999 were derived from Piya Hanvoravongchai, 1999.

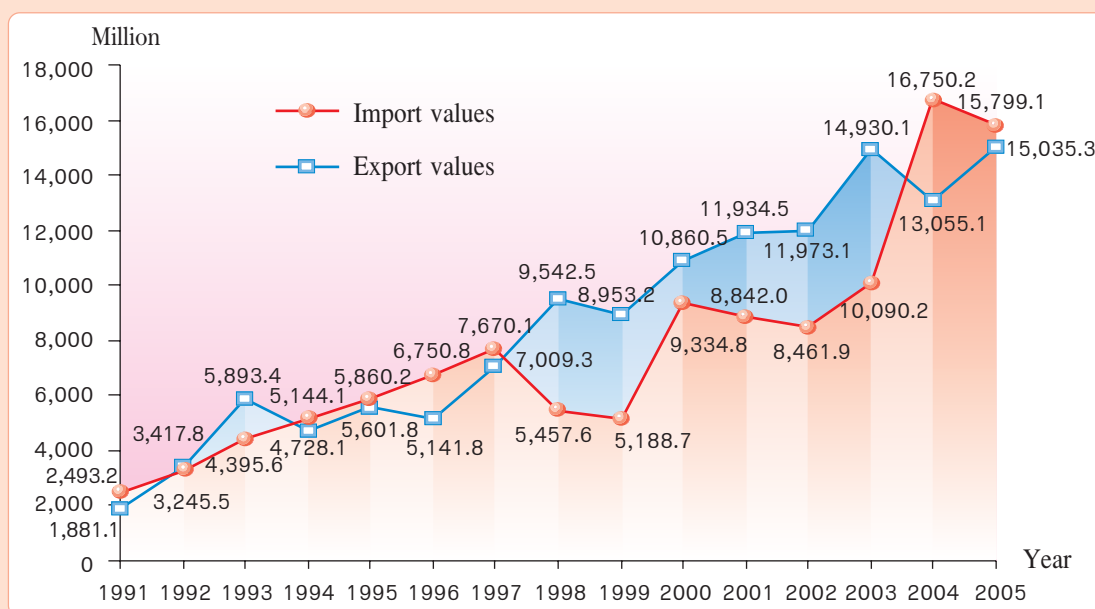
Data for 2003-2005 were derived from the Radiology and Medical Devices Division, Department of Medical Sciences, MoPH, 2006.

**Note:** The number for each year is as recorded at the end of the year, except for 2000.



The values of imported medical equipment rose 14.1% annually between 1991 and 2005. At the beginning of the economic crisis, the import values were decreasing, but increased by as much as 66.0% in 2004 whereas the values of exports have been rising since 1997, except for 2004 which had a small decrease (Figure 6.61).

**Figure 6.61** Values of imported and exported medical devices, Thailand, 1991-2005

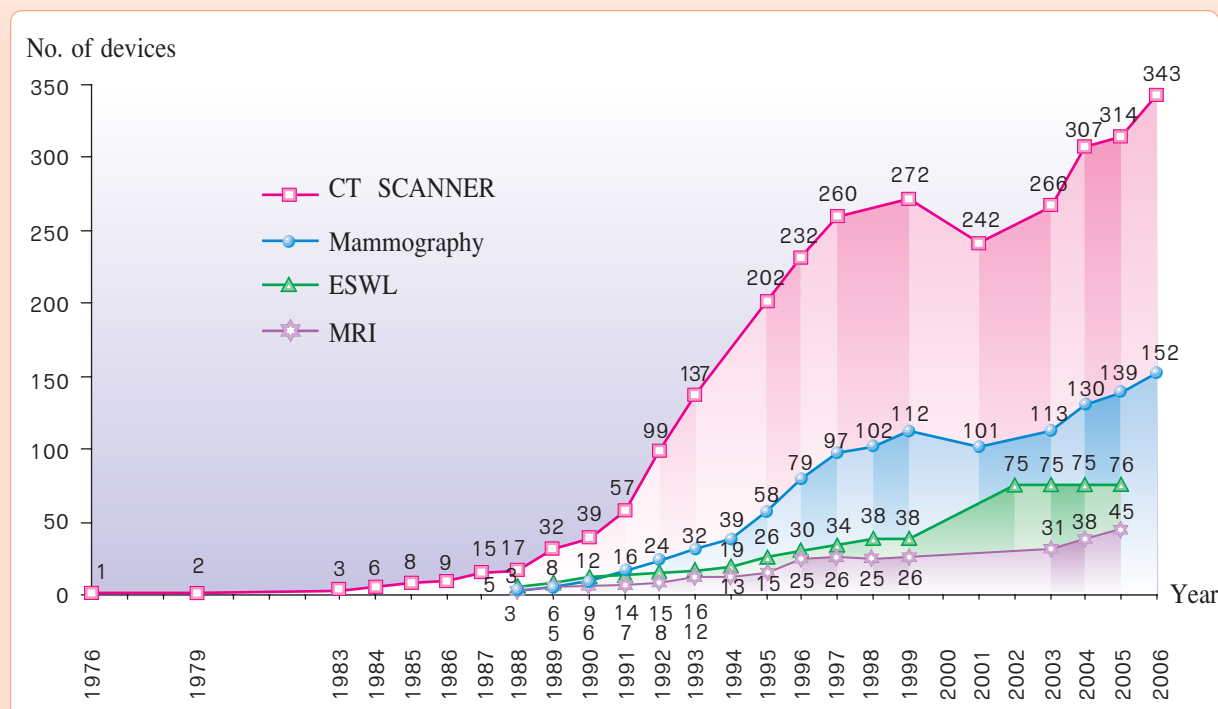


**Source:** Department of Customs, Ministry of Finance.

The increase in values of technology imports was partly due to rising prices of high-cost equipment, particularly CT scanners, MRI devices, lithotripters and mammogram devices (Figure 6.62).



**Figure 6.62** Numbers of high-cost medical technologies, Thailand, 1976-2006



**Sources:** - Wongduern Jindawatthana et al. High-cost Medical Devices in Thailand: Distribution, Utilization and Accessibility, 1999.

- For 2002-2006, data were derived from reports on health resources of the Bureau of Policy and Strategy, Office of the Permanent Secretary, and the Division of Radiology and Medical Devices, Department of Medical Sciences, MoPH.

The problem of inequalities in high-technology diffusion, especially CT scanner, MRI, ESWL and mammography, can be considered based on the device to population ratios (number of devices per 1 million population). For Bangkok, the ratios are highest for CT scanners, MRI, ESWL and mammography devices. But when using the discrepancy index, for Bangkok, the indices for all 4 types of devices ranged from 3.2 to 7.7 (compared with the national average), and for provincial areas the indices ranged from 0.4 to 1.3 (Table 6.13). For CT scanners, the discrepancy index dropped in 1999 but rose in 2006 (Table 6.14), the Bangkok/Northeast discrepancy declining from 12-fold in 1994 to 7.2-fold in 1999 and rose to 9.3-fold in 2006. This has shown that, even though the economic crisis is over, inequalities in medical device diffusion have increased.

**Table 6.13** Ratio of high-cost medical technologies to population and discrepancy index by region, 2006

Region	Ratio of medical devices per 1 million population				Discrepancy index			
	ESWL (2005)	CT	MRI (2005)	Mammogram	ESWL (2005)	CT	MRI (2005)	Mammogram
Bangkok Metropolis	3.9	20.5	5.4	14.3	3.2	3.7	7.7	6.0
Provincial areas	1.0	4.0	0.3	1.3	0.8	0.7	0.4	0.5
Central	1.0	7.4	0.2	2.4	0.8	1.3	0.3	1.0
North	0.9	4.0	0.3	0.9	0.8	0.7	0.4	0.4
Northeast	0.8	2.2	0.2	0.7	0.7	0.4	0.3	0.3
South	1.2	2.9	0.5	1.3	1.0	0.5	0.7	0.5
<b>Nationwide</b>	<b>1.2</b>	<b>5.5</b>	<b>0.7</b>	<b>2.4</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>	<b>1.0</b>

**Sources:** - Report on Health Resources. Bureau of Policy and Strategy, MoPH (ESWL data for 2005).  
 - Division of Radiology and Medical Devices, Department of Medical Sciences (MRI, 2005; CT and mammography devices, 2006).

**Table 6.14** Ratio of CT scanner to population and discrepancy index by region, 1994 and 1998-2006

Region	No. of CT scanners					Ratio of CT scanners per 1 million population					Discrepancy index				
	1994	1998	1999	2003	2006	1994	1998	1999	2003	2006	1994	1998	1999	2003	2006
Bangkok Metropolis	88	83	89	89	115	15.7	14.8	15.9	13.3	20.5	12.1	8.6	7.2	7.8	9.3
Provincial areas	117	156	183	177	228	2.2	2.8	3.3	3.1	4.0	1.7	1.6	1.5	1.8	1.8
Central	45	66	74	80	110	3.3	4.6	5.2	5.3	7.4	2.7	2.7	2.4	3.1	3.4
North	31	37	41	37	48	2.6	3.1	3.4	3.2	4.0	2.0	1.8	1.5	1.9	1.8
Northeast	26	36	46	38	46	1.3	1.8	2.2	1.7	2.2	1.0	1.0	1.0	1.0	1.0
South	15	17	22	22	24	2.0	2.1	2.8	2.5	2.9	1.5	1.2	1.3	1.5	1.3
<b>Nationwide</b>	<b>205</b>	<b>239</b>	<b>272</b>	<b>266</b>	<b>343</b>	<b>3.5</b>	<b>3.9</b>	<b>4.5</b>	<b>4.2</b>	<b>5.5</b>	<b>2.7</b>	<b>2.3</b>	<b>2.0</b>	<b>2.5</b>	<b>2.5</b>

**Sources:** For 1994, data were derived from Viroj Tangcharoensathien et al. Diffusion of Medical Equipment in Thailand, 1995.

For 1998 and 2003-2006, data were derived from the Division of Radiology and Medical Devices, Department of Medical Sciences.

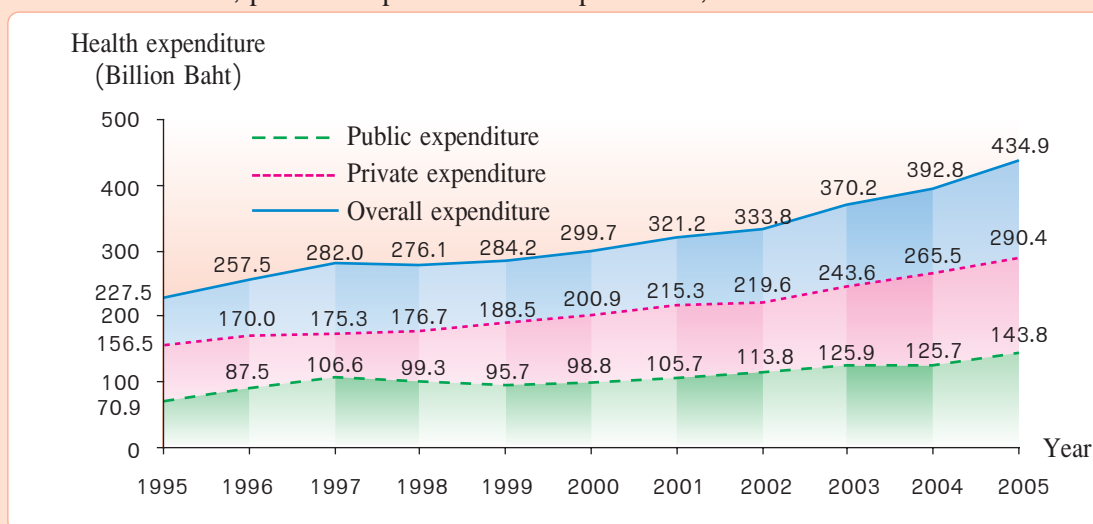
For 1999, data were derived from Wongduern Jindawatthana et al. High-cost Medical Devices in Thailand: Distribution, Utilization and Accessibility, 1999.

## 4. Health Expenditures

### 4.1 Trends in Overall Health Expenditure

During the past decades, health expenditures in Thailand were on a rapid upward trend, rising from 25,315 million baht in 1980 to 434,974 million baht in 2005 (Table 6.15 and Figure 6.63), a 17.2-fold increase. Per-capita health spending rose from 545 baht in 1980 to 6,994 baht in 2005 (Figure 6.64), a 12.8-fold increase in current prices.

**Figure 6.63** Overall, public and private health expenditures, 1995-2005

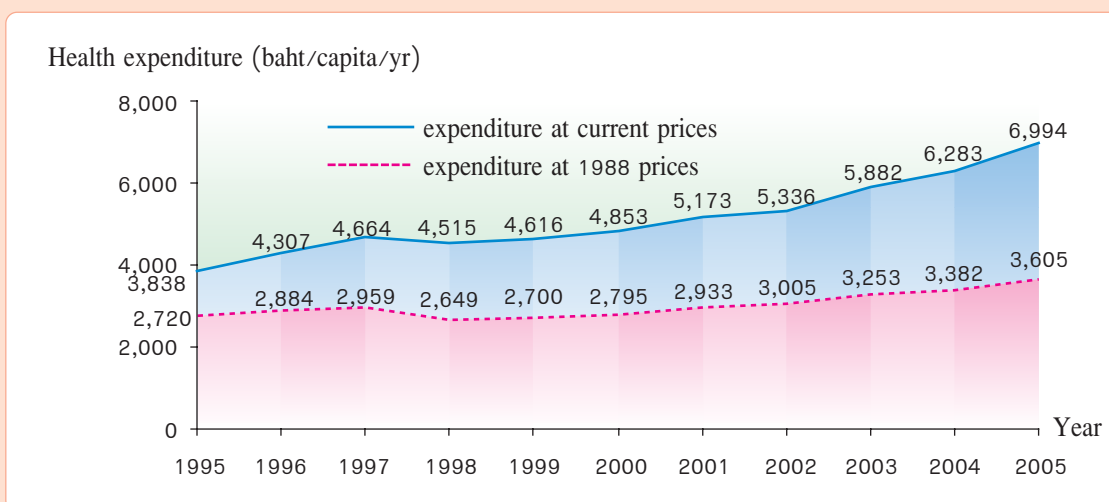


**Sources:** 1. Office of the National Economic and Social Development Board. National Income, Thailand, 1951-2005.

2. Viroj Tangcharoensathien. Sufferings and Causes in Health Systems, 1996.

3. Charles Myers. Financing Health Services and Medical Care in Thailand, 1985.

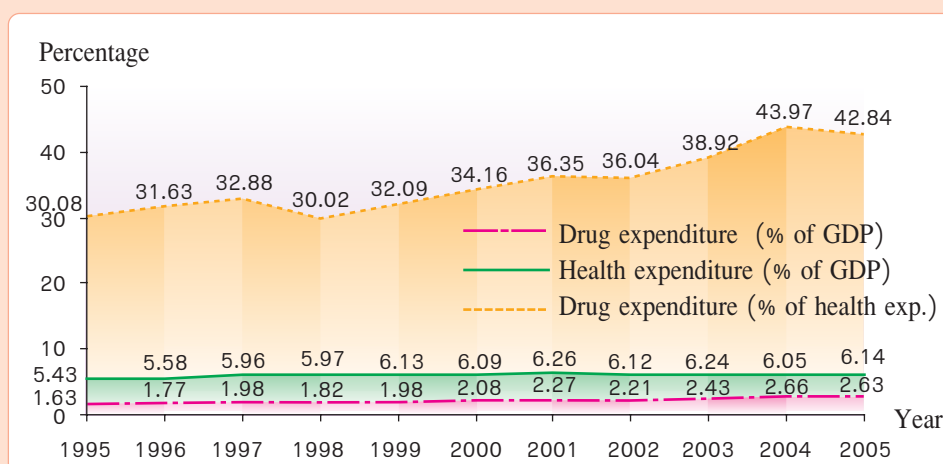
**Figure 6.64** Overall health expenditure per capita at current prices and at 1988 prices, 1995-2005



**Sources:** Tables 6.15 and 6.17.

As a percentage of GDP, the national health expenditure rose from 3.8% in 1980 to 6.1% in 2005 (Figure 6.65), the growth rising at the rate faster than that for GDP, i.e. an average at 7.7% in real terms while the average GDP growth was only 5.7% annually (Table 6.16). Most of health spending was on curative care as evidenced by the fact that the proportion of pharmaceutical spending rose to 42.8% of overall health spending in 2005 (Table 6.16 and Figure 6.65).

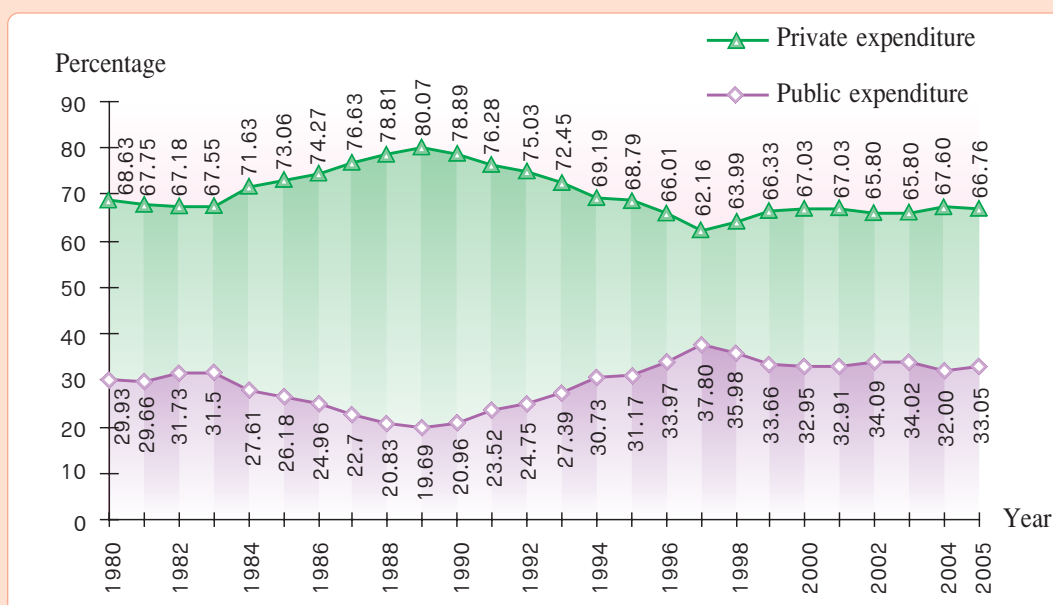
**Figure 6.65** Overall health and drug expenditures in relation to GDP and proportion of drug expenditure to health expenditure, 1995-2005



Source: Table 6.16.

Regarding sources of health expenditure, a higher proportion was from the private including household sector (66.8% of overall health expenditure in 2005), whereas an overall proportion (33%) was from the public sector (Figure 6.66).

**Figure 6.66** Proportions of public and private health expenditures, 1980-2005



Source: Table 6.17.



**Table 6.15** Health expenditure at current prices, 1980-2005 (million baht)

Year	Public sector						Private sector				International financial aid		Total health expenditure	
	MoPH	Other ministries	Civil servant benefit scheme	State enterprise benefit scheme	Works' compensation fund	Social security	Total	Percent	Private health insurance	Households & employers	Total	Percent	Amount	Per capita As percentage of GDP
1980	4,495	2,210	660	111	100	-	7,576	29.93	224	17,150	17,374	68.68	25,315	544.94
1981	5,572	2,535	995	167	149	-	9,418	29.66	284	21,229	21,513	67.75	31,755	668.70
1982	6,652	2,838	1,219	204	153	-	11,066	31.73	318	23,109	23,427	67.18	34,873	719.16
1983	7,902	3,134	1,482	248	205	-	12,971	31.50	350	27,469	27,819	67.55	41,181	832.63
1984	8,618	3,467	1,791	300	250	-	14,426	27.61	469	36,951	37,420	71.63	52,241	1,036.61
1985	9,044	3,716	2,157	362	236	-	15,515	26.18	547	42,751	43,298	73.06	59,265	1,146.75
1986	9,275	3,965	2,594	435	221	-	16,490	24.96	630	48,432	49,062	74.27	66,060	1,254.78
1987	9,525	4,082	2,828	474	274	-	17,183	22.70	756	57,258	58,014	76.63	75,704	1,439.10
1988	10,373	4,338	3,156	529	347	-	18,743	20.83	951	69,955	70,906	78.81	89,968	1,649.70
1989	11,733	4,448	3,521	590	397	-	20,689	19.69	1,162	82,988	84,150	80.07	105,091	1,895.31
1990	16,225	4,558	4,316	723	443	-	26,265	20.96	1,403	97,450	98,853	78.89	125,302	2,224.04
1991	20,569	4,699	5,127	859	624	778	32,656	23.52	1,544	104,348	105,892	76.28	138,818	2,449.93
1992	24,604	4,840	5,854	981	753	2,057	39,089	24.75	1,775	116,745	118,520	75.03	157,965	2,753.20
1993	32,898	4,928	7,906	1,291	927	2,473	50,423	27.39	2,061	131,297	133,358	72.45	184,062	3,141.85
1994	39,319	5,558	9,954	1,668	1,169	3,773	61,441	30.73	2,307	136,047	138,354	69.19	199,949	3,405.40
1995	45,833	6,677	11,156	1,869	1,370	3,991	70,896	31.17	4,984	151,508	156,492	68.79	227,477	3,837.50
1996	55,861	7,768	13,587	2,418	1,610	6,239	87,483	33.97	6,296	163,693	169,989	66.01	257,507	4,307.00
1997	68,934	7,182	15,503	2,756	1,987	10,245	106,607	37.80	7,518	167,780	175,298	62.16	282,001	4,663.80
1998	65,065	5,740	16,440	2,817	1,630	7,637	99,329	35.98	7,803	168,876	176,679	63.99	276,090	4,514.50
1999	62,787	6,087	15,174	2,539	1,404	7,676	95,667	33.66	8,171	180,356	188,527	66.33	284,235	4,615.90
2000	63,001	6,195	17,062	1,622	1,257	9,623	98,760	32.95	7,291	193,634	200,925	67.03	299,757	4,852.80
2001	61,563	7,134	19,180	3,013	1,277	13,543	105,710	32.91	8,400	206,942	215,342	67.03	321,239	5,173.40
2002	70,923	6,884	20,475	3,081	1,220	11,223	113,806	34.09	9,734	209,886	219,620	65.80	333,798	5,336.10
2003	74,134	8,579	22,679	3,971	1,480	15,113	125,956	34.02	11,128	232,457	243,585	65.80	370,206	5,881.90
2004	77,721	7,056	19,798	4,101	1,490	15,553	125,719	32.00	12,581	252,956	265,537	67.60	392,829	6,282.60
2005	85,914	6,070	28,951	3,741	1,507	17,592	143,775	33.05	13,861	276,547	290,408	66.76	434,974	6,993.60

**Notes:**

1. NESDB, Thailand's National Income, 1951-2005
2. Viroj Tangcharoensathien. Sufferings and Causes in Health System, 1996.
3. Chares Myers. Financing Health services and Medical Care in Thailand, 1985



**Notes:** Methods for estimating health expenditure:

1. MoPH—real figures from the Bureau of Policy and Strategy, Office of the Permanent Secretary.
2. Workers' Compensation Fund and Social Security—real figures from the Social Security Office.
3. Civil servants welfare—real figures from the Comptroller—General's Department, Ministry of Finance.
4. Health spending of households and employers—figures were derived from NESDB's National Income Reports; since 1994, such figures have been adjusted to include only fees for curative care, medication, and medical supplies/equipment; while the spending on emergency care has been shifted to "other service item", resulting in a drop in this category.
5. Other ministries
  - 5.1 1980-1983 — from Financing Health Services and Medical Care in Thailand, Charles Myers, 1985.
  - 5.2 1984-1992 (even number years) — from the Viroj's Sufferings and Causes Study.
  - 5.3 1984-1992 (odd number years) — by averaging the figures in the previous and following years.
  - 5.4 1994-2000 — from the Bureau of the Budget.
  - 5.5 2001-2005 — figures were derived from actual expenditure or spending as reported by the Comptroller-General's Department, Ministry of Finance, computed by NESDB.
6. State enterprise welfare
  - Estimates based on a constant proportion in relation to the civil servants welfare, i.e. =  $\text{civil servants welfare} \times \frac{1,668}{9,954}$  (based on national health account figures for 1994)
  - 1996-2005 — real numbers from the State Enterprise Office, Bureau of the Budget.
7. Private health insurance
 

Data for 1980-1986, derived by Charles Myers from the Insurance Department.

Data for 1994, from Viroj Tangcharoensathien.

  - 7.1 1980-1983 — from Charles Myer's report.
  - 7.2 1984-1994 — using the ratio of private insurance to total private health expenditure, i.e. ~1.26 for 1983 and ~1.62 for 1994, and average increasing ratios during the period.
  - 7.3 1995-2005 — real numbers from the Insurance Department, Ministry of Commerce.
8. Foreign aid
  - 8.1 1980-1983 — from Charles Myer's report.
  - 8.2 1984-1992 (even number years) — from Viroj's Sufferings and Causes Study.
  - 8.3 1984-1993 (odd number years) — by averaging the figures in the previous and following years.
  - 8.4 1994-2001 — data were derived from Viroj Tangcharoensathien et al. Report on National Health Accounts, 1994-2001.
  - 8.5 2002-2005, data were derived from the World Health Organization, the Department of Technical and Economic Cooperation, and all MoPH's departments.

**Table 6.16** Health and drug expenditures in relation to GDP, 1980-2005 (million baht)

Year	GDP			health expenditure			drug expenditure					
	Actual values	Values in 1988 prices	Increase (percent)	Actual values	Values in 1988 prices	Increase (percent)	Percentage of GDP	Actual values	Values in 1988 prices	Increase (percent)	As percentage of GDP	As percentage of health expenditure
1980	662,482	913,733	4.61	25,315	34,916	-	3.82	-	-	-	-	-
1981	760,356	967,706	5.91	31,755	40,415	15.75	4.18	-	-	-	-	-
1982	841,569	1,019,501	5.35	34,873	42,246	4.53	4.14	-	-	-	-	-
1983	920,989	1,076,432	5.58	41,181	48,131	13.93	4.47	16,686	19,502	-	1.81	40.52
1984	988,070	1,138,353	5.75	52,241	60,187	25.05	5.29	20,629	23,767	21.87	2.09	39.49
1985	1,056,496	1,191,255	4.65	59,265	66,824	11.03	5.61	26,317	29,674	24.85	2.49	44.41
1986	1,133,397	1,257,177	5.53	66,060	73,275	9.65	5.83	18,669	20,708	-30.21	1.65	28.26
1987	1,299,913	1,376,847	9.52	75,704	80,184	9.43	5.82	21,352	22,616	9.21	1.67	28.73
1988	1,559,804	1,559,804	13.29	89,968	89,968	12.20	5.77	26,674	26,674	17.94	1.71	29.65
1989	1,856,992	1,749,952	12.19	105,091	99,033	10.08	5.66	33,763	31,817	19.28	1.82	32.13
1990	2,183,545	1,945,372	11.23	125,302	111,635	12.72	5.74	35,369	31,511	-0.96	1.62	28.23
1991	2,506,635	2,111,862	8.56	138,818	116,955	4.77	5.54	39,464	33,249	5.51	1.57	28.43
1992	2,830,914	2,282,572	8.08	157,965	127,368	8.90	5.58	42,770	34,486	3.72	1.51	27.08
1993	3,170,258	2,473,937	8.38	184,062	143,634	12.77	5.81	42,364	33,059	-4.14	1.34	23.02
1994	3,629,341	2,722,006	10.03	199,949	149,962	4.41	5.51	52,823	39,617	19.83	1.45	26.41
1995	4,186,212	2,967,542	9.02	227,477	161,255	7.53	5.43	68,437	48,514	22.46	1.63	30.08
1996	4,611,041	3,087,751	4.05	257,507	172,438	6.93	5.58	81,440	54,536	12.41	1.77	31.63
1997	4,732,610	3,002,925	-2.75	282,001	178,935	3.77	5.96	92,728	58,838	7.89	1.98	32.88
1998	4,626,447	2,715,051	-9.59	276,090	162,025	-9.45	5.97	82,888	48,643	-17.33	1.82	30.02
1999	4,637,079	2,712,800	-0.08	284,235	166,284	2.63	6.13	91,208	53,359	9.70	1.98	32.09
2000	4,923,263	2,835,981	4.54	299,757	172,671	3.84	6.09	102,400	58,986	10.55	2.08	34.16
2001	5,133,836	2,910,338	2.62	321,239	182,108	5.47	6.26	116,767	66,194	12.22	2.27	36.35
2002	5,451,854	3,069,738	5.48	333,798	187,949	3.21	6.12	120,290	67,731	2.32	2.21	36.04
2003	5,917,368	3,272,881	6.62	370,206	204,760	8.94	6.24	144,085	79,693	17.66	2.43	38.92
2004	6,489,847	3,494,175	6.76	392,829	211,502	3.29	6.05	172,734	93,001	16.70	2.66	43.97
2005	7,087,660	3,653,433	4.56	434,974	224,213	6.01	6.14	186,331	96,047	3.28	2.63	42.84
Average			5.70	7.72			7.52					

Source : Tables 6.15 and 6.17

Note : Since 1994, NESDB has adjusted the GDP figures.



**Table 6.17 Proportions of sources of health expenditures in Thailand, 1980-2005(1988 prices)**

Source of spending	1980	1982	1984	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
<b>1. Public sector</b>																							
Ministry of Public Health	17.76	19.07	16.50	14.04	12.58	11.53	11.16	12.95	14.82	15.58	17.87	19.67	20.15	21.69	24.44	23.57	22.10	21.02	19.16	21.25	20.03	19.78	19.75
Other ministries	8.73	8.14	6.64	6.00	5.39	4.82	4.23	3.64	3.39	3.06	2.68	2.78	2.94	3.02	2.55	2.08	2.14	2.07	2.22	2.06	2.32	1.80	1.40
Civil servants benefit scheme	2.61	3.50	3.43	3.93	3.74	3.51	3.35	3.44	3.69	3.71	4.30	4.98	4.91	5.28	5.50	5.95	5.34	5.69	5.97	6.13	6.13	5.04	6.66
State enterprise benefit scheme	0.44	0.58	0.57	0.66	0.63	0.59	0.56	0.58	0.62	0.62	0.70	0.83	0.82	0.94	0.98	1.02	0.89	0.54	0.94	0.92	1.07	1.04	0.86
Workers' compensation fund	0.40	0.44	0.48	0.33	0.36	0.39	0.38	0.35	0.45	0.48	0.50	0.58	0.60	0.62	0.70	0.59	0.49	0.42	0.40	0.37	0.40	0.38	0.35
Social security	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	1.30	1.34	1.89	1.75	2.42	3.63	2.77	2.70	3.21	4.22	3.36	4.08	3.96	4.04
<b>Total</b>	29.93	31.73	27.61	24.96	22.70	20.83	19.69	20.96	23.52	24.75	27.39	30.73	31.17	33.97	37.80	35.98	33.66	32.95	32.91	34.09	34.02	32.00	33.05
<b>2. Private sector</b>																							
Private health insurance	0.88	0.91	0.90	0.95	1.00	1.06	1.11	1.12	1.11	1.12	1.12	1.15	2.19	2.44	2.66	2.82	2.88	2.43	2.61	2.92	3.01	3.20	3.19
Households and employers	67.75	66.27	70.73	73.32	75.63	77.76	78.97	77.77	75.17	73.91	71.33	68.04	66.6	63.57	59.5	61.17	63.45	64.6	64.42	62.88	62.79	64.39	63.57
<b>Total</b>	68.63	67.18	71.63	74.27	76.63	78.81	80.07	78.89	76.28	75.03	72.45	69.19	68.79	66.01	62.16	63.99	66.33	67.03	67.03	65.80	65.80	67.60	66.76
<b>3. Other</b>																							
International financial aid	1.44	1.09	0.76	0.77	0.67	0.35	0.24	0.15	0.19	0.23	0.15	0.08	0.04	0.01	0.03	0.03	0.01	0.02	0.06	0.11	0.18	0.40	0.18
<b>Total (%)</b>	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Overall health expenditure (million baht)	34,916	42,246	60,187	73,275	80,184	89,968	99,033	111,635	116,955	127,368	143,634	149,962	161,255	172,438	178,935	182,025	166,284	172,671	182,108	187,949	204,760	211,502	224,213
Increase rate(%)	-	4.53	25.05	9.65	9.43	12.20	10.08	12.72	4.77	8.90	12.77	4.41	7.53	6.93	3.77	-9.45	2.63	3.84	5.47	3.21	8.94	3.29	6.02
As percentage of GDP	3.82	4.14	5.29	5.83	5.82	5.77	5.66	5.74	5.54	5.58	5.81	5.51	5.43	5.58	5.96	5.97	6.13	6.09	6.26	6.12	6.24	6.05	6.14
Population (million)	46.45	48.49	50.40	52.65	52.61	54.54	55.45	56.34	56.66	57.37	58.58	58.72	59.28	59.79	60.46	61.15	61.58	61.77	62.09	62.55	62.94	62.53	62.20
Per capita expenditure(baht)	752	871	1,194	1,392	1,524	1,650	1,786	1,981	2,064	2,220	2,452	2,554	2,720	2,884	2,959	2,649	2,700	2,795	2,933	3,005	3,253	3,382	3,605
Increase (%)	-	15.82	37.08	16.58	9.51	8.23	8.27	10.94	4.17	7.56	10.44	4.16	6.50	6.03	2.60	-10.48	1.93	3.52	4.94	2.45	8.27	3.97	6.57

Source: Table 6.16

In comparison with other Asian countries (Table 6.18), although Thailand's per capita health expenditure is not so high, its spending as a percentage of GDP is higher than those for other countries; and its proportion of public health spending is lower than that of private health spending, the people bearing a greater share of healthcare spending for themselves.

**Table 6.18** Comparison of health expenditures among some Asian countries

Country	Health expenditure		
	Per capita (USD)	As percentage of GDP	Proportion, Govt.: household
Indonesia	113	3.1	35.9 : 64.1
The Philippines	174	3.2	43.7 : 56.3
Sri Lanka	121	3.5	45.0 : 55.0
Malaysia	374	3.8	58.2 : 41.8
Thailand (2004)	145	6.1	32.0 : 67.6
Singapore	1,156	4.5	36.1 : 63.9
South Korea	1,074	5.6	49.4 : 50.6

**Source:** The World Health Report, 2006 (data for 2003).

**Note:** For 2004, the exchange rate of 40 baht to a US dollar is used.

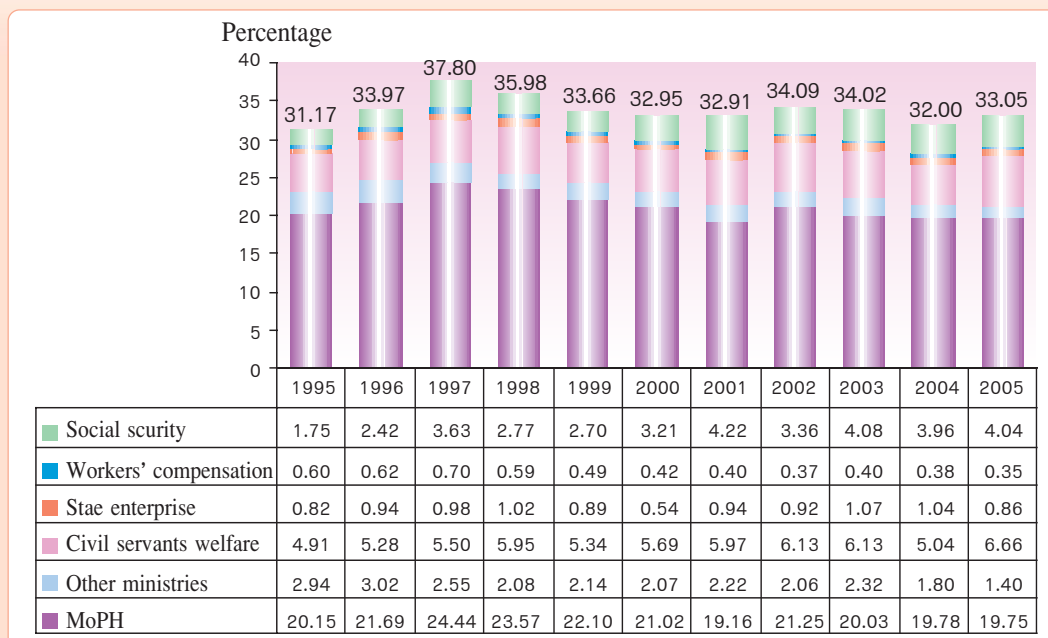
## 4.2 Public Health Expenditure

The major source of public expenditure on health is the government budget, especially the MoPH which is a central administration agency. During the 1980-1989 decade, the proportion of public spending on health dropped from 29.9% to 19.7%. But after 1989, the public spending proportion had a rising trend to 37.8% in 1997, during the period of rapid economic recovery and continuous growth. After the economic crisis the government had to adjust the national budget downwards, resulting in a drop to 32.9% in 2001, but increased again in 2002 to 34.1%, probably due to the launch of the universal health care policy.

An analysis of the sources of public spending on health revealed that the proportion from the MoPH had a falling trend from 24.4% in 1997 to 19.7% in 2005, while the proportion of health expenditure under the civil servants medical benefits scheme rose from 5.5% in 1997 to 6.7% in 2005; similarly, the proportion of health expenditure under the social security scheme also rose from 2.4% in 1996 to 4% in 2005 (Figure 6.67).



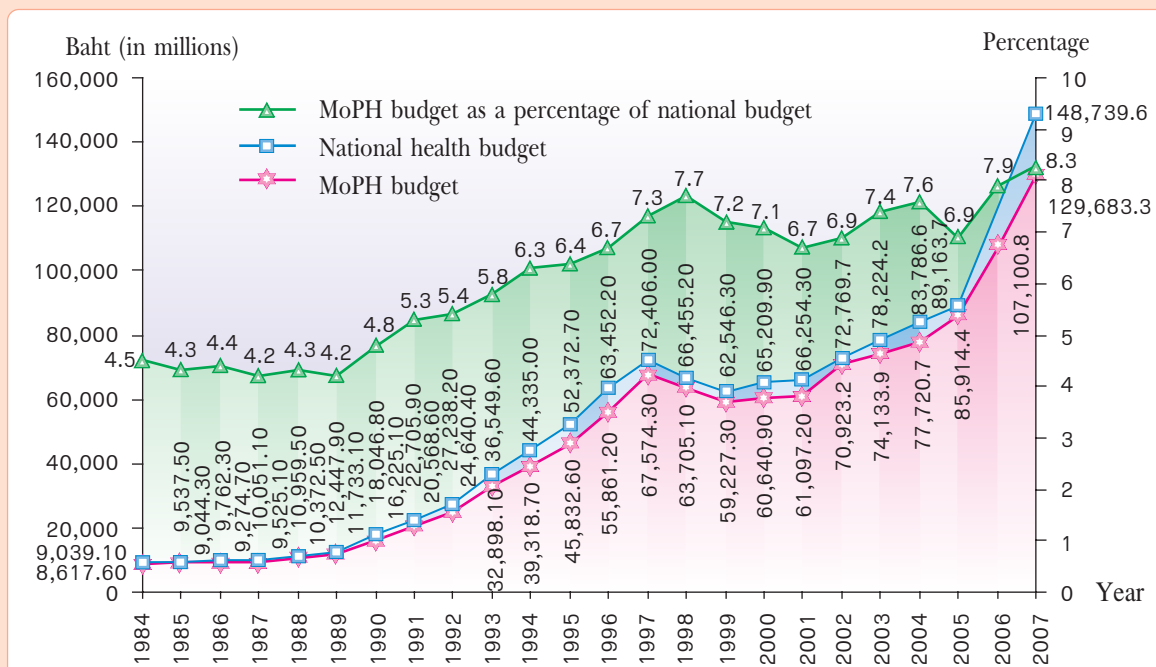
**Figure 6.67** Proportion of public health expenditure, 1995-2005



Source: Table 6.17.

Regarding the budget of the MoPH, the proportion in relation to the national budget rose from 6.7% in 2001 to 7.6% and 8.3% in 2004 and 2007, respectively (Figure 6.68), reflecting the continuous importance accorded by the government to the health service system.

**Figure 6.68** The National health budget and the MoPH budget, 1984-2007



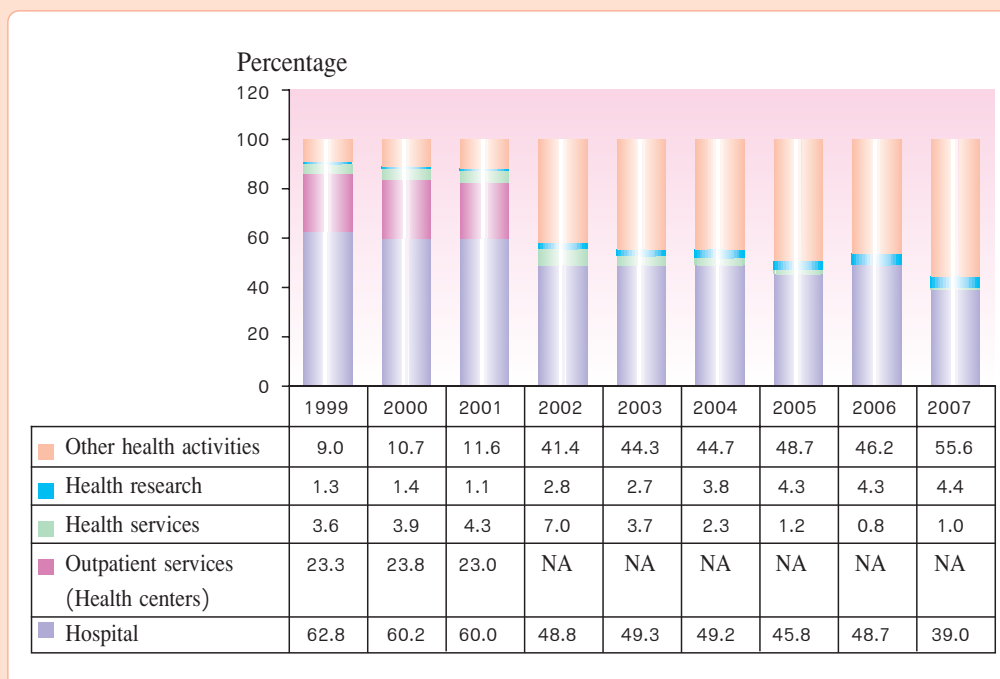
Source: Bureau of the Budget.

**Note:** For 1995-2007, the MoPH budget includes the health insurance revolving funds (previously known as health card revolving funds).

In connection with the allocation of government health budget, importance has been accorded to curative care, as evidenced by the 60% to 66% of budget allocated hospital-based services, while only 20% to 24% of health budget is allocated for health services at subdistrict health centres focusing on health promotion and disease prevention (Figure 6.69). Since 2002, the budget system has been restructured, according to the Universal Coverage of Health Care Scheme, and the investment budget decreased, resulting in a drop in the proportion of budget for hospitals. However, the budget increase is noted for the universal healthcare fund (other health programmes) including the budget for health centres as well as health promotion and disease prevention

When considering the amount of budget, it was found that the trends in hospital budget were on the rise as the MoPH budget, especially the budget for other health activities which include the universal healthcare fund, rose considerably from 30,113 million baht in 2002 to 82,741 million baht in 2007 (Figure 6.70).

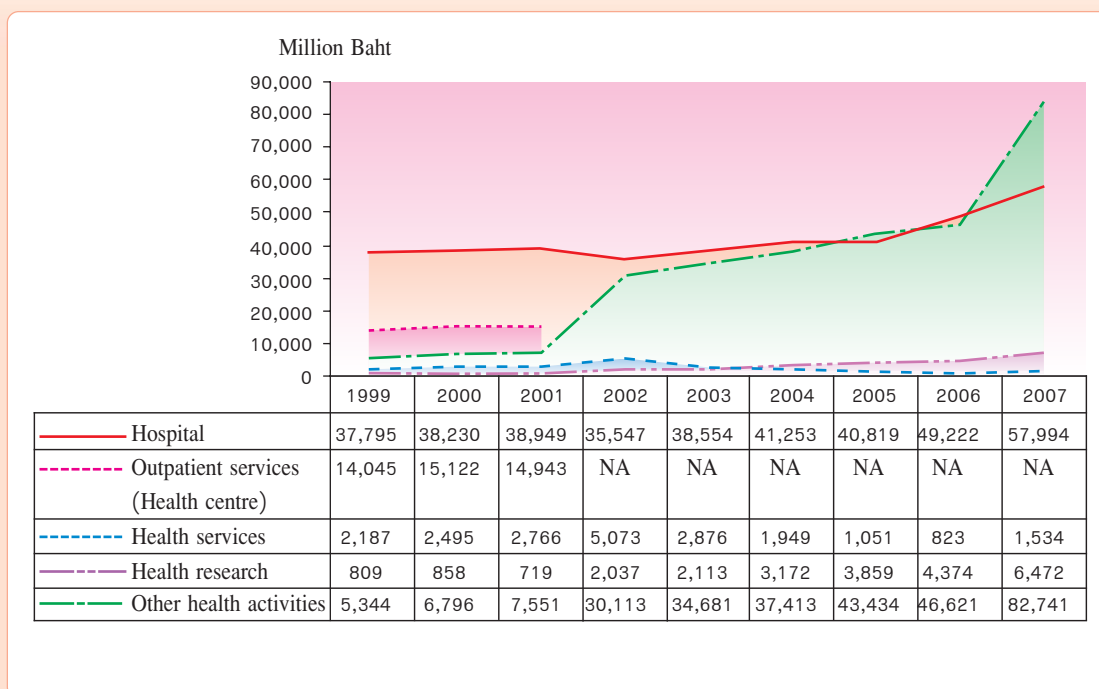
**Figure 6.69** Proportion of health budget by category, 1999-2007







**Figure 6.70** Health budget by category, 1999-2007



**Source:** Bureau of the Budget.

**Note:** Since 2002, the Bureau of the Budget has included the outpatient service budget (at health centres) in the “other health activities” category.



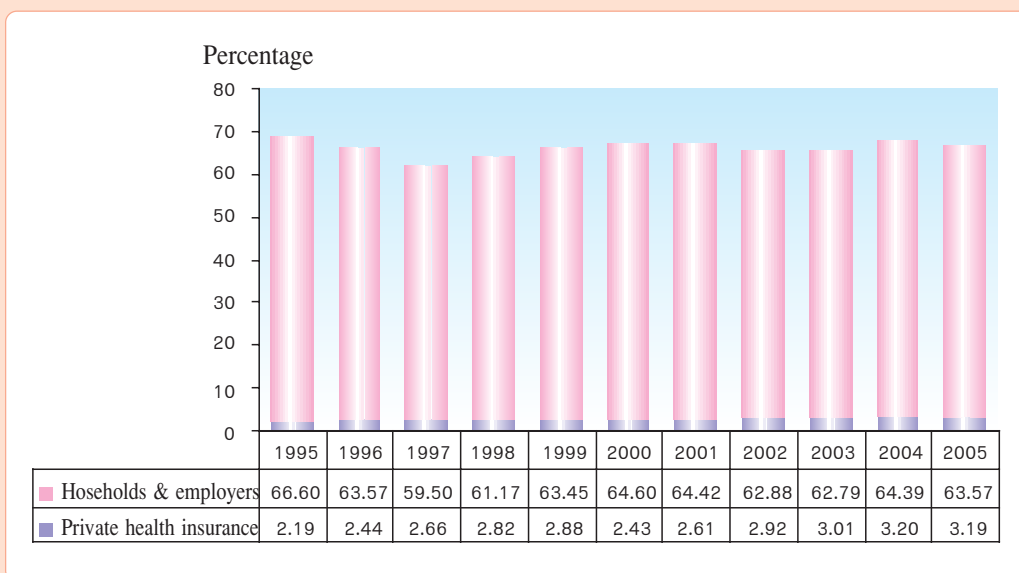
### 4.3 Private and Household Health Expenditure

The private sector has households as the largest source of funds for health care since the people sometimes have to make an out-of-pocket payment for the services, according to their behaviour of buying drugs for self-medication, or whenever they are not entitled to such services at a private clinic or private hospital, or when they do not follow the steps or procedures of the state healthcare scheme, in the designated area, or at the healthcare facility. Therefore, the household financing plays a very significant role in healthcare delivery.

The proportion of household spending has always been more than 60% (Table 6.17 and Figure 6.71). In 1980, such a proportion was as high as 68.6% and rose to 80.1% in 1989 due to the decrease in government budget, resulting in the households bearing a greater share of healthcare costs. After 1989 until 1997 with the economic crisis, the household spending proportion steadily dropped to 62.2%, but rose again to 67.03% in 2000; with a decreased state budget in 2005, the proportion slightly dropped to 66.77% despite the government policy on universal health care. This situation has shown that using the services that are not covered by the universal health care scheme is still high, particularly drug purchasing for self-care, attending a private clinic, and bypassing the steps required when using state health services, attending a health facility in another area, and the people have to pay for their own services when doing so.

In analyzing the sources of private health expenditure, it was found that the major source is the households and employers rather than private health insurance. The proportion of private health insurance slightly increased from 2.2% in 1995 to 3.2% in 2005 which was very little compared with that from the households and employers (Figure 6.72).

**Figure 6.71** Proportion of private health expenditure, 1995-2005

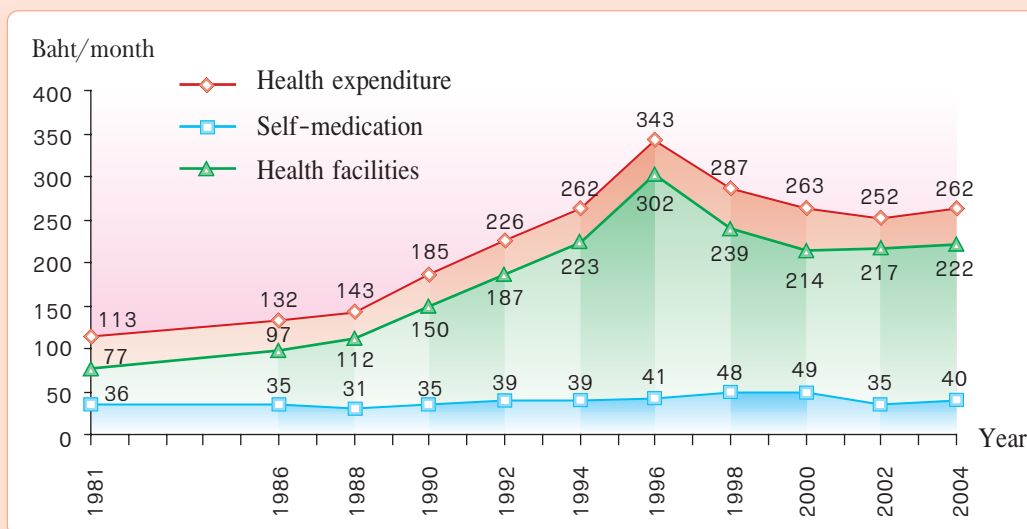


**Source:** Table 6.17.

The pattern of household health expenditure was derived from the household income and expenditure survey conducted every five years by the National Statistical Office in 1976, 1981, 1986 and every two years from 1988 to 2004. As shown in Table 6.19, household expenditure for the period 1981-1996 was rather stable at 3.6% to 3.9% of spending on household consumption each month and tended to decline to 3.2% during the economic crisis period, and further dropped to 2.4% in 2004. Significant observations are as follows:

1) **Household health expenditure for self-medication** had a declining trend from 31.9% in 1981 to 11.9% in 1996. On the contrary, the proportion of service purchases at health facilities (including drug consumption and services at private clinics, and state and private hospital) had a rising trend from 68.1% to 88.0% for the same period. There was a change in the trend when the economic crisis occurred in 1997, more people turned to purchasing drugs for self-medication, the proportion of self-care rising to 18.6% in 2000, with a declining trend in attending health care facilities. When the economy recovered in 2002, the proportion of self-medication dropped to 15.3% and the proportion of health spending at health facilities, especially private hospitals, had a rising trend (Figure 6.72 and Table 6.19).

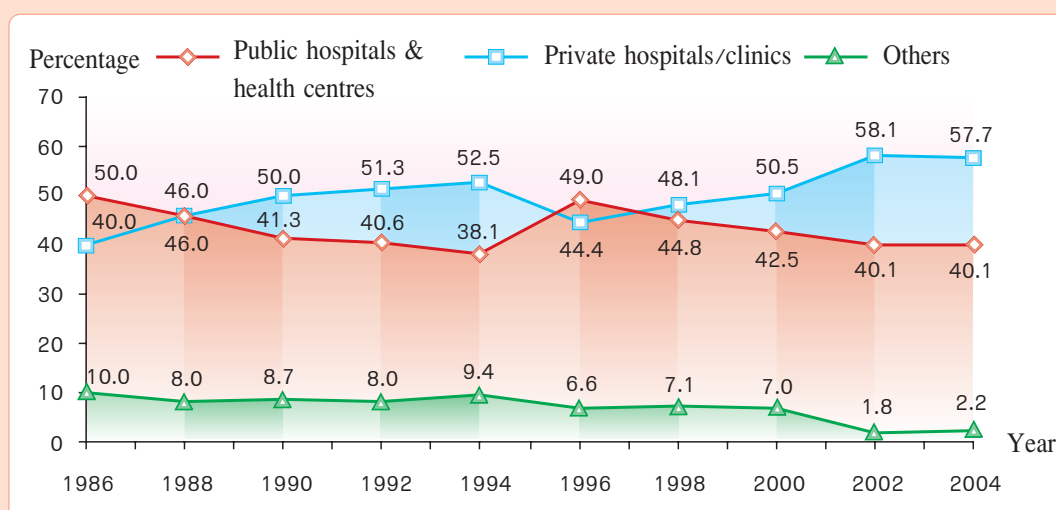
**Figure 6.72** Household health expenditure, 1981-2004



**Source:** Report on Household Socio-Economic Survey. National Statistical Office.

**2) Health expenditure** when attending health facilities had a rising proportion for private facilities, but declining for state facilities. As shown in Figure 6.73, household spending at private health facilities (clinics and hospitals) had a rising trend from 40% in 1986 to 52.5% in 1994. On the contrary, household spending at public hospitals and health centres declined from 50% to 38.1% for the same period. At the beginning of the economic crisis period, more people turned to attend public hospitals and health centres and fewer people went to private hospitals and clinics. For other services, such as dental care and opticians' services, the spending proportion was 8% to 10%. It is noteworthy that since 2002, the beginning of economic recovery, the household spending on healthcare at private hospitals/clinics had increased to 57.7% by 2004.

**Figure 6.73** Proportion of household health spending, 1986-2004



**Source:** Report on Household Socio-Economic Survey. National Statistical Office.

**Table 6.19** Household health spending pattern (baht/month), 1981-2004.

Pattern of expenditure	1981		1986		1988		1990		1992		1994		1996		1998		2000		2001		2002		2004	
	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%
Family size (Person)	4.5	-	4.3	-	4.0	-	4.1	-	3.9	-	3.8	-	3.7	-	3.7	-	3.6	-	3.6	-	3.5	-	3.4	-
Total expenditure per month	3,374	-	3,783	-	4,161	-	5,437	-	6,529	-	7,567	-	9,190	-	10,389	-	9,848	-	10,025	-	10,889	-	12,297	-
Consumption expenditure per month	3,151	-	3,486	-	3,804	-	4,942	-	5,892	-	6,787	-	8,072	-	8,966	-	8,558	-	8,758	-	9,601	-	10,885	-
Health expenditure per month	113	3.6	132	3.8	143	3.9	185	3.7	226	3.8	262	3.9	343	4.2	287	3.2	263	3.1	264	3.0	252	2.6	262	2.4
Self-medication expenditure	36	31.9	35	26.5	31	21.7	35	18.9	39	17.3	39	14.9	41	11.9	48	16.7	49	18.6	46	17.4	35	13.9	40	15.3
Spending at health facilities	77	68.1	97	73.5	112	78.3	150	81.1	187	82.7	223	85.1	302	88.0	239	83.3	214	81.4	218	82.6	217	86.1	222	84.7
- Public hospital & health centres	-	-	48	50	52	46	62	41.3	76	40.6	85	38.1	148	49.0	107	44.8	91	42.5	98	45.0	87	40.1	89	40.1
- Private hospitals/clinics	-	-	39	40	51	46	75	50.0	96	51.3	117	52.5	134	44.4	115	48.1	108	50.5	110	50.4	126	58.1	128	57.7
- Others	-	-	10	10	9	8	13	8.7	15	8.0	21	9.4	20	6.6	17	7.1	15	7.0	10	4.6	4	1.8	5	2.2

**Source:** Report on Household Socio-Economic Survey. National Statistical Office.

## 5. Accessibility to Health Services

### 5.1 Coverage of Health security

Thailand has a tendency to expand health security or insurance to cover all the people under major schemes: civil servants medical benefits (also for state enterprise employees), social security, medical services for the poor and society-supported groups, voluntary health insurance project, private health insurance, and vehicle accident victims protection. In 2001, all the schemes could cover 71.0% of the population. Since 2001, under the universal health care policy, the coverage of health security had risen to 96.0% by 2006 (74.3% under the universal coverage of health care schemes), leaving 4.0% without any health insurance coverage (Table 6.20).

**Table 6.20** Percentage of Thai people with health security, 1991, 1996, 2001 and 2003–2006

Health insurance scheme	Before the launch of the UC healthcare scheme			After the launch of the UC healthcare scheme			
	1991	1996	2001	2003	2004	2005	2006
1. Universal coverage healthcare	–	–	0.9	74.7	73.5	72.2	74.3
– Gold card with Tor (not paying 30 baht/visit)	–	–	–	74.7	30.6	28.1	28.6
– Gold card without Tor (paying 30 baht/visit)	–	–	0.9		42.9	44.1	45.7
2. Medical welfare for the poor (Sor Por Ror)	12.7	12.6	31.5	–	–	–	–
3. Medical benefits for civil servants and state enterprise employees	15.3	10.2	8.5	8.9	9.4	9.8	8.9
– Civil servants	13.2	9.0	7.5	8.9	9.4	9.8	8.9
– State enterprise employees	2.1	1.2	1.0				
4. Social security and workers' compensation fund	–	5.6	7.2	9.6	10.7	11.0	11.4
5. Voluntary health insurance	4.5	16.1	22.1	1.7	0.8	1.0	0.7
– Health card, MoPH	1.4	15.3	20.8	–	–	–	–
– Private insurance	3.1	0.8	1.3	1.7	0.8	1.0	0.7
6. Others	0.9	1.0	0.8	–	–	1.1	0.7
Population with health insurance	33.5	45.5	71.0	94.9	94.3	95.1	96.0
Population without health insurance	66.5	54.5	29.0	5.1	5.7	4.9	4.0

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

2. Viroj Tangcharoensathien, et al. An analysis of data from the Reports on Health and Welfare Surveys, 2003–2006. National Statistical Office.

**Note:** The number of insured persons with private health insurance companies in 2004 was 2.88 million, or 4.4% of total population, but some of them had coverage from more than one scheme.

In addition, it was found that, in 2006, the proportion of rural residents with universal healthcare cards was higher than that for urban residents. But more urban residents had healthcare coverage under the social security scheme and the medical benefits scheme for civil servants than did rural residents (Table 6.21).

**Table 6.21** Percentage of people with health insurance coverage in municipal and non-municipal areas, 1991, 1996, 2001, 2003, 2004, and 2006

Health insurance coverage	Municipal areas						Non-municipal areas					
	1991	1996	2001	2003	2004	2006	1991	1996	2001	2003	2004	2006
No insurance	65	58	42	9	10.1	7.7	68	52	22	3	3.5	2.5
Civil servants and state enterprise officials	22	17	16	15	15.3	14.1	6	7	9	6	6.5	6.6
Universal coverage healthcare	-	-	-	56	54.6	56.3	-	-	-	84	82.8	82.1
Social security	-	11	13	18	18.2	19.8	-	3	4	6	7.0	7.7
Medical welfare for the poor	7	5	15	-	-	-	21	16	39	-	-	-
Health card	1	6	10	-	-	-	2	20	27	-	-	-
Private health insurance	5	2	3	3	1.8	1.6	1	1	1	1	0.3	0.3
Others	1	1	1	-	-	0.6	1	1	1	-	-	0.7

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

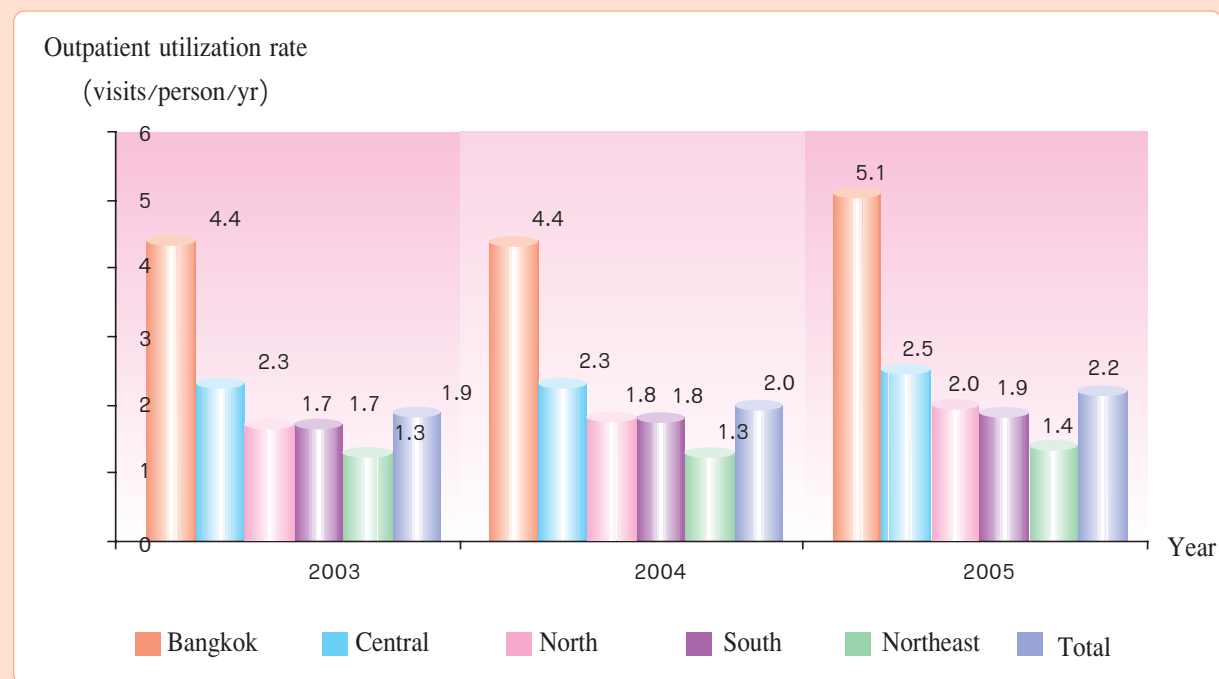
2. Viroj Tangcharoensathien et al. An analysis of data from the Reports on Health and Welfare Surveys, 2003, 2004 and 2006. National Statistical Office.

**Note:** The number of insured persons with private health insurance companies in 2004 was 2.88 million, or 4.4% of total population, but some of them had coverage from more than one scheme.



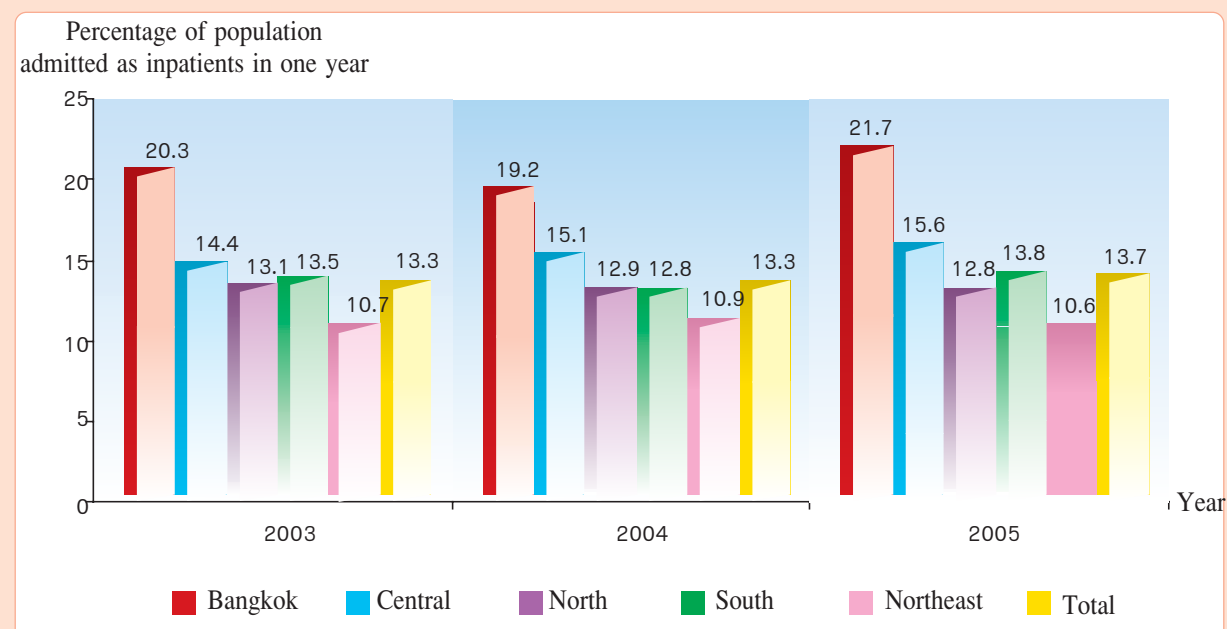
An analysis of the relationship between service utilization and the population/doctor ratios and between inpatient service utilization and the population/bed ratios (Figure 6.76 and Figure 6.77) reveals that the provinces with a lot of health resources (low population/doctor and population/bed ratios) will have higher utilization rates, confirming the influence of health resources on the chances of people's service utilization.

**Figure 6.74** Rate of outpatient service utilization, 2003-2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

**Figure 6.75** Rate of inpatient service utilization, 2003-2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.



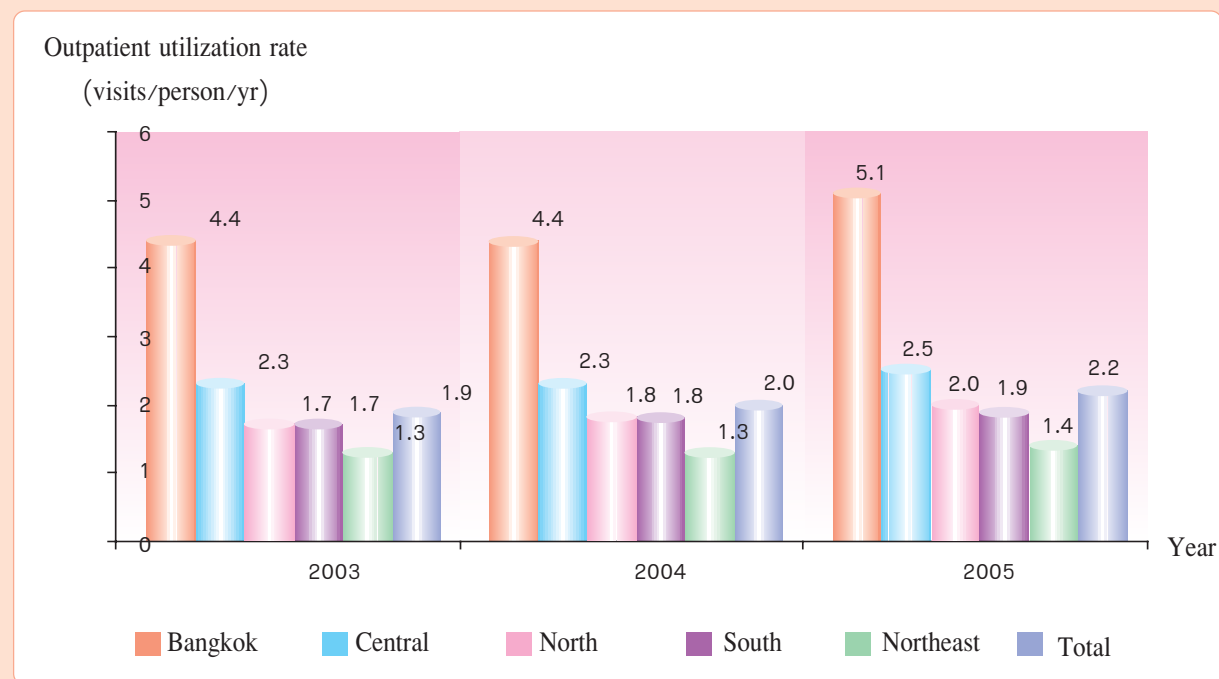
## 5.2 Rate of Health Service Utilization

The utilization of health services at health facilities with inpatient beds is on a rising trend. In 2005, the rate of outpatient service utilization at hospitals under all agencies was 2.2 visits per person per year, the rate being highest in Bangkok and lowest in the Northeast. That reflects the rate of access to outpatient services being highest in Bangkok (including for outpatients coming from other provinces) (Figure 6.74). Similarly, the rate of inpatient service utilization was highest in Bangkok and lowest in the Northeast (Figure 6.75).



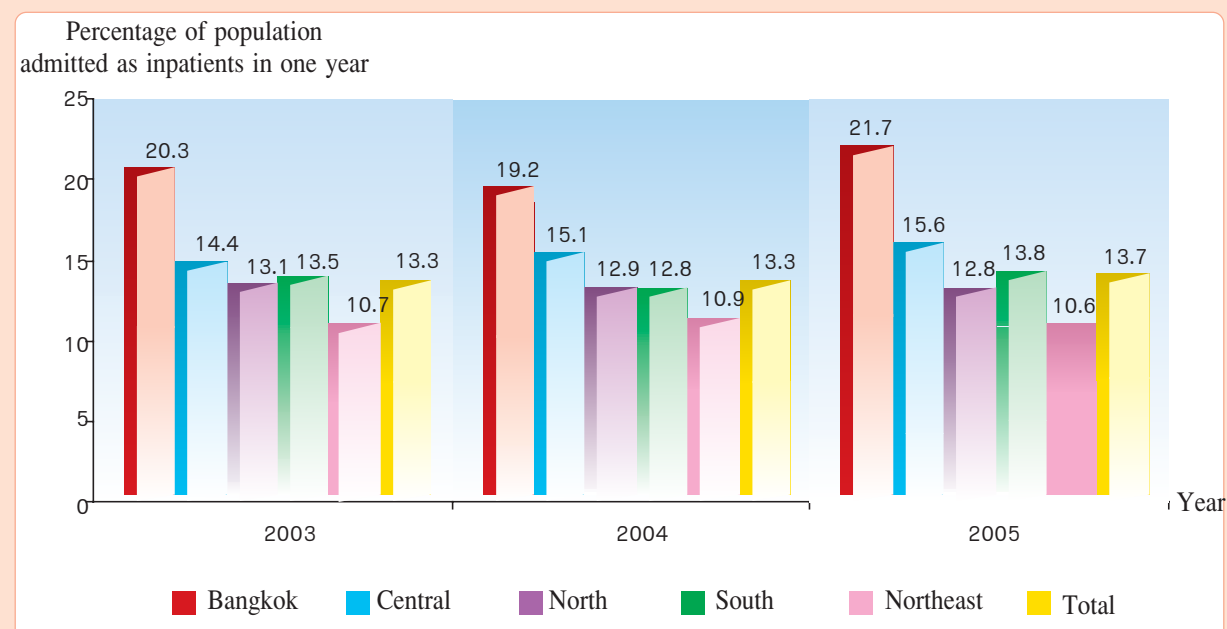
An analysis of the relationship between service utilization and the population/doctor ratios and between inpatient service utilization and the population/bed ratios (Figure 6.76 and Figure 6.77) reveals that the provinces with a lot of health resources (low population/doctor and population/bed ratios) will have higher utilization rates, confirming the influence of health resources on the chances of people's service utilization.

**Figure 6.74** Rate of outpatient service utilization, 2003-2005



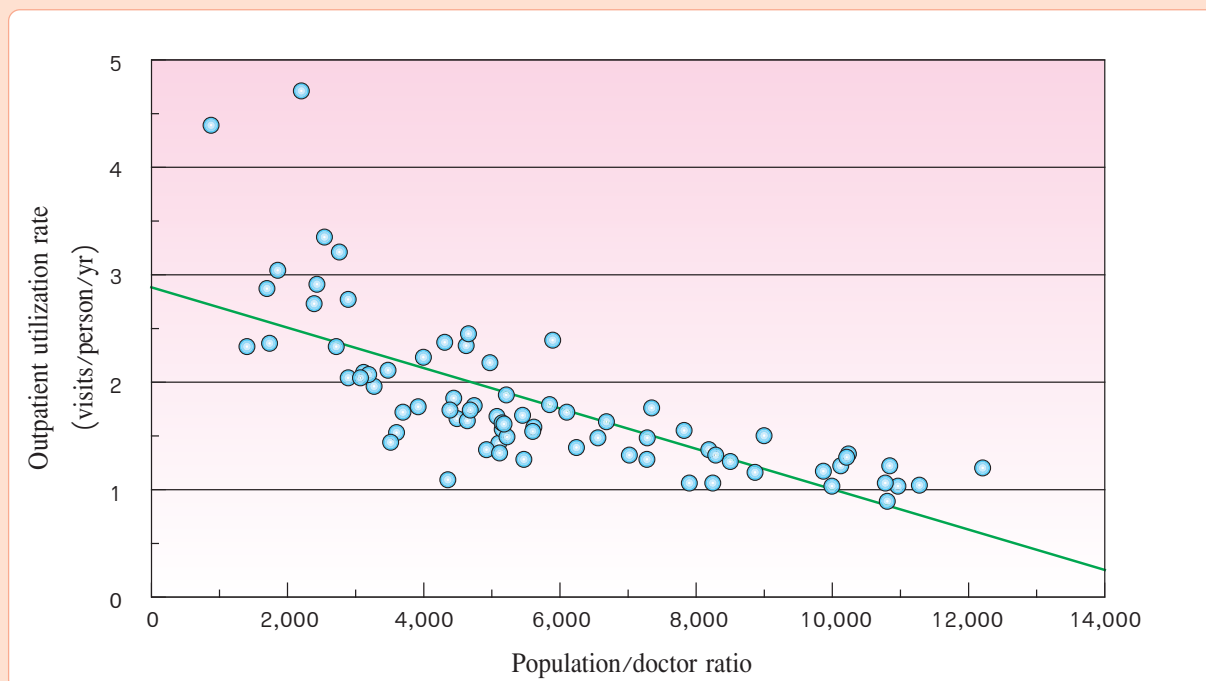
Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

**Figure 6.75** Rate of inpatient service utilization, 2003-2005



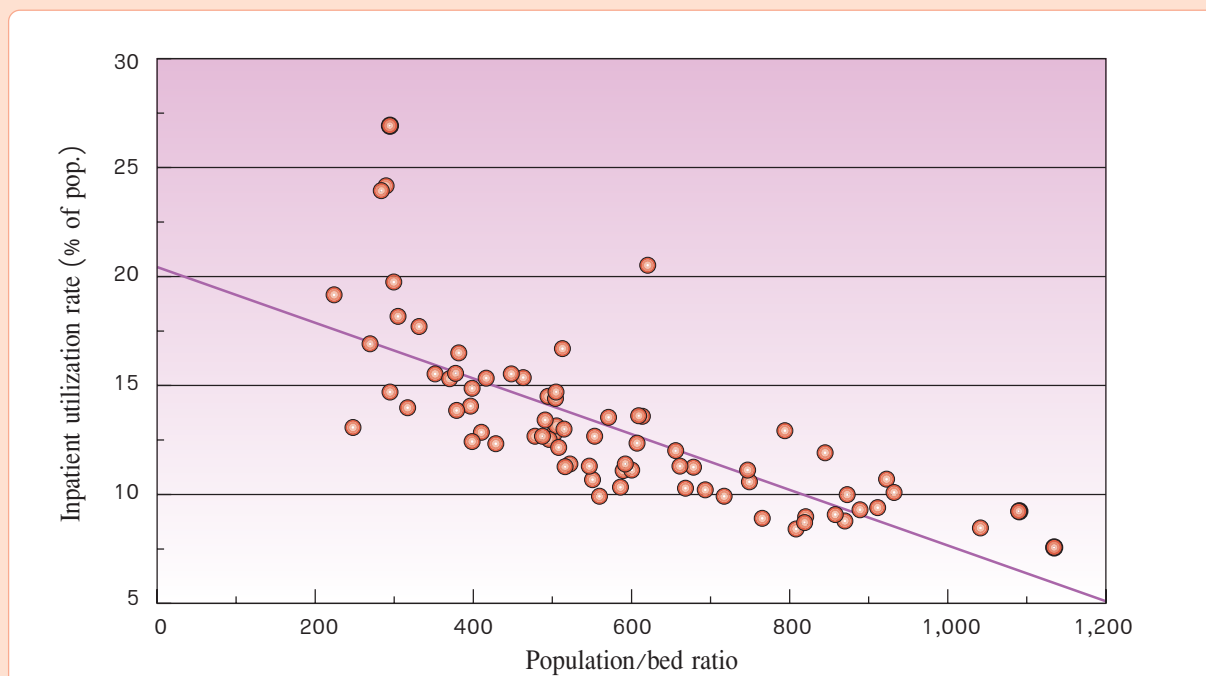
Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

**Figure 6.76** Relationship between the rate of outpatient service utilization and population/doctor ratios at provincial level, 2004



**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

**Figure 6.77** Relationship between the rate of inpatient service utilization and population/bed ratios at provincial level, 2004

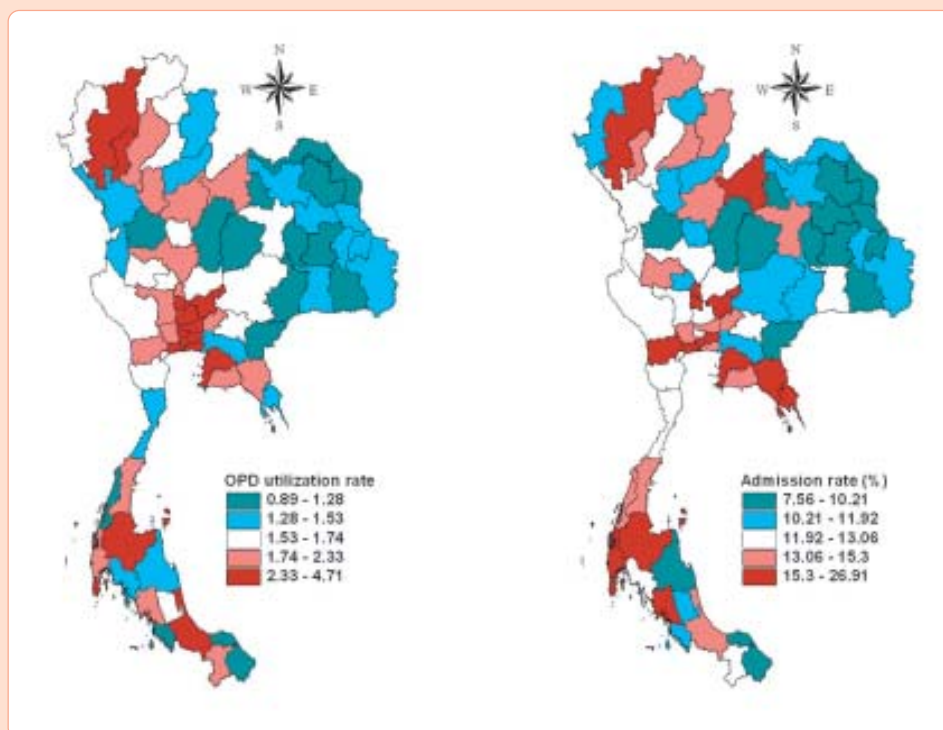


**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.



A geographical distribution analysis of service utilization rates at provincial level reveals that the provinces that are the centres of the region and the provinces in the central region have a high utilization rate, while most provinces in the Northeast have a lower utilization rate than other provinces (Figure 6.78).

**Figure 6.78** Geographical distribution of inpatient service (OPD) utilization rates and inpatient service (admission) rates at provincial level, 2004



**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.



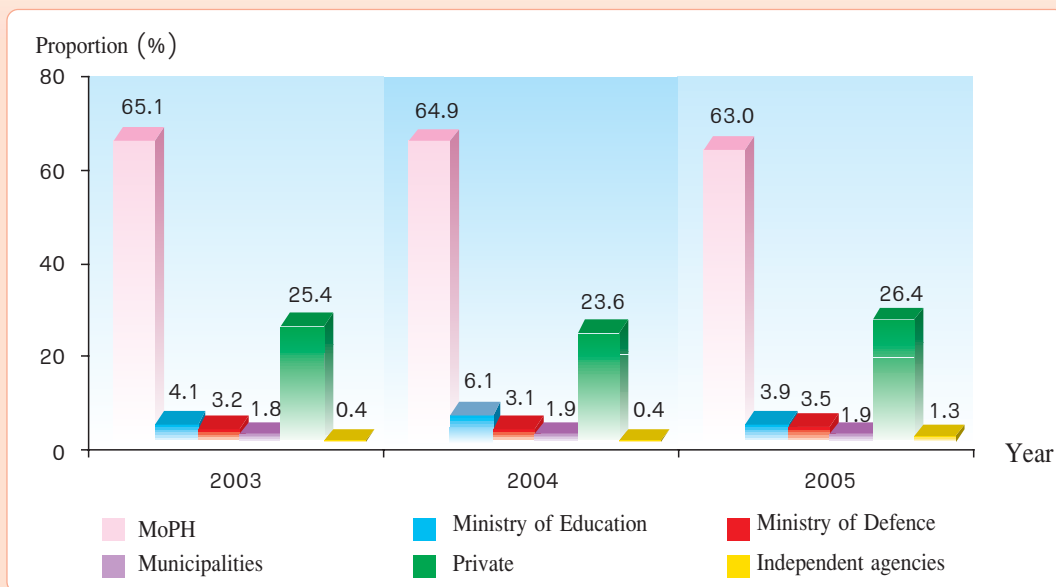


### **5.3 Utilization of Health Services by Agency and Service Level**

In 2005, the proportion of outpatients by agency of hospitals was highest for hospitals under the MoPH, followed by private and university hospitals (Figure 6.79). Similarly, the proportion of inpatients or admissions, for the same year, was highest in MoPH hospitals, followed by private and university hospitals (Figure 6.80).

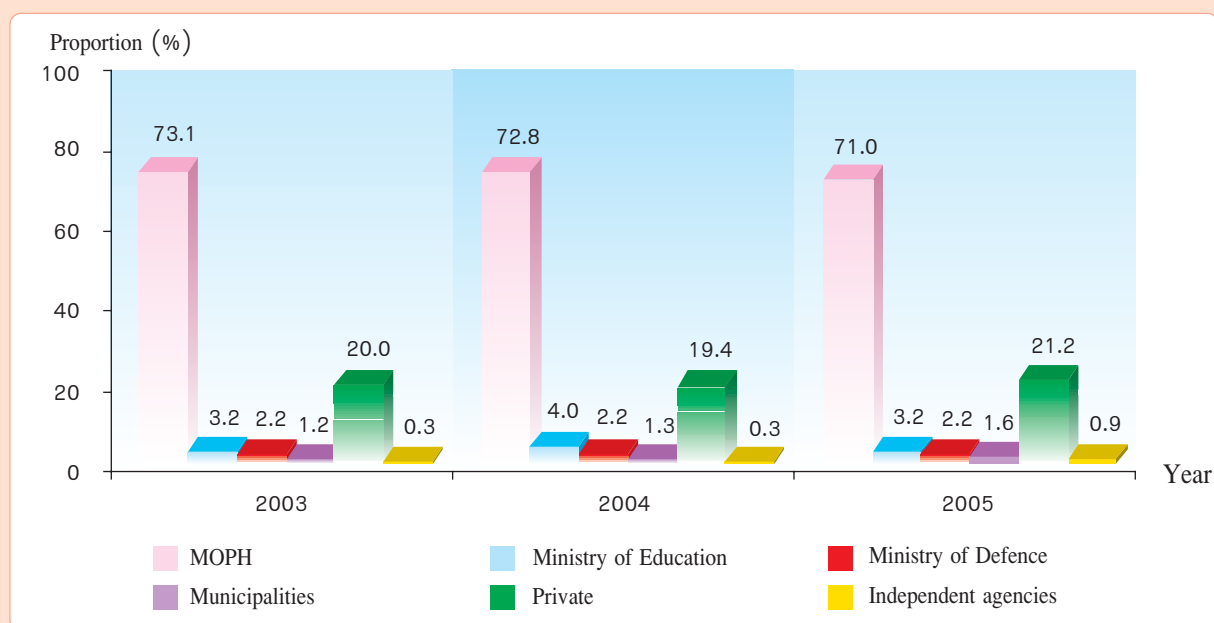


**Figure 6.79** Proportions of outpatients by agency of hospitals, 2003-2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

**Figure 6.80** Proportions of inpatients by agency of hospitals, 2003-2005

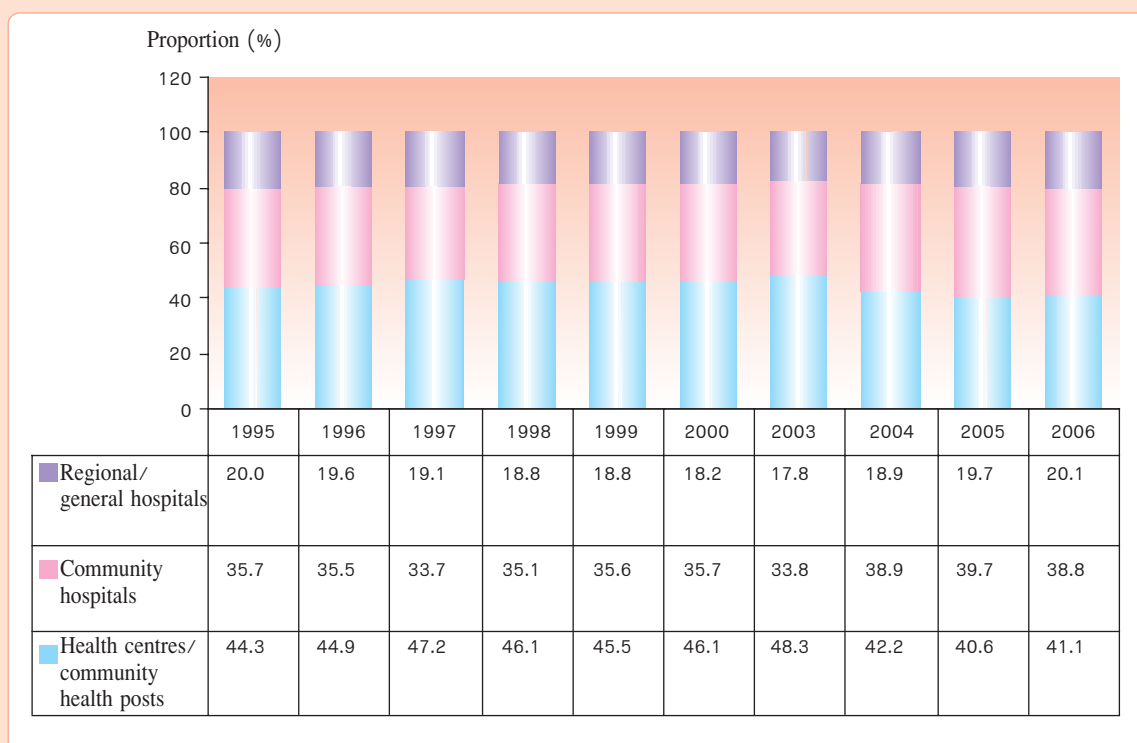


Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.



In analyzing the proportions of outpatient service utilization, including the services at subdistrict health centres, only in MoPH hospitals (community, general and regional hospitals) to see the trends in service utilization by level of health facilities, it was found that in 2003 the proportion of outpatient utilization at health centres increased to 48% but decreased later on. But the proportion of outpatients at community, general and regional hospitals has increased slightly since 2004 (Figure 6.81). For the number of outpatients, the number at community hospitals has markedly increased since 2004 while the number at health centres declined slightly (Figure 6.82).

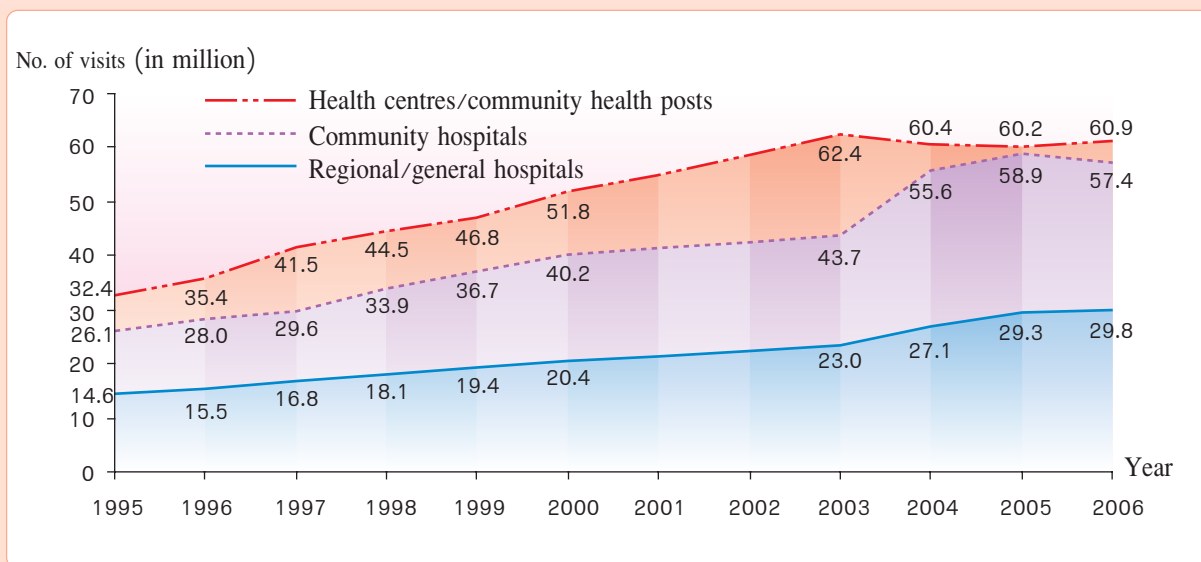
**Figure 6.81** Proportions of outpatients by level of MoPH health facilities, 1995-2006



**Source:** Bureau of Health Service System Development, Department of Health Service Support, MoPH.



**Figure 6.82** Numbers of outpatients (OPD visits) by level of MoPH health facilities, 1995-2006



**Source:** Bureau of Health Service System Development, Department of Health Service Support, MoPH.



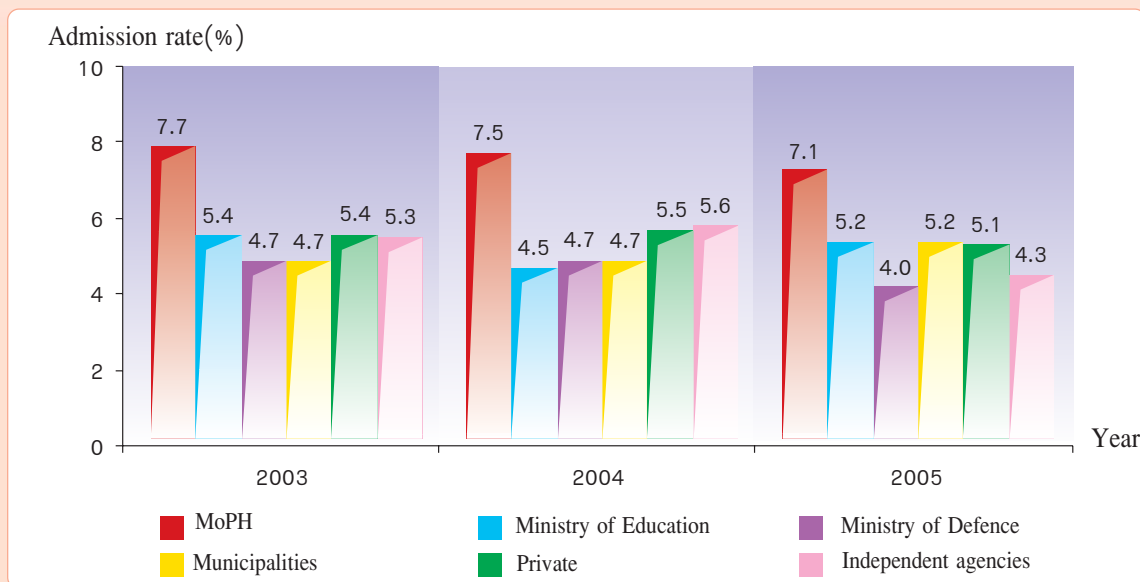
## 6. Efficiency and Quality of Health Service Delivery

### 6.1 Admission of Inpatients

Admissions of patients for medical treatment in hospital can be analyzed in terms of inpatient/outpatient ratio which reflects the chance of being admitted as inpatients for all outpatients (visits). With respect to the efficiency of inpatient care, if each patient has an equal health need, a greater number of admissions will reflect a lower level of efficiency as inpatient care will require more resources and higher healthcare costs. However, the severity of patient will have to be taken into account and it is associated with the accessibility to healthcare. A good access to health care will make outpatients less severe and there will be fewer admissions.

The health resources survey reveals that MoPH hospitals have the highest inpatient/outpatient rate, followed by hospitals under other agencies, with rates being close to each other (Figure 6.83).

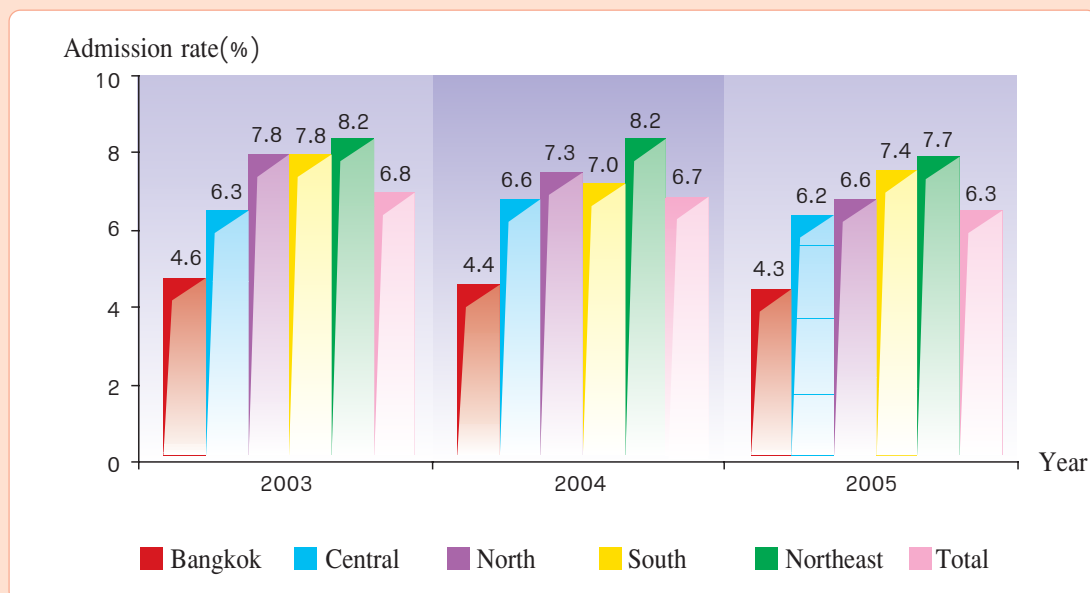
**Figure 6.83** Rate of admissions (inpatients/outpatient) by agency of hospitals, 2003-2005



**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

A regional comparison of admissions indicates that the Northeast has the highest inpatient/outpatient rate, while Bangkok has the lowest rate (Figure 6.84). Regarding efficiency, it may be interpreted that the Northeast has a tendency to have more admissions than other regions. But in reality such a situation may be a result of the difference in access to health care, i.e. outpatients in the Northeast may be more severe than those in other regions, thus a larger number of them will require inpatient care, due to lower level of access to curative care.

**Figure 6.84** Rate of admissions (inpatient/outpatient) by region, 2003-2005



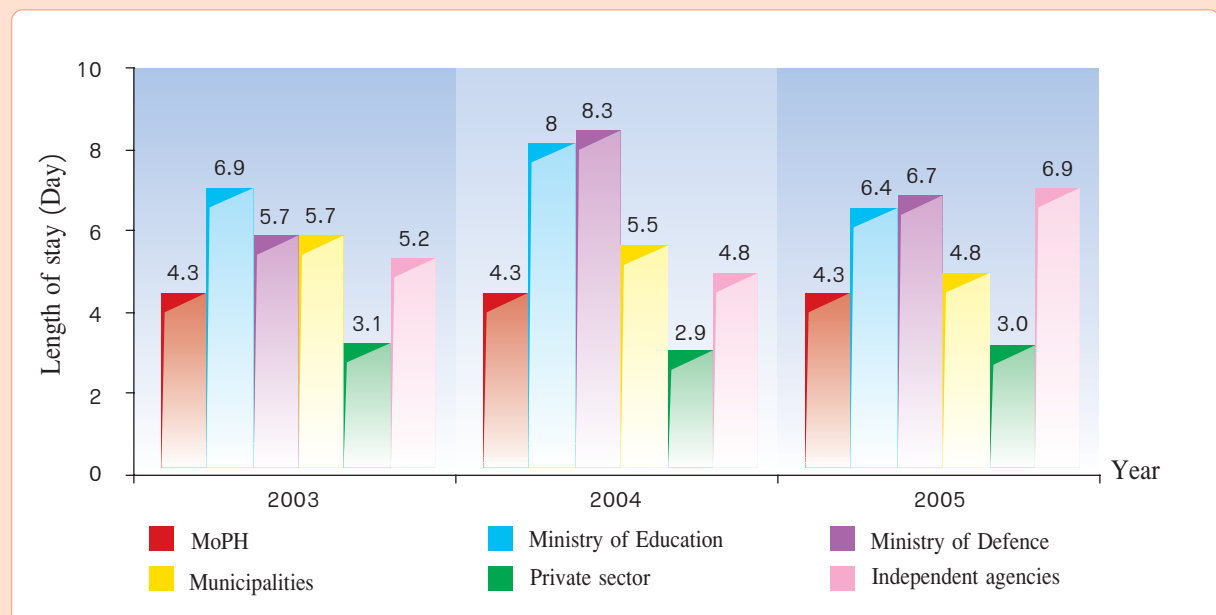
**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

## 6.2 Length of Stay of Inpatients

An analysis of the length of stay of inpatients may help reflect the efficiency of inpatient care to a certain extent. If all patients have an equal severity of illness, a longer length of stay will result in a higher treatment cost, meaning less efficient treatment.

Data from the health resources survey revealed that private hospitals had the shortest length of stay of three days, while those under universities and the Ministry of Defence had the longest, approximately 8 days, in 2004, which dropped to 6 or 7 days in 2005 (Figure 6.85). Such characteristics might be due to the severity of patients; hospitals with a high level of efficiency tend to admit patients with complexity resulting in a longer length of stay, especially in university hospitals.

**Figure 6.85** Average length of stay of inpatients by agency of hospitals, 2003-2005

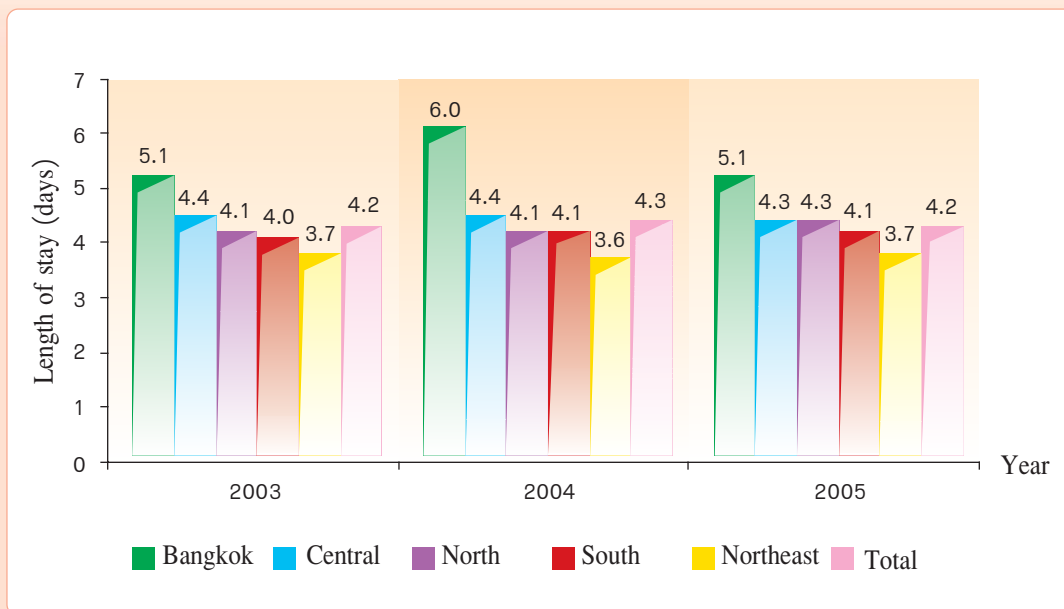


**Source:** Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

A regional analysis reveals that the length of stay for Bangkok is longest (5-6 days), while it is shortest (3.7 days) for the Northeast (Figure 6.86). Factors related to hospital capacity might make high-capacity hospitals in Bangkok admit patients with complexity and longer hospitalization. The same is true for provinces that are the centres of regions and some provinces in the Central, North and South (Figure 6.87).

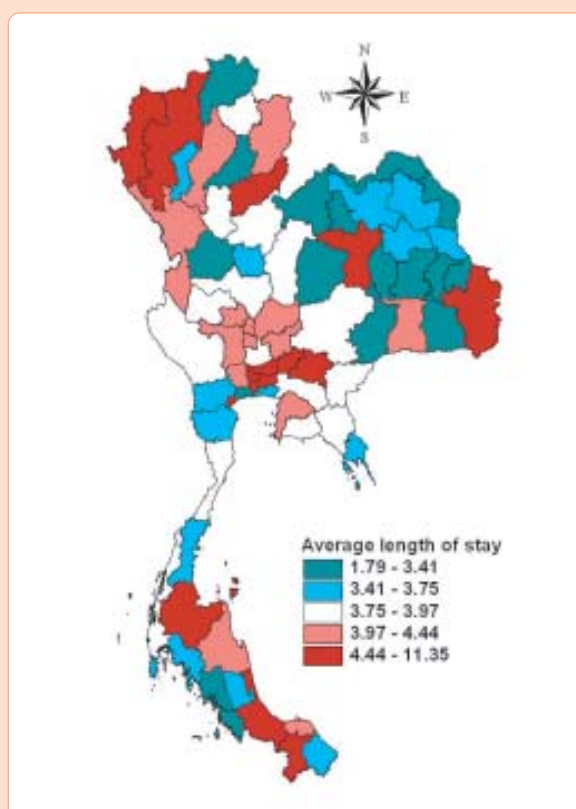


**Figure 6.86** Average length of stay of inpatients by region, 2003-2005



Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

**Figure 6.87** Geographical distribution of average length of stay by province, 2004

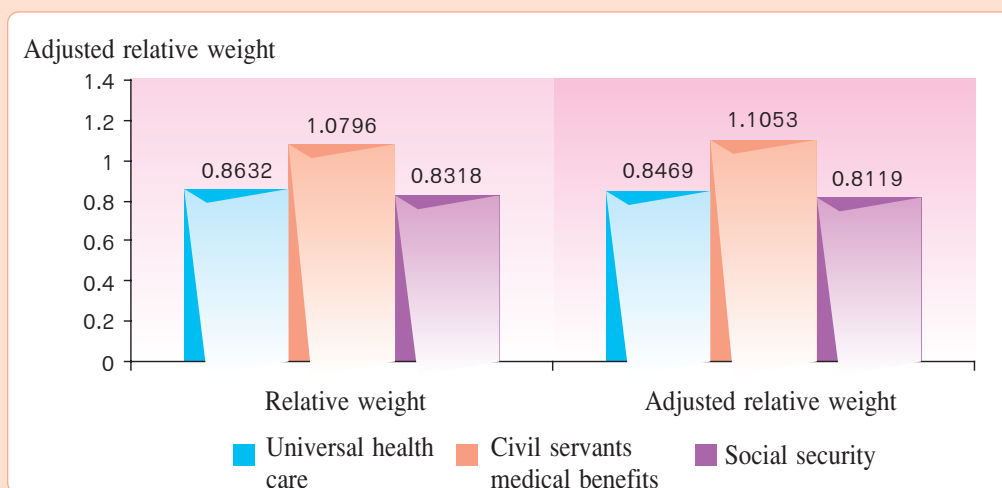


Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

### 6.3 Average Relative Weight

Average relative weight reflects the characteristics of patients hospitalized and the necessity in the use of resources for medical treatment of each patient. However, it partly reflects the hospital's decision to admit a patient as well. The data suggest that the average relative weight of patients who are civil servants (with state medical benefits entitlement) is greater than those under the universal health care and the social security schemes; those under the social security scheme have the lowest average relative weight (Figure 6.88).

**Figure 6.88** Adjusted relative weights of inpatients under three health insurance schemes



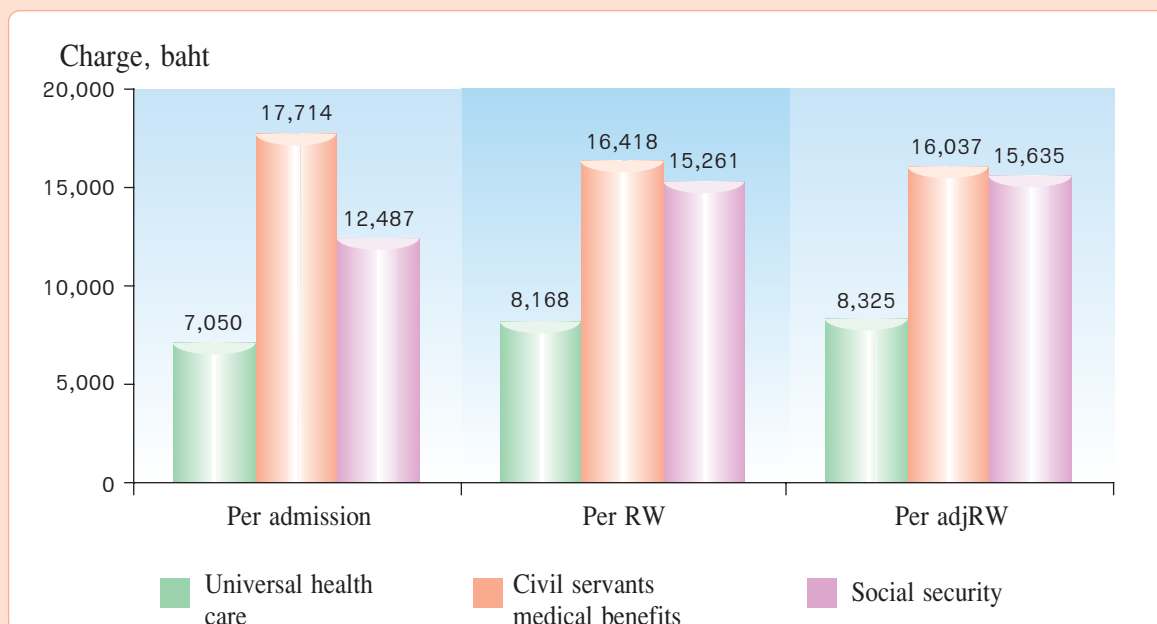
**Source:** Pini Faramnuayphol. Analysis of inpatient data, 2004. National Health Security Office.

#### 6.4 Average Charge per Relative Weight Unit

Charge per unit of relative weight reflects the cost calculation of hospital which is related to services provided, hospital costs and pricing method of each hospital. The data suggest that patients who are civil servants have the largest charge per admission, followed by those under the social security scheme. A comparison of relative weights reveals that the adjusted relative weights of civil servants and those with social security are close to each other, but two times greater than that for those under the universal healthcare scheme (Figure 6.89).



**Figure 6.89** Average charges per admission, per relative weight and per adjusted relative weight of patients under three health insurance schemes



**Source:** Pini Faramnuayphol. Analysis of inpatient data, 2004. National Health Security Office.



## 7. Equities in Health Services

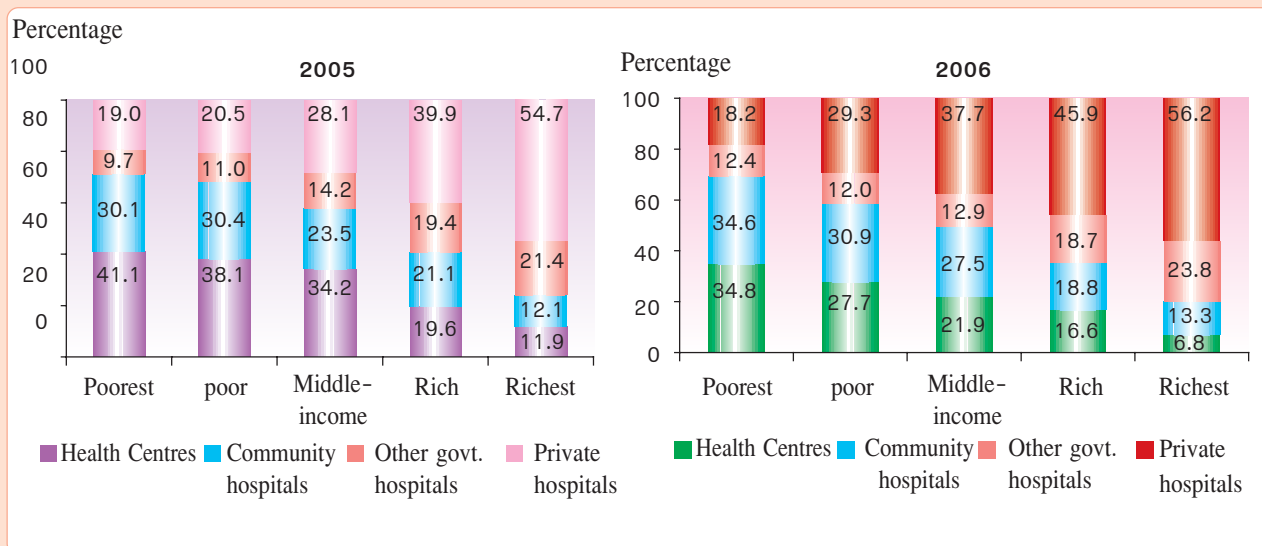
### 7.1 Equities in Health Service Utilization

Chances of choosing health services for people are different depending on their socio-economic status. The 2005-2006 health and welfare survey revealed that, only for services at subdistrict health centres, community hospitals, regional/general hospitals, and private hospitals, the poorest group attended health centres the most (35-40%), while the richest group chose private hospitals the most (50%). That reflects the chances of choosing services; private hospitals are attended mostly by high-income groups and general/regional hospitals are also attended by a largest proportion of the richest group (Figure 6.90). The differences in the health service selection opportunity might affect the quality of services according to the capacity of health facilities; the more services will be required if the illness needs to be treated at a high-capacity facility.





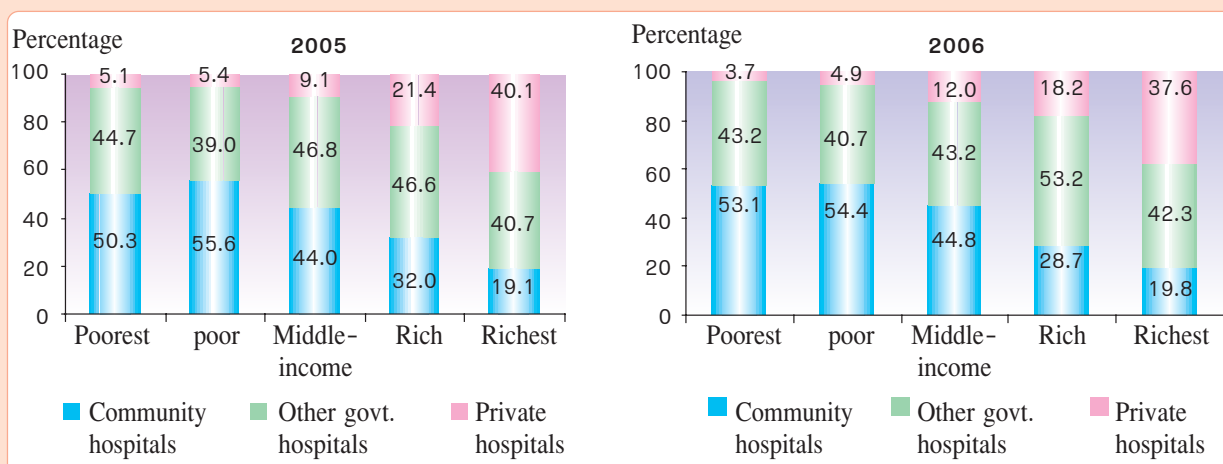
**Figure 6.90** Percentage of health facility selection when ill by level of household's average monthly income, 2005-2006



**Source:** Viroj Tangcheroensathien et al. Analysis of data from the 2005-2006 Health and Welfare Survey, National Statistical Office.

For cases requiring hospitalization, the characteristics are similar, i.e. the poorest group would be admitted to community hospitals the most (50%), while the richest would have the highest chance of being admitted to private hospital (40%), compared with other income groups. However, hospitalization at general and regional hospitals is not much different; all income groups have a 40% to 45% chance of being hospitalized (Figure 6.91), indicating that the poorest group still has a rather high chance of getting admitted to high-capacity hospitals although their chance of getting hospitalized in private hospitals is smallest.

**Figure 6.91** Percentage of health facility selection when hospitalized by level of household's average monthly income, 2005-2006



**Source:** Viroj Tangcheroensathien et al. Analysis of data from the 2005-2006 Health and Welfare Survey, National Statistical Office.



Besides, a comparison of health service utilization according to patients' entitlement reveals that the implementation of the universal healthcare policy has resulted in the people's access to and attendance of health facilities when ill increasing from 49% in 1991 to 71.3% in 2006. For the group without any health insurance, their chance of utilizing health facilities has increased from 47% in 1991 to 55.1% in 2006; and, for the groups with civil servants benefits and universal health care coverage, their utilization of health facilities when ill is highest, compared with other groups (Table 6.22).

**Table 6.22** Morbidity rates and proportions of utilization of health facilities by type of medical welfare scheme, 1991, 1996, 2001 and 2004-2006

Welfare scheme	Morbidity rate (episodes/ person/yr)						Percentage of utilizing health facilities					
	1991	1996	2001	2004	2005	2006	1991	1996	2001	2004	2005	2006
No health insurance	5.7	3.5	3.3	3.2	3.4	2.6	47	62	61	60.6	66.6	55.1
Universal (30-baht) healthcare scheme	-	-	3.4	5.1	4.8	3.4	-	-	62	72.8	76.5	72.1
Medical care for the poor	7.2	6.9	5.3	-	-	-	50	67	74	-	-	-
Health card, MoPH	7.0	4.5	3.7	-	-	-	55	68	71	-	-	-
Welfare for civil servants and state enterprise employees	5.4	3.7	3.6	4.8	4.5	4.1	60	71	75	73.1	75.1	75.8
Social security	-	2.5	2.5	3.0	2.7	1.9	-	58	66	63.0	68.6	66.8
Private insurance	4.4	3.5	3.0	1.9	2.1	2.4	42	72	65	60.2	77.0	50.6
<b>Total</b>	<b>5.9</b>	<b>4.0</b>	<b>3.9</b>	<b>4.7</b>	<b>4.4</b>	<b>3.3</b>	<b>49</b>	<b>65</b>	<b>70</b>	<b>71.6</b>	<b>75.3</b>	<b>71.3</b>

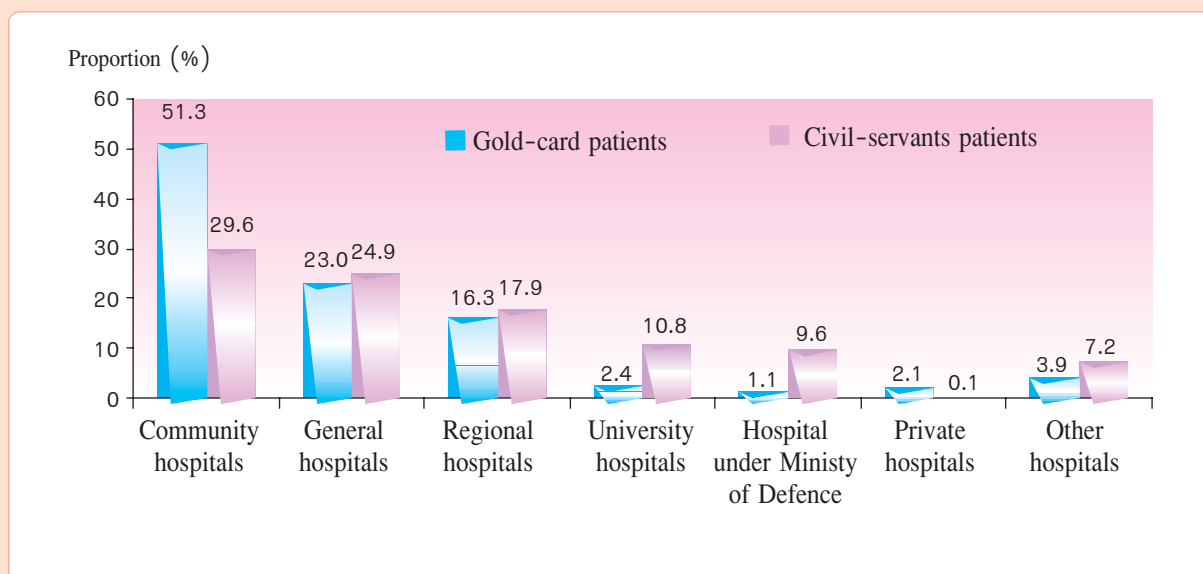
**Sources:** 1. Reports on Health and Welfare Surveys, 1991, 1996 and 2001. National Statistical Office.  
2. Viroj Tangcharoensathien and colleagues. An analysis of data from the Reports on Health and Welfare Surveys, 2004-2006. National Statistical Office.

**Note:** The number of insured persons with private health insurance companies in 2004 was 2.88 million, or 4.4% of total population, but some of them had coverage from more than one scheme.



A comparison of proportions of hospitalization by level and category of hospitals of patients with different healthcare entitlements reveals that, based on data on patients claiming medical expenses, patients under the universal healthcare scheme (gold-card holders) have a higher proportion of hospitalization at community hospitals than the patients who are civil servants, while the patients who are civil servants have a higher proportion of hospitalization at general/regional hospitals, university hospitals and Ministry of Defence's hospitals than gold card holders. For private hospitals, data available are minimal due to limitations in claiming medical expenses (Figure 6.92). Such differences in the proportions reflect the differences in the choices of selecting hospitals for patients with different health insurance entitlements.

**Figure 6.92** Proportion of hospitalizations in different types of hospitals of patients under two health insurance schemes



**Source:** Pinij Faramnuayphol. Analysis of inpatient data, 2004. National Health Security Office.

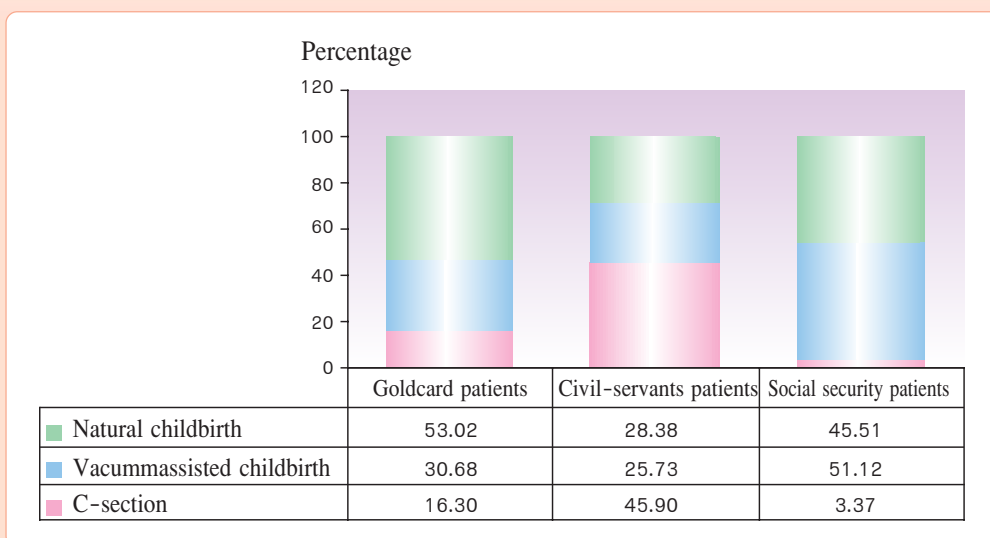
## 7.2 Equity in Health Services Delivery

Characteristics of services rendered by healthcare providers or health facilities may be different. Some medical treatment procedures have been selected for comparison purposes among patients with different health insurance converges, such as cesarean section and coronary artery surgery among patients under the civil servants medical benefits, universal healthcare and social security schemes, based on the inpatients medical expense claims database for 2004.

The rate of cesarean sections has reflected the joint decision on childbirth method of the obstetrician and the expectant mother. Actually, according to the medical indications, the rate of cesarean sections should not be much different. But the data have shown that the cesarean section rate for civil servants was as high as 46% whereas that for gold-card holders was only 16% and for social security members only 3% (Figure 6.93) .



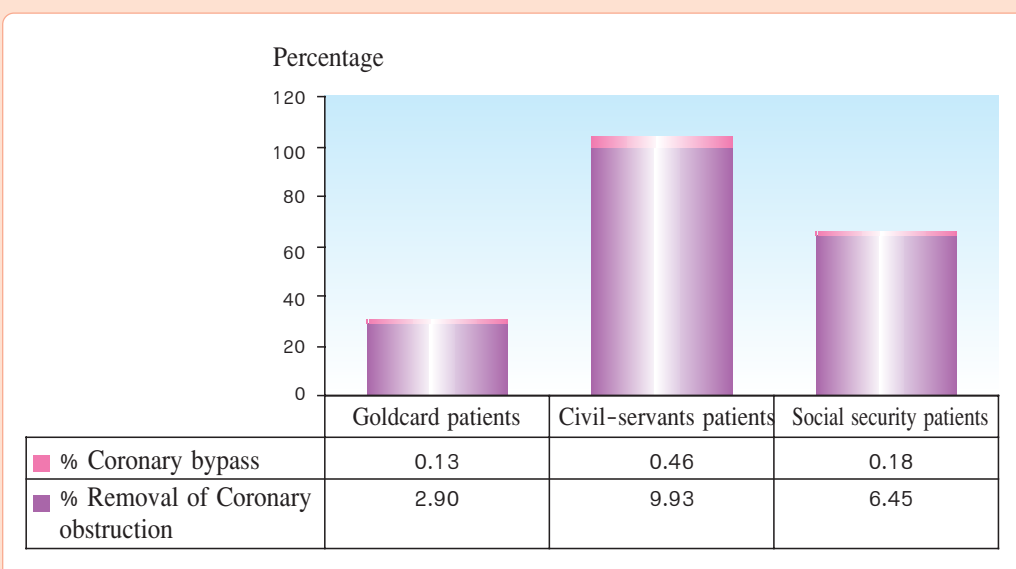
**Figure 6.93** Rates of cesarean sections among childbirth givers under three health insurance schemes



**Source:** Pinij Faramnuayphol. Analysis of inpatient database, 2004. National Health Security Office.

Regarding coronary artery surgery on patients with acute ischemic heart disease, major operations normally performed are coronary artery bypass graft (CABG) and coronary artery balloon dilation for removal of coronary artery obstruction. The data suggest that the rate of operations on patients who were civil servants was highest, followed by patients under the social security and gold-card (universal healthcare) schemes (Figure 6.94), reflecting the differences in opportunities to undergo surgical treatment for patients under different health insurance schemes, especially those who were gold cardholders.

**Figure 6.94** Rates of heart surgeries on patients with ischemic heart disease under three health insurance schemes



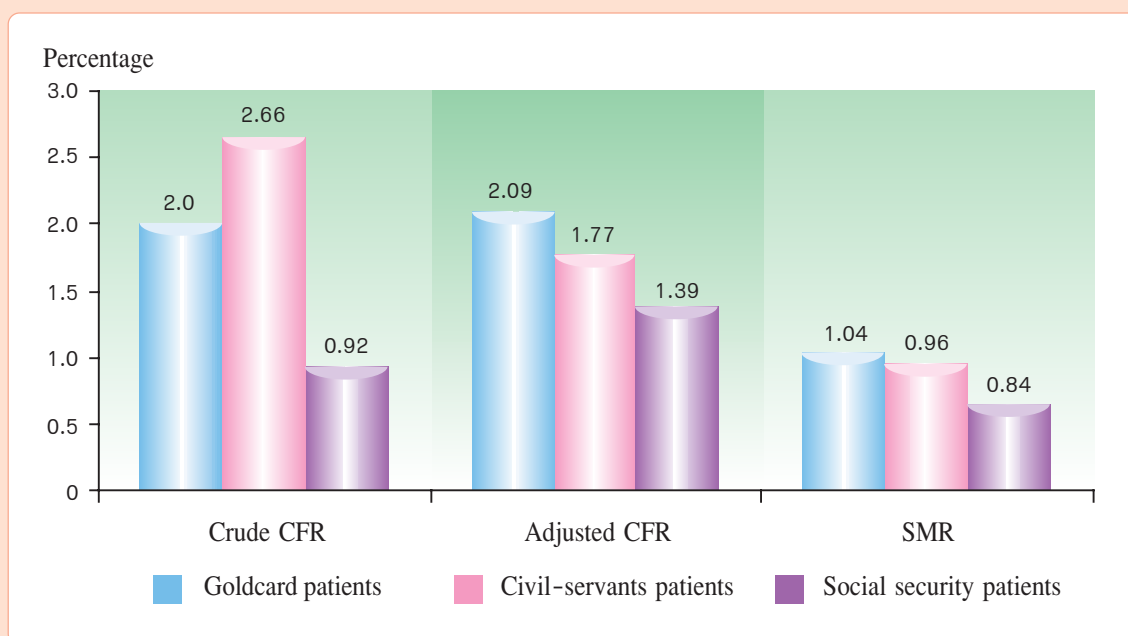
**Source:** Pinij Faramnuayphol. Analysis of inpatient data, 2004. National Health Security Office.



### 7.3 Equity in Outcome of Health Services

The case-fatality rate of inpatients is regarded as “outcome” of health services. If the severity of all illnesses is equal, the chance of patients dying of each illness will be close to one another. An analysis of case-fatality rates, specifically age-adjusted case-fatality rates, by age of patients under three health insurance schemes revealed that gold-card patients (under the universal healthcare scheme) had the highest case-fatality rate of 2.09%, rather than civil servant-patients (under the civil servants medical benefits scheme) with the adjusted case-fatality rate of 1.77% and social security patients at 1.39%. Similarly, an analysis of standardized mortality ratios (SMR) revealed that the SMR for gold-card patients was 1.04 (chances of dying being 1.04 times of the expected value), which was higher than that for civil servant-patients (0.96) and social security patients (0.64) (Figure 6.95). This means that, having age adjusted, gold-card patients will have the highest case-fatality rate, followed by civil servant-patients and social security patients, probably associated with different illness characteristics of patients, service selection and capacity of health facilities.

**Figure 6.95** Crude case-fatality rates, age-adjusted case-fatality rates, and standardized mortality ratios of patients under three health insurance schemes



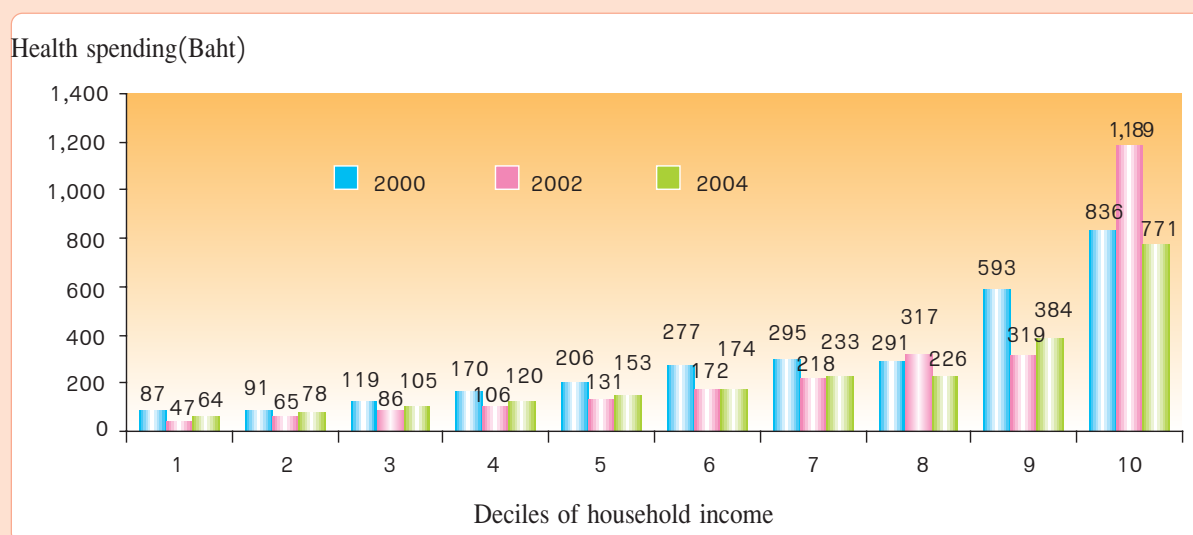
**Source:** Pinij Faramnuayphol. Analysis of inpatient data, 2004. National Health Security Office.



## 7.4 Equity in Healthcare Spending

Household health spending according to households' socio-economic status should be equitable, i.e. a poor household should pay less to the system than a rich household in an amount proportional to their household incomes. As a result of the universal healthcare policy, household health spending has decreased. In 2002, health spending among the poor groups (deciles 1 to 4) dropped by 27-45%. However, it is noteworthy that for the richest group (decile 10) their health spending increased by 42%, probably due to their use of health services beyond their entitlements or non-use of universal healthcare resulting in a higher health spending. But in 2004, health spending among the poor groups (deciles 1 to 4) increased by 10-30% which was lower compared to that for 2000; and it was noted that for the rich groups (deciles 8 to 10) health spending also dropped by 7-30% (Figure 6.96).

**Figure 6.96** Comparison of average household health spending in 10 deciles of households before and after the launch of the universal healthcare scheme



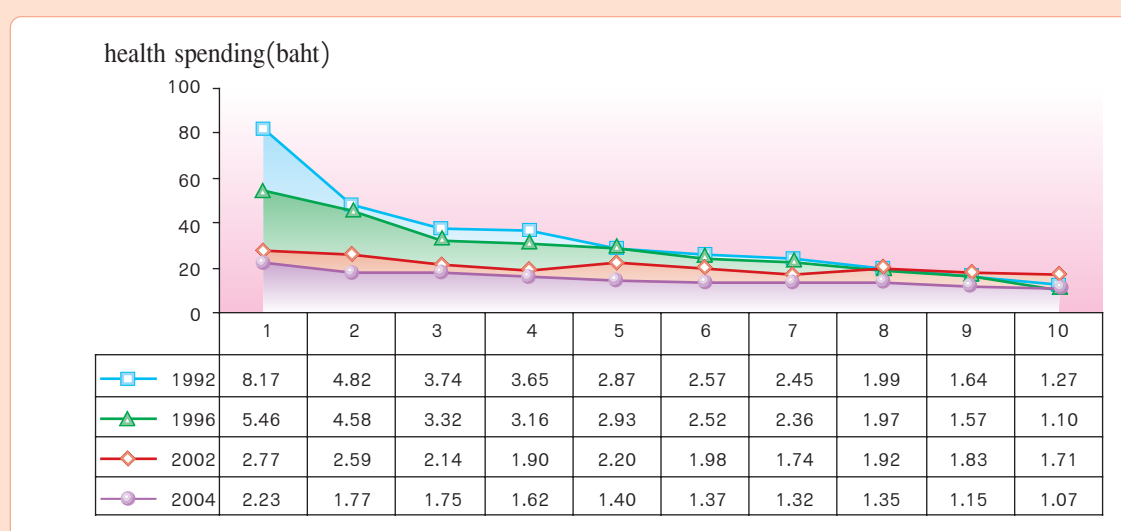
**Source:** - Viroj Tangcharoensathien. Financing of the Universal Healthcare System: Present and Future. International Health Policy Programme, 2004.  
 - Suphon Limwattananond et al. Analysis of data from households' socio-economic survey, 2004. National Statistical Office.

**Note:** Analysis was done only for the last quarters of 2000 and 2002.



According to an analysis of the proportions of household health spending by income group, the burden of people's health spending is not in accordance with their ability to pay. When comparing the proportion of health spending of each income group, low-income people have a higher proportion of health spending than high-income people (Figure 6.97). After the government launched the health insurance scheme for various groups of underprivileged people and the universal healthcare scheme, it was found that the differences in burden of health spending between the rich and the poor had a declining trend, from 6.4 times in 1992 to 1.6 times in 2002, but rising slightly to 2.1 times in 2004 (Table 6.23).

**Figure 6.97** Percentage of health spending in relation to household income by decile of income, 1992, 1996, 2002 and 2004



**Source:** Supon Limwattananon et al. Analysis of data from households' socio-economic survey, 2004. National Statistical Office.

**Table 6.23** Proportion of health spending to household income by decile of income, 1992-2004

Year	Income decile										Difference of decile 1 and decile 10
	1	2	3	4	5	6	7	8	9	10	
1992	8.17	4.82	3.74	3.65	2.87	2.57	2.45	1.99	1.64	1.27	6.4
1994	7.56	4.75	4.49	3.60	3.26	3.03	2.53	2.32	2.03	1.26	6.0
1996	5.46	4.58	3.32	3.16	2.93	2.52	2.36	1.97	1.57	1.10	5.0
1998	4.22	3.07	2.95	2.90	2.59	2.43	1.94	2.00	1.57	1.23	3.4
2000	4.58	3.67	3.29	2.78	2.38	2.22	2.06	1.68	1.55	1.27	3.6
2002	2.77	2.59	2.14	1.90	2.20	1.98	1.74	1.92	1.83	1.71	1.6
2004	2.23	1.77	1.75	1.62	1.40	1.37	1.32	1.35	1.15	1.07	2.1

**Source:** Supon Limwattananon et al. Analysis of data from households' socio-economic survey, 2004. National Statistical Office.





In addition, it was found that, in 2004, most people including low-income group had a rather low burden of health spending in relation to income. Among the poorest, 82.2% of them spent less than 5% of their income on health and 94% of the richest also spent less than 5% of their income on health (Table 6.24).

**Table 6.24** Percentage of households classified by percentage of household health spending in 10 decile groups, 2004

Decile	Health spending as percentage of household income						
	0-5%	6-10%	11-20%	21-30%	31-40%	41-50%	over 50%
1	82.2	7.3	4.7	1.2	0.3	0.1	0.8
2	91.4	5.2	1.9	0.7	0.2	0.4	0.4
3	92.2	4.6	2.2	0.3	0.1	0.1	0.5
4	92.2	5.0	1.7	0.4	0.3	0.2	0.2
5	92.2	4.8	1.9	0.4	0.3	0.2	0.2
6	92.5	4.7	1.8	0.6	0.2	0.04	0.1
7	94.2	3.1	1.7	0.4	0.2	0.03	0.4
8	94.6	2.9	2.0	0.3	0.1	0.1	0.03
9	94.5	2.8	1.6	1.0	0.02	0.0	0.1
10	94.0	3.9	1.5	0.4	0.1	0.0	0.1
<b>Total</b>	<b>92.0</b>	<b>4.4</b>	<b>2.1</b>	<b>0.6</b>	<b>0.2</b>	<b>0.1</b>	<b>0.3</b>

**Source:** Supon Limwattananon et al. Analysis of data from households' socio-economic survey, 2004. National Statistical Office.



