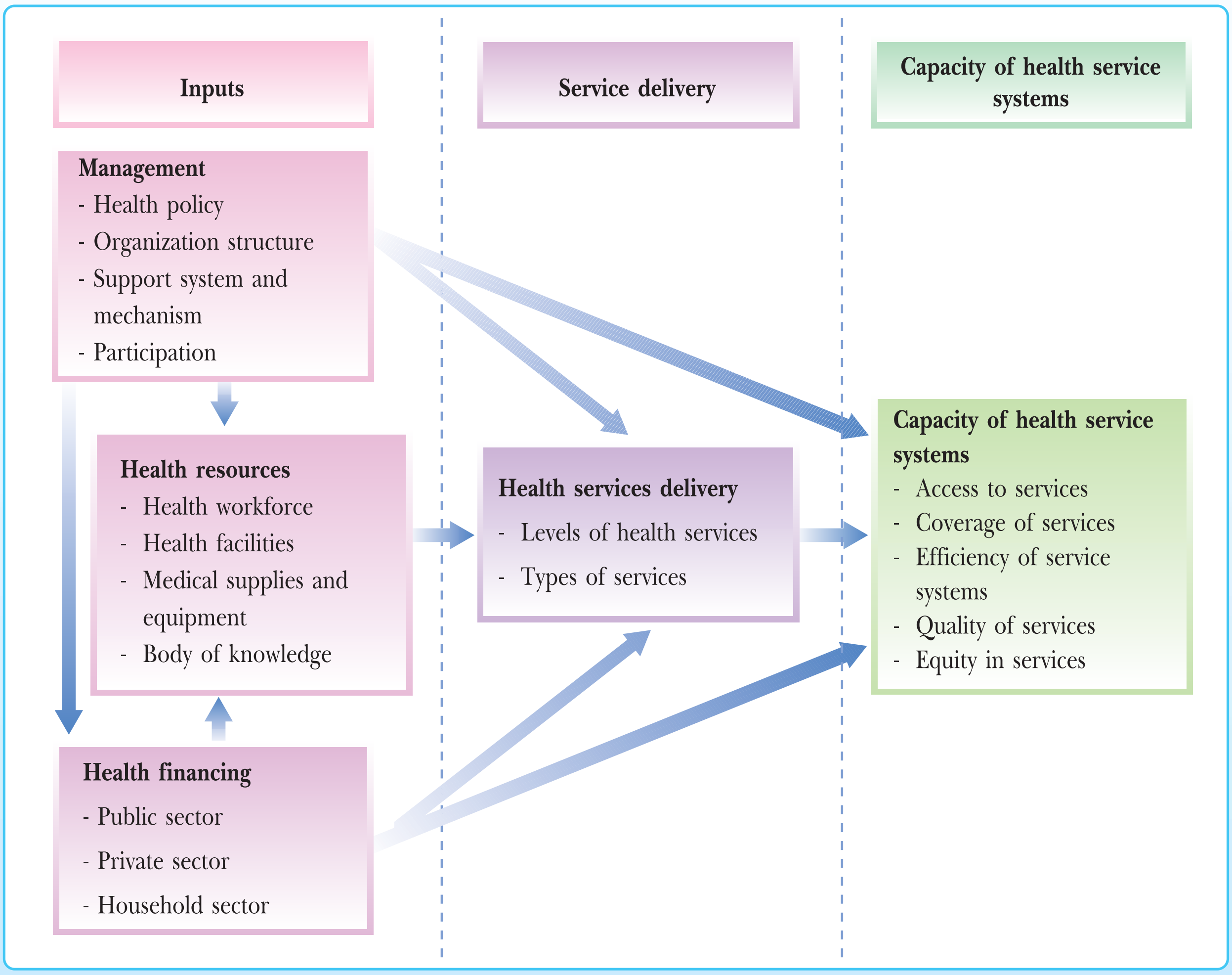
CHAPTER 6

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 health 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 mechanisms, health resources, and health financing, which affect health service delivery and capacity of health service systems (Figure 6.1)**

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



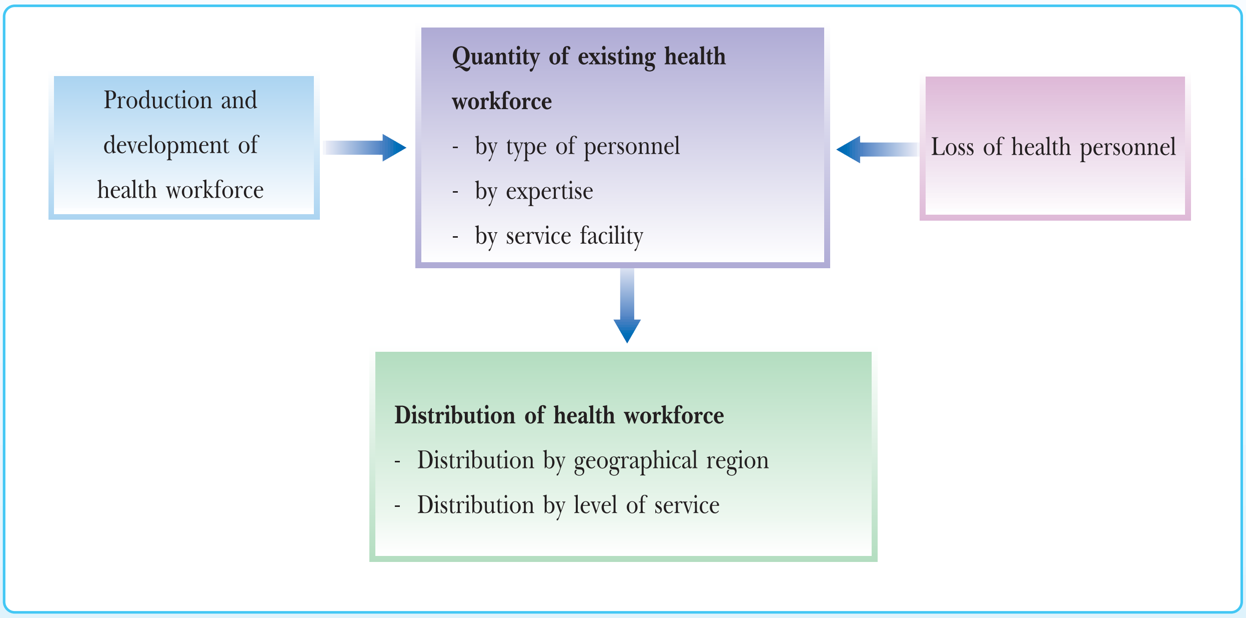
Chapter 6 deals with the information about health resources, health financing and capacity of health service systems in seven parts, i.e. (1) health workforce, (2) health facilities, (3) health technology, (4) health expenditure, (5) accessibility to health services, (6) efficiency and quality of health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

1. Health Workforce

Health workforce 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 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 health workforce 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 workforce situation

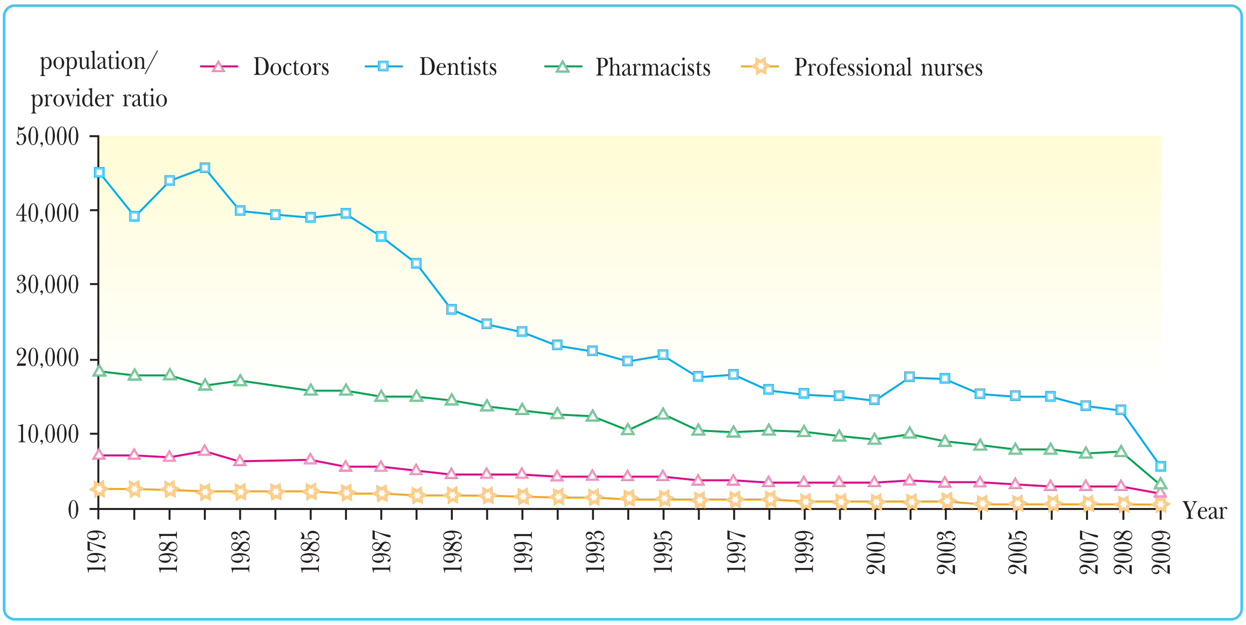


1.1 Situation and Trends in Quantity of Health Workforce

1.1.1 Trends in Ratio of Population to Health-care Provider by Type of Personnel

The overall situation of health workforce during the past period, using the ratio of population to health-care provider, has shown that the trends in quantities have been improving steadily (Figure 6.3).

Figure 6.3 Ratios of population to health-care provider, 1979–2009

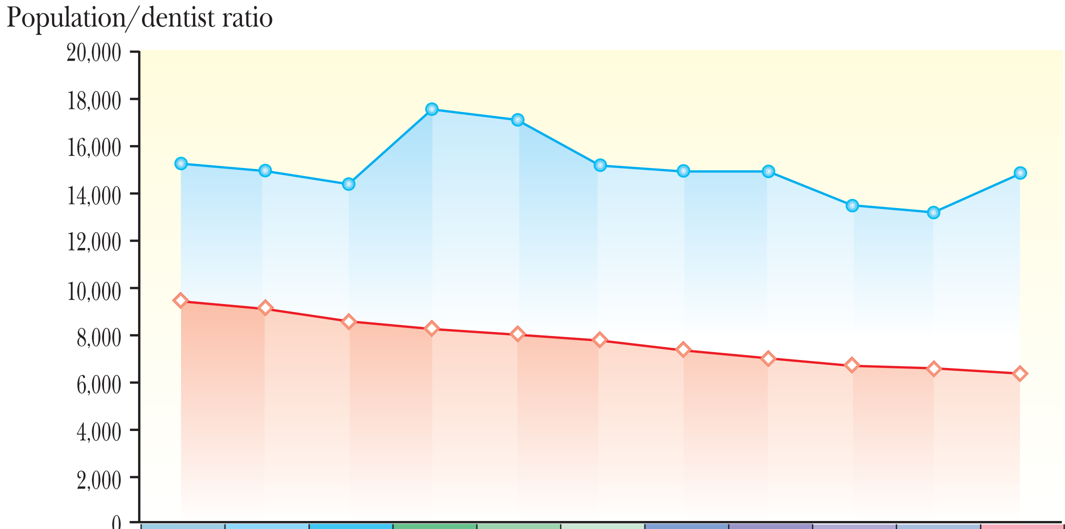


Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Note: In 1979, data were adjusted and the ratios were recalculated due to the incompleteness of data.

Data from the MoPH health resource survey might be inaccurate due to incompleteness of data obtained, especially for dentists; the population/dentist ratio reported by the Bureau of Policy and Strategy was 1.6-fold to 2.3-fold lower than that revealed by the Dental Health Personnel Report of the Department of Health (Figure 6.4).

Figure 6.4 Ratios of population to dentist, 1999–2009 (from 2 sources of data)



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Pop./dentist(BPS)	15,295	14,917	14,384	17,606	17,182	15,143	14,901	14,959	13,525	13,148	14,833
Pop./dentist(DOH)	9,436	9,074	8,624	8,252	8,022	7,811	7,340	7,086	6,731	6,572	6,393

Sources: - Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.
- Report on Dental Health Personnel, 1999–2009, Department of Health, MoPH.

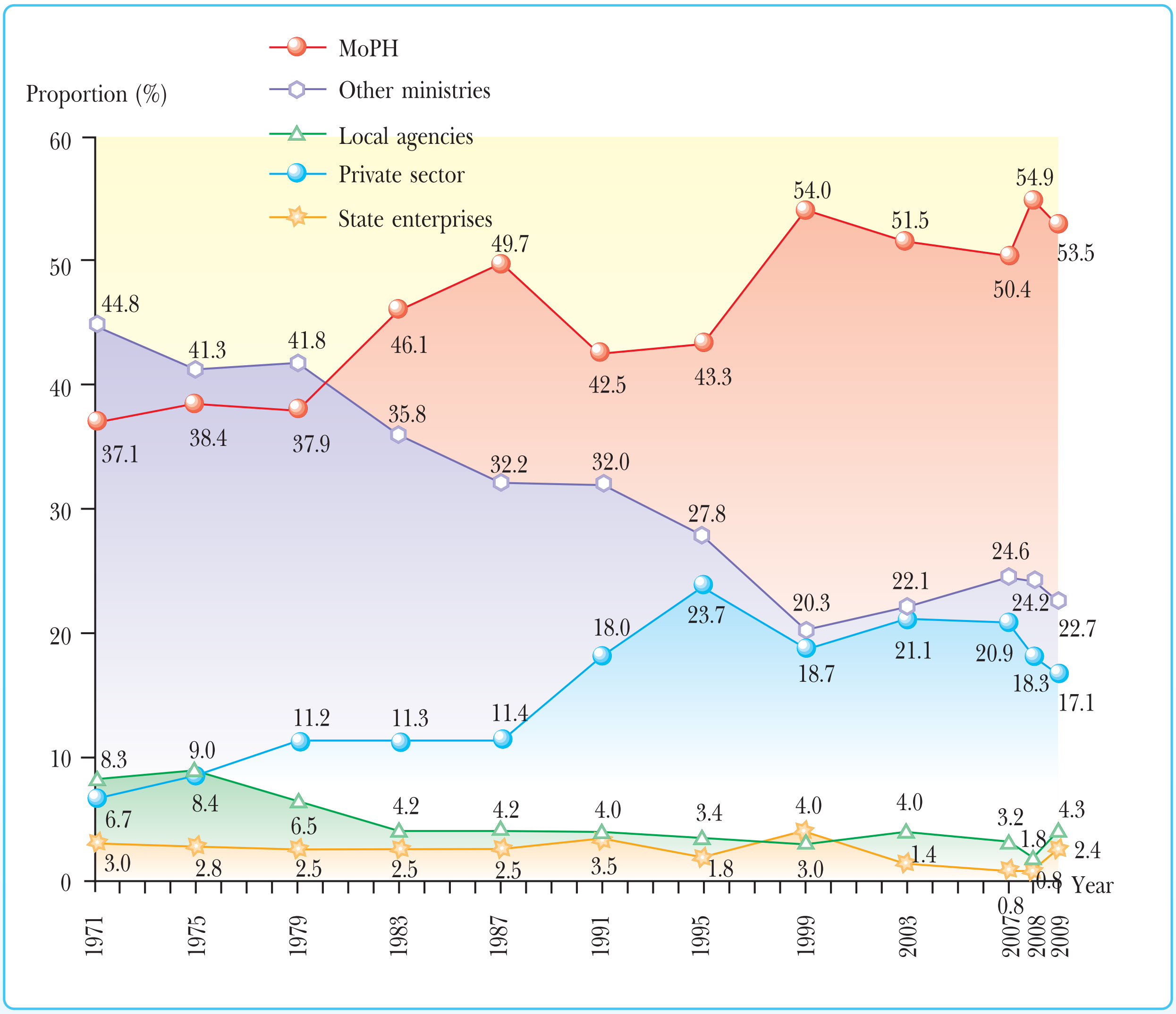
1.1.2 Health Workforce by Agency

1) Doctors

In 2009, there were 35,789 physicians or medical doctors who were alive and living in Thailand (Medical Council, 2010). But according to the report on health resources survey of 2009, there were only 19,089 doctors, which was 13% lower than that reported in the 2008 survey, due to data incompleteness. Therefore, in 2009, based on the data from the Medical Council, the proportions of doctors were recalculated for each agency and region as shown in Figures 6.5 and 6.21; and it was found that the proportion was lower in the public sector but higher in the private sector, i.e. from 93.2% in 1971 to 82.9% in 2009 in the public sector and from 6.7% to 17.1% in the private sector during the some period (Figure 6.5).

Most of the doctors in Bangkok work for other ministries, followed by the private sector, while in the provinces, most of them work for MoPH (Figure 6.6); this feature is similar for all professions.

Figure 6.5 Proportions of doctors by agency, 1971–2009



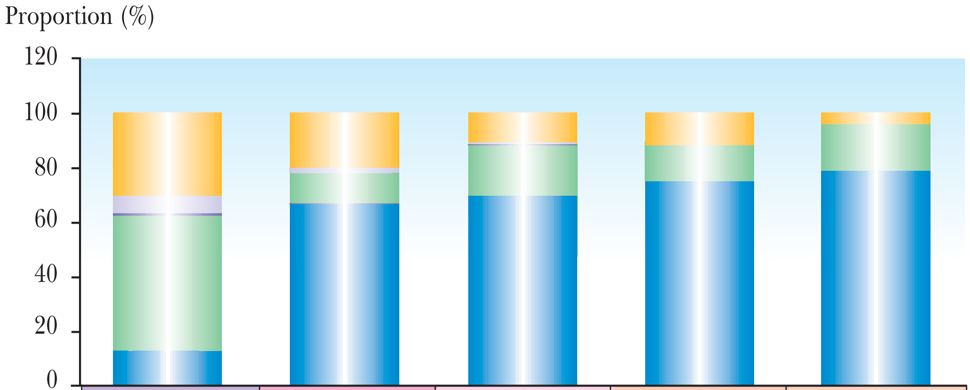
Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Note: As the 2009 data were incomplete, the proportion and number of doctors for each type of agency were recalculated using the formulas below:

Proportion for each agency = (New number of doctors by agency/ Number of all doctors alive and living in country) x 100

$$\text{New number of doctors for each agency} = \frac{\text{Proportion of doctors by agency from 2009 MoPH report}}{100} \times \text{Number of all doctors alive and living in country}$$

Figure 6.6 Proportions of doctors by agency and region, 2008



	Bangkok	Central	North	South	Northeast
Private sector	31.60	20.70	11.90	12.50	5.00
Local agencies	5.70	0.30	0.50	0.20	0.30
State enterprises	1.00	1.90	0.40	0.00	0.02
Other ministries	49.70	10.70	18.20	12.80	16.80
MoPH	12.00	66.40	69.00	74.50	77.90

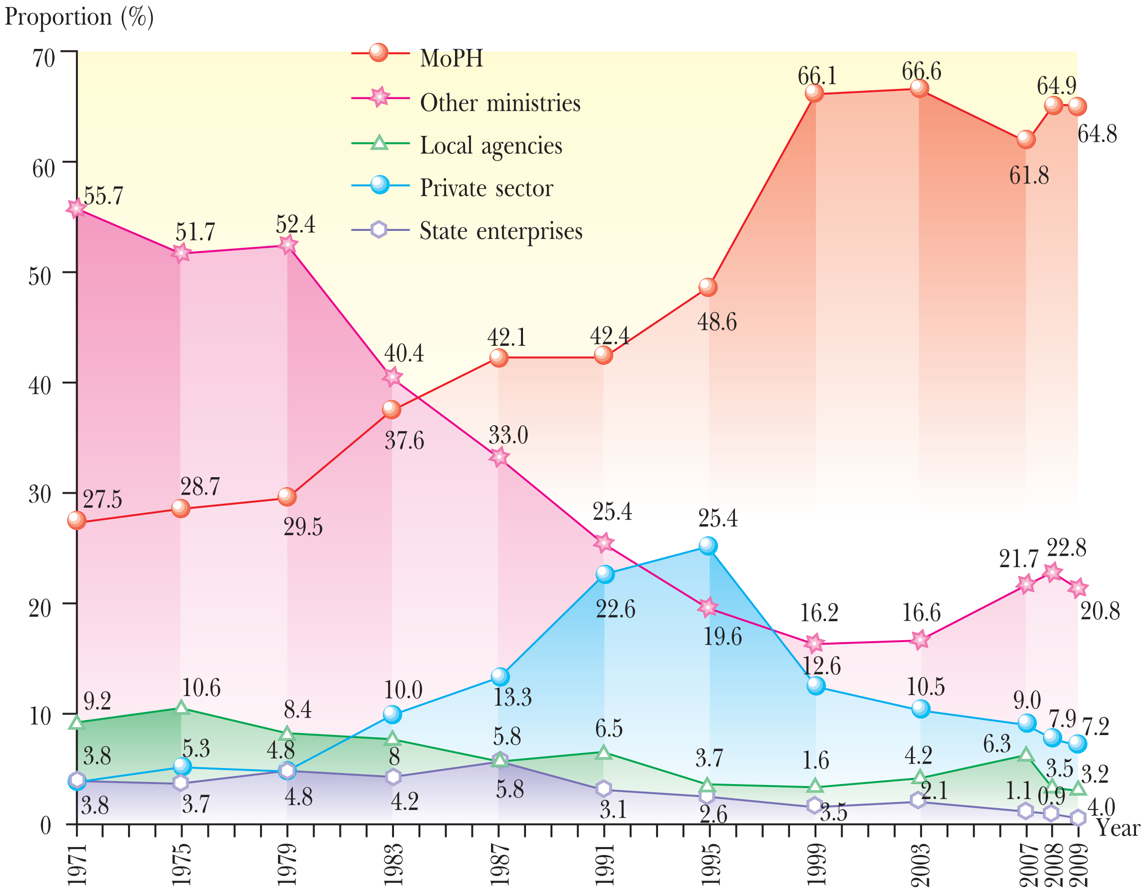
Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

2) Dentists

In 2009, Thailand had a total of 10,571 dentists who were alive and living in Thailand (Dental Council, 2010), whereas the 2009 health resources survey revealed that there were only 4,278, which was 11% lower than that found in the 2008 survey due to data incompleteness. So, for 2009, the figure from the Dental Council was used for recalculating the proportions of dentists by agency and region as shown in Figures 6.7 and 6.22. Overall, it was found that the proportion of dentists was declining in the public sector (MoPH, other ministries, state enterprises and local agencies) from 96.2% in 1971 to 92.8% in 2009, but rising in the private sector from 3.8% in 1971 to 7.2% in 2009 (Figure 6.7).

As for dentists in Bangkok, most of them work for other ministries, followed by the local agency (i.e. Bangkok Metropolitan Administration, or BMA) and the private sector, while in other regions, most of them work for MoPH (Figure 6.8).

Figure 6.7 Proportions of dentists by agency, 1971–2009



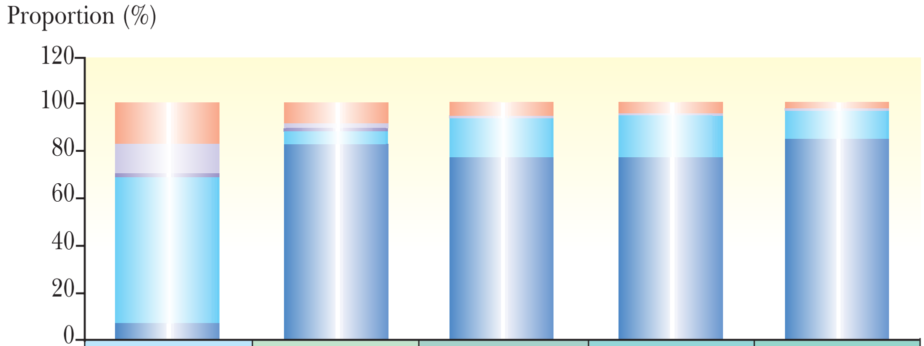
Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Note: As the 2009 data were incomplete, the proportion and number of dentists for each type of agency were recalculated using the formulas below:

Proportion for each agency = (New number of dentists by agency/ Number of all dentists alive and living in country) x 100

$$\text{New number of dentists for each agency} = \frac{\text{Proportion of dentists by agency from 2009 MoPH report}}{100} \times \text{Number of all dentists alive and living in country}$$

Figure 6.8 Proportions of dentists by region, 2008

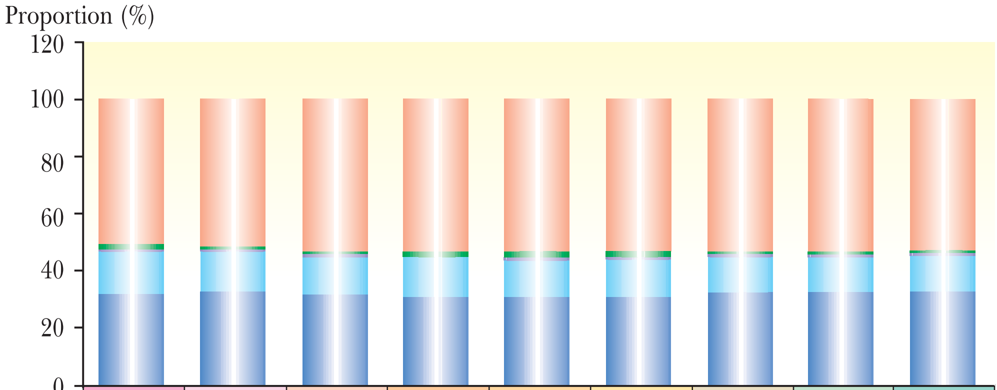


	Bangkok	Central	North	South	Northeast
Private sector	17.30	8.70	5.50	4.20	2.00
Local agencies	12.40	1.70	0.80	0.60	0.90
State enterprises	2.10	1.40	0.30	0.00	0.09
Other ministries	61.80	5.90	16.30	17.90	12.00
MoPH	6.50	82.40	77.00	77.30	85.00

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

However, according to the dental personnel survey of the Department of Health covering 93% of all dentists alive and living in the country, the number being 1.6-fold to 2.3-fold greater than that shown in the health resources report, and the proportion of dentists was mostly in the private sector while only 30% worked for MoPH. The proportions of dentists by agency did not change much (Figure 6.9).

Figure 6.9 Proportions of dentists by agency, 2001–2009 (according to DoH database)



	2001	2002	2003	2004	2005	2006	2007	2008	2009
Private sector	51.0	51.4	53.2	53.4	53.9	54.1	53.4	53.3	52.6
Local agencies	1.8	1.7	1.6	1.7	1.6	1.5	1.5	1.5	1.5
State enterprises	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.8	0.8
Other ministries	15.2	13.8	13.3	13.5	13.2	13.0	12.3	12.2	11.7
MoPH	31.3	32.4	31.3	30.8	30.7	31.0	32.4	32.2	33.4

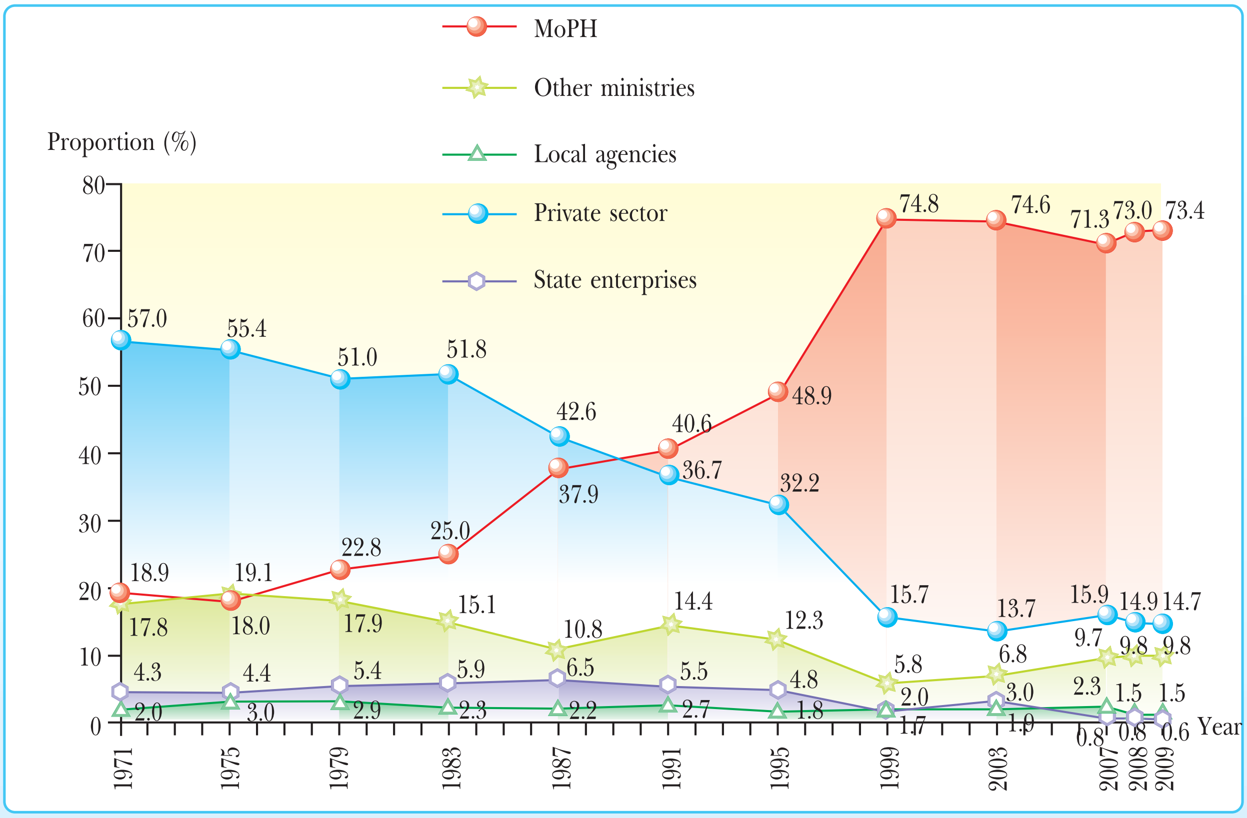
Source: Report on Dental Health Personnel, 2001–2009. Department of Health, MoPH.

3) Pharmacists

In 2009, there were a total of 24,401 pharmacists alive and living in the country (Pharmacy Council, 2010), while the 2009 health resources survey showed that there were only 7,689, which was 10% lower than that for the 2008 survey due to data incompleteness. Thus, for 2009, the data from the Pharmacy Council were used for recalculating the proportions of pharmacists by agency and region as shown in Figures 6.10 and 6.24. It was found that, during 1971–1985, about half of pharmacists (approximately 50%) worked in the private sector (drug manufacturing industries, import companies and drugstores), while only 43.0%–50.9% worked in the public sector. But after the government launched the compulsory working for newly graduated pharmacists in 1984 and 2006, the proportion of pharmacists working in the public sector especially MoPH rose to 73.4% in 2009, while that in the private sector dropped to only 14.7% in the same year (Figure 6.10).

Most of those pharmacists in Bangkok work in the private sector, which is close to that for other ministries, but for other regions, most of them work for MoPH (Figure 6.11).

Figure 6.10 Proportions of pharmacists by agency, 1971–2009



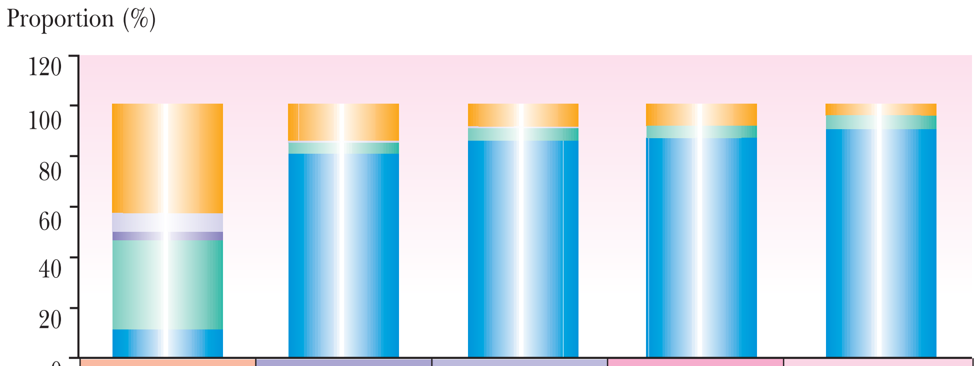
Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Note: As the 2009 data were incomplete, the proportion and number of pharmacists for each type of agency were recalculated using the formulas below:

Proportion for each agency = (New number of pharmacists by agency/ Number of all pharmacists alive and living in country) x 100

$$\text{New number of pharmacists for each agency} = \frac{\text{Proportion of pharmacists by agency from 2009 MoPH report}}{100} \times \text{Number of all pharmacists alive and living in country}$$

Figure 6.11 Proportions of pharmacists by region, 2008



	Bangkok	Central	North	South	Northeast
Private sector	42.8	14.1	8.7	8.2	4.4
Local agencies	7.7	0.2	0.5	0.3	0.3
State enterprises	3.4	0.8	0.1	0.0	0.0
Other ministries	35.2	4.8	5.4	4.4	4.8
MoPH	10.9	80.1	85.4	87.1	90.5

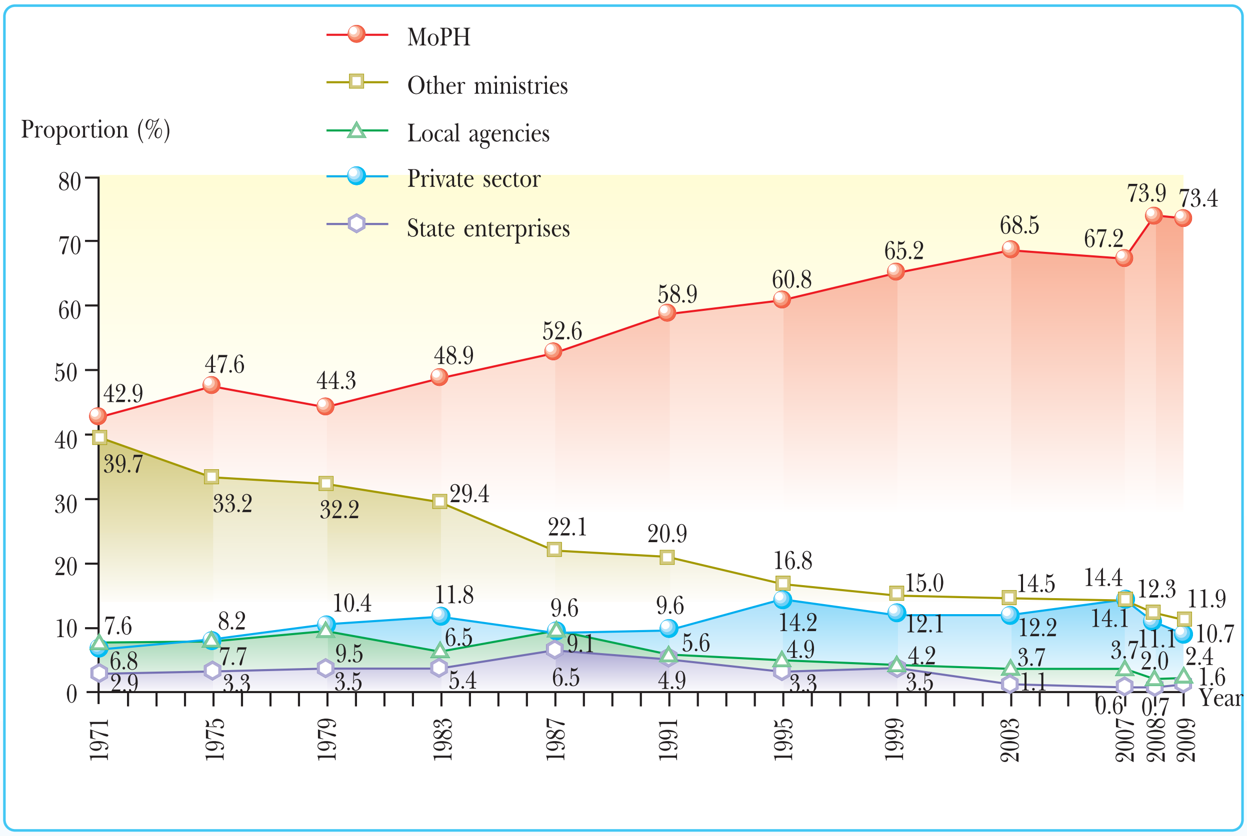
Source: Report on Health Resources Survey. Bureau of Policy and Strategy, MoPH.

4) Professional Nurses

In 2009, Thailand had 120,948 professional or registered nurses actually working and living in the country (Nursing Council, 2010). But the 2009 health resources survey revealed that there were only 101,760 professional nurses or 7% lower than that found in the 2008 survey due to data incompleteness. Thus, in 2009, the figure from the Nursing Council was used to recalculate the proportions of nurses by agency and region as shown in Figures 6.12 and 6.25, which showed that the proportion in the public sector (MoPH, other ministries, state enterprises and local agencies) was declining from 93.1% in 1971 to 89.3% in 2009, while that in the private sector was rising from 6.8% in 1971 to 10.7% in 2009 (Figure 6.12).

Most of the nurses in Bangkok work for other ministries, while in other regions they mostly work for MoPH (Figure 6.13).

Figure 6.12 Proportions of professional nurses by agency, 1971–2009



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

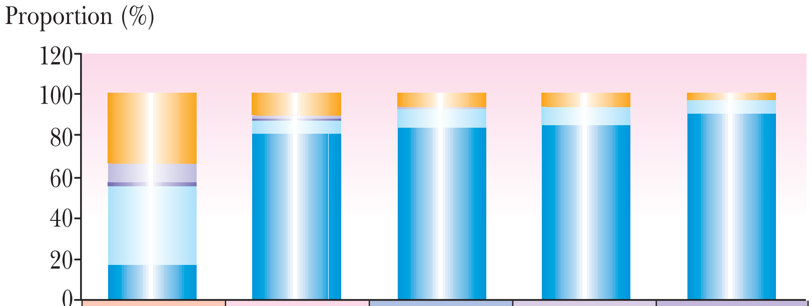
Note: As the 2009 data were incomplete, the proportion and number of nurses for each type of agency were recalculated using the formulas below:

Proportion for each agency = (New number of nurses by agency/ Number of all nurses alive and living in country) x 100

New number of nurses for each agency =

$$\frac{\text{Proportion of nurses by agency from 2009 MoPH report}}{100} \times \text{Number of all nurses alive and living in country}$$

Figure 6.13 Proportions of professional nurses by agency and region, 2008

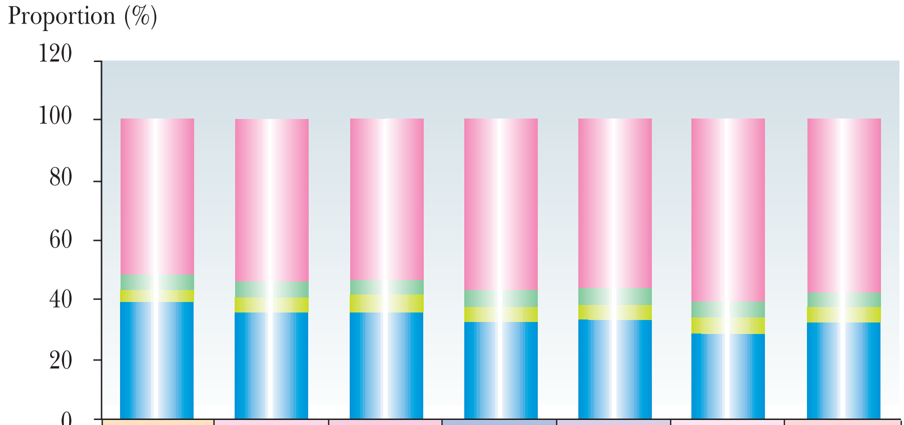


	Bangkok	Central	North	South	Northeast
Private sector	33.7	10.8	6.7	6.1	3.1
Local agencies	9.2	1.0	0.5	0.8	0.4
State enterprises	1.6	1.5	0.2	0.06	0.03
Other ministries	38.9	6.4	9.4	8.0	6.3
MoPH	16.5	80.3	83.2	85.1	90.2

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

Another important aspect in the management of health workforce is their part-time work in the private sector. Among all part-time health-care providers, doctors had the largest proportion (50%–60%), followed by professional nurses (28%–38%); the rising trend was noted for doctors (Figure 6.14).

Figure 6.14 Proportions of part-time health-care providers in the private sector, 2003–2009



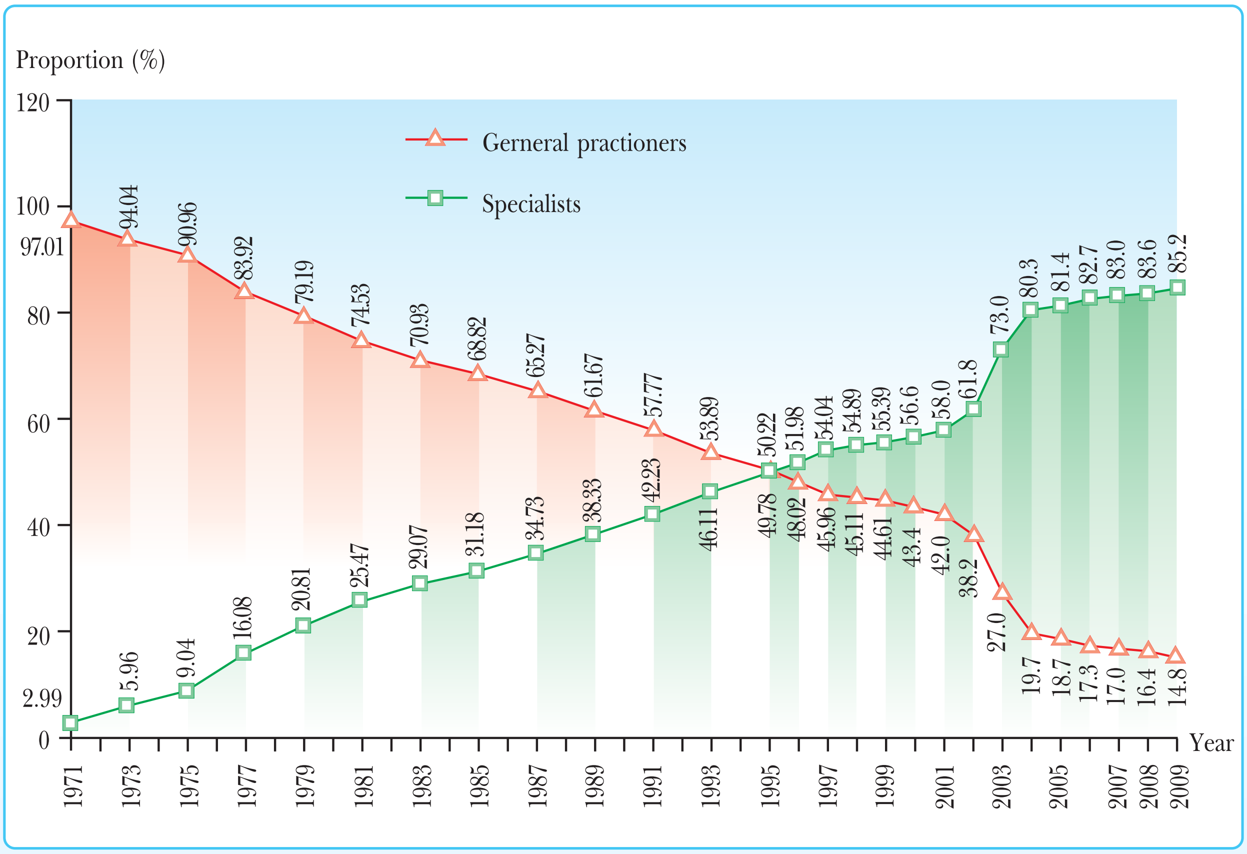
	2003	2004	2005	2006	2007	2008	2009
Doctors	50.1	51.8	51.8	56.0	55.4	59.5	56.7
Dentists	4.7	5.3	5.5	5.8	6.0	6.1	5.3
Phamacists	4.6	4.7	5.1	4.4	5.1	4.8	5.0
Professional nurses	37.5	34.4	34.9	32.2	32.5	28.8	32.0

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

1.1.3 Specialties of Health Workforce

Specialties of health-care 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 2009, the proportion of doctors with medical specialty certification in various fields was as high as 85.2% of all medical doctors (Figure 6.15).

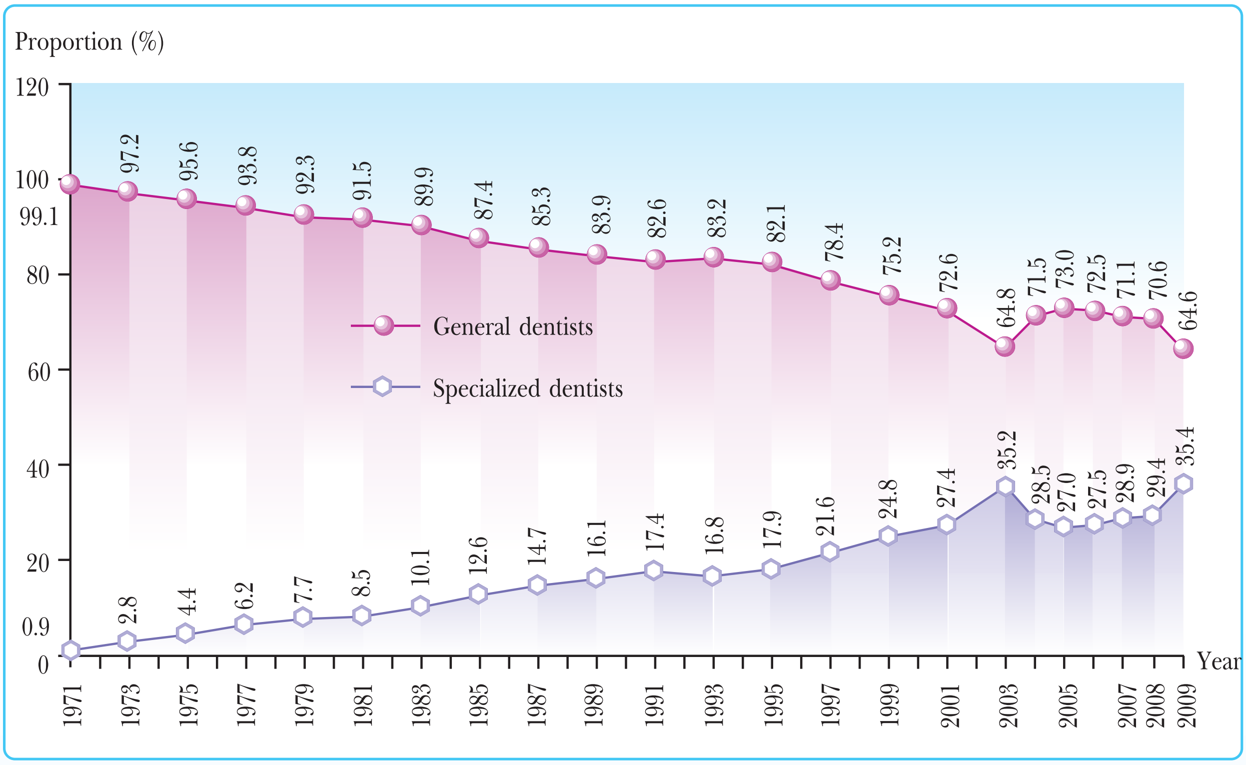
Figure 6.15 Proportions of medical general practitioners and specialists, 1971–2009



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

Similarly, for dentists in Thailand, there was a rising trend for them to undertake dental specialty training in 2003, but the proportion of dentists with dental specialty certification dropped to a rather stable level during 2004–2008 and rose again in 2009 to 35.4% of all dentists (Figure 6.16).

Figure 6.16 Proportions of general and specialized dentists, 1971–2009



Source: Dental Health Division, Department of Health, MoPH.

1.2 Production and Development of Health Workforce

1.2.1 Production of Doctors

At present, there are 18 medical schools in Thailand (17 public and 1 private), including another state-run university (Kasetsart University), which started producing medical graduates in 2007

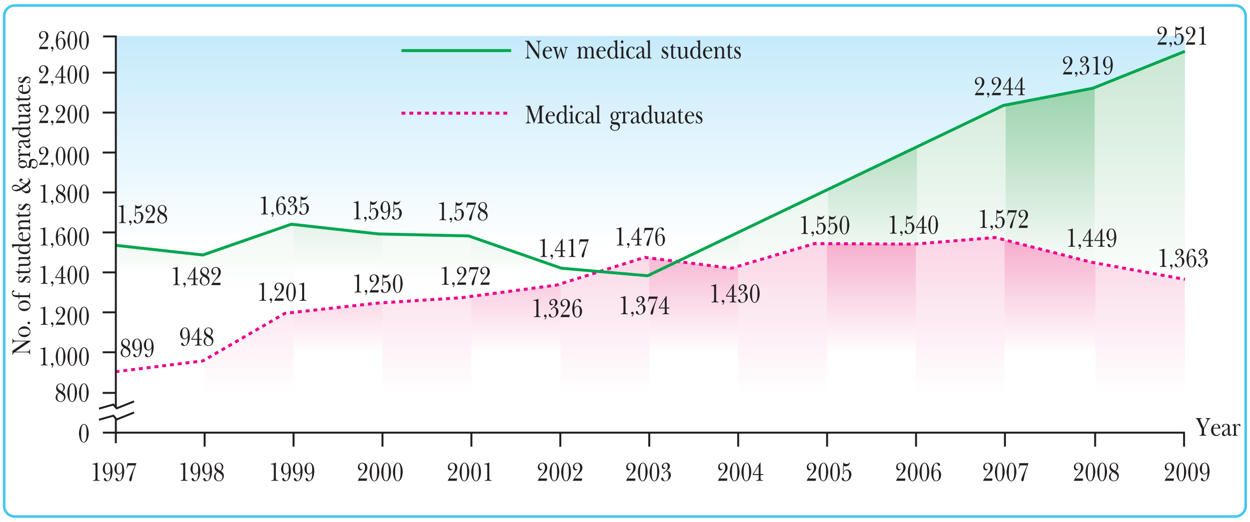
Apart from distributing more doctors to the rural areas, MoPH has been undertaking two projects as follows:

(1) The Project on Increased Production of Medical Doctors for Rural People. A total of 5,097 medical students have been admitted under the project since 1996 and 2,156 of whom have graduated.

(2) The "One District, One Doctor" Project. A total of 1,098 medical students have been admitted from the district level since 2005; to date there have been no graduates yet. However, upon graduation, they will be required to work for MoPH for 12 years.

The number of medical student admissions is on the rise, particularly during 2007–2008; and the number of newly graduated doctors has also been rising steadily (Figure 6.17).

Figure 6.17 Numbers of medical student admissions and newly graduated doctors, 1997–2009



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

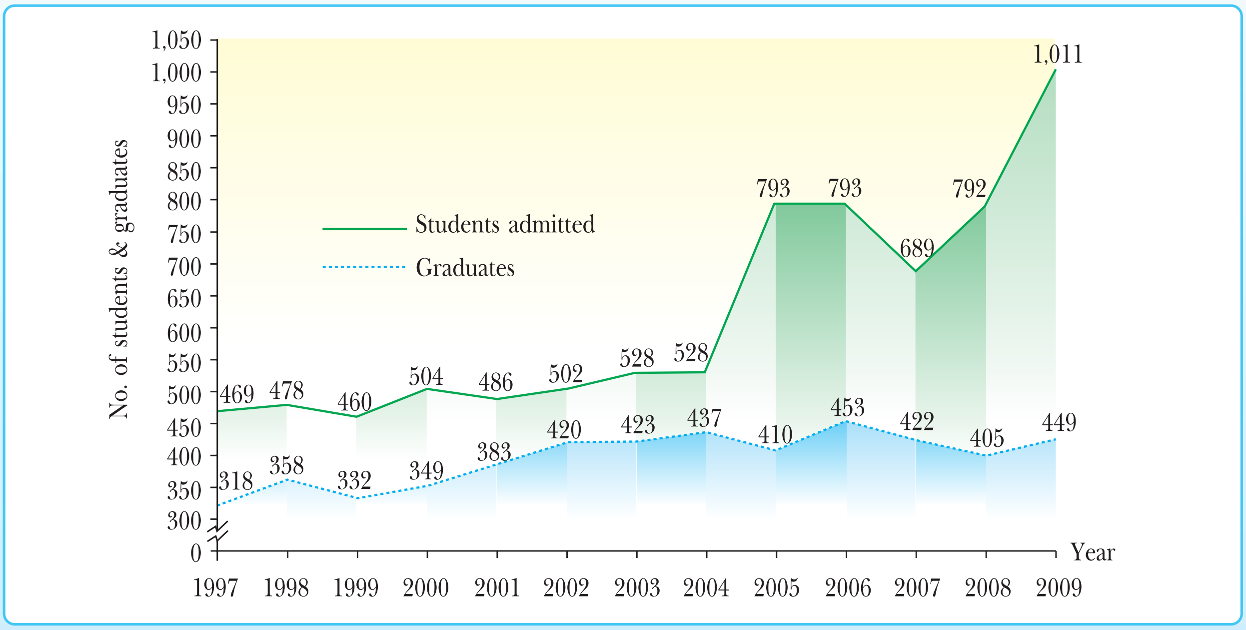
Medical graduates data, from the Medical Council of Thailand.

1.2.2 Production of Dentists

At present, the production of dentists in Thailand is undertaken by 10 institutions (9 public and 1 private); the private one is Rangsit University, which started accepting dental students in 2005.

At present, there are approximately 900–1,000 new dentists graduating each year, but for the period 2002–2009, there were only 400–450 new graduates annually as shown in Figure 6.18.

Figure 6.18 Numbers of dental students admitted and dental graduates, 1997–2009



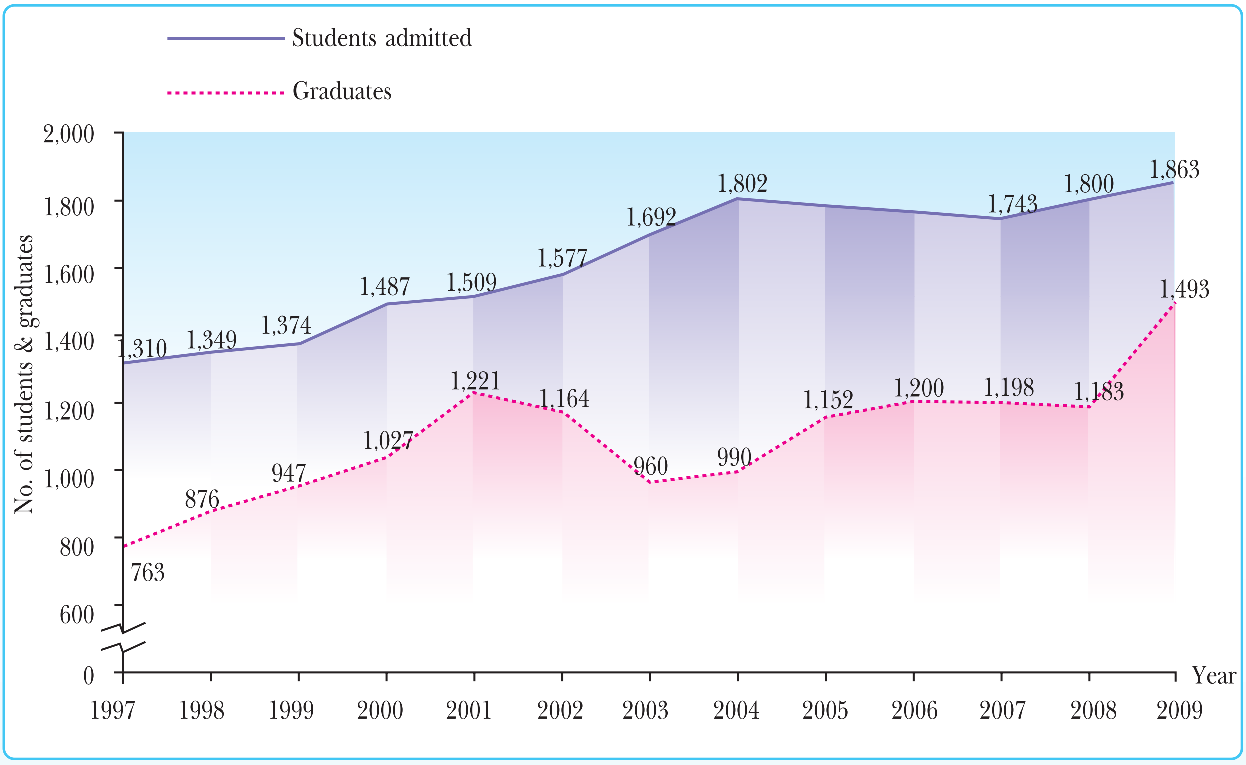
Sources: **Student admissions data**, from the Bureau of Policy and Planning, Office of the Higher Education Commission (HEC).

Dental graduates data, from the Dental Council of Thailand.

1.2.3 Production of Pharmacists

At present, Thailand has 14 schools of pharmacy (11 public and 3 private). Between 1997 and 2009, there were increases in both admissions and graduates. The number of graduates dropped slightly in 2003–2004, but rose to 1,493 in 2009 (Figure 6.19)

Figure 6.19 Numbers of pharmacy students admitted and graduates, 1997–2009



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

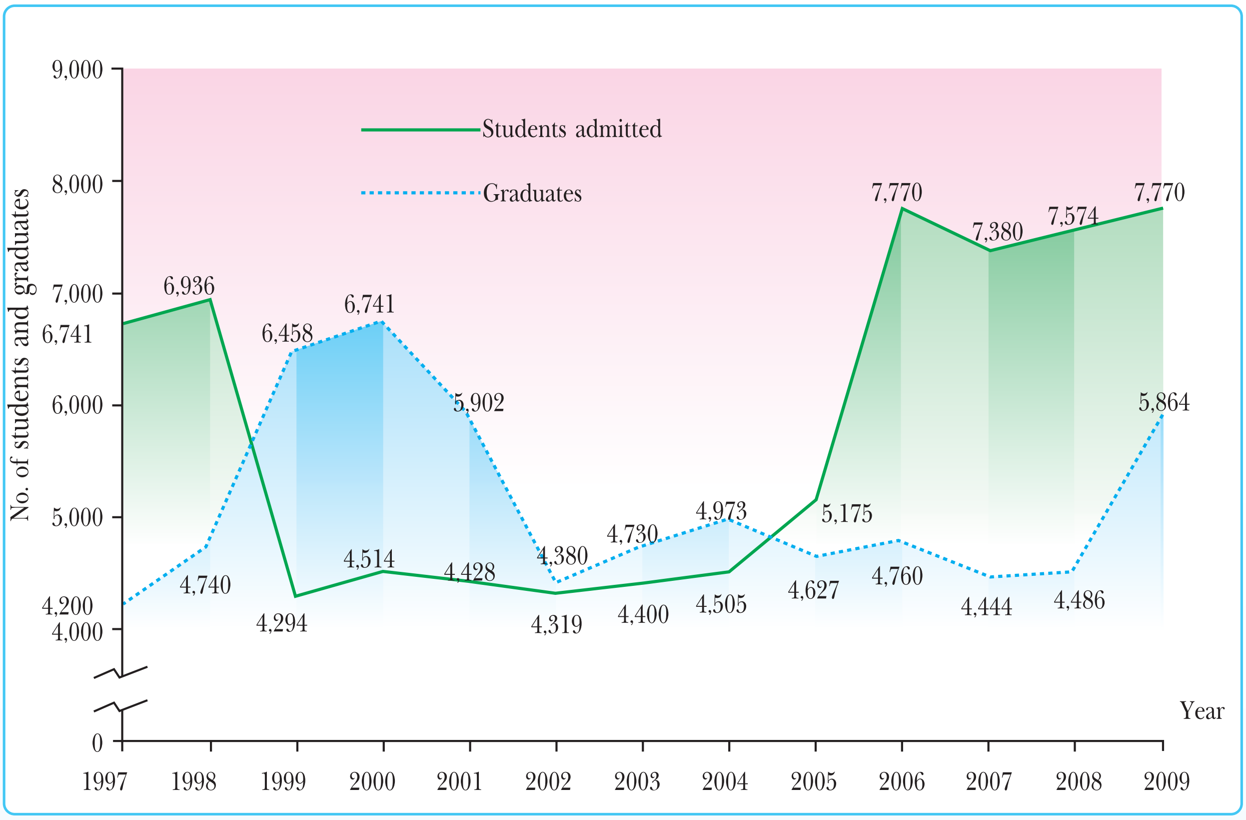
Data on graduate, from the Pharmacy Council of Thailand.

1.2.4 Professional Nurses

At present, Thailand has 74 nursing colleges/institutions (64 public and 10 private) including one state-run institution (Suranaree Technology University) which began offering a nursing education programme in 2009.

Between 2006 and 2009, there was a plan to admit approximately 7,000 nursing students each year and the number of nursing graduates is shown in Figure 6.20.

Figure 6.20 Numbers of nursing students admitted and graduates, 1997–2009



Sources: **Student admissions data**, from the Nursing Council of Thailand, Ministry of Public Health and the report on projection of nursing personnel demand and supply for 2009–2019.
Data on graduates, from the Nursing Council of Thailand

1.2.5 Losses of Health Workforce in the Public Sector

This section mainly focuses on the issue of resignation from civil service which reflects the change in the type of agency for which health-care providers work, especially shifting from the public 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 MoPH, the significant problem is the resignation of medical doctors; the net loss is on a rising trend, the peak being during the economic booming period in 1996 (before the economic crisis). During that time period, as many as 21 community hospitals had no doctors at all (Table 6.1).

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 MoPH became a serious issue again. However, the loss declined in 2004, but rose again between 2005 and 2009 with the annual loss of 600–800 doctors, most likely due to the recovery in the private sector (Table 6.1). However, as the number of newly graduated doctors has been rising, the proportion of net loss has been declining steadily.

Table 6.1 Number and proportion of doctors lost in relation to newly appointed doctors, Office of the Permanent Secretary, MoPH, 1994–2009

Fiscal year	No. of doctors						Net loss (No./ percent)
	Increases			Decreases (resignation)			
	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
2007	1,128	150	1,278	736	-	736	586/51.9
2008	1,024	159	1,183	785	-	785	626/61.1
2009	999	191	1,190	669	-	669	478/47.8

Source: Bureau of Central Administration, Office of the Permanent Secretary, MoPH.

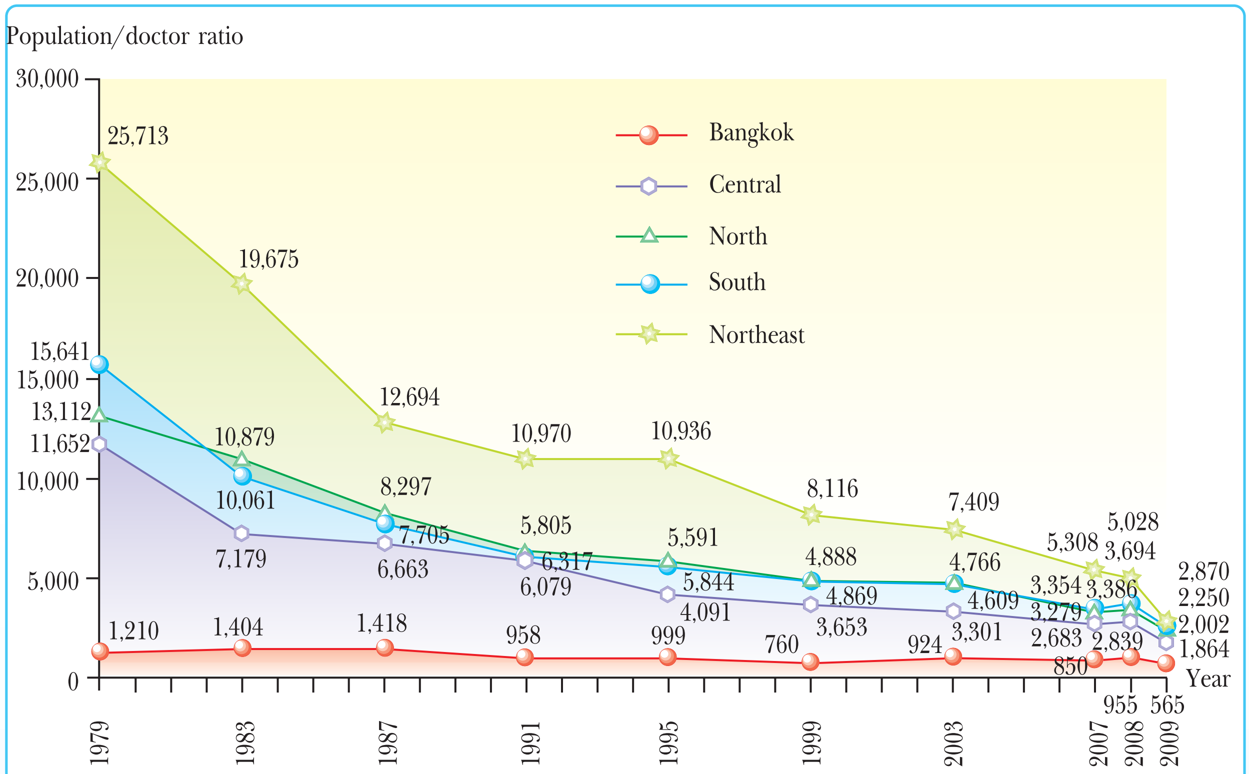
Notes:
1. Parent agencies adjusted their own data for fiscal years 1995–2003.
2. According to the cabinet resolution, since 1999 MoPH has been required to accept the graduates who have been awarded scholarships as state employees under MoPH, rather than as civil servants.
3. In 2004, MoPH appointed all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

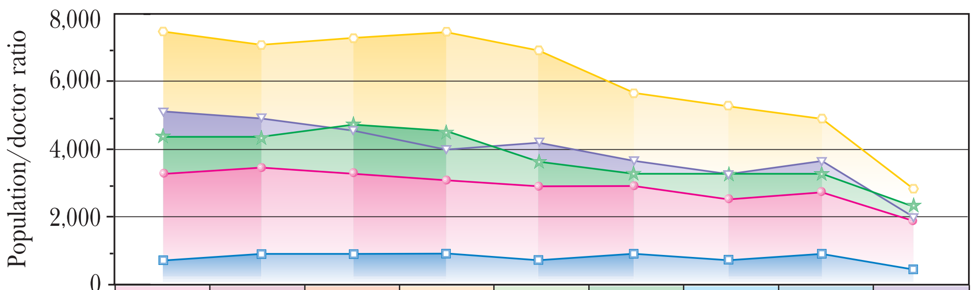
1.3 Distribution of Health Workforce by Geographical Region

1.3.1 Ratio of Population to Health-care Provider by Region

The population/doctor ratio has been on an improved trend since 1979 and the regional disparities have significantly declined. Between 2001 and 2009, a regional comparison of the population/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 6.21).

Figure 6.21 Population/doctor ratios by region, 1979–2009





	2001	2002	2003	2004	2005	2006	2007	2008	2009	Year
Bangkok	760	952	924	879	867	886	850	955	565	
Central	3,375	3,566	3,301	3,134	3,054	2,963	2,683	2,839	1,864	
North	4,488	4,499	4,766	4,534	3,768	3,351	3,279	3,386	2,002	
South	5,127	4,984	4,609	3,982	4,306	3,789	3,354	3,694	2,250	
Northeast	7,614	7,251	7,409	7,466	7,015	5,738	5,308	5,028	2,870	

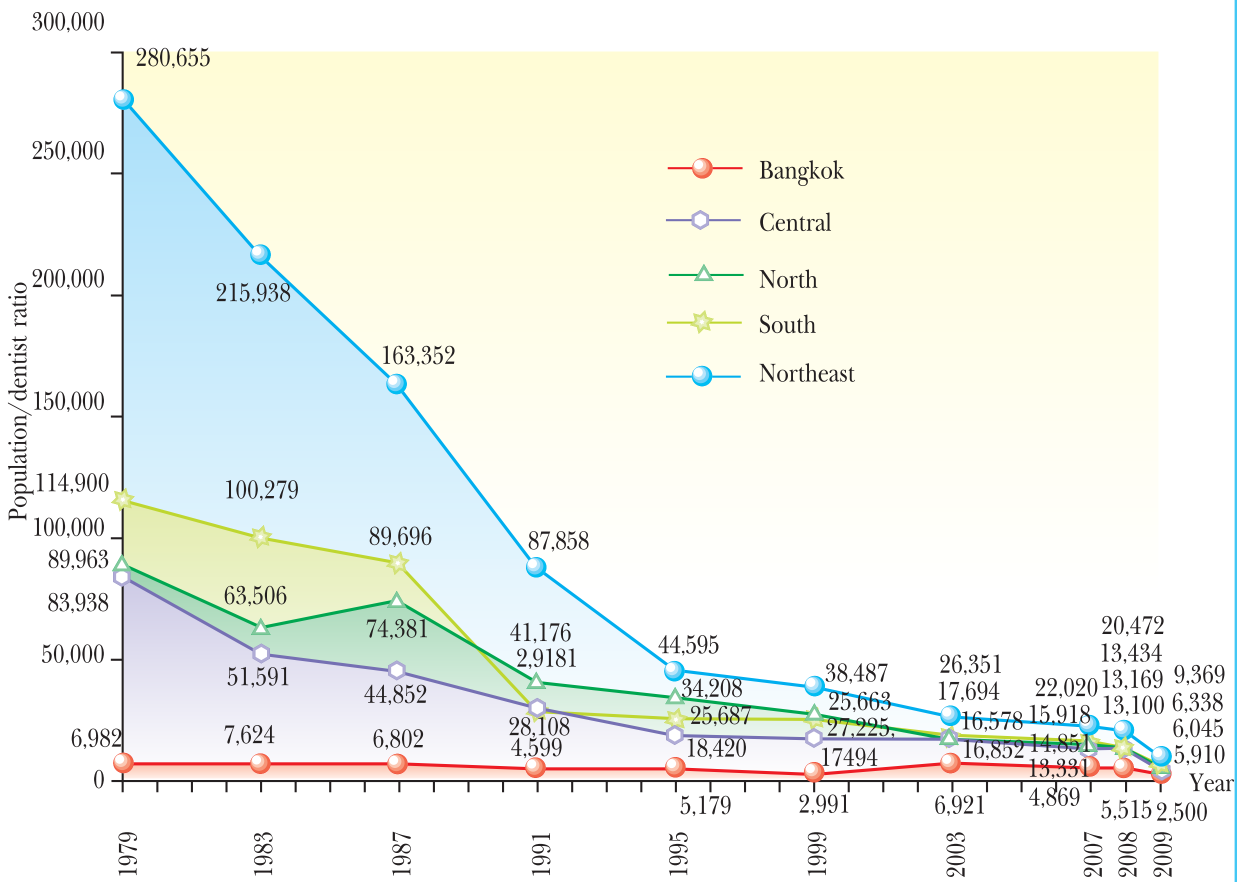
Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

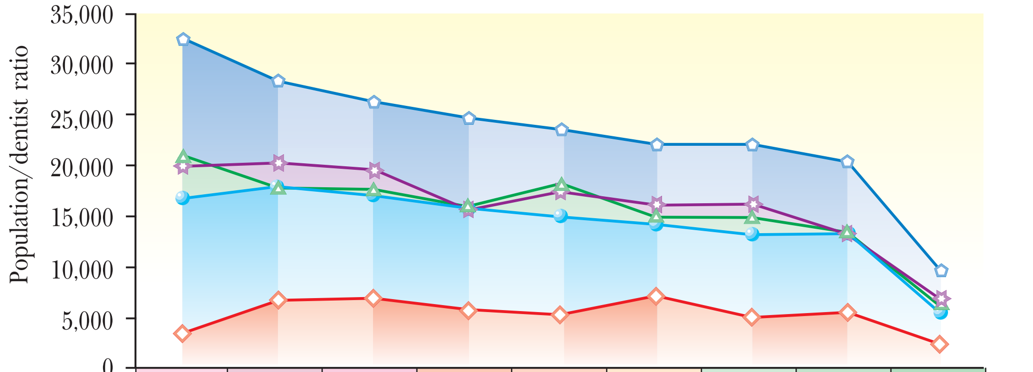
Note: As the 2009 data were incomplete, the proportion of doctors for each type of region was recalculated using the formulas below:

$$\frac{\text{Doctor proportion by region from 2009 MoPH report}}{100} \times \text{Total number of doctors alive and living in country}$$

Similarly, the population/dentist ratio in the Northeast has steadily declined; however, the ratio for the Northeast, for the period 2006–2009, was still different from those in other regions (Figure 6.22).

Figure 6.22 Population/dentist ratios by region 1979–2009





	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bangkok	3,190	6,614	6,921	5,583	5,064	7,035	4,869	5,515	2,500
Central	16,588	17,810	16,852	15,775	14,840	14,104	13,131	13,169	5,910
North	20,993	17824	17,694	16,039	18,111	14,803	14,852	13,434	6,045
South	19,963	20,105	19,578	15,620	17,366	15,968	15,918	13,100	6,338
Northeast	32,499	28,432	26,351	24,699	23,378	22,081	22,020	20,472	9,369

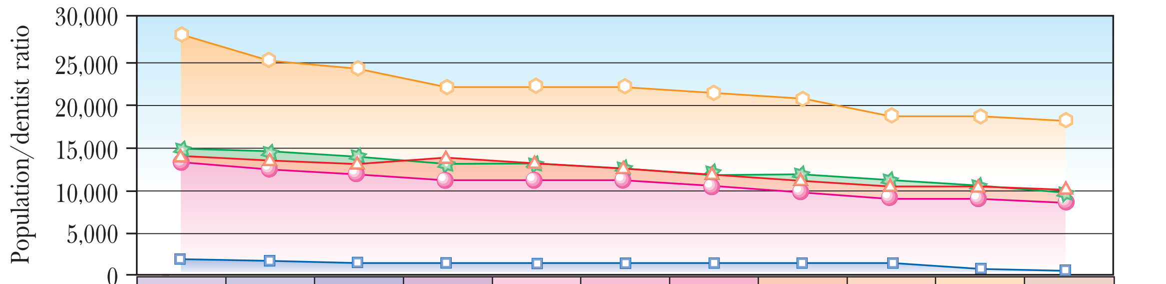
Source: Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

Note: As the 2009 data were incomplete, the proportion of dentists for each type of region was recalculated using the formulas below:

$$\frac{\text{Dentists proportion by region from 2009 MoPH report}}{100} \times \begin{array}{c}\text{Total number of}\\ \text{dentists alive and}\\ \text{living in country}\end{array}$$

However, according to 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 (Figure 6.23).

Figure 6.23 Population/dentist ratios by region, 1999–2009 (based on DoH database)

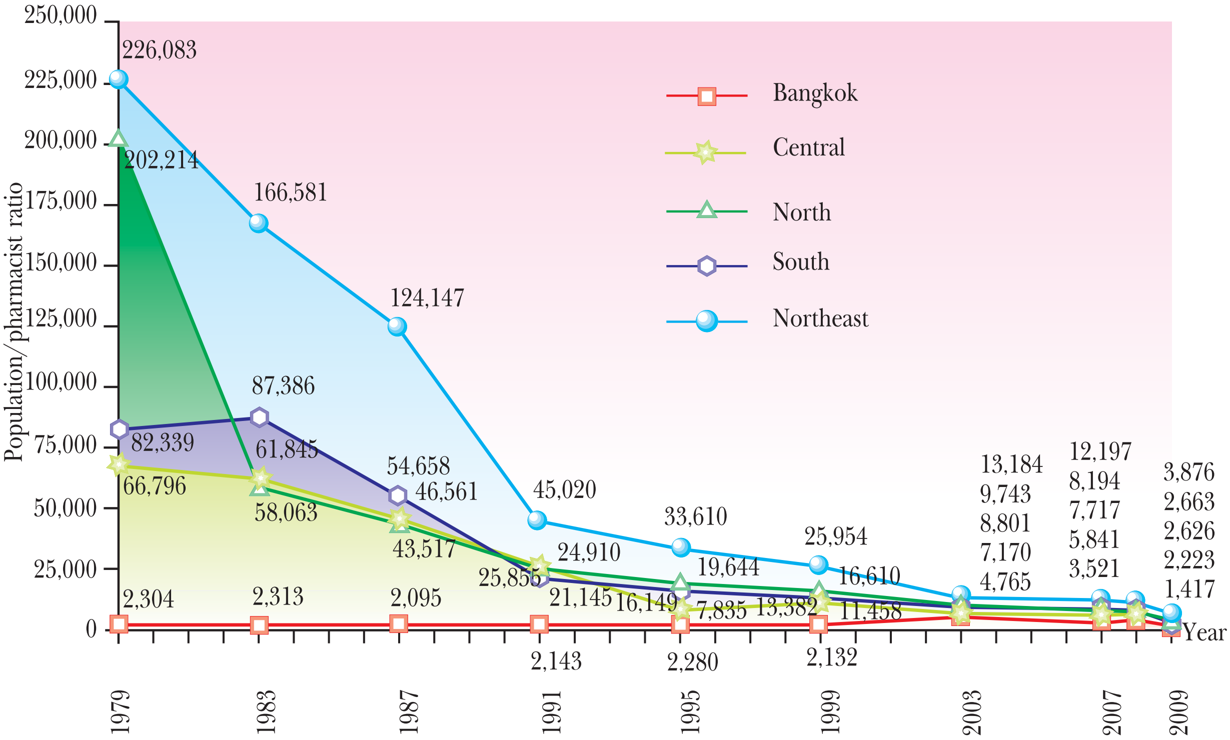


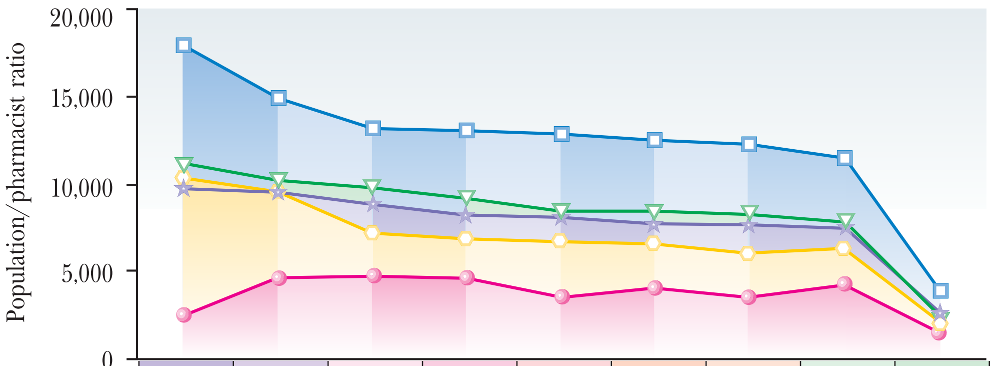
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bangkok	1,722	1,690	1,605	1,506	1,458	1,422	1,305	1,266	1,230	1,195	1,168
Central	12,864	12,042	11,524	11,474	11,259	11,235	10,494	9,967	9,268	9,116	8,909
North	14,956	14,468	13,566	13,471	13,137	12,752	11,830	11,571	10,820	10,276	9,903
South	14,640	14,032	13,383	13,852	13,443	12,160	11,877	11,118	10,657	10,345	10,101
Northeast	28,005	25,034	24,462	22,112	21,739	21,967	21,120	20,527	18,540	18,597	17,641

Source: Report on Dental Health Personnel, 2001–2009, Department of Health, MoPH.

Regarding the population/pharmacist ratio, there has been a steadily declining trend; the ratio for the Northeast has had a steady decline and the ratios are comparable for the North, the South and the Central (Figure 6.24).

Figure 6.24 Population/pharmacist ratios by region, 1979–2009





	2001	2002	2003	2004	2005	2006	2007	2008	2009	Year
Bangkok	2,485	4,667	4,765	4,632	3,562	4,047	3,527	4,143	1,417	
Central	10,213	9,557	7,170	6,819	6,700	6,580	5,841	6,270	2,223	
North	11,082	10,115	9,743	9,037	8,372	8,443	8,194	7,844	2,663	
South	9,712	9,569	8,801	8,292	8,125	7,759	7,717	7,551	2,626	
Northeast	17,979	14,987	13,184	13,048	12,869	12,385	12,197	11,495	3,876	

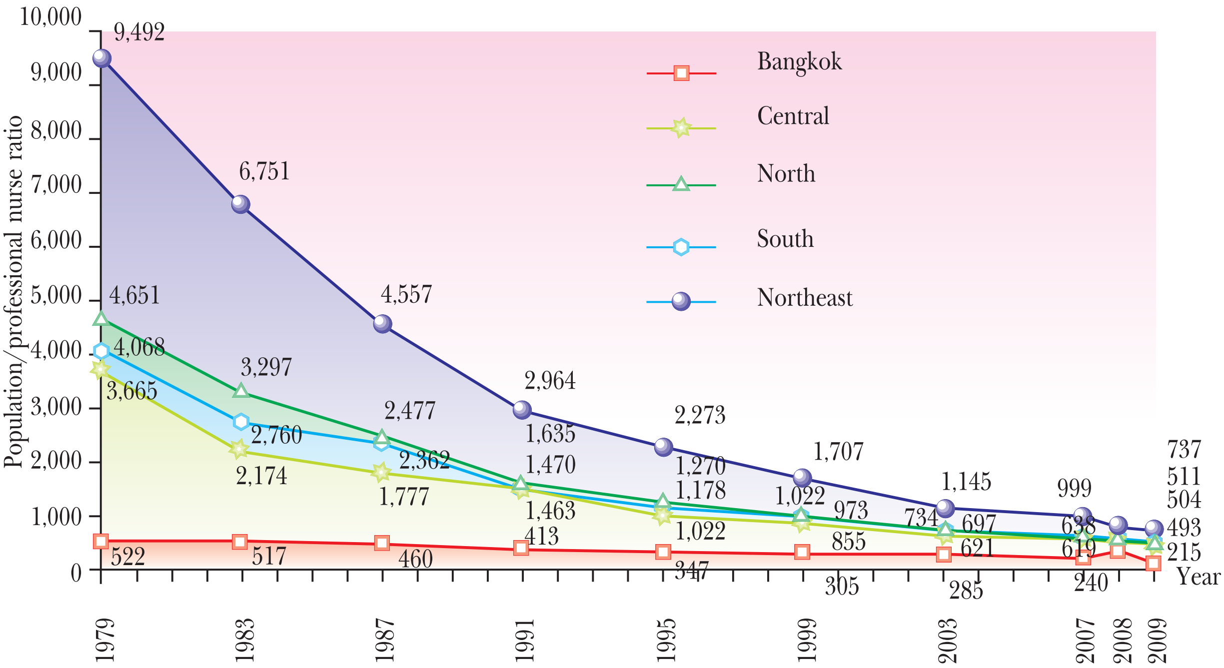
Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

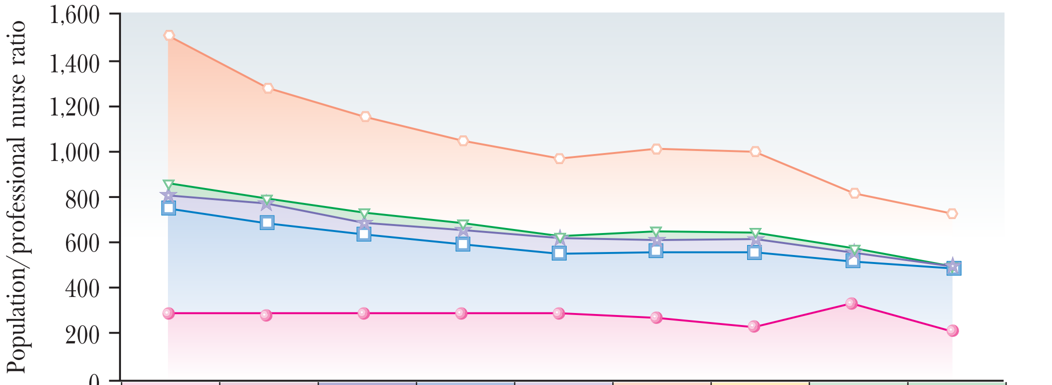
Note: As the 2009 data were incomplete, the proportion of pharmacists for each region was recalculated using the formulas below:

$$\frac{\text{Pharmacists proportion by region from 2009 MoPH report}}{100} \times \begin{array}{c}\text{Total number of}\\ \text{pharmacists alive and}\\ \text{living in country}\end{array}$$

The population/professional nurse ratio has also been declining; the Northeast has the ratio closer to those for other regions (Figure 6.25).

Figure 6.25 Population/professional nurse ratios by region, 1979–2009





	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bangkok	287	279	285	289	285	273	240	332	215
Central	749	684	631	593	550	563	554	519	493
North	856	785	734	684	528	648	638	567	504
South	807	765	692	659	622	614	619	558	511
Northeast	1,498	1,278	1,145	1,045	968	1,009	999	819	737

Year

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

Note: As the 2009 data were incomplete, the proportion of professional nurses for each region was recalculated using the formula below:

$$\frac{\text{Professional nurses proportion by region from 2009 MoPH report}}{100} \times \text{Total number of professional nurses actually working and living in country}$$

For health personnel at subdistrict health centres, the overall population to health worker ratio was stable between 2006 and 2008. But in 2009, the trend was improving, especially for the Northeast with the highest ratio and the South with lowest ratio (Table 6.2). Overall, the regional disparities were declining, partly due to the implementation of the policy on primary care unit development with the assignment of nurses to work at health centres.

Table 6.2 Health personnel at subdistrict health centres by region, 1987–2003 and 2006–2009

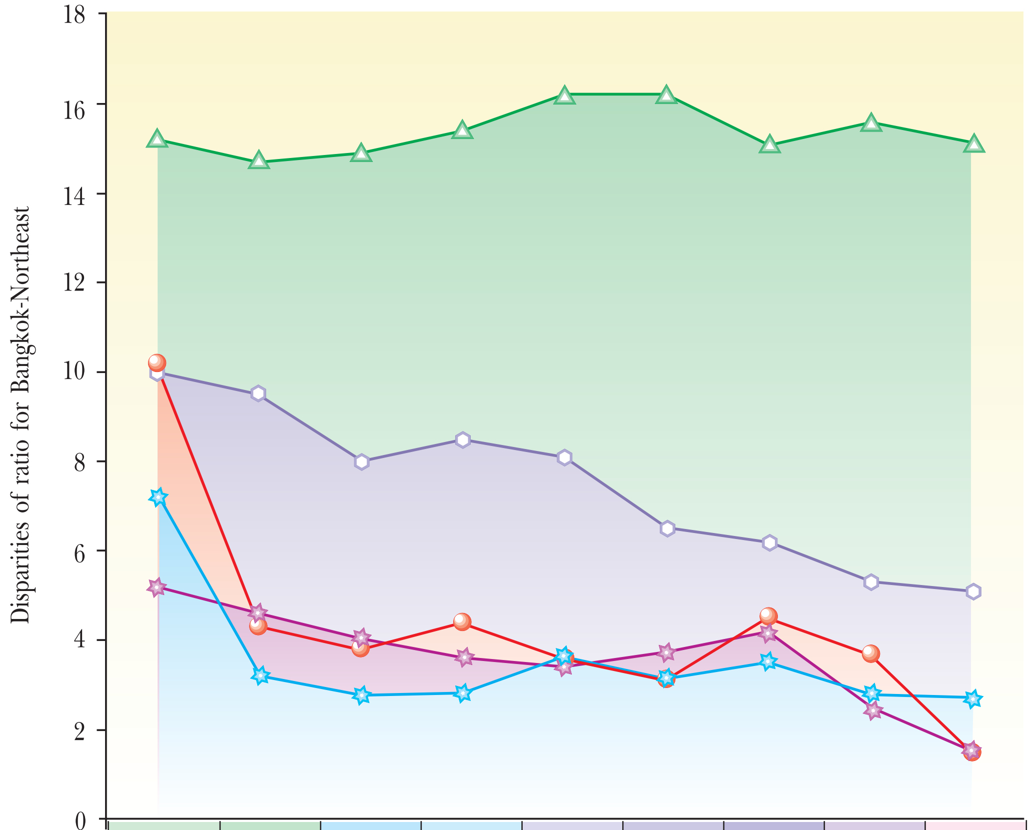
Region	No. of health workers (and staff to population ratio)												
	1987	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2006**	**2007**	**2008**	**2009**
Central	4,217	7,724	7,917	8,928	9,017	8,769	8,150	8,027	7,604	8,174	8,166	8,804	9,002
	(1:1,833)	(1:1,125)	(1:1,109)	(1:1,207)	(1:1,180)	(1:1,059)	(1:1,453)	(1:1,470)	(1:1,552)	(1:1,625)	(1:1,634)	(1:1,523)	(1:1,556)
North	3,233	5,734	6,826	6,970	7,167	7,068	6,558	6,456	6,043	6,349	6,337	7,159	7,484
	(1:2,387)	(1:1,512)	(1:1,293)	(1:1,389)	(1:1,349)	(1:1,292)	(1:1,572)	(1:1,603)	(1:1,713)	(1:1,662)	(1:1,674)	(1:1,489)	(1:1,449)
South	2,318	4,628	5,038	5,152	5,264	5,146	4,843	4,761	4,463	4,609	4,588	5,415	5,688
	(1:2,064)	(1:1,161)	(1:1,079)	(1:1,129)	(1:1,127)	(1:1,141)	(1:1,378)	(1:1,416)	(1:1,511)	(1:1,557)	(1:1,572)	(1:1,339)	(1:1,327)
Northeast	4,573	9,114	10,430	10,236	10,569	10,248	9,693	9,591	9,015	9,632	9,619	11,050	11,051
	(1:3,167)	(1:1,785)	(1:1,582)	(1:1,681)	(1:1,655)	(1:1,666)	(1:1,938)	(1:1,971)	(1:2,097)	(1:1,956)	(1:1,968)	(1:1,722)	(1:1,681)
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	1:1.33	1:1.34	1:1.35	1:1.20	1:1.20	1:1.13	1:1.08
Total	**14,341**	**27,200**	**30,211**	**31,286**	**32,017**	**31,231**	**29,244**	**28,835**	**27,125**	**28,764**	**28,710**	**32,428**	**33,225**
	(1:2,421)	**(1:1,434)**	**(1:1,309)**	**(1:1,390)**	**(1:1,366)**	**(1:1,324)**	**(1:1,628)**	**(1:1,657)**	**(1:1,762)**	**(1:1,733)**	**(1:1,745)**	**(1:1,552)**	**(1:1,534)**

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, data were derived from the Bureau of Central Administration, Office of the Permanent Secretary, MoPH.
3. For 2006–2009, data were derived from the Bureau of Policy and Strategy, Office of the Permanent Secretary, MoPH.

Notes: The figure in ( ) is the ratio of one health worker to population outside municipal areas and sanitary districts.

A comparison of population/health-care provider ratios for Bangkok and the Northeast reveals that the disparities have declined steadily, especially for doctors, at about 5-fold, and for dentists, pharmacists and nurses at about 2.5-fold to 4-fold between 2008 and 2009, due to data incompleteness; based on the re-estimated number of personnel, the regional disparities have dropped by half to 1.5- to 2.7-fold (Figure 6.26). But for dentists, based on the data from the Health Department, the Bangkok-Northeast disparities would remain high at 15-fold for 2009 (Figure 6.26).

Figure 6.26 Disparities of population/health-care provider ratios for Bangkok and the Northeast, 2001–2009



	2001	2002	2003	2004	2005	2006	2007	2008	2009
Doctors	10.0	9.5	8.0	8.5	8.1	6.5	6.2	5.3	5.1
Dentists(BPS)	10.2	4.3	3.8	4.4	3.6	3.1	4.5	3.7	1.5
Dentists(DoH)	15.2	14.7	14.9	15.4	16.2	16.2	15.1	15.6	15.1
Phamacists	7.2	3.2	2.8	2.8	3.6	3.1	3.5	2.8	2.7
Professional nurses	5.2	4.6	4.0	3.6	3.4	3.7	4.2	2.5	1.5

Year

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

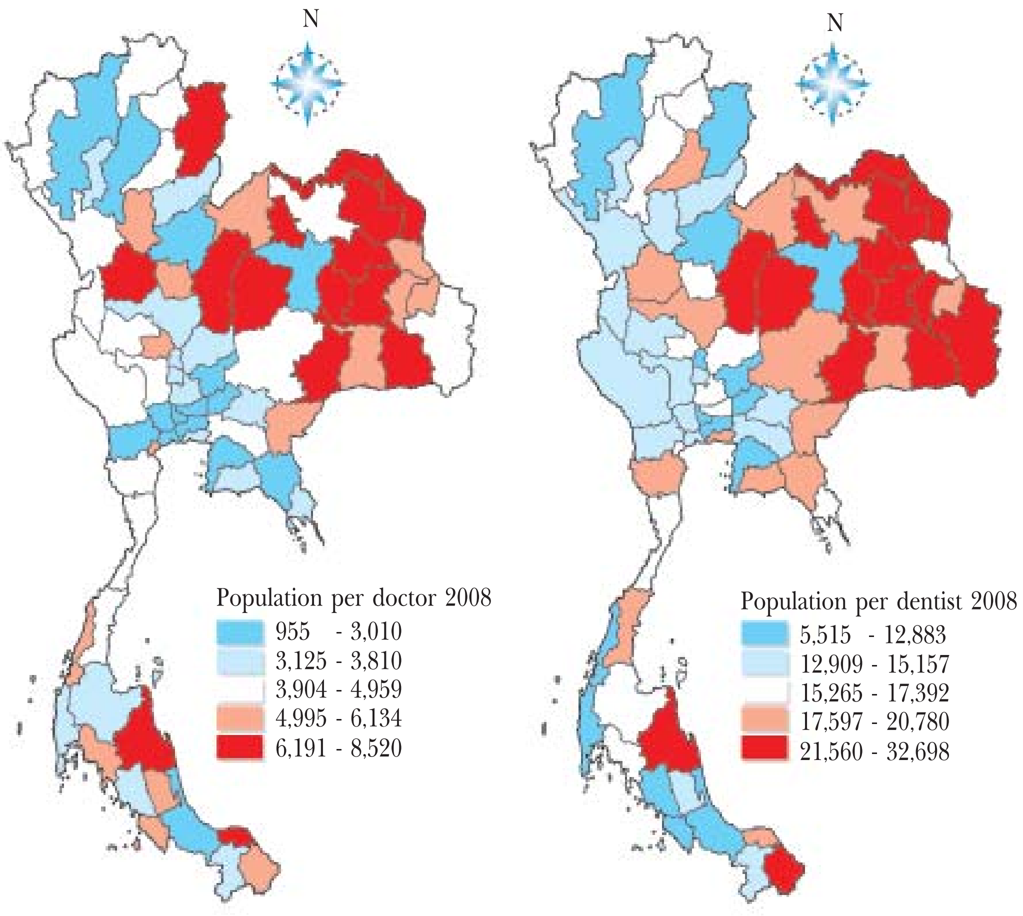
- Report on Dental Health Personnel, 1999–2009, Department of Health MoPH.

Note: For 2009, due to data incompleteness, the numbers were re-estimated.

1.3.2 Ratios of Population to Health-care Provider by Province

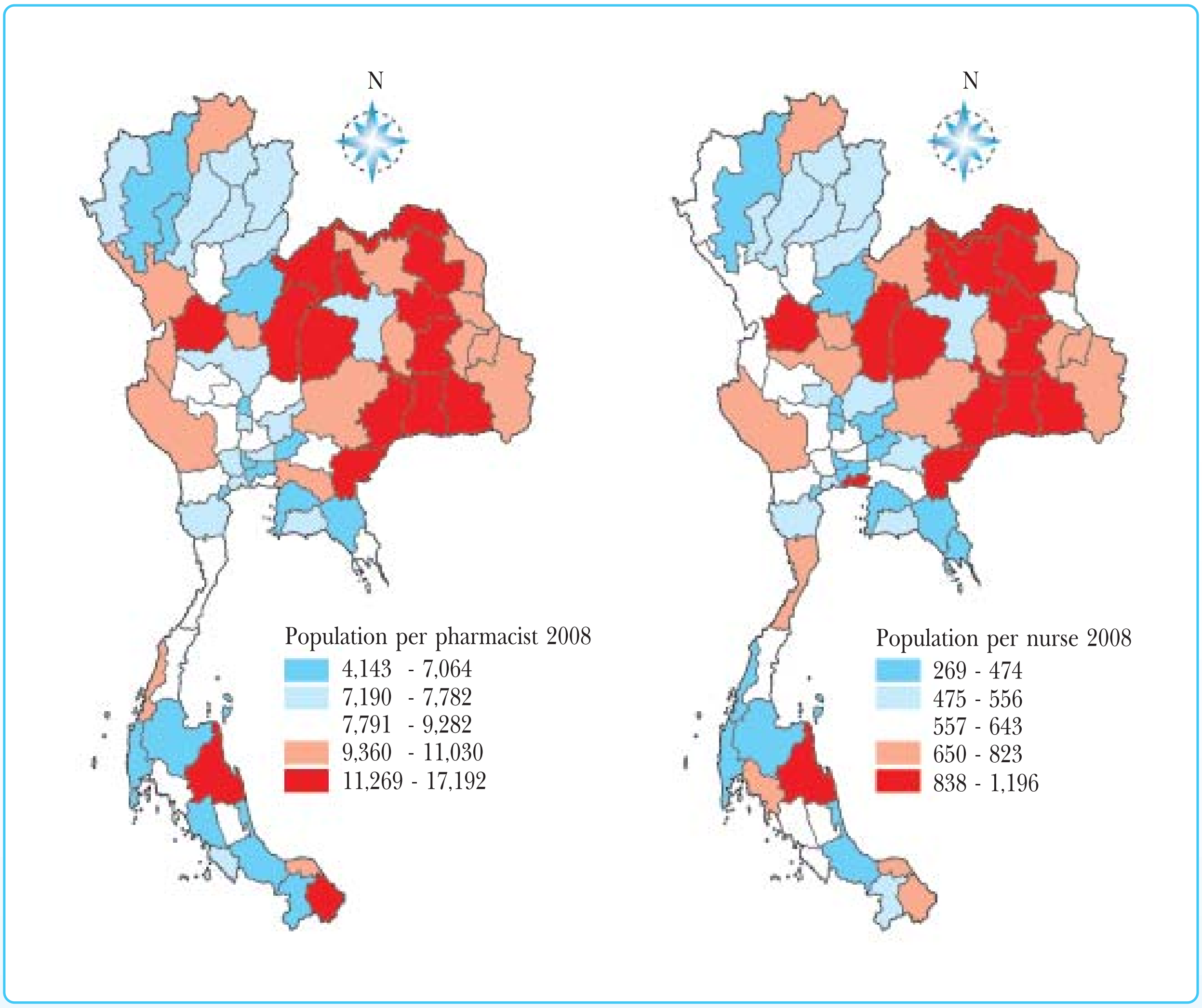
A comparison of population/health-care provider ratios for all 76 provinces grouped in five quintiles and shown in different colours for each quintile on a shaded area map (Figures 6.27 and 6.28) reveals that most provinces in the Northeast have a higher ratio, compared with those in other regions, except for the 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 6.27 Geographical distribution of doctors and dentists: population/doctor and population/dentist ratios, 2008



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

Figure 6.28 Geographical distribution of pharmacists and nurses: population/pharmacist and population/nurse ratios, 2008



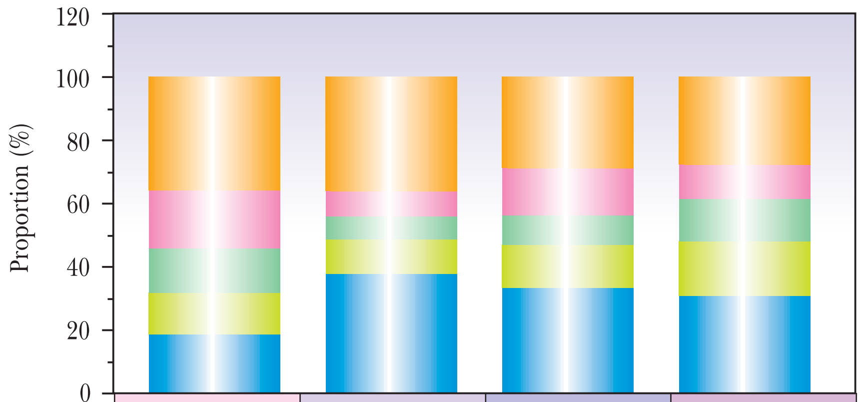
Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

1.4 Distribution of Health Workforce by Level of Services and Workload

1.4.1 Proportion of Health Workforce 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 professions, and the proportion in community hospitals is lower than other professions. For professional nurses, most of them work at community hospitals, followed by general and regional hospitals. But for dentists and pharmacists, most of them work at community hospitals (Figure 6.29).

Figure 6.29 Proportion of health personnel by type of hospitals, 2009



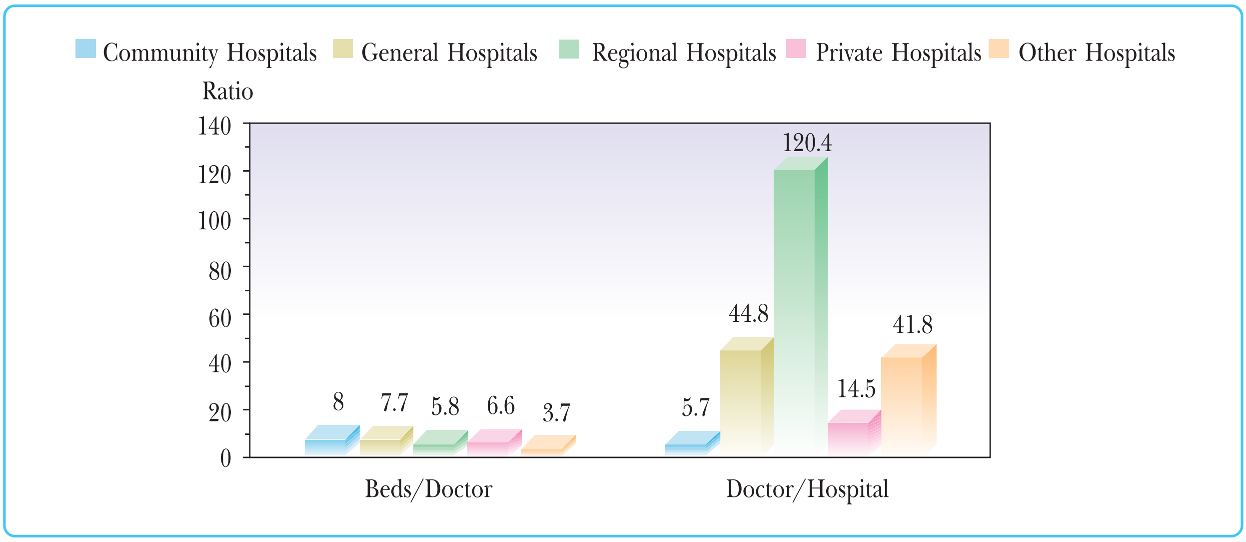
	Doctors	Dentists	Phamacists	Professional nurses
Community hospitals	19.3	39.7	33.9	30.5
General hospitals	11.8	10.8	13.3	17.3
Regional hospitals	13.1	6.7	9.7	12.5
Private hospitals	17.1	7.2	14.7	10.8
Others	38.7	35.6	28.4	26.9

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

1.4.2 Beds-to-Doctor Ratios and Average Number of Doctors by Service Level

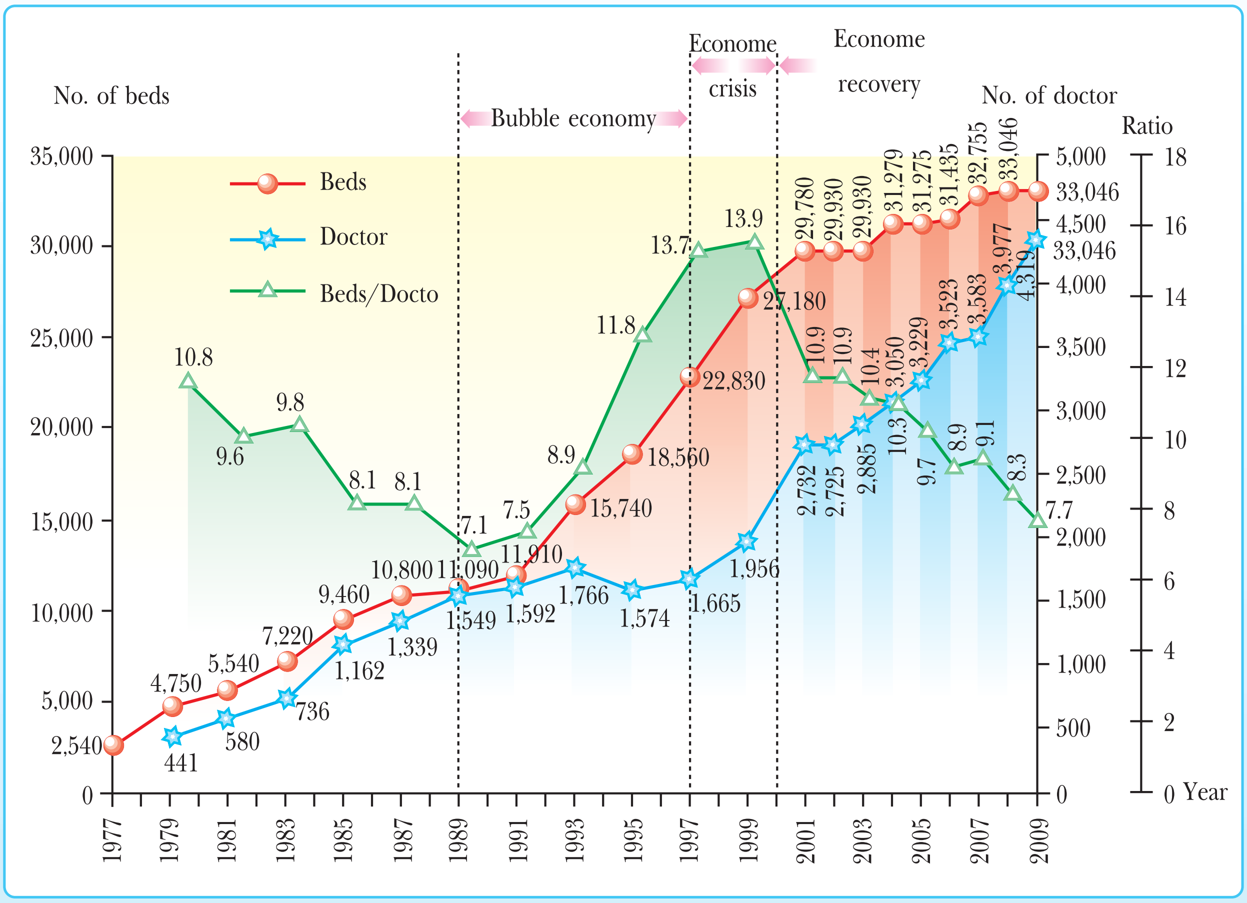
In 2008, it was found that community hospitals had the highest beds/doctor ratio, close to that for general hospitals, followed by regional hospitals and private hospitals. For the doctors per hospital comparison, on average, a community hospital had 5.7 doctors; a general hospital had 45 doctors; a regional hospital had 120 doctors; and a private hospital had 14 doctors (Figure 6.30). (Private hospitals also had some part-time doctors, whose number was greater than full-time doctors). 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 increased markedly due to a considerable increase in the number of beds but no increase in the number of doctors. But after the crisis, the ratio began to decline due to increasing numbers of doctors, the rate being greater than that for beds (Figure 6.31).

Figure 6.30 Beds/doctor ratios and doctors/hospital ratios by type of hospitals, 2008



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

Figure 6.31 Numbers of beds and doctors, and beds/doctor ratio at community hospitals, 1977–2009



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

- Bureau of Policy and Strategy, Office of the Permanent Secretary, MoPH.

1.4.3 Workload of Health Workforce by Level of Services

For the 7-year period of 2002–2009, the health resources surveys 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. The workload of doctors at community hospitals was on a declining trend, but those at other agencies had a stable workload (Table 6.3).

Table 6.3 Workloads of doctors, 2002, 2005 and 2007–2009

Health facility	2002		2005		2007		2008		2009	
	Workload per doctor	Comparative index	Workload per doctor	Comparative index	Workload per doctor	Comparative index	Workload per doctor	Comparative index	Workload per doctor	Comparative index
Community hospitals	34,379	2.1	29,997	1.9	28,487	2.0	25,728	1.7	23,006	1.5
General hospitals	18,805	1.1	17,987	1.1	19,742	1.4	16,680	1.1	17,260	1.1
Regional hospitals	12,020	0.7	13,046	0.8	13,305	0.9	14,373	0.9	11,721	0.7
University hospitals	4,931	0.3	3,812	0.24	2,701	0.19	2,934	0.2	3,353	0.2
Private hospitals	12,849	0.8	14,273	0.9	15,681	1.1	15,168	1.0	15,295	1.0
Total	**16,535**	**1.0**	**15,788**	**1.0**	**14,469**	**1.0**	**15,340**	**1.0**	**15,808**	**1.0**

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

Notes: * In order that the inpatient workload 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
3. For 2009, data were incomplete.

2. Health Facilities

2.1 Situation and Trends of Health Facilities

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

2.1.1 Health Facilities in the Public Sector

In Bangkok, there are 5 medical school hospitals, 26 general hospitals, 13 specialized hospitals/institutions, and 68 public health centres (with 76 branches) in all districts.

Regional level. There are 6 medical school hospitals, 25 regional hospitals, and 48 specialized hospitals.

Provincial level. There are 69 general hospitals covering all provincial areas (a decrease by 1 hospital, i.e. Chonprathan Hospital transferred to the Ministry of Education).

District level. There are 734 community hospitals, covering 83.6% of all districts, and 284 municipal health centres.

Tambon (subdistrict) level. There are 9,768 health centres, covering all subdistricts, several of which have more than one health centre.

Village level. There are 151 community health posts, 48,049 rural community primary health care centres, and 3,108 urban community primary health care centres.

Table 6.4 Health facilities in the public sector, 2009

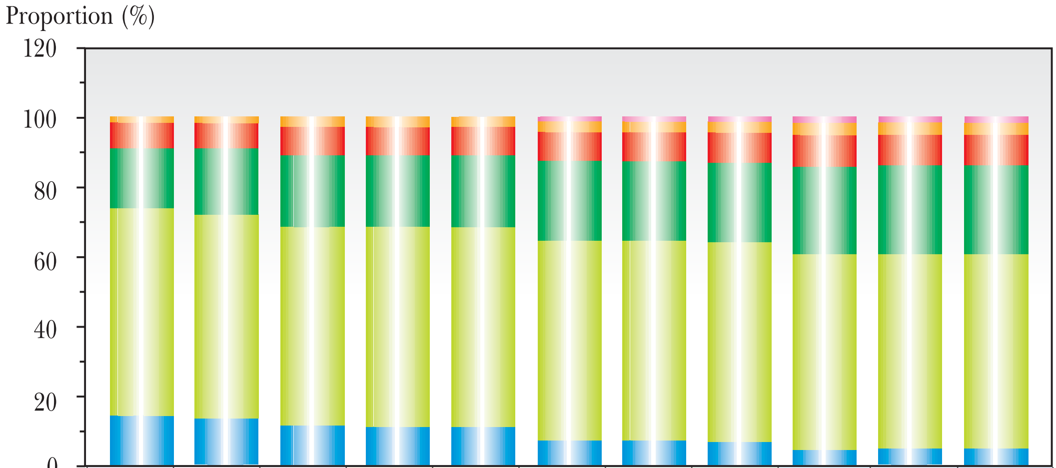
Administrative level	Health facility	Number	Coverage
Bangkok Metropolis	Medical school hospitals	5	
	General hospitals	26	
	MoPH	4	
	Royal Thai Police	1	
	Ministry of Justice	4	
	Ministry of Defence	5	
	BMA	8	
	State enterprises	4	
	Specialized hospitals/institutions	13	
	Public health centres/branches	68/76	All districts under BMA
Regional level and branches	Medical school hospitals	6	
	Regional hospitals	25	
	Specialized hospitals:	48	
	Health promotion hospitals	12	
	Psychiatric hospitals	13	

Administrative level	Health facility	Number	Coverage
	Neurological hospital	1	
	Rajprachasamasai Institute	1	
	Bamrasnaradura Institute	1	
	Chest Disease Institute	1	
	Cancer prevention & control centres	7	
	Drug dependence treatment centres	6	
	Mettapracharak Watraikhing Hospital	1	
	Centre for elderly care	1	
	Dermatology Institute	1	
	Dental Institute	1	
	Sirindhorn National Medical Rehabilitation Centre	1	
	Thanyarak Institute	1	
75 provinces	General hospitals	71	100%
	General hospitals, under MoPH	69	
	General hospitals, under MoE	2	
	Military hospitals under the Ministry of Defence	59	
	Hospital under the Royal Thai Police	1	
878 districts	Community hospitals	734	83.6%
	Municipal health centres (2009)	284	
7,255 subdistricts	Health centres (2009)	9,768	100%
74,954 villages	Community health posts	151	
	Community PHC centres		
	Rural (2007)	48,049	64.1%
	Urban (2003)	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 2009, there were only 37 10-bed hospitals while there were as many as 409 30-bed hospitals among all 734 community hospitals; the proportion of 10-bed hospitals was only 5%, while that for 30-bed hospitals had increased to 55.7% and the proportions of 60-bed, 90-bed, 120-bed, and 150-bed hospitals had also risen (Figure 6.32).

Figure 6.32 Proportions of community hospitals by hospital size, 1999–2009



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
10 bed	14.33	13.45	11.53	11.45	11.45	7.16	7.16	7.01	4.66	5.04	5.04
30 bed	59.27	58.54	56.94	57.24	57.24	57.44	57.44	57.42	55.89	55.72	55.72
60 bed	17.56	19.05	20.56	20.41	20.41	22.73	22.73	22.80	25.48	25.34	25.34
90 bed	7.30	7.28	8.19	8.14	8.14	8.26	8.26	8.38	8.90	8.99	8.99
120 bed	1.54	1.68	2.50	2.48	2.48	3.31	3.31	3.30	3.70	3.54	3.54
150 bed	0.00	0.00	0.28	0.28	0.28	1.10	1.10	1.10	1.37	1.36	1.36

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 for those with a good economic status. With people's high purchasing power, there are investments in health-care services for the people in the localities. In 2009, there were private health facilities in four categories as follows:

(1) Pharmacies or drugstores (3 types): 11,154 modern pharmacies, 4,047 pharmacies selling only packaged drugs, and 1,986 traditional medicine drugstores.

(2) Clinics: 17,671 clinics without inpatient beds.

(3) Hospitals: 322 private hospitals with inpatient beds.

(4) Health-related business places: 1,268

The number and proportion of private health facilities in Bangkok and the provinces are shown in Table 6.5.

Table 6.5 Private health facilities, 2009

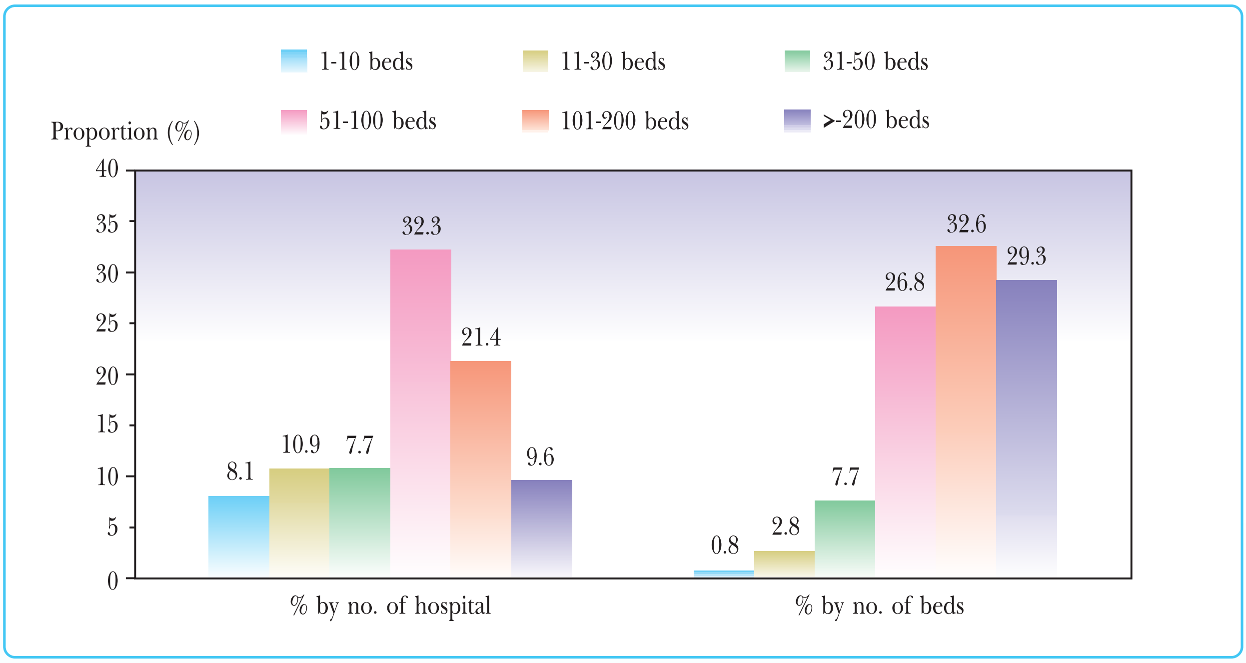
Health facility	Bangkok		Provincial areas		Total
	No.	Percent	No.	Percent	
1. Pharmacies					
1.1Modern pharmacies	3,757	33.7	7,397	66.3	11,154
1.2Modern pharmacies selling only packaged drugs	433	10.7	3,614	89.3	4,047
1.3Traditional medicine drugstores	400	20.1	1,586	79.9	1,986
Total	**4,590**	**26.7**	**12,597**	**73.3**	**17,187**
2. Medical premises without inpatient beds (clinics)	3,878	21.9	13,793	78.1	17,671
3. Medical premises with inpatient beds (private hospitals)					
- No. of hospitals	96	29.9	226	70.2	322
- No. of beds	13,933	41.7	19,472	58.3	33,405
4. Health-related business places					
4.1Spa for health	86	23.7	277	76.3	363
4.2Massage for health	170	20.3	667	79.7	837
4.3Beauty massage	20	29.4	48	70.6	68
Total	**276**	**21.8**	**992**	**78.2**	**1,268**

Sources: 1. Drug Control Bureau, Food and Drug Administration, MoPH.
2. Bureau of Sanatorium and Art of Healing, Department of Health Service Support, MoPH.
3. Office of Health Business Promotion, Department of Health Service Support, MoPH.

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

For private hospitals, in 2009 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 100 beds and 200 beds), see Figure 6.33.

Figure 6.33 Proportion of private hospitals by hospital size, 2009



Source: Bureau of Sanatorium and Art of Healing, 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 2009, most of large hospitals with over 200 beds were located in Bangkok (Table 6.6).

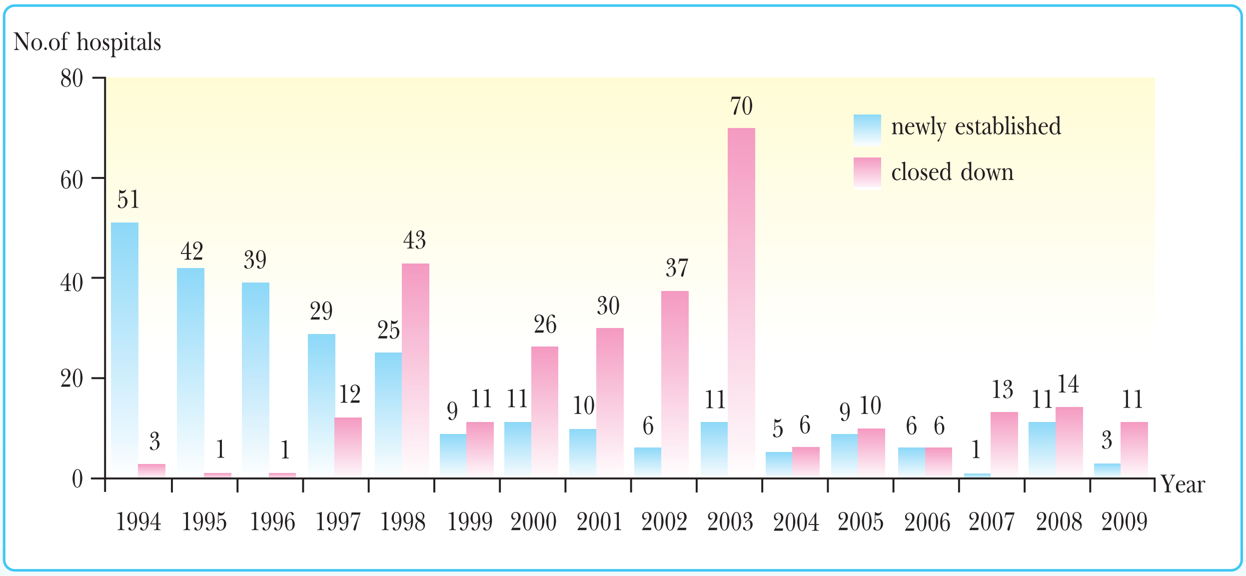
Table 6.6 Number of private hospitals by number of beds and region, 2009

Region	1–10 beds		11 - 30 beds		31 - 50 beds		51 - 100 beds		101 - 200 beds		>200 beds	
	Hospitals	beds	Hospitals	beds	Hospitals	beds	Hospitals	beds	Hospitals	beds	Hospitals	beds
Bangkok	2	15	12	306	15	643	20	1,759	26	4,158	21	7,052
Central	10	97	11	298	12	539	41	3,575	22	3,623	7	1,895
Northeast	5	67	1	30	14	660	16	1,390	4	560	1	214
North	4	40	6	170	7	337	22	1,800	8	1,104	2	620
South	5	45	5	136	9	413	5	415	9	1,444	-	-
Total	**26**	**264**	**35**	**940**	**57**	**2,592**	**104**	**8,939**	**69**	**10,889**	**31**	**9,781**

Source: Medical Registration Bureau, 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 (hospitals or sanatoriums with inpatient beds), it was found that the trends were declining while the number of closures were rising during the period 1998–2003 (after the 1997 economic crisis), when as many as 70 hospitals were shut down in 2003. 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 6.34). However, since 2007 the number of hospitals closing down has been larger than that for new ones.

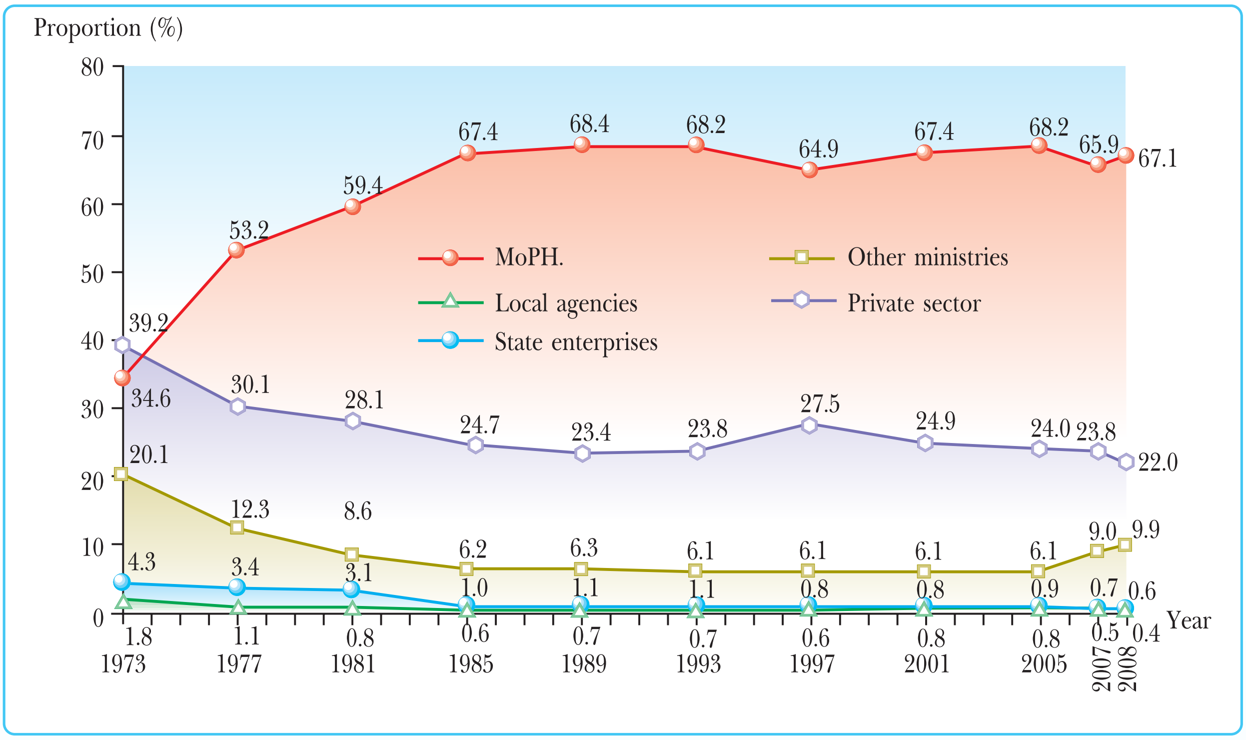
Figure 6.34 Number of private hospitals newly established and closed down, 1994–2009



Source: Bureau of Sanatorium and Art of Healing, Department of Health Service Support, MoPH.

Regarding the proportion of hospitals under MoPH, the trend was rising until 1985 but after that the proportion has been stable, while that for private hospitals and other agencies has been declining slightly (Figure 6.35).

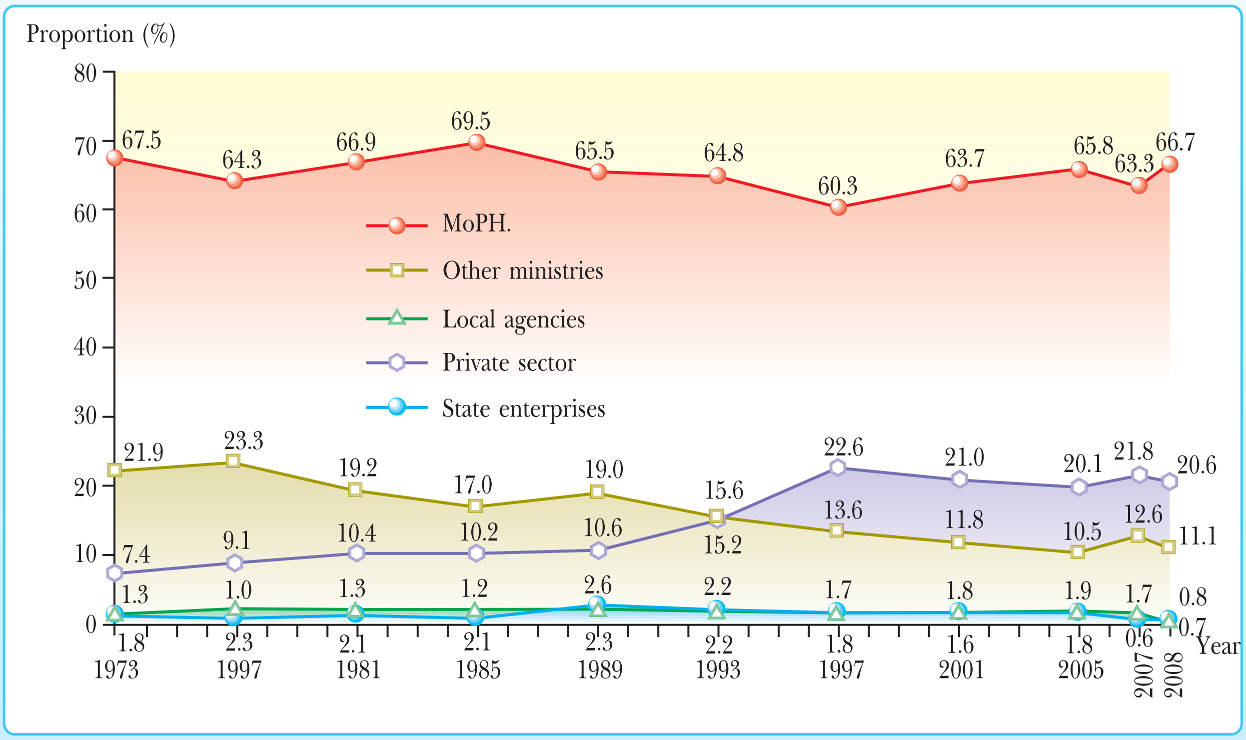
Figure 6.35 Proportions of hospitals by agency, 1973–2008



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

The proportion of beds in MoPH hospitals has been fairly stable, while that for private hospitals has been on the rise and that for other agencies has been declining (Figure 6.36).

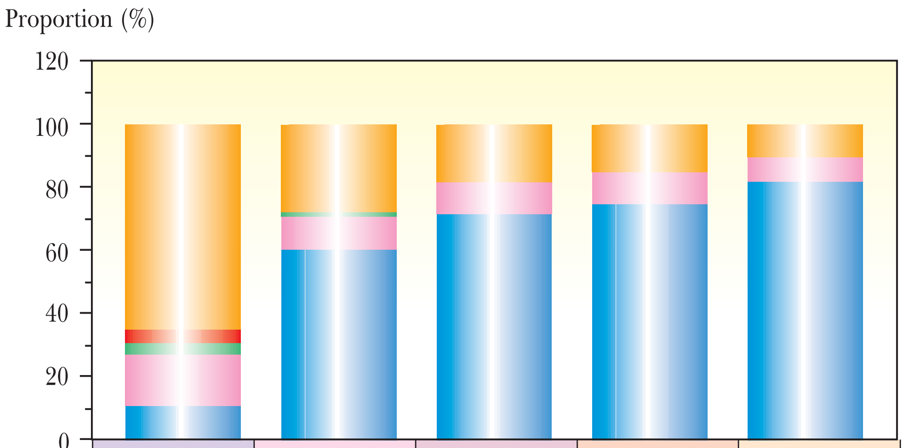
Figure 6.36 Proportions of hospital beds by agency, 1973–2008



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

A regional comparison revealed that most hospitals in Bangkok are private ones, followed by those under other ministries, whereas in provincial areas, most of them are under MoPH (Figure 6.37). Regarding the proportions of hospital beds by region, they are actually similar to those for hospitals, but the hospitals under other ministries have a higher proportion of hospital beds compared to that for hospitals (Figure 6.38), reflecting the fact that the hospitals under other ministries are large hospitals.

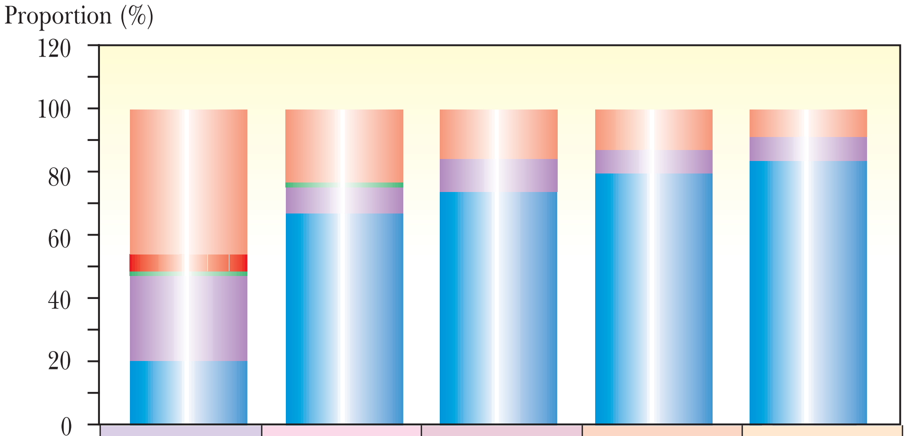
Figure 6.37 Proportions of hospitals by agency and region, 2008



	Bangkok	Central	North	South	Northeast
MoPH	11.0	60.3	71.4	74.5	81.9
Other ministries	16.5	10.4	10.0	10.1	7.4
State enterprises	3.3	1.4	0.0	0.0	0.0
Local agencies	4.4	0.0	0.4	0.0	0.0
Private sector	64.8	27.9	18.1	15.4	10.7

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

Figure 6.38 Proportions of hospital beds by agency and region, 2008

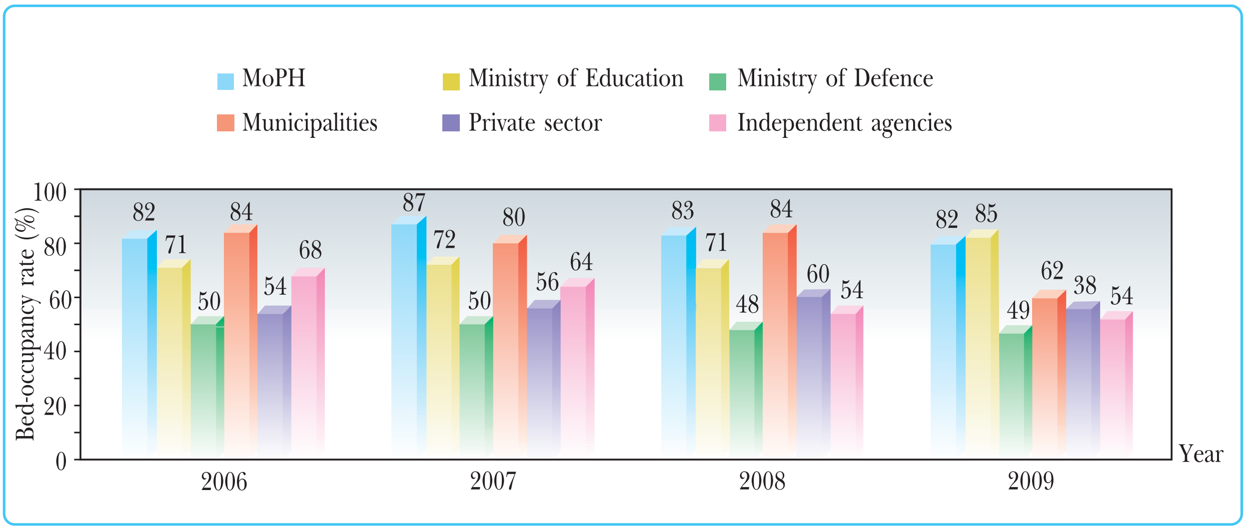


	Bangkok	Central	North	South	Northeast
MoPH	20.0	66.7	73.8	79.7	83.6
Other ministries	27.2	8.2	10.0	7.4	7.8
State enterprises	1.4	1.6	0.0	0.0	0.0
Local agencies	5.3	0.0	0.4	0.0	0.0
Private sector	46.1	23.5	16.0	12.8	8.6

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

An analysis of bed-occupancy rates reflects the efficiency in the use of existing beds and the burden on the hospital when admitting as inpatients. Based on the 2009 data, the hospitals under the Ministry of Education had the highest bed-occupancy rate, close to those under MoPH, while those under the Ministry of Defence had the lowest rate (Figure 6.39).

Figure 6.39 Bed-occupancy rates by agency, 2006–2009



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

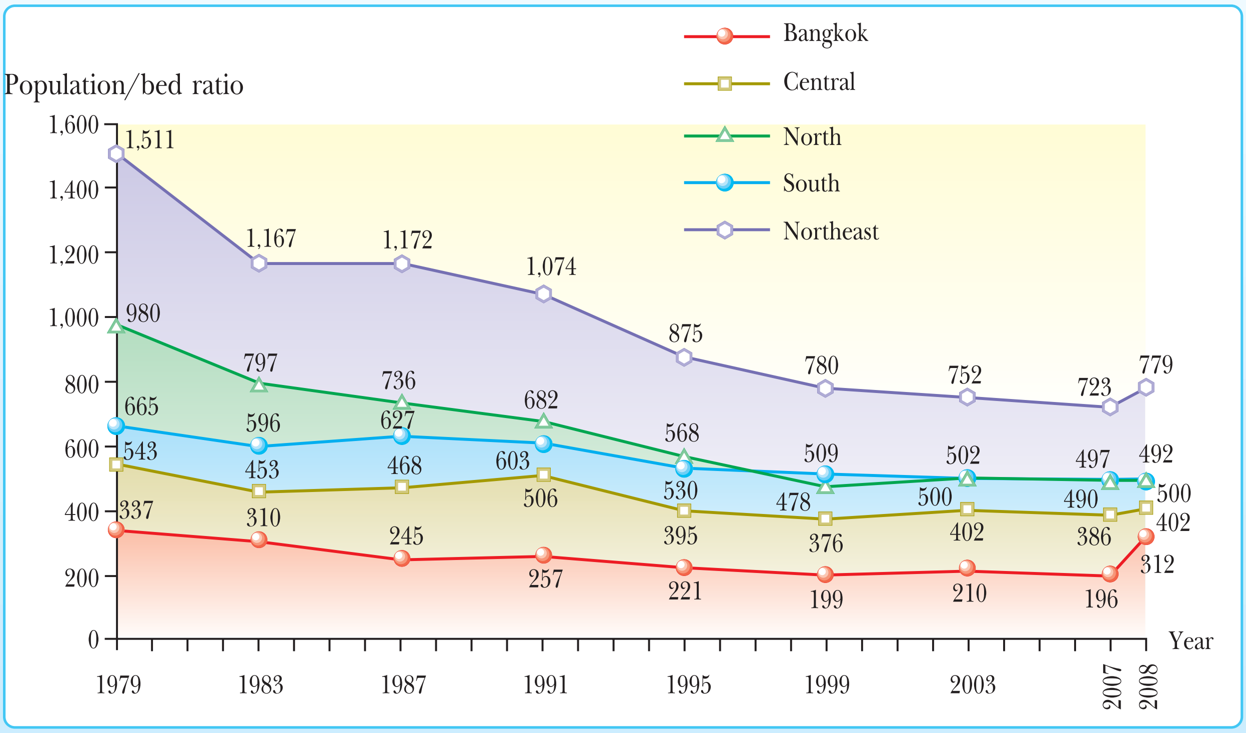
Note: Data for 2009 were incomplete.

2.2 Distribution of Health Facilities

2.2.1 Geographical Distribution of Hospitals

Trends in the population to hospital bed ratio constantly declined but with regional disparities (Figure 6.40); and during the 1998–2008 period, the ratio dropped slightly in the Northeast (with more beds) except for the rising ratio in 2008, while those for other regions seemed to be stable or rising slightly (Figure 6.40).

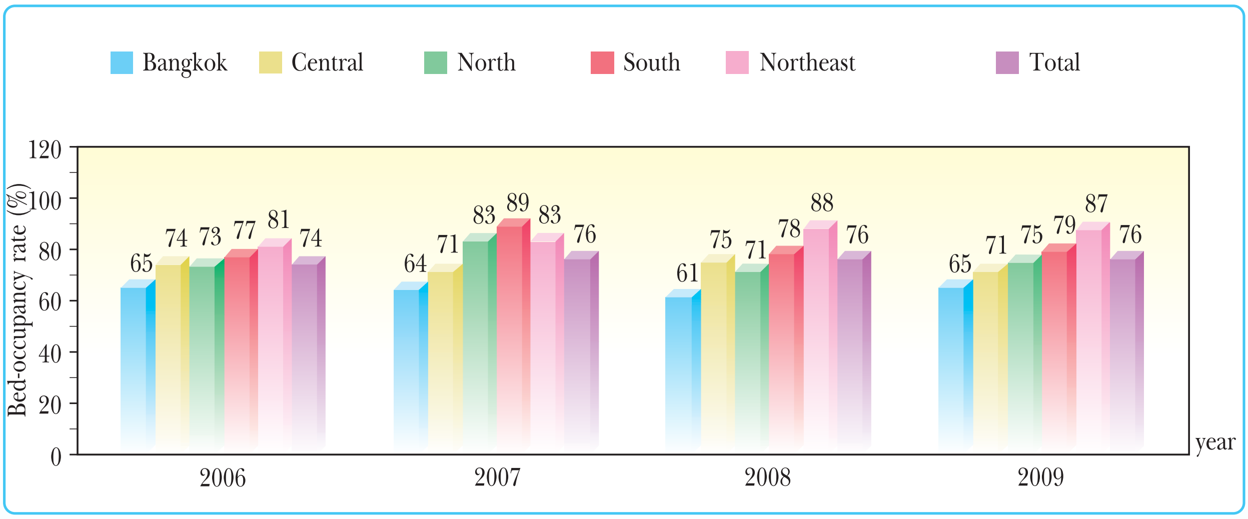
Figure 6.40 Population/bed ratios by region, 1979–2008



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

In addition, the Northeast had the highest bed-occupancy rate (Figure 6.41) reflecting a higher burden of the hospitals in that region, compared with other regions.

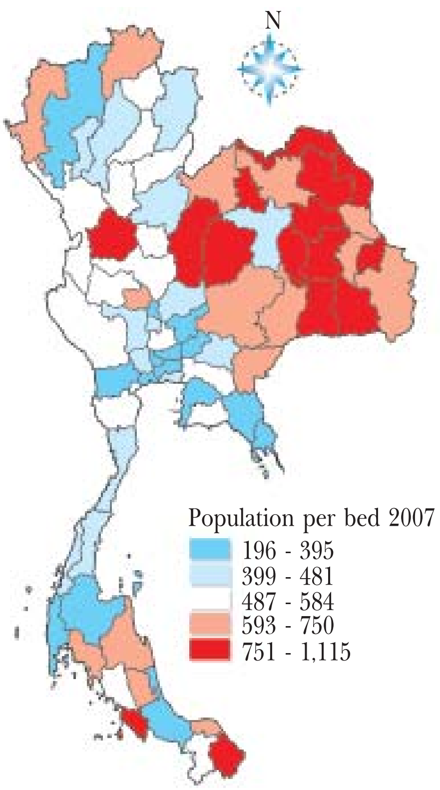
Figure 6.41 Bed-occupancy rates by region, 2006–2009



Source: Report on Health Resources, 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 health-care providers (Figure 6.42)

Figure 6.42 Geographical distribution of population/bed ratios by province, 2007



Source: Report on Health Resources, 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 2009, there were 9,769 health centres nationwide.

The health centre to population ratio during the last decade had a rising trend in all regions of the country, from 1:10,064 in 1979 to 1:5,218 in 2009. Although health centres were mostly clustered in the Central region in the past, the regional disparities have actually decreased as a result of the policy on health centre distribution and upgrading midwifery centres to health centres implemented since 1982 as shown in Table 6.7.

Table 6.7 Distribution of health centres by region in 1979, 1987, 1996–2003, 2006 and 2009

Region	No. of health centres and health centre/population ratio											
	1979	1987	1996	1997	1998	1999	2000	2001	2002	2003	2006	2009
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)	2,558 (1:5,476)
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)	2,231 (1:4,862)
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)	1,512 (1:4,993)
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)	3,468 (1:5,356)
Disparity between Northeast and national ratios	1 : 1.3	1 : 1.2	1 : 1.2	1 : 1.2	1 : 1.1	1 : 1.1	1 : 1.2	1 : 1.1	1 : 1.1	1 : 1.1	1 : 1.1	1 :1.0
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)**	**9,769 (1:5,218)**

Sources: Data for 1979–2001 were derived from the Division of Provincial Health, Office of the Permanent Secretary, MoPH.
Data for 2002–2006 were derived from the Bureau of Central Administration, Office of the Permanent Secretary, MoPH.
Data for 2009 were derived from the Bureau of Policy and Strategy, Office of the Permanent Secretary, 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, 2003 and 2006 were derived from the Bureau of Registration Administration, Department of Provincial Administration, Ministry of Interior.
3. For 2009, data on population outside municipal areas were derived from the Bureau of Policy and Strategy, MoPH.

2.2.3 Geographical Distribution of Drugstores

The ratio of drugstore to population had an improved trend for the past decade, from 1:4,931 in 1996 to 1:3,628 in 2009. Most drugstores are located in the Central region (including Bangkok) (Table 6.8).

Table 6.8 Distribution of drugstores by region, 1996–2009

Region	No. of drugstores and drugstore/population ratio													
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Central	6,644	6,690	6,904	7,465	7,534	7,826	7,895	8,821	8,696	8,960	9,088	9,769	9,782	10,394
	(1:2,908)	(1:2,925)	(1:2,869)	(1:2,675)	(1:2,665)	(1:2,590)	(1:2,547)	(1:2,350)	(1:2,373)	(1:2,295)	(1:2,291)	(1:2,154)	(1:2,170)	(1:2,042)
North	1,989	1,958	2,029	2,029	2,045	1,982	1,964	2,087	2,103	2,179	2,179	2,185	2,185	2,332
	(1:6,004)	(1:6,149)	(1:5,976)	(1:5,984)	(1:5,923)	(1:6,111)	(1:6,180)	(1:5,808)	(1:5,690)	(1:5,444)	(1:5,455)	(1:5,438)	(1:5,435)	(1:5,092)
South	1,189	1,152	1,237	1,243	1,273	1,354	1,398	1,510	1,507	1,535	1,535	1,799	1,799	2,035
	(1:6,534)	(1:6,837)	(1:6,472)	(1:6,524)	(1:6,430)	(1:6,104)	(1:5,983)	(1:5,601)	(1:5,618)	(1:5,521)	(1:5,576)	(1:4,796)	(1:4,835)	(1:4,274)
Northeast	2,303	2,396	2,378	2,536	2,253	2,148	2,166	2,566	2,574	2,751	2,668	2,631	2,631	2,663
	(1:9,019)	(1:8,759)	(1:8,923)	(1:8,423)	(1:9,445)	(1:9,986)	(1:9,950)	(1:8,431)	(1:8,339)	(1:7,742)	(1:8,003)	(1:8,127)	(1:8,139)	(1:8,041)
Total	**12,125**	**12,196**	**12,548**	**13,273**	**13,105**	**13,310**	**13,423**	**14,984**	**14,880**	**15,425**	**15,470**	**16,384**	**16,397**	**17,424**
	(1:4,931)	**(1:4,958)**	**(1:4,874)**	**(1:4,639)**	**(1:4,713)**	**(1:4,665)**	**(1:4,660)**	**(1:4,200)**	**(1:4,202)**	**(1:4,032)**	**(1:4,048)**	**(1:3,841)**	**(1:3,855)**	**(1:3,628)**

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.

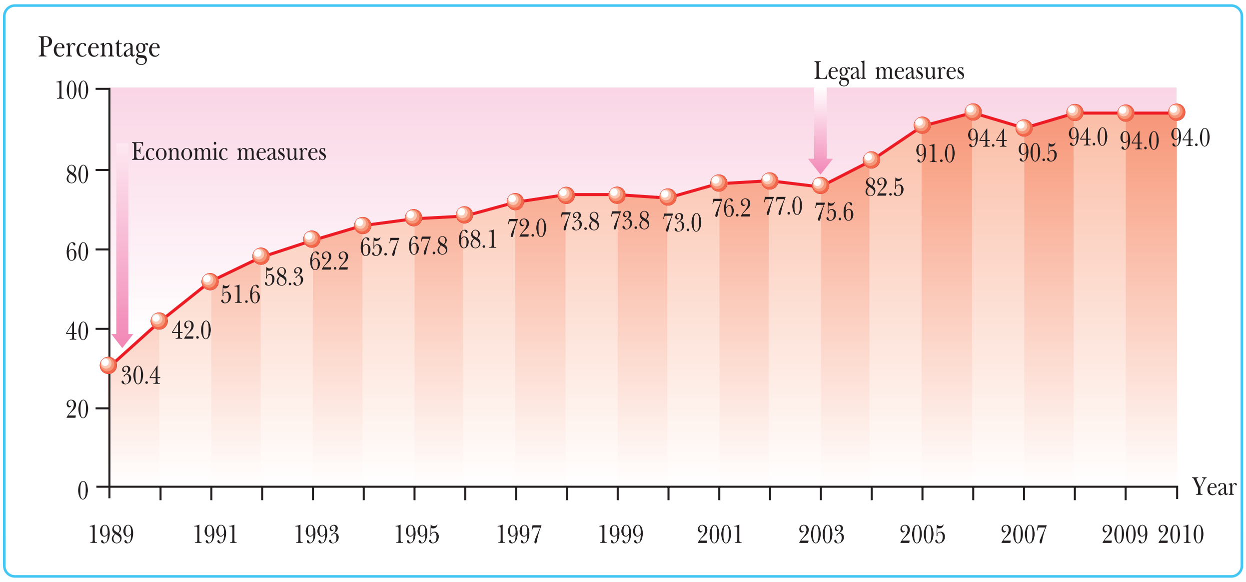
3. Health Technologies

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

3.1 Drugs 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, MoPH issued a rule requiring that all pharmaceutical manufacturers have a GMP certification. In 2010, 94% of the manufacturers are GMP-certified, while the rest are in the process of applying for GMP certification (Figure 6.43).

Figure 6.43 Percentage of GMP–certified drug manufacturers, 1989–2010



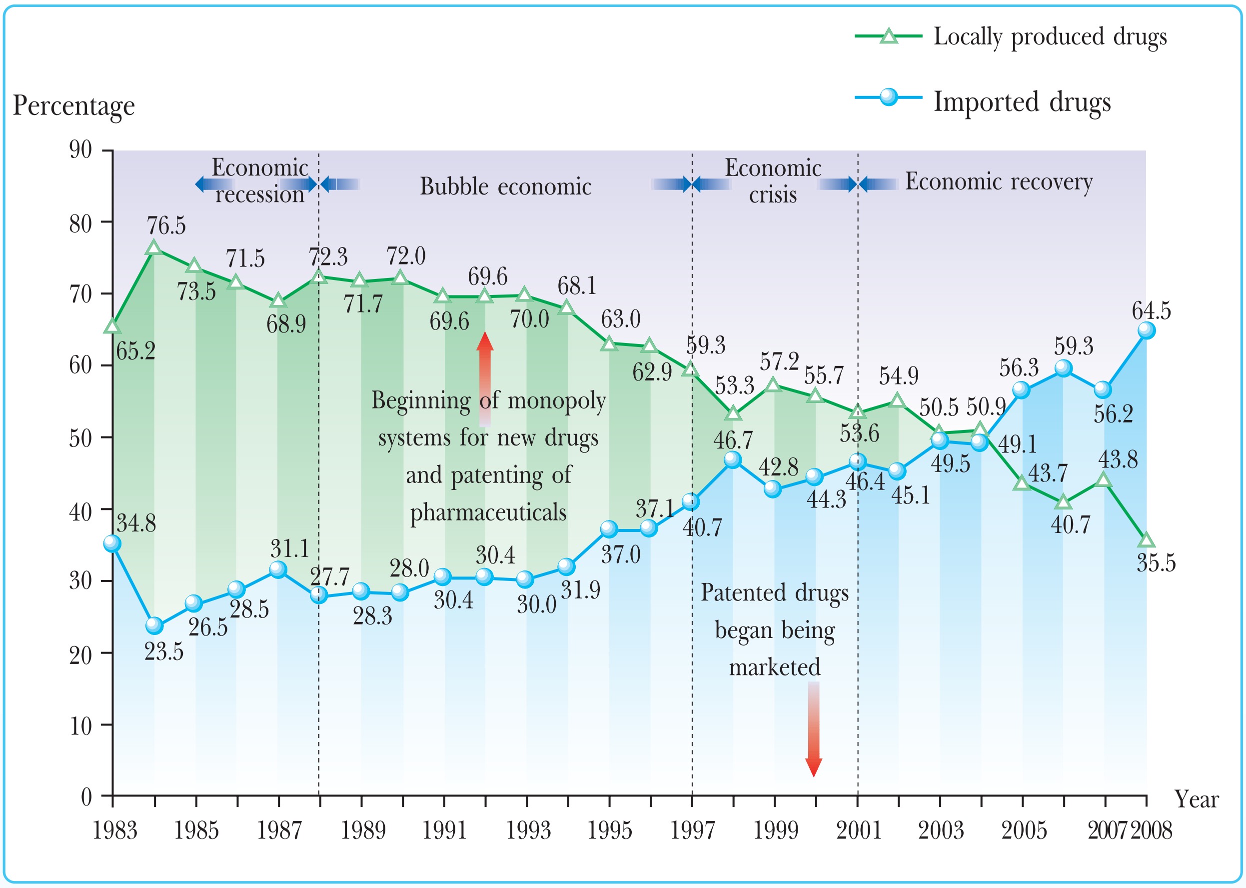
Source: Drug Control Bureau, Food and Drug Administration, MoPH.

Previously, the drugs used in the country were domestically produced; but during the period 1992–2006, with a high economic growth and new drug marketing monopolies under the Drug Act, the proportion of imported drugs was rising but slowed down during the economic crisis. After the crisis, since 2002, the proportion of imported drugs was rising steadily to 56.3% in 2005 and 64.5% in 2009 (Figure 6.44) due to economic recovery and drug monopolies under the patent system.

When considering the values of local production and drug imports, the trends rose steadily, while the import values rose and surpassed the production values for 2005, the difference being nearly 30 billion baht in 2008 (Table 6.9).

In addition to producing and dispensing drugs for domestic consumption, some drugs are exported to other countries, the export values rising from 481 million baht in 1989 to 9,184 million baht in 2009 (Figure 6.45).

Figure 6.44 Percentages of locally produced and imported drugs (for human use) 1983–2008



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

Table 6.9 Values of locally produced and imported drugs (for human use), 1983-2008

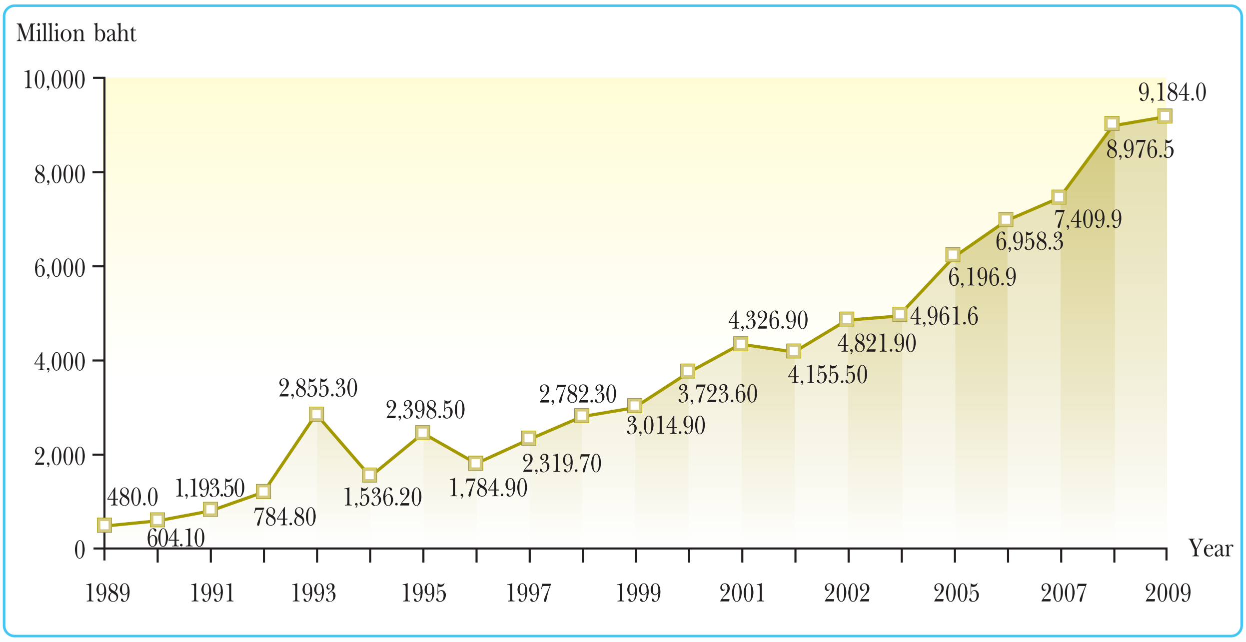
Unit: million baht

Year	Wholesale values of drugs(current prices as reported)								Estimated retail value in country x 1.8	Estimated consumption value. 2008		Increase (%)		Retail value as percentage of health spending (%)
	Locally produced		Imported			Exports	Local consumption(1)	Estimated local consumption (wholesale)x1.675		Wholesale prices	Retail prices	Current prices	Constant prices	
	Value	%	Value	%	Total									
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	22,718.30	40,893.15	0.0	0.0	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	27,837.12	50,106.99	23.6	22.5	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	34,692.57	62,446.62	27.6	24.6	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	24,190.58	43,543.04	-29.1	-30.3	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	27,014.46	48,626.04	14.4	11.7	28.73
1988	6,708.8	72.3	2,571.0	27.7	9,279.8	432.7	8,847.1	14,818.9	26,674.0	32,486.81	58,476.26	24.9	20.3	29.65
1989	8,372.9	71.7	3,307.6	28.3	11,680.5	480.8	11,199.7	18,759.5	33,767.1	38,991.26	70,184.27	26.6	20.0	32.13
1990	8,886.0	72.0	3,449.1	28.0	12,335.1	604.1	11,731.0	19,649.4	35,369.0	38,593.73	69,468.71	4.7	-1.0	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	40,677.83	73,220.10	11.6	5.4	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	42,769.9	42,362.26	76,252.07	8.4	4.1	27.08
1993	11,831.0	70.0	5,075.3	30.0	16,906.3	2,855.3	14,051.0	23,535.4	42,363.8	40,593.66	73,068.59	-0.9	-4.2	23.02
1994	12,969.7	68.1	6,086.6	31.9	19,056.3	1,536.2	17,520.1	29,346.2	52,823.1	48,186.41	86,735.53	24.7	18.7	26.41
1995	15,820.9	63.0	9,276.4	37.0	25,097.3	2,398.5	22,698.8	38,020.5	68,436.9	59,007.23	106,213.01	29.6	22.5	30.09
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	66,449.98	119,609.97	19.0	12.6	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	71,563.55	128,814.39	13.9	7.7	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	59,210.92	106,579.66	-10.6	-17.3	30.02
1999	19,033.9	57.2	14,232.3	42.8	33,266.2	3,014.9	30,251.3	50,670.9	91,207.7	65,001.30	117,002.34	10.0	9.8	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	71,799.99	129,299.91	12.3	10.5	34.16
2001	23,087.9	53.6	19,967.6	46.4	43,055.5	4,326.9	38,728.6	64,870.4	116,766.7	80,572.77	145,030.95	14.0	12.2	36.35
2002	24,144.6	54.9	19,867.9	45.1	44,012.5	4,115.5	39,897.0	66,827.5	120,289.5	82,504.30	148,507.79	3.0	2.4	35.87
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	97,002.04	174,603.68	19.8	17.6	38.72
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	113,116.86	203,610.35	19.9	16.6	43.73
2005	29,704.8	43.7	38,293.4	56.3	67,998.2	6,196.9	61,801.3	103,517.1	186,330.8	116,821.39	210,278.50	7.9	3.3	42.61
2006	30,910.9	40.7	45,004.6	59.3	75,915.5	6,958.3	68,957.2	115,503.3	207,906.0	124,528.19	224,150.74	11.6	6.6	41.82
2007	41,232.4	43.8	53,000.1	56.2	94,232.5	7,409.9	86,822.6	145,427.9	261,770.1	153,268.64	275,883.55	25.9	23.1	48.08
2008	35,322.9	35.5	64,148.1	64.5	99,471.0	8,976.5	90,494.5	151,578.3	272,840.9	151,578.29	272,840.92	4.2	-1.1	46.39
											Average, 21 years	12.9	8.6	

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

Note:
1. The estimated number has to be deducted by the export value (Figure 6.45)
2. The number from report were 67.5% lower than actuality (underreported by 48% and the report did not include druge from the Government Pharmaceutical Organization and narcotics as well as psychotropic drugs.)
3. Retail price is approximately 1.8 times the wholesale price.

Figure 6.45 Values of drugs exported from Thailland (current prices), 1989-2009



Sources: Food and Administration, MoPH.

Note: Data for 1989-2009 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 most of them are 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 6.10).

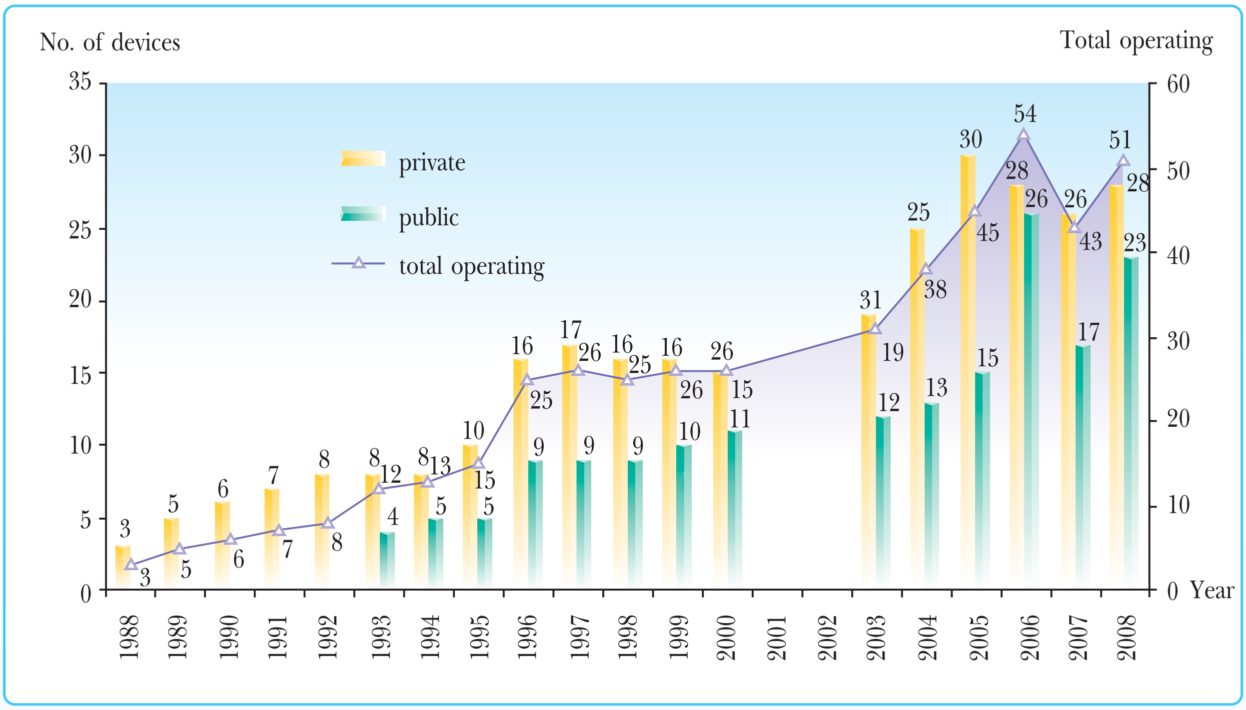
Table 6.10 Number and distribution of important medical devices

Device	Number of devices			Number by sector		Remarks
	Total	In Bangkok: No. (%)	In provinces: No. (%)	Public(%)	Private(%)	
1. CT scanners[1]	399	128 (32.1)	271 (67.9)	145 (36.3)	254 (63.7)	2009
2. Magnetic resonance imaging devices (MRI) [1]	51	17 (33.3)	34 (66.7)	23 (45.1)	28 (54.9)	2008
3. Lithotripters[2]	74	9 (12.2)	65 (87.8)	48 (64.9)	26 (35.1)	2008
4. Mammography devices [1]	215	117 (54.4)	98 (45.6)	85 (39.5)	130 (60.5)	2009
5. Ultrasound devices[2]	2,158	323 (15.0)	1,835 (85.0)	1,624 (75.3)	534 (24.7)	2009

Sources: (1) Bureau of Radiology and Medical Devices, Department of Medical Services, MoPH.
(2) Report on Health Resources Survey, Bureau of Policy and Strategy, MoPH.

The use of high-tech medical devices is on the rise in Thailand the number of subdevices, such as MRI devices, has been rising in both public and private sectors (Figure 6.46).

Figure 6.46 Number of MRI devices in the private and public sectors in Thailand



Sources: Data for 1988-2000 were derived from Piya Hanvoravongchai, 1999.

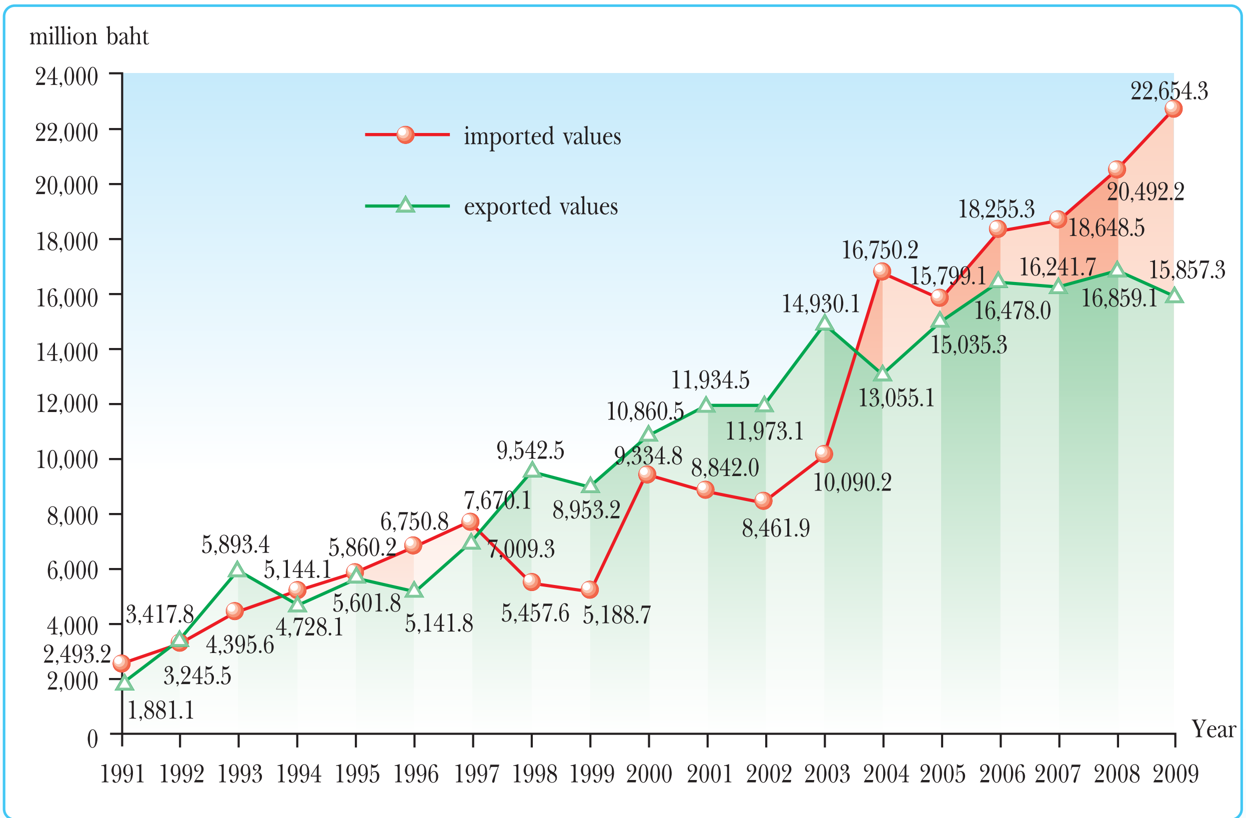
Data for 2003-2005 were derived from the Radiology and Medical Devices Division, Department of Medical Sciences, MoPH, 2006.

Data for 2006–2008 were derived from the Bureau of Policy and Strategy, Office of the Permanent Secretary, MoPH.

Note: The number for each year is as recorded at the end of the year.

The values of imported medical equipment rose by 13.04% annually between 1991 and 2009. At the beginning of the economic crisis, the import values were decreasing, but increased by as much as 19.2% in 2003, whereas the values of exports have been rising since 1997. Since 2004, the import values have been markedly greater than the export values (Figure 6.47).

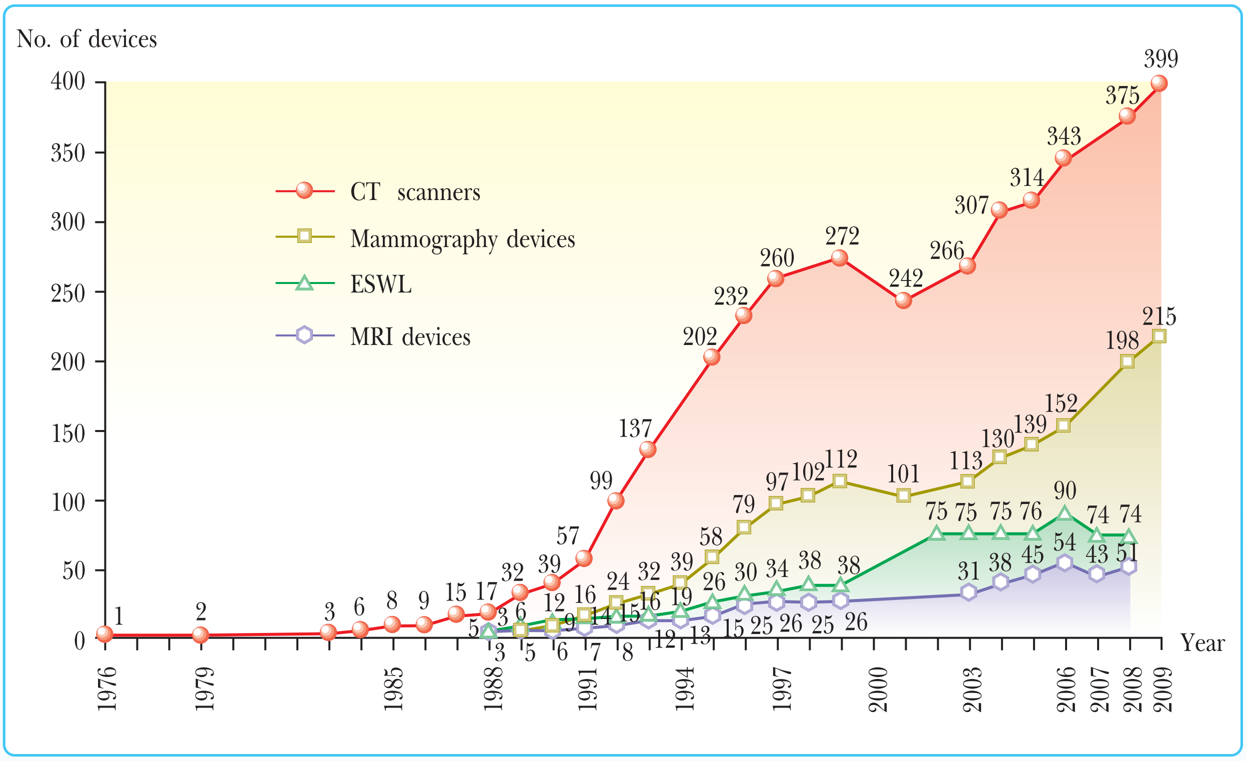
Figure 6.47 Values of imported and exported medical devices, Thailand, 1991–2009



Source: Department of Customs, Ministry of Finance.

The increase in values of technology imports was partly due to the imports of high-cost devices, particularly CT scanners, MRI devices, lithotripters and mammography devices (Figure 6.48).

Figure 6.48 Numbers of high-cost medical technologies, Thailand, 1976–2009



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

- For 2002-2009, data were derived from reports on health resources of the Bureau of Policy and Strategy, Office of the Permanent Secretary, and the Bureau of Radiology and Medical Devices, Department of Medical Sciences, MoPH.

The problem of inequalities in high-technology diffusion, especially CT scanners, MRI devices, ESWL and mammography devices, 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 1.3 to 6.0 (compared with the national average), and for provincial areas the indices ranged from 0.4 to 1.3 (Table 6.11). For CT scanners, the discrepancy index has been rising (Table 6.12); the Bangkok/Northeast discrepancy rose to 9-fold in 2009. This has shown that, even though the economic crisis is over, inequalities in medical device diffusion have increased.

Table 6.11 Ratio of high-cost medical technologies to population and discrepancy index by region, 2009

Region	Ratio of medical devices per 1 million population				Discrepancy index			
	ESWL	CT	MRI	Mammography	ESWL	CT	MRI	Mammography
Bangkok Metropolis	1.6	22.5	3.0	20.5	1.3	3.6	3.7	6.0
Provincial areas	1.1	4.7	0.6	1.7	0.9	0.7	0.7	0.5
Central	1.3	8.3	0.8	3.1	1.1	1.3	1.0	0.9
North	1.5	4.7	0.5	1.0	1.3	0.7	0.6	0.3
Northeast	0.7	2.3	0.4	1.2	0.6	0.4	0.5	0.4
South	1.4	4.1	0.8	1.3	1.2	0.7	1.0	0.4
Nationwide	**1.2**	**6.3**	**0.8**	**3.4**	**1.0**	**1.0**	**1.0**	**1.0**

Sources: - Report on Health Resources, Bureau of Policy and Strategy, MoPH (ESWL data for 2008).
- Bureau of Radiology and Medical Devices, Department of Medical Sciences (data on CT, MRI and mammography devices, 2009).

Table 6.12 Ratio of CT Scanners to population and discrepancy index by region, 1999–2009

Region	No. of CT scanners					Ratio of CT scanners per 1 million population					Discrepancy Index				
	1999	2003	2006	2008	2009	1999	2003	2006	2008	2009	1999	2003	2006	2008	2009
Bangkok Metropolis	89	89	115	118	128	15.9	13.3	20.5	20.7	22.5	3.5	3.2	3.7	3.5	3.6
Provincial areas	183	177	228	257	271	3.3	3.1	4.0	4.5	4.7	0.7	0.7	0.7	0.8	0.7
Central	74	80	110	119	129	5.2	5.3	7.4	7.7	8.3	1.2	1.3	1.3	1.3	1.3
North	41	37	48	54	56	3.4	3.2	4.0	4.5	4.7	0.8	0.8	0.7	0.8	0.7
Northeast	46	38	46	49	50	2.2	1.7	2.2	2.3	2.3	0.5	0.4	0.4	0.4	0.4
South	22	22	24	35	36	2.8	2.5	2.9	4.0	4.1	0.6	0.6	0.5	0.7	0.7
Nationwide	**272**	**266**	**343**	**375**	**399**	**4.5**	**4.2**	**5.5**	**5.9**	**6.3**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**

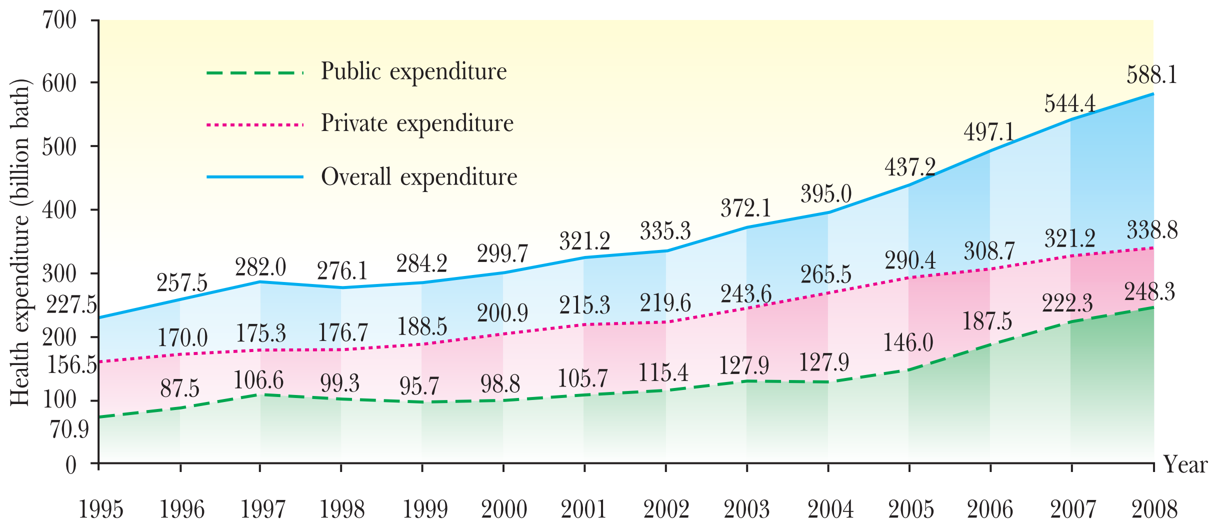
Sources: For 2003–2009, data were derived from the Bureau of Radiology and Medical Devices, Department of Medical Sciences, MoPH.
For 1999, data were derived from Wongduern Jindawatthana et al. High-cost Medical Devices in Thailand: Distribution, Utilization and Accessibility, 1999.

4. Health Expenditure

4.1 Trends in Overall Health Expenditure

During the past decades, health expenditure in Thailand was on a rapidly upward trend, rising from 25,315 million baht in 1980 to 588,154 million baht in 2008 (Figure 6.49), a more than 20–fold increase. Per-capita health spending rose from 545 baht in 1980 to 9,304 baht in 2008 (Table 6.13) an almost 17-fold increase in current prices.

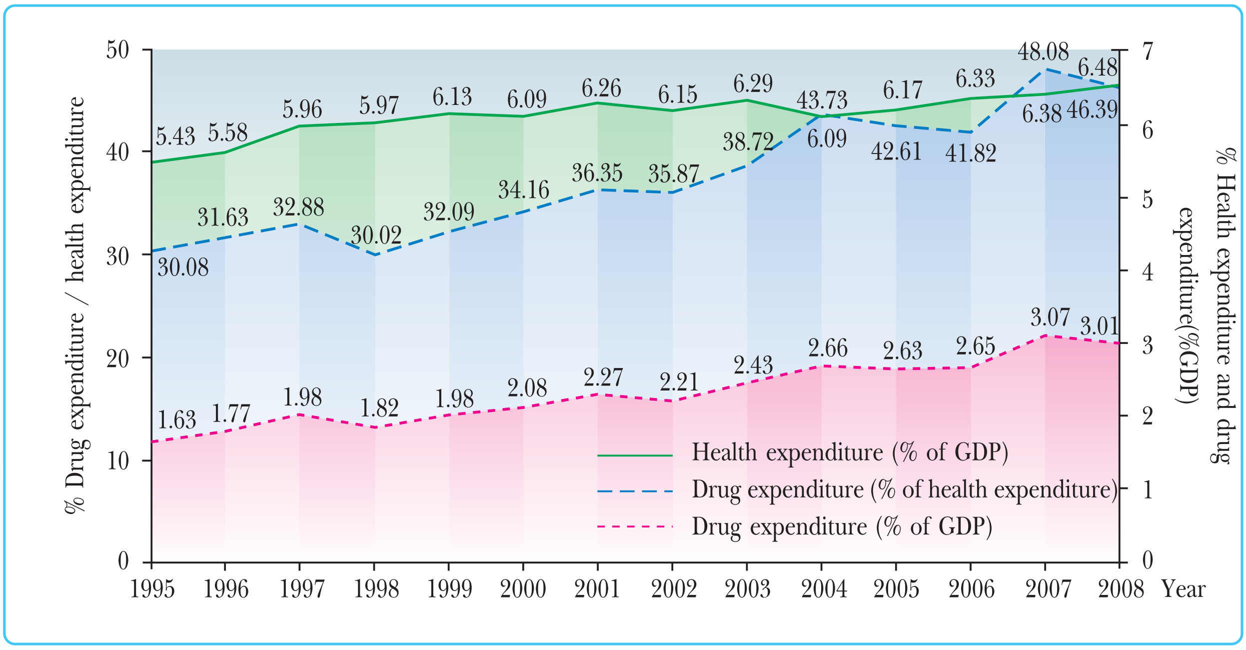
Figure 6.49 Overall, public and private health expenditures, 1995–2008



Source: Table 6.13.

As a percentage of GDP, the national health expenditure rose from 3.8% in 1980 to 6.4% in 2008 (Figure 6.50), the growth rising at the rate faster than that for GDP, i.e. an average of 7.6% in real terms while the average GDP growth was only 5.6% annually (Table 6.14). Most of health spending was on curative care as evidenced by the fact that the proportion of pharmaceutical spending rose to 46.4% of overall health spending in 2008 (Table 6.14 and Figure 6.50).

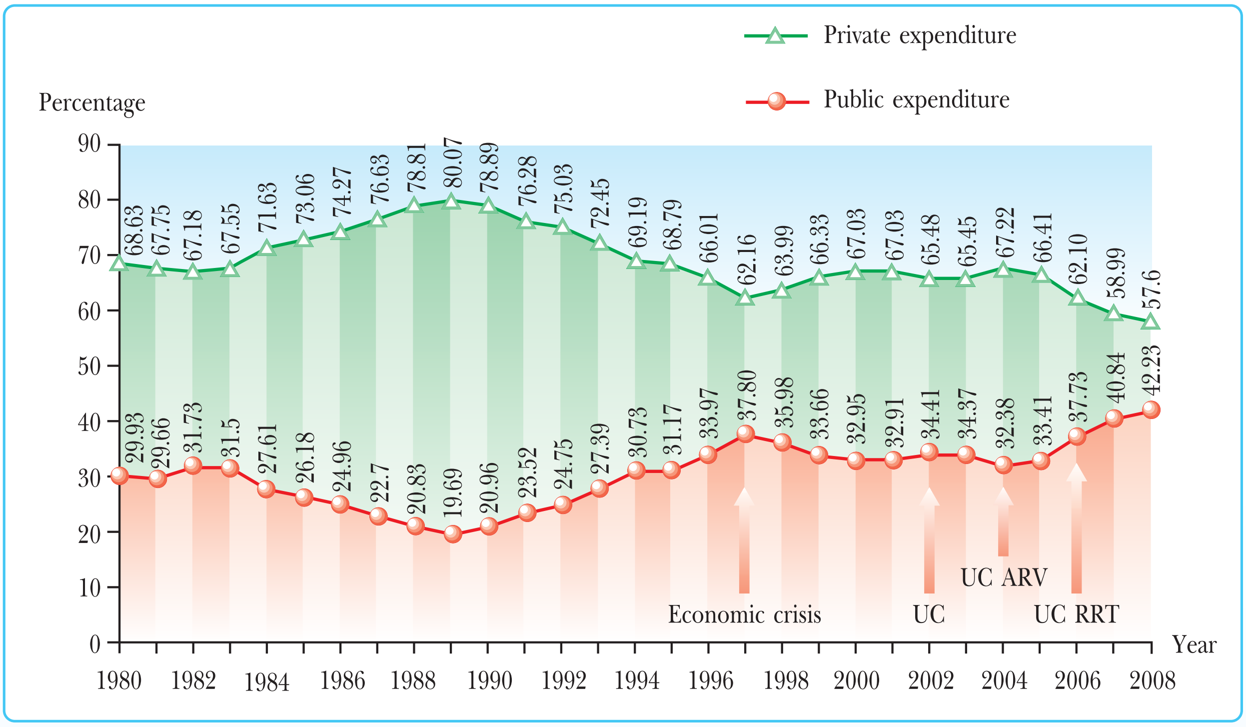
Figure 6.50 Overall health and drug expenditures and proportion of drug expenditure to health expenditure, all in relation to GDP, 1995–2008



Source: Table 6.14.

Regarding sources of health expenditure, a higher proportion was from the private including household sector (57.6% of overall health spending in 2008), whereas the state health spending was 42.2% of total health spending (Figure 6.51). Since the launching of the universal health-care system (2002) with universal access to antiretroviral therapy and renal replacement therapy, the state health spending has substantially risen.

Figure 6.51 Proportions of public and private health expenditures, 1980–2008



Source: Table 6.13.

Notes: UC = universal coverage of health care

ARV = antiretroviral drugs

RRT = renal replacement therapy

Table 6.13 Health expenditure at current prices, 1980-2008(million baht)

Year	Public sector									Private sector				Internetional financial aid		Total health expenditure		
	MoPH	Other ministeries	Civil servant benefit scheme	state enterprise benefit scheme	Workers' compensa-tion fund	Social security	Indepen-dent and state supervised agencies	Total	Percent	Private health insurance	House-holds & employers	Total	Percent	Total	Percent	Amount	Per capita	As percentage of GDP
1980	4,495	2,210	660	111	100	-	-	7,576	29.93	224	17,150	17,374	68.63	365	1.44	25,315	544.94	3.82
1981	5,572	2,535	995	167	149	-	-	9,418	29.66	284	21,229	21,513	67.75	824	2.59	31,755	668.70	4.18
1982	6,652	2,838	1,219	204	153	-	-	11,066	31.73	318	23,109	23,427	67.18	380	1.09	34,873	719.16	4.14
1983	7,092	3,134	1,482	248	205	-	-	12,971	31.50	350	27,469	27,819	67.55	391	0.95	41,181	832.63	4.47
1984	8,618	3,467	1,791	300	250	-	-	14,426	27.61	469	36,951	37,420	71.63	395	0.76	52,241	1,036.61	5.29
1985	9,044	3,716	2,157	362	236	-	-	15,515	26.18	547	42,751	43,298	73.06	452	0.76	59,265	1,146.75	5.61
1986	9,275	3,965	2,594	435	221	-	-	16,490	24.96	630	48,432	49,062	74.27	508	0.77	66,060	1,254.78	5.83
1987	9,525	4,082	2,828	474	274	-	-	17,183	22.70	756	57,258	58,014	76.63	507	0.67	75,704	1,439.10	5.82
1988	10,373	4,338	3,156	529	347	-	-	18,743	20.83	951	69,955	70,906	78.81	319	0.35	89,968	1,649.70	5.77
1989	11,733	4,448	3,521	590	397	-	-	20,689	19.69	1,162	82,988	84,150	80.07	252	0.24	105,091	1,895.31	5.66
1990	16,225	4,558	4,316	723	443	-	-	26,265	20.96	1,403	97,450	98,853	78.89	184	0.15	125,302	2,224.04	5.74
1991	20,569	4,699	5,127	859	624	778	-	32,656	23.52	1,544	104,348	105,892	76.28	270	0.19	138,818	2,449.93	5.54
1992	24,604	4,840	5,854	981	753	2,057	-	39,089	24.75	1,775	116,745	118,520	75.03	356	0.23	157,965	2,753.20	5.58
1993	32,898	4,928	7,906	1,291	927	2,473	-	50,423	27.39	2,061	131,297	133,358	72.45	281	0.15	184,062	3,141.85	5.81
1994	39,319	5,558	9,954	1,668	1,169	3,773	-	61,441	30.73	2,307	136,047	138,354	69.19	154	0.08	199,949	3,405.40	5.51
1995	45,833	6,677	11,156	1,869	1,370	3,991	-	70,896	31.17	4,984	151,508	156,492	68.79	89	0.04	227,477	3,837.50	5.43
1996	55,861	7,768	13,587	2,418	1,610	6,239	-	87,483	33.97	6,296	163,693	169,989	66.01	35	0.01	257,507	4,307.00	5.58
1997	68,934	7,1,82	15,503	2,756	1,987	10,245	-	106,607	37.80	7,518	167,780	175,298	62.16	96	0.03	282,001	4,663.80	5.96
1998	65,065	5,740	16,440	2,817	1,630	7,637	-	99,329	35.98	7,803	168,876	176,679	63.99	82	0.03	276,090	4,514.50	5.97
1999	62,787	6,087	15,174	2,539	1,404	7,676	-	95,667	33.66	8,171	180,356	188,527	66.33	41	0.01	284,235	4,615.90	6.13
2000	63,001	6,195	17,062	1,622	1,257	9,623	-	98,760	32.95	7,291	193,634	200,925	67.03	72	0.02	299,757	4,852.80	6.09
2001	61,563	7,134	19,180	3,013	1,277	13,543	-	105,710	32.91	8,400	206,942	215,342	67.03	187	0.06	321,239	5,173.40	6.26
2002	70,923	6,884	20,475	3,081	1,220	11,223	1,595	115,401	34.41	9,734	209,886	219,620	65.48	372	0.11	335,393	5,361.61	6.15
2003	74,134	8,579	22,679	3,971	1,480	15,113	1,954	127,910	34.37	11,128	232,457	243,585	65.45	665	0.18	372,160	6,912.95	6.29
2004	77,721	7,056	19,798	4,101	1,490	15,533	2,189	127,900	32.28	12,581	252,956	265,537	67.22	1,573	0.40	395,018	6,317.59	6.09
2005	85,914	6,070	28,951	3,741	1,507	17,592	2,301	146,076	33.41	13,861	276,547	290,408	66.41	791	0.18	437,275	7,030.62	6.17
2006	107,101	8,919	37,037	8,068	1,684	21,029	3,736	187,574	37.73	10,258	298,433	308,691	62.10	837	0.17	497,102	7,937.96	6.33
2007	129,683	10,343	46,514	8,882	1,735	21,686	3,531	222,374	40.84	11,099	310,088	321,187	58.99	890	0.16	544,451	8,651.21	6.38
2008	142,114	11,820	54,937	9,780	1,688	23,767	4,255	268,287	42.23	13,507	325,295	338,802	57.60	991	0.17	588,154	9,304.17	6.48

Source:
1. NESDB, Thailand's National Income, 1951-2008
2. Viroj Tangcharoensathien. Sufferings and Causes in Health System, 1996
3. Charles Myers, Financing Health Services and Medical Care in Thailand, 1985
4. International Health Policy Program, MoPH. Thai National Health Accounts 2006-2008.

Table 6.14 Health and drug expenditures as percentage of GDP, 1980-2008 (million baht)

Year	GDP			Health expenditure				Drug expenditure				
	Actual value	Value in 1988 prices	Increase (percent)	Actual value	Value in 1988 prices	Increase (percent)	As percentage of GDP	Actual value	Value in 1988 prices	Increase (percent)	As percentage of GDP	As percentage of health expenditure
1980	662,482	910,457	-	25,315	34,791	-	3.82	-	-	-	-	-
1981	760,356	927,535	1.88	31,755	38,737	11.34	4.18	-	-	-	-	-
1982	841,569	977,264	5.36	34,873	40,496	4.54	4.14	-	-	-	-	-
1983	920,989	1,029,583	5.35	41,181	46,037	13.68	4.47	16,686	18,653	-	1.81	40.52
1984	988,070	1,094,770	6.33	52,241	57,882	25.73	5.29	20,629	22,857	22.53	2.09	39.49
1985	1,056,496	1,143,520	4.45	59,265	64,147	10.82	5.61	26,317	28,485	24.62	2.49	44.41
1986	1,133,397	1,205,844	5.45	66,060	70,283	9.57	5.83	18,669	19,862	-30.27	1.65	28.26
1987	1,299,913	1,350,395	11.99	75,704	78,644	11.90	5.82	21,181	22,181	11.67	1.67	28.73
1988	1,559,804	1,559,804	15.51	89,968	89,968	1440	5.77	26,674	26,674	20.25	1.71	29.65
1989	1,856,992	1,760,616	12.87	105,091	99,637	10.75	5.66	33,763	32,011	20.01	1.82	32.13
1990	2,183,545	1,956,310	11.12	125,302	112,262	12.67	5.74	35,369	31,688	-1.01	1.62	28.23
1991	2,506,635	2,121,435	8.44	138,818	117,486	4.65	5.54	39,464	33,399	5.40	1.57	28.43
1992	2,830,914	2,302,231	8.52	157,965	128,464	9.34	5.58	42,770	34,783	4.14	1.51	27.08
1993	3,170,258	2,494,247	8.34	184,062	144,813	12.73	5.81	42,364	33,331	-4.17	1.34	23.02
1994	3,629,341	2,718,376	8.99	199,949	149,762	3.42	5.51	52,823	39,564	18.70	1.45	26.41
1995	4,186,212	2,963,585	9.02	227,477	161,040	7.53	5.43	68,437	48,449	22.46	1.63	30.08
1996	4,611,041	3,089,150	4.24	257,507	172,516	7.13	5.58	81,440	54,560	12.61	1.77	31.63
1997	4,732,610	2,998,921	-2.92	282,001	178,696	3.58	5.96	92,728	58,759	7.70	1.98	32.88
1998	4,626,447	2,713,554	-9.52	276,090	161,935	-938	5.97	82,888	48,616	-17.26	1.82	30.02
1999	4,637,079	2,713,416	-0.01	284,235	166,322	2.71	6.13	91,208	53,371	9.78	1.98	32.09
2000	4,923,263	2,834,377	4.46	299,757	172,573	3.76	6.09	102,400	58,953	10.46	2.08	34.16
2001	5,133,836	2,908,656	2.62	321,239	182,003	5.46	6.26	116,767	66,156	12.22	2.27	36.35
2002	5,451,854	3,070,255	5.56	335,393	188,879	3.78	6.15	120,290	67,742	2.40	2.21	35.87
2003	5,917,368	3,270,929	6.68	372,160	205,718	8.92	6.29	144,085	79,646	17.57	2.43	38.72
2004	6,489,847	3,489,516	6.54	395,018	212,397	3.25	6.09	172,734	92,877	16.61	2.66	43.73
2005	7,087,660	3,648,562	4.56	437,275	225,099	5.98	6.17	186,331	95,919	3.28	2.63	42.61
2006	7,850,193	3,860,666	5.81	497,102	244,471	8.61	6.33	207,906	102,247	6.60	2.65	41.82
2007	8,529,836	4,100,672	6.22	544,451	261,742	7.06	6.38	261,770	125,844	23.08	3.07	48.08
2008	9,075,493	4,139,796	0.95	588,154	268,287	2.50	6.48	272,841	124,457	-1.10	3.01	46.39
		Average	5.56			7.57				7.01		

Note: Tables 6.9 and 6.13

Table 6.15 Proportions of health spending as a percentage of overall health expenditure in Thailand by funding source, 1980-2008

	1980	1986	1988	1989	1991	1992	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
1. Public sector																					
Ministry of Public Health	17.76	14.04	11.53	11.16	14.28	15.58	19.66	20.15	21.69	24.44	23.57	22.09	21.02	19.16	21.15	19.92	19.68	19.65	21.55	23.82	24.34
Other ministries	8.73	6.00	4.82	4.23	3.39	3.06	2.78	2.94	3.02	2.55	2.08	2.14	2.07	2.22	2.05	2.31	1.79	1.39	1.79	1.90	2.02
Civil servants benefit scheme	2.61	3.93	3.51	3.35	3.69	3.71	4.98	4.90	5.28	5.50	5.95	5.34	5.69	5.97	6.10	6.09	5.01	6.62	7.45	8.54	9.41
State enterprise benefit scheme	0.44	0.66	0.59	0.56	0.62	0.62	0.83	0.82	0.94	0.98	1.02	0.89	0.54	0.94	0.92	1.07	1.04	0.86	1.62	1.63	1.67
Workers' compensation fund	0.40	0.33	0.39	0.38	0.45	0.48	0.58	0.60	0.63	0.70	0.59	0.49	0.42	0.40	0.36	0.40	0.38	0.34	0.34	0.32	0.29
Social security	0.00	0.00	0.00	0.00	0.56	1.30	1.89	1.75	2.42	3.63	2.77	2.70	3.21	4.22	3.35	4.06	3.94	4.02	4.23	3.98	4.04
Independent and state-supervised agencies	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.48	0.53	0.55	0.53	0.75	0.65	0.72
Total	**29.93**	**24.96**	**20.83**	**19.69**	**23.52**	**24.75**	**30.73**	**31.17**	**33.97**	**37.80**	**35.98**	**33.66**	**32.95**	**32.91**	**34.41**	**34.37**	**32.38**	**33.41**	**37.73**	**40.84**	**42.23**
2. Private sector																					
Private health insurance	0.88	0.95	1.06	1.11	1.11	1.12	1.15	2.19	2.44	2.66	2.82	2.88	2.43	2.61	2.90	2.99	3.18	3.17	2.06	2.04	2.30
Household and employers	67.75	73.32	77.76	78.97	75.17	73.91	68.04	66.60	63.57	59.50	61.17	63.45	64.60	64.42	62.58	62.47	64.04	63.24	60.03	56.95	55.31
Total	**68.63**	**74.27**	**78.81**	**80.07**	**76.28**	**75.03**	**69.19**	**68.79**	**66.01**	**62.16**	**63.99**	**66.33**	**67.03**	**67.03**	**65.48**	**65.45**	**67.22**	**66.41**	**62.10**	**58.99**	**57.60**
3. **Other**																					
International financial aid	1.44	0.77	0.35	0.24	0.19	0.23	0.08	0.04	0.01	0.03	0.03	0.01	0.02	0.06	0.11	0.18	0.40	0.18	0.17	0.16	0.17
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: Table 6.13

In comparison with other Asian countries (Table 6.16), 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 health-care spending for themselves.

Table 6.16 Comparison of health expenditures among some Asian countries

Country	Health expenditure		
	Per capita (USD)	As percentage of GDP	Proportion, govt.: household
Indonesia	81	2.2	54.5 : 45.5
Philippines	130	3.9	34.7 : 65.3
Sri Lanka	179	4.2	47.5 : 52.5
Malaysia	604	4.4	44.4 : 55.6
Thailand (2008)	**282**	**6.4**	**42.4 : 57.6**
Singapore	1,643	3.1	32.6 : 67.4
South Korea	1,688	6.3	54.9 : 45.1

Source: The World Health Report, 2010 (data for 2007).

Note: For 2008, based on the exchange rate of 33 baht to a US dollar.

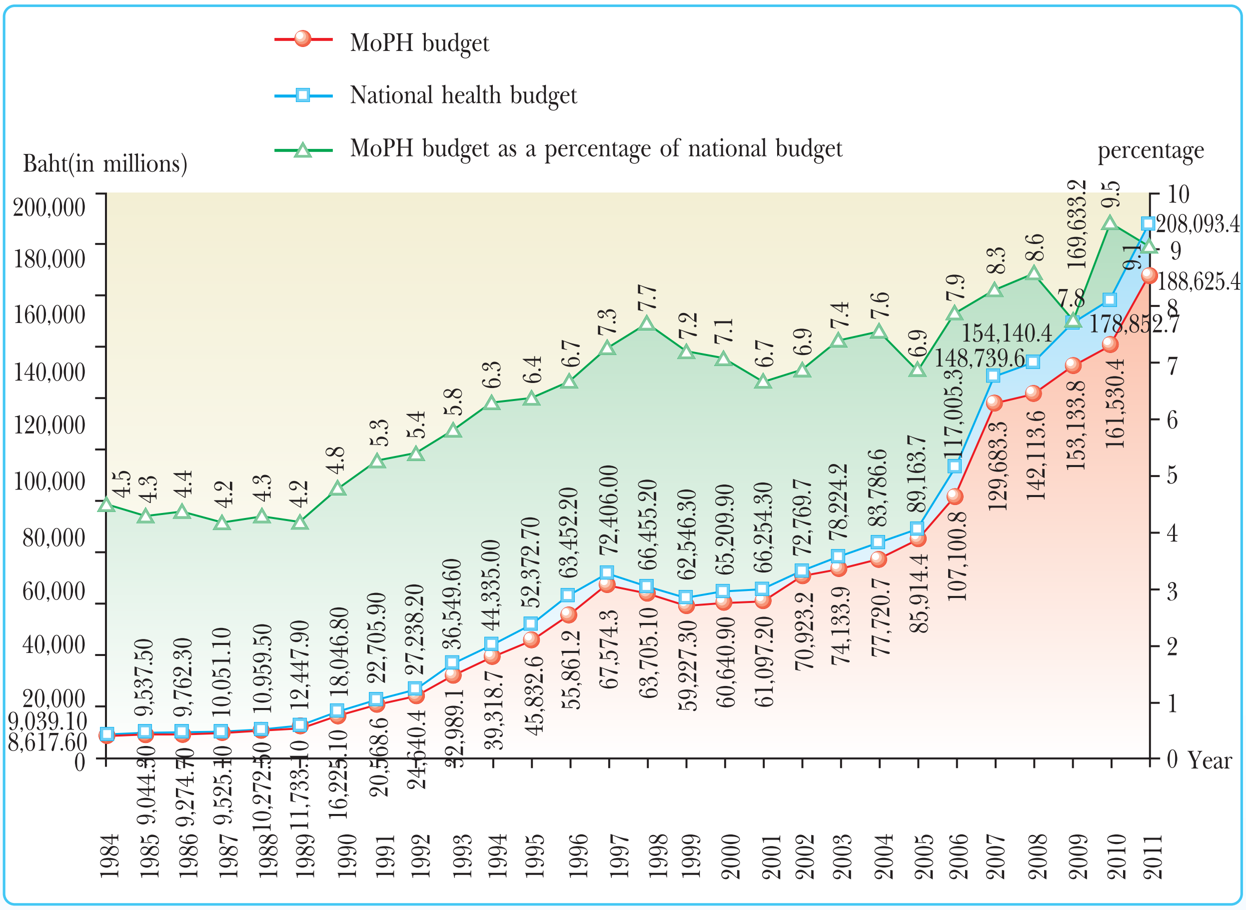
4.2 Public Health Expenditure

The major source of public expenditure on health is the government budget, especially through 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 proportion had a rising trend to 37.8% in 1997, during the period of rapid economic recovery and continuous growth. So, after the economic crisis the government had to adjust the national budget downwards, resulting in a drop to 32.9% in 2001, but it rose again in 2008 to 42.2%, probably due to the launch of the universal health-care policy and the substantial increase in civil servants' health benefit spending.

An analysis of the sources of public health spending revealed that the proportion from MoPH had a falling trend from 24.4% in 1997 to 19.7% in 2005 and to 24.3% in 2008, while the proportion of health expenditure under the civil servants medical benefits scheme rose from 5.5% in 1997 to 9.4% in 2008; similarly, the proportion of health expenditure under the social security scheme also rose from 3.6% in 1997 to 4% in 2008 (Table 6.15).

Regarding the MoPH budget, the proportion in relation to the national budget rose from 6.7% in 2001 to 9.1% in 2011 (Figure 6.52), reflecting the continuous importance accorded by the government to the health service system.

Figure 6.52 The national health budget and MoPH budget, 1984–2011



Source: Bureau of the Budget.

Note: For 1995-2010, the MoPH budget includes the health insurance revolving funds (previously known as health card revolving funds).

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 health insurance coverage at a private clinic or private hospital, or when they do not follow the steps or procedures of the state health-care scheme, in the designated area, or at the health facility. Therefore, the household financing plays a very significant role in health-care delivery.

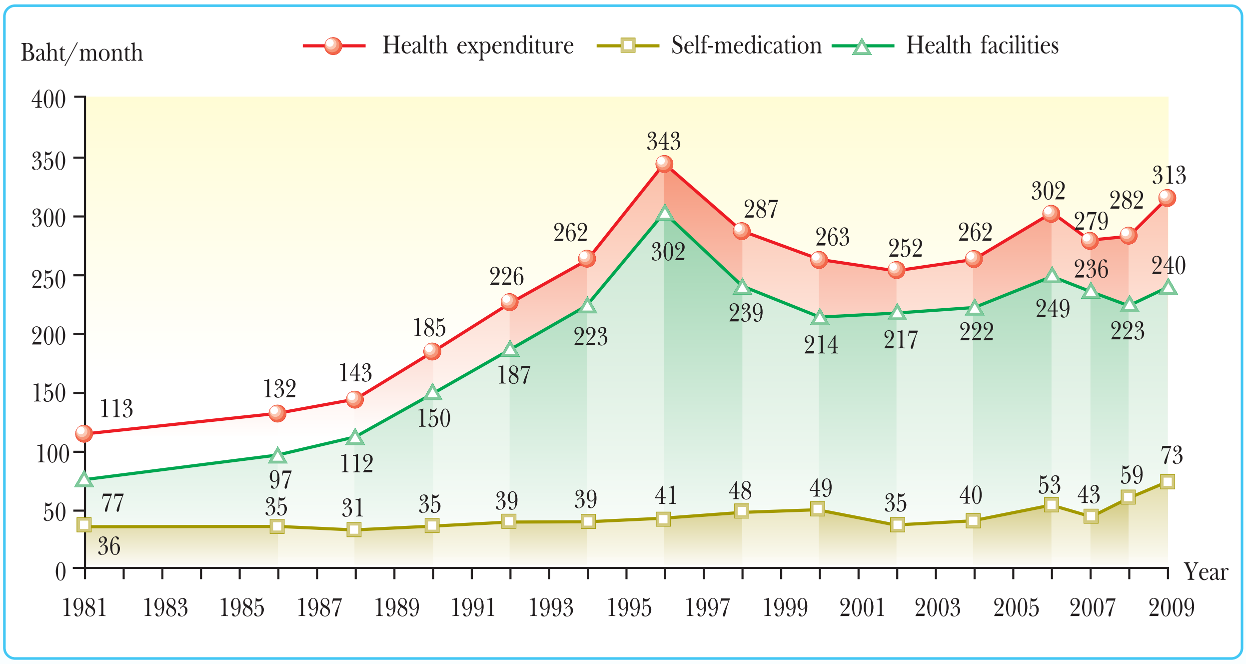
The proportion of household spending has always been more than 60% (Table 6.15). In 1980, such a proportion was as high as 68.6% and rose to 80.1% in 1989 due to the decrease in government budget, resulting in the households bearing a greater share of health-care costs. After 1989 until 1997 with the economic crisis, the household spending proportion steadily dropped to 62.2%, but rose again to 67.03% in 2000 with a decreased state budget. Beginning in 2005, the proportion slightly dropped to 62.1% in 2006 and 57.6% in 2008, reflecting the decreased family burden resulting from the universal health-care policy. This situation has shown that the use of 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 in such instances, the people have to pay for their own services.

In analyzing the sources of private health expenditure, it has been found that the major source is the households and employers rather than private health insurance. The proportion of private health insurance is only 2% to 3%, which is very little compared with that from the households and employers.

The pattern of household health expenditure derived from the household income and expenditure survey conducted by the National Statistical Office during 1981–1996 revealed a rather stable rate of 3.6% to 3.9% of overall family spending each month. The proportion declined to 3.2% during the economic crisis and dropped further to 2.6% in 2002 and 2.2% in 2009. 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 services purchased at health facilities (including drug consumption and services at private clinics, and state and private hospitals) 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 as 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 facilities. When the economy recovered in 2002, the proportion of self-medication dropped to 13.9%. But during 2007–2009, the self-medication spending rose again to 23.3% in 2009, whereas the health-care spending at private hospitals dropped to 76.7% in the same year (Figure 6.53 and Table 6.17).

Figure 6.53 Household health expenditure, 1981–2009

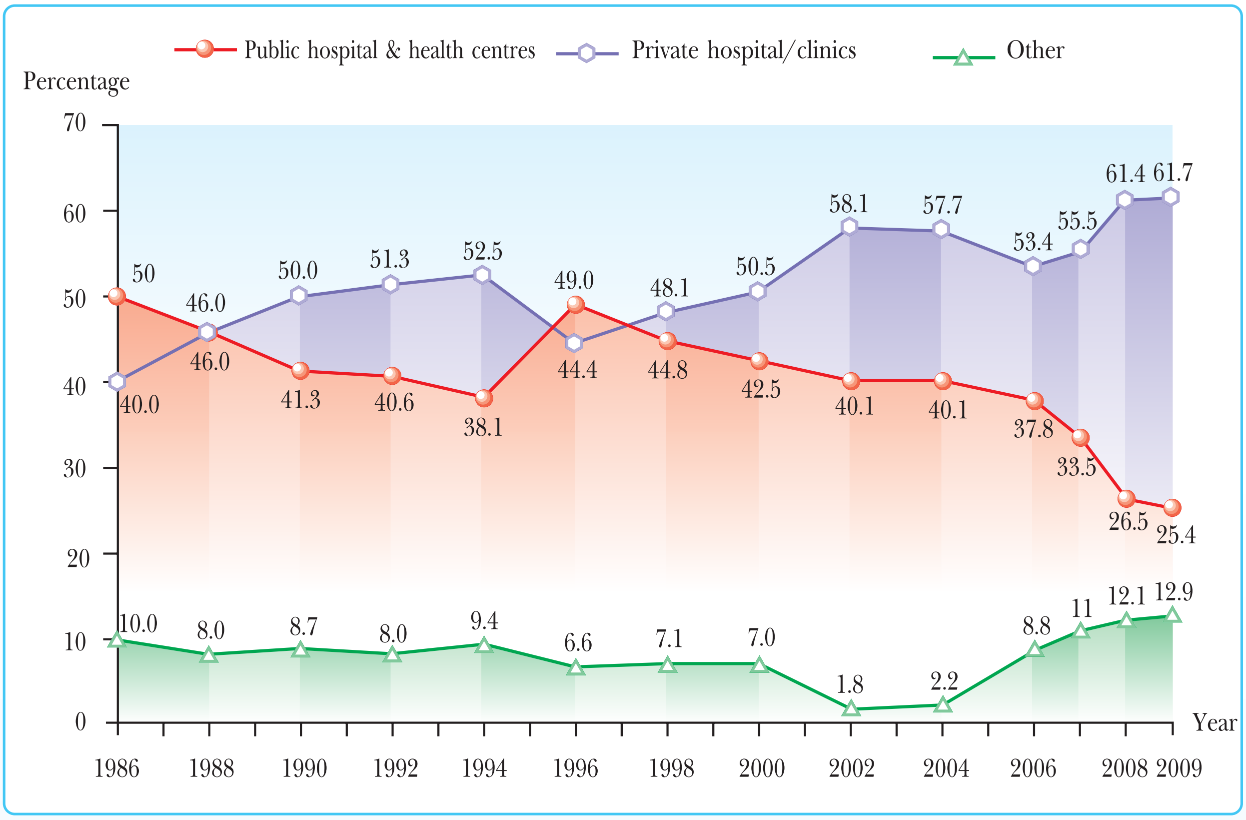


Source: Report on Household Socio-Economic Survey. National Statistical Office.

Note: The estimates are expected to be lower than reality as the survey coverage often missed high-income families.

2) **Health expenditure when attending health facilities** had a rising proportion for private facilities, but declining for state facilities. As shown in Figure 6.54, 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 attended 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% of household health spending. It is noteworthy that since 2002, the beginning of economic recovery and the universal health care, the household spending on health care at private hospitals/clinics increased to 58% in 2004 and 61.7% in 2009, while such spending at state health facilities dropped to 25.4% for the same year, whereas the spending at other health facilities rose to 12.9%, probably due to attending state health facilities under the universal health-care system, making the people spend less at such places.

Figure 6.54 Proportion of household health spending when attending health facilities, 1986–2009



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

Table 6.17 Household health spending pattern (baht/month), 1981-2009

Pattern of expenditure	1981		1986		1988		1990		1992		1994		1996		1998	
	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%
Family size (persons)	4.5	-	4.3	-	4.0	-	4.1	-	3.9	-	3.8	-	3.7	-	3.7	-
Total expenditure per month	3,374	-	3,783	-	4,161	-	5,437	-	6,529	-	7,567	-	9,190	-	10,389	-
Consumption expenditure per month	3,161	-	3,486	-	3,804	-	4,942	-	5,892	-	6,787	-	8,072	-	8,966	-
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
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
Spending at health facilities	77	68.1	97	73.5	112	78.3	150	81.1	187	82.7	22.3	85.1	302	88.0	239	83.3
- Public hospitals & health centres	-	-	48	50.0	52	46	62	41.3	76	40.6	85	38.1	148	49.0	107	44.8
- Private hospitals/ clinics	-	-	39	40.0	51	46	75	50.0	96	51.3	117	52.5	134	44.4	115	48.1
- Other	-	-	10	10	9	8	13	8.7	15	8.0	21	9.4	20	6.6	17	7.1

Pattern of expenditure	2000		2001		2002		2004		2006		2007		2008		2009	
	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%	Baht	%
Family size (persons)	3.6	-	3.6	-	3.5	-	3.4	-	3.3	-	3.3	-	3.3	-	3.3	-
Total expenditure per month	9,848	-	10,025	-	10,889	-	12,297	-	14,311	-	14,500	-	15,942	-	16,205	-
Consumption expenditure per month	8,558	-	8,758	-	9,601	-	10,885	-	12,701	-	12,735	-	14,087	-	14,244	-
Health expenditure per month	263	3.1	264	3.0	252	2.6	262	2.4	302	2.4	279	2.2	282	2.0	313	2.2
Self-medication expenditure	49	18.6	46	17.4	35	13.9	40	15.3	53	17.5	43	15.4	59	20.9	73	23.3
Spending at health facilities	214	81.4	218	82.6	217	86.1	222	84.7	249	82.5	236	84.6	223	79.1	240	76.7
- Public hospitals & health centres	91	42.5	98	45.0	87	40.1	89	40.1	94	37.8	79	33.5	59	26.5	61	25.4
- Private hospitals/ clinics	108	50.5	110	50.4	126	58.1	128	57.7	133	53.4	131	55.5	137	61.4	148	61.7
- Other	15	7.0	10	4.6	4	1.8	5	2.2	22	8.8	26	11.0	27	12.1	31	12.9

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

5. Accessibility of Health Services

5.1 Coverage of Health Security

Thailand has been expanding health security or insurance coverage to 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 97.4% by 2009 (76.1% under the universal coverage scheme), leaving 2.6% without any health insurance (Table 6.18).

Table 6.18 Percentage of Thai people with health security, 1991, 1996, 2001 and 2003-2009

Health insurance scheme	Before the launch of the UC health-care scheme			After the launch of the UC health-care scheme					
	1991	1996	2001	2003	2004	2005	2006	2007	2009
1. Universal coverage health care	-	-	0.9	74.7	73.5	72.2	74.3	73.6	76.1
- Gold card with Tor (not paying 30 baht/visit)	-	-	-	74.7	30.6	28.1	28.6	42.8	76.1
- Gold card without Tor (paying 30 baht/visit)	-	-	0.9		42.9	44.1	45.7	30.9	
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	9.1	7.7
- Civil servants	13.2	9.0	7.5	8.9	9.4	9.8	8.9	9.1	7.7
- 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	12.1	12.3
5. Voluntary health insurance	4.5	16.1	22.1	1.7	0.8	1.0	0.7	1.1	0.9
- 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	1.1	0.9
6. Others	0.9	1.0	0.8	-	-	1.1	0.7	0.5	0.4
Population with health insurance	33.5	45.5	71.0	94.9	94.3	95.1	96.0	96.3	97.4
Population without health insurance	66.5	54.5	29.0	5.1	5.7	4.9	4.0	3.7	2.6

Sources: 1. Reports on Health and Welfare Surveys, 1991, 1996, 2001, 2003, 2004, 2007 and 2009. National Statistical Office.

2. Viroj Tangcharoensathien, et al. An analysis of data from the Reports on Health and Welfare Surveys, 2003-2009. 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 2009, the proportion of rural residents with universal health-care cards was higher than that for urban residents. But more urban residents had health-care coverage under the social security scheme and the medical benefits scheme for civil servants than did rural residents (Table 6.19).

Table 6.19 Percentage of people with health insurance coverage in municipal and non-municipal areas, 1991, 1996, 2001, 2003, 2004, 2006, 2007 and 2009

Health insurance coverage	Municipal areas								Non-municipal areas							
	1991	1996	2001	2003	2004	2006	2007	2009	1991	1996	2001	2003	2004	2006	2007	2009
No insurance	65	58	42	9	10.1	7.7	7.3	5.3	68	52	22	3	3.5	2.5	2.1	1.4
Civil servants and state enterprise employees	22	17	16	15	15.3	14.1	14.6	12.1	6	7	9	6	6.5	6.6	6.6	5.8
Universal health care	-	-	-	56	54.6	56.3	55.3	60.3	-	-	-	84	82.8	82.1	81.6	83.1
Social security	-	11	13	18	18.2	19.8	20.2	19.7	-	3	4	6	7.0	7.7	8.6	9.1
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	2.5	2.1	1	1	1	1	0.3	0.3	0.5	0.2
Others	1	1	1	-	-	0.6	0.2	0.5	1	1	1	-	-	0.7	0.6	0.4

Sources: 1. Reports on Health and Welfare Surveys, 1991, 1996, 2001, 2003, 2006, 2007 and 2009. National Statistical Office.

2. Viroj Tangcharoensathien et al. An analysis of data from the Reports on Health and Welfare Surveys, 2003, 2004, 2006, 2007 and 2009. 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.

5.2 Rate of Health Service Utilization

The utilization of health services at hospitals (health facilities with inpatient beds) is on the rise; the rate of service utilization at hospitals (visits/person/year) rose from 1.8 in 2001 to 3.4 in 2009, the rate being highest in Bangkok (4–6 visits) and lowest in the Northeast (1.2–3 visits). That reflects the rate of access to outpatient services being highest in Bangkok (including for outpatients coming from other provinces) (Figure 6.20). Similarly, the rate of hospitalizations or inpatient service utilization also rose from 10% in 1995 to 14.7% in 2007, but dropped slightly in 2009 due to incomplete survey coverage, the rate being highest in Bangkok and lowest in the Northeast (Figure 6.21).

An analysis of the relationship between service utilization and provincial health resources reveals that the outpatient service rate is associated with the population/doctor ratio and the inpatient service rate and the population/bed ratio (Figure 6.55 and Figure 6.56). This reflects the fact that the provinces with a lot of health resources (low population/doctor and population/bed ratios) will have higher utilization rates, and confirms the influence of health resources on the chances of people's service utilization.

Table 6.20 Rate of outpatient service utilization by region, 2001–2009

Region	Utilization rate (visits/person/year)								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bangkok	4.0	3.9	4.4	4.4	5.1	5.4	6.4	4.1	3.7
Central	2.0	2.1	2.3	2.3	2.5	2.7	2.9	3.3	4.2
North	1.6	1.6	1.7	1.8	2.0	2.0	2.1	2.2	3.1
Northeast	1.2	1.3	1.3	1.3	1.4	1.5	1.6	1.5	3.1
South	1.7	1.7	1.7	1.8	1.9	1.9	2.1	2.1	3.2
Total	**1.8**	**1.8**	**1.9**	**2.0**	**2.2**	**2.3**	**2.5**	**2.4**	**3.4**

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

Note: Incomplete survey courage.

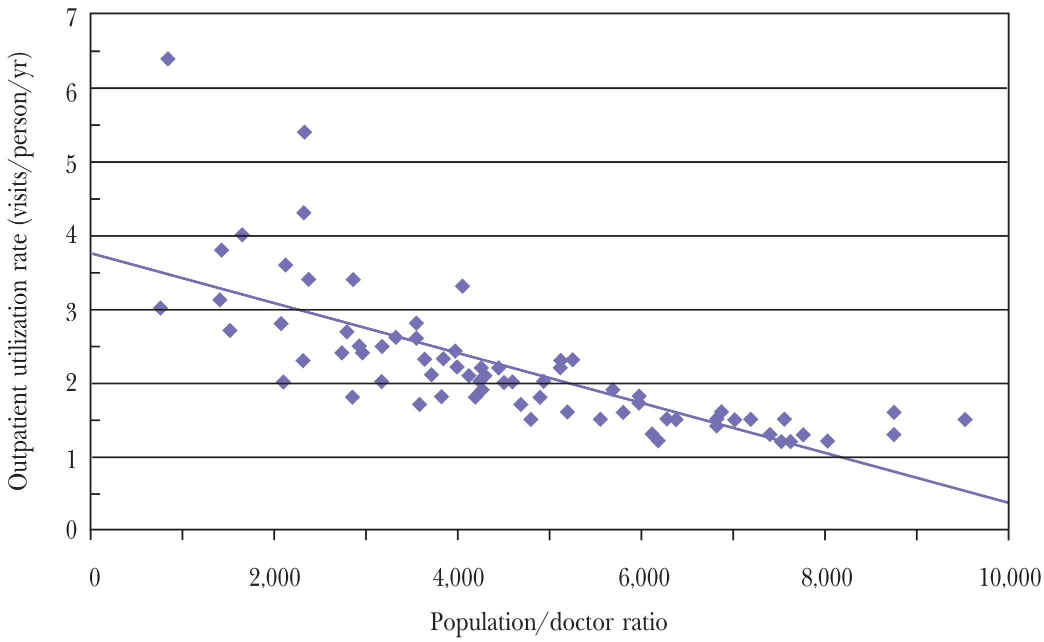
Table 6.21 Rate of inpatient service utilization by region, 1995–2009

Region	Utilization rate (visits/person/year)									
	1995	1997	1999	2001	2003	2005	2006	2007	2008	2009
Bangkok	11.6	15.5	19.9	22.3	20.3	21.7	20.1	26.2	14.4	11.0
Central	12.4	13.8	15.0	15.7	14.4	15.6	16.1	15.9	15.3	15.2
North	9.4	11.9	12.7	15.0	13.1	12.8	13.3	13.5	13.2	10.9
Northeast	8.4	11.0	10.4	10.7	10.7	10.6	10.9	11.3	11.2	11.3
South	10.7	12.3	12.0	13.9	13.5	13.8	14.6	15.0	16.6	15.7
Total	**10.1**	**12.4**	**13.0**	**14.2**	**13.3**	**13.7**	**14.0**	**14.7**	**13.6**	**12.8**

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

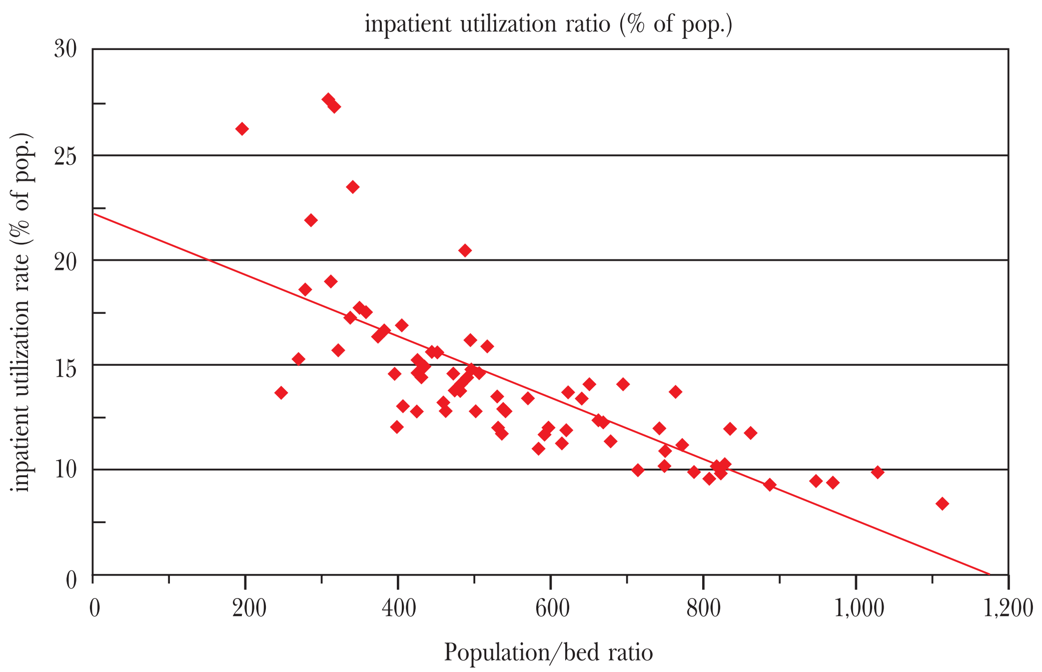
Note: Incomplete survey courage.

Figure 6.55 Relationship between the rate of outpatient service utilization and population/doctor ratio at provincial level, 2007



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

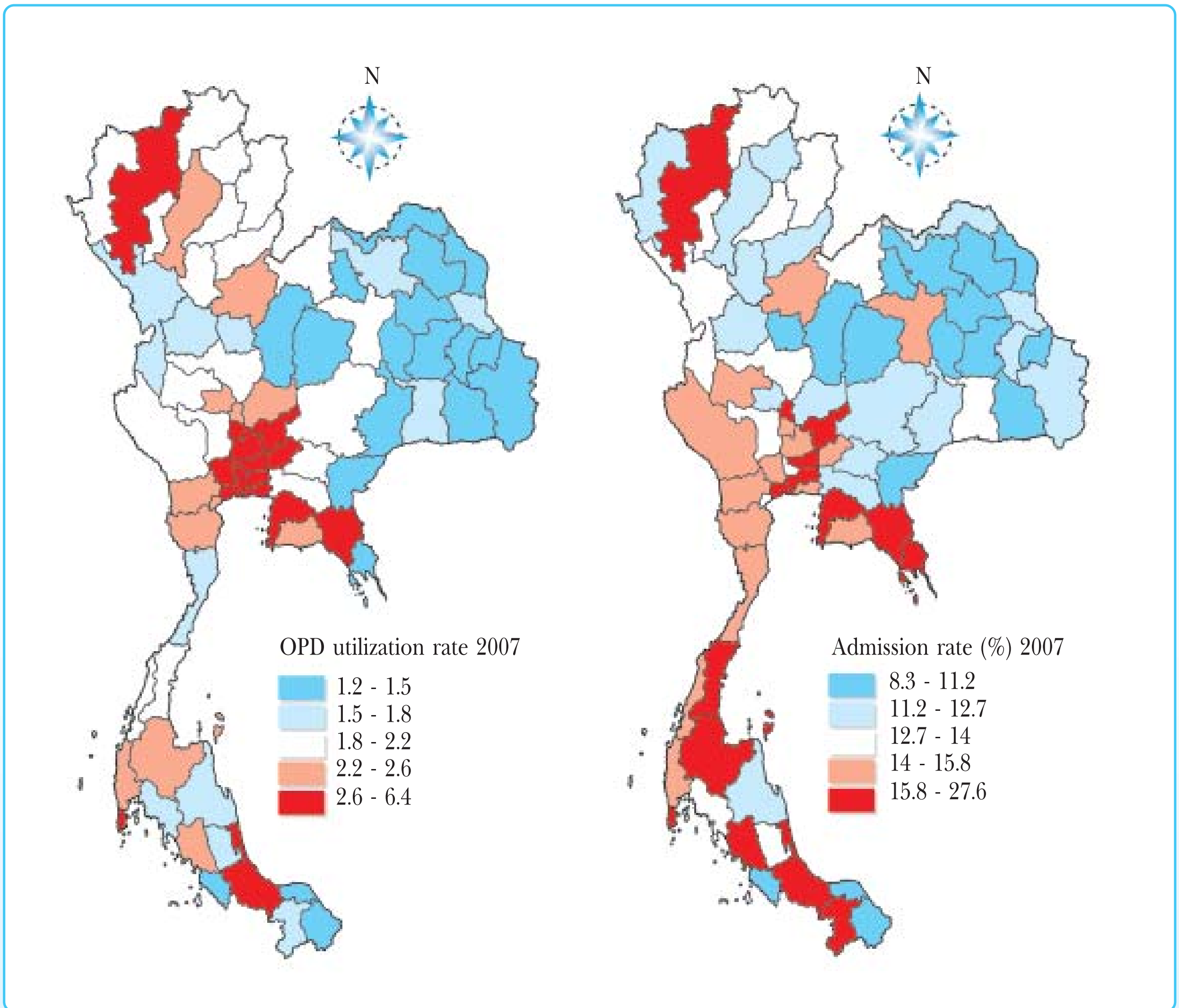
Figure 6.56 Relationship between the rate of inpatient service utilization and population/bed ratio at provincial level, 2007



Source: Report on Health Resources, 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 regions 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 6.57).

Figure 6.57 Geographical distribution of outpatient (OPD) service utilization rates and inpatient service (admission) rates at provincial level, 2007

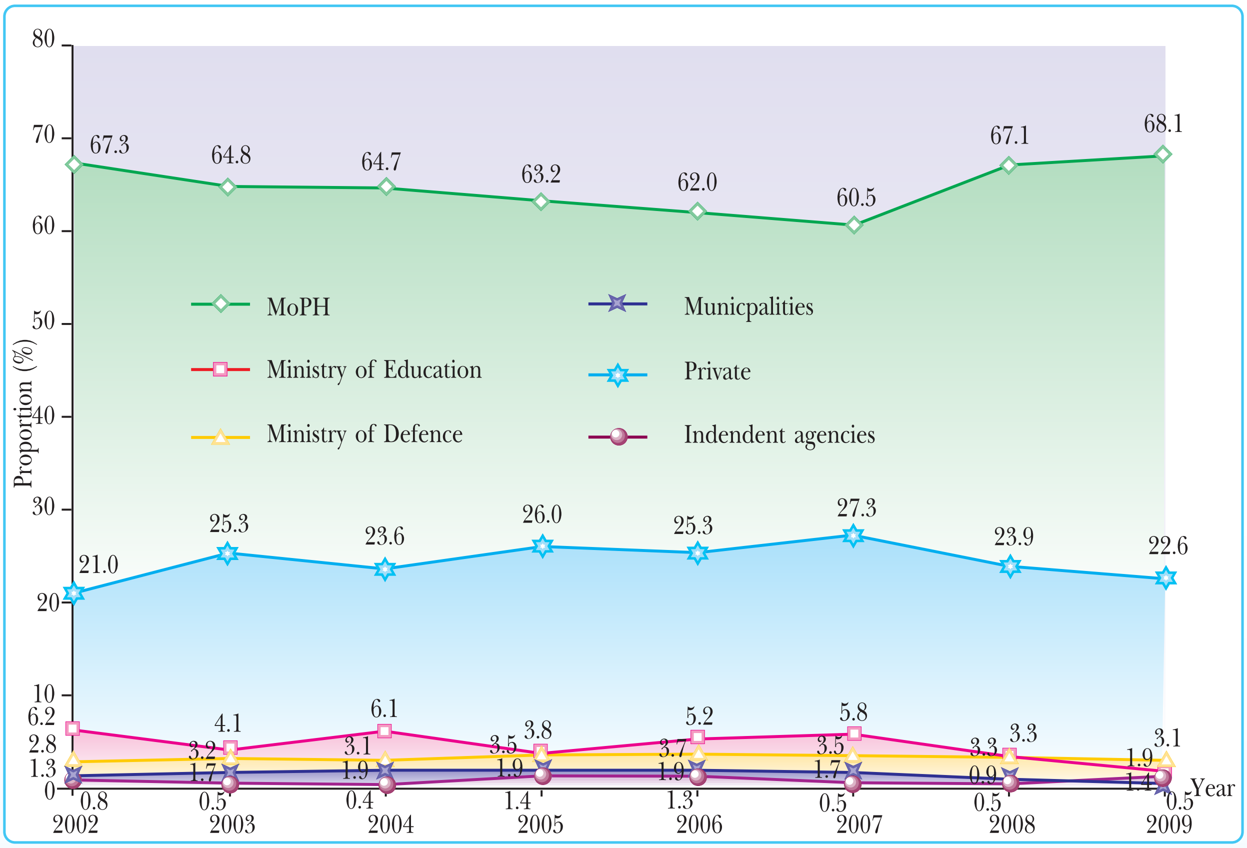


Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

5.3 Utilization of Health Services by Agency and Service Level

During the last seven-year period (2002–2009), the proportion of outpatients by agency of hospitals was highest for hospitals under MoPH or about two-thirds (65%) of all patients, followed by private hospitals with about one-fifth (24%) of all patients, and university hospitals (4%) (Figure 6.58). Similarly, the proportion of inpatients or admissions, for the same period, was highest in MoPH hospitals (73%), followed by private hospitals (20%) and university hospitals (3%) (Figure 6.59).

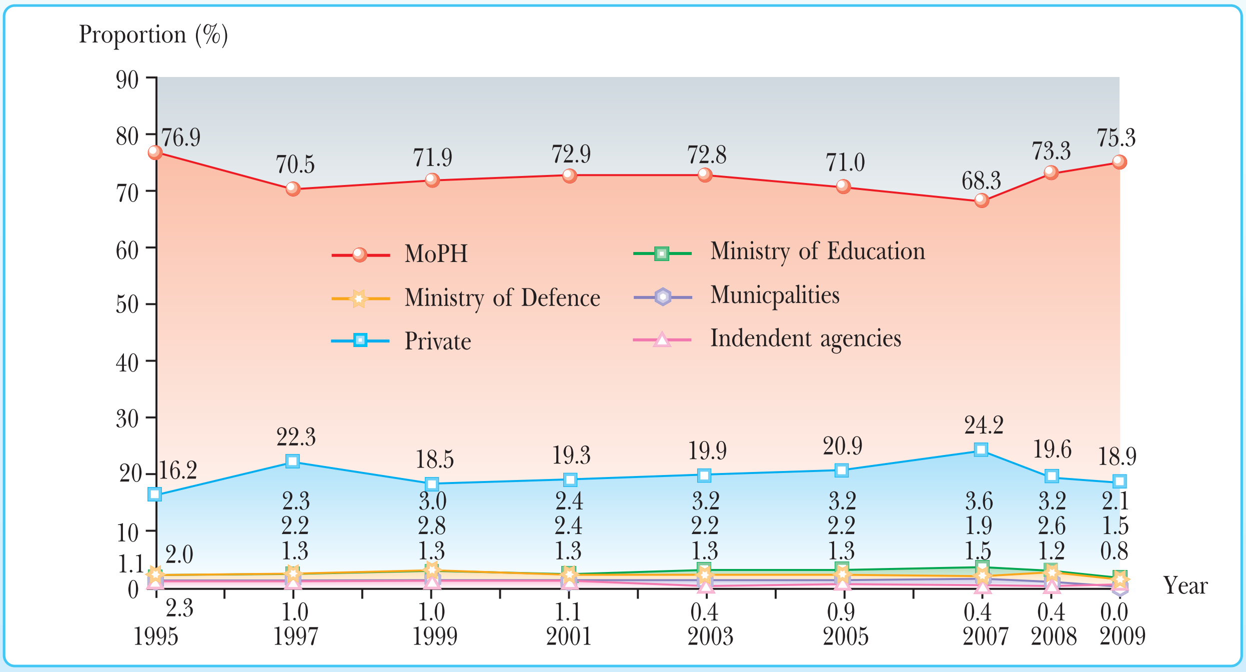
Figure 6.58 Proportions of outpatients (visits) by agency of hospitals, 2002–2009



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

Note: Data on coverage was incomplete.

Figure 6.59 Proportions of inpatients by agency of hospitals, 1995–2009

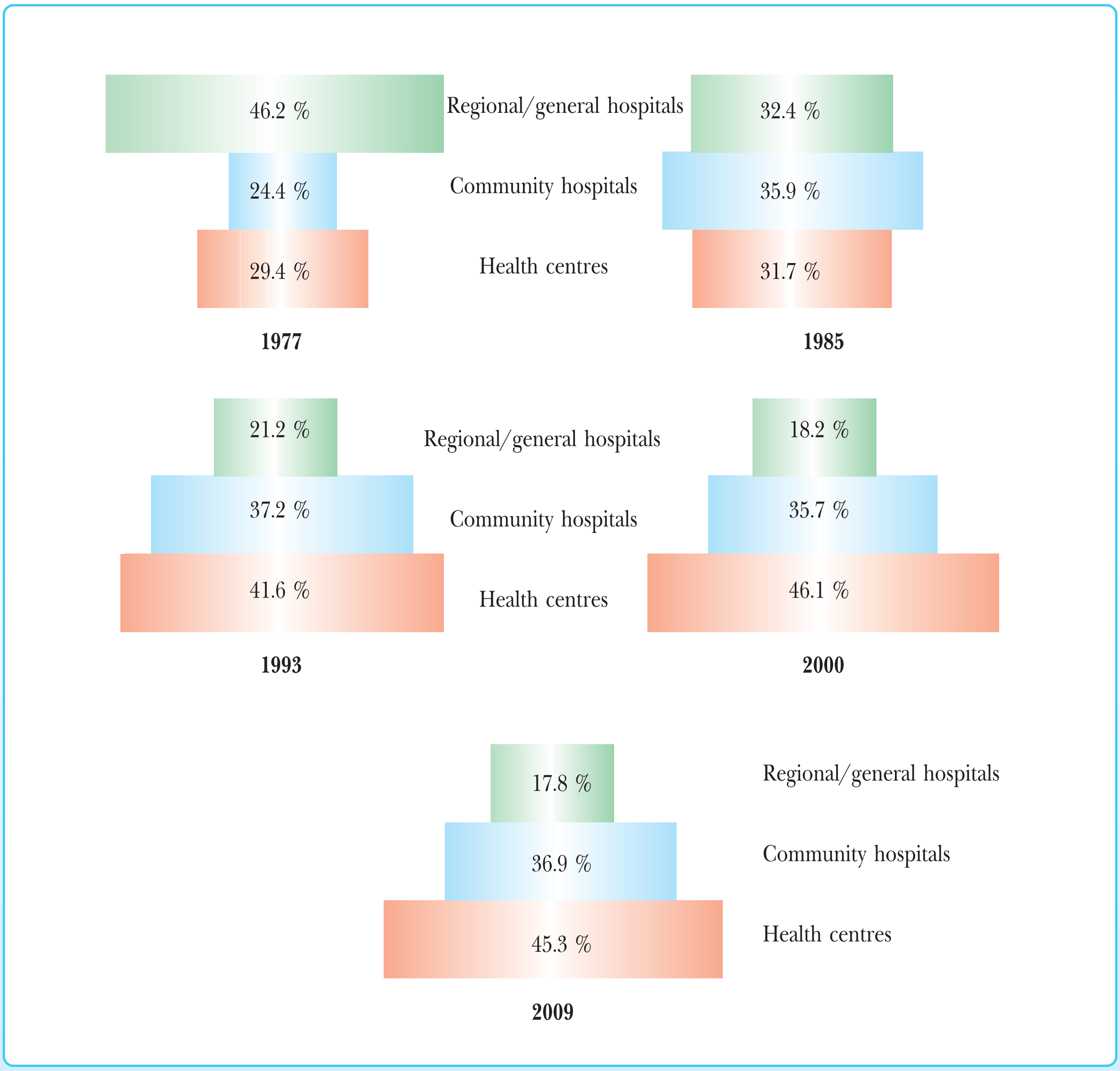


Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

Note: Data on coverage was incomplete.

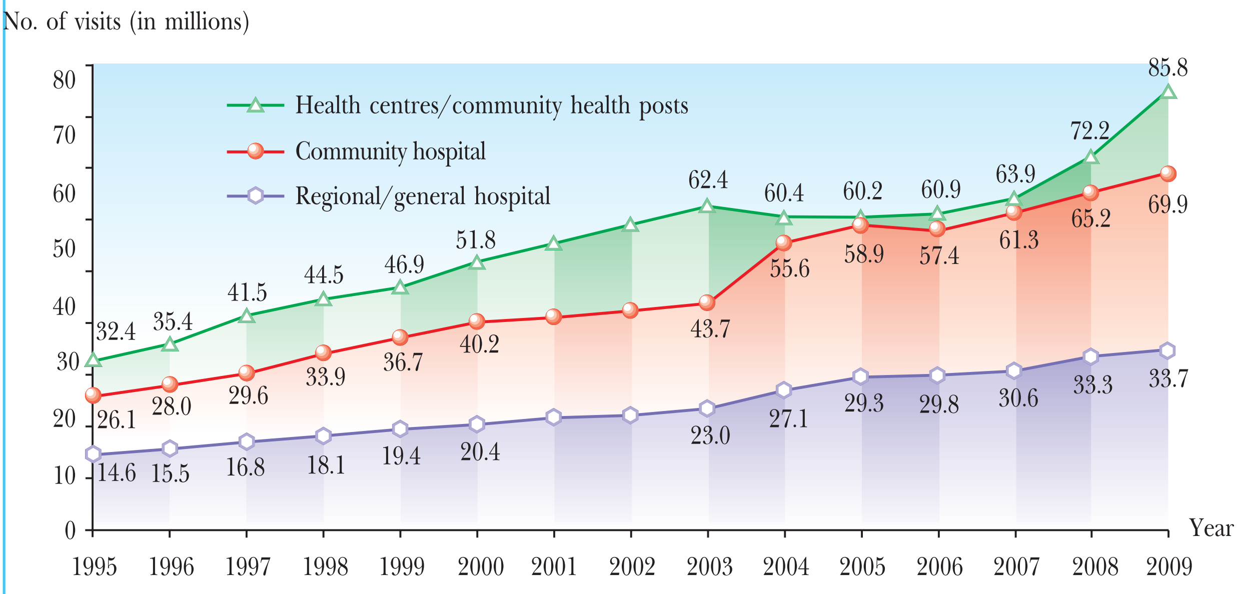
In analyzing the proportions of outpatient service utilization, including the services at subdistrict health centres, only in MoPH hospitals (community, general and regional hospitals) to see the trends in service utilization by level of health facilities, it was found that the major change that had occurred was the rising trend in the number of outpatient visits at the aforementioned hospitals, especially the increase rate was highest for subdistrict and community health centres followed by community hospitals. The increase was lowest for regional hospitals. So, the structure of patients is gradually changing from an inverted triangle to a regular triangle (Figures 6.60 and 6.61).

Figure 6.60 Proportions of outpatients by level of MoPH health facilities, 1977–2009



Source: Bureau of Policy and Strategy, MoPH.

Figure 6.61 Numbers of outpatients (OPD visits) by level of MoPH health facilities,1995–2009



Sources: Bureau of Policy and Strategy and Bureau of Health Service System Development, MoPH.

6. Efficiency and Quality of Health Service Delivery

6.1 Hospitalization

When analyzing the efficiency of hospitalization, or admission for 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 health-care costs. However, the severity of the outpatient will have to be taken into account and it is associated with the access to health care. 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 (7%), while the hospitals under other agencies have similar inpatient/outpatient rates (4%–5.5%), as shown in Table 6.22; and by region, it has been found that the Northeast and the South have the highest inpatient/outpatient rate (7.5%–7.8%), whereas Bangkok has the lowest rate (4.3%) (Table 6.23).

Table 6.22 Rate of admissions (inpatients/outpatients) by agency of hospitals, 2002–2009

Agency	Admission rate (percentage of inpatients in relation to outpatients)							
	2002	2003	2004	2005	2006	2007	2008	2009
MoPH	7.9	7.7	7.5	7.1	7.0	6.7	6.2	6.3
Ministry of Education	4.2	5.4	4.5	5.2	4.0	3.7	5.5	6.4
Ministry of Defence	8.6	4.7	4.7	4.0	3.2	3.2	4.4	2.7
Other ministries	4.6	4.4	9.7	7.1	3.0	2.4	2.7	3.2
Municipalities	5.4	4.7	4.7	5.2	4.1	4.3	3.8	0.3
Private sector	6.3	5.4	5.5	5.1	5.1	5.2	4.6	4.8
Independent agencies	4.2	5.1	5.6	4.3	4.2	4.9	3.7	3.4

Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.
Note: Data on coverage was incomplete.

Regarding efficiency, a high admission rate may be interpreted as low efficiency. But actually, such a high rate may result from differences in access to health care, which means that the outpatients at hospitals in the Northeast and the South may be more seriously ill than those in other regions. So they will need a longer hospital stay resulting from their lower accessibility compared to other regions.

Table 6.23 Rate of admissions (inpatients/outpatients) by region, 2001–2009

Region	Admission rate (percentage of inpatients in relation to outpatients)								
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bangkok	5.6	5.2	4.6	4.4	4.3	3.7	4.1	3.5	3.2
Central	7.9	7.3	6.3	6.6	6.2	5.9	5.5	4.6	5.2
North	9.3	7.9	7.8	7.3	6.6	6.8	6.4	6.1	6.0
South	8.2	8.1	7.8	7.0	7.4	7.6	7.2	7.7	7.2
Northeast	9.2	8.1	8.2	8.2	7.7	7.4	7.3	7.3	6.8
Total	**8.0**	**7.3**	**6.8**	**6.7**	**6.3**	**6.1**	**5.9**	**5.7**	**5.7**

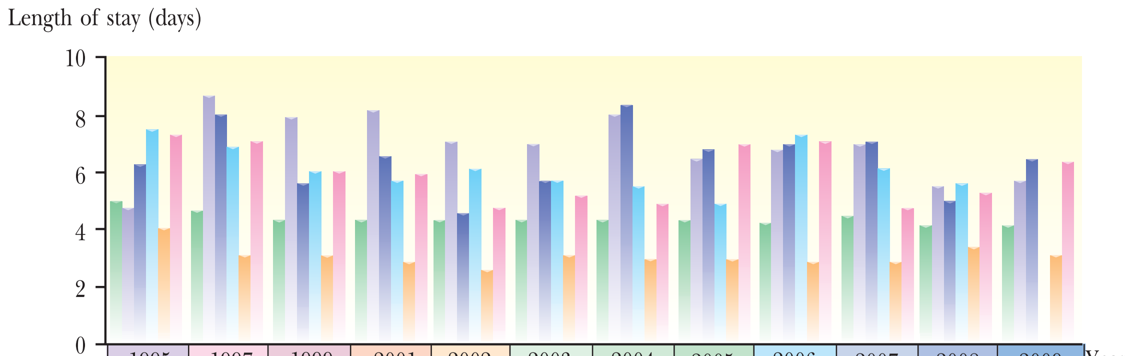
Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.
Note: Data on coverage was incomplete.

6.2 Average Length of Stay of Inpatients

An analysis of the average 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 long length of stay will result in a higher treatment cost, meaning less efficient treatment.

Data from the 1995–2009 health resources surveys revealed that private hospitals had the shortest average length of stay of 3 days, while those under universities and the Ministry of Defence had the longest, approximately 6.3–6.7 days (Figure 6.62). Such characteristics might result from the severity of patients; hospitals with a high level of efficiency tend to admit patients with complex illnesses resulting in a longer length of stay, especially in university hospitals.

Figure 6.62 Average length of stay of inpatients by agency of hospitals, 1995–2009



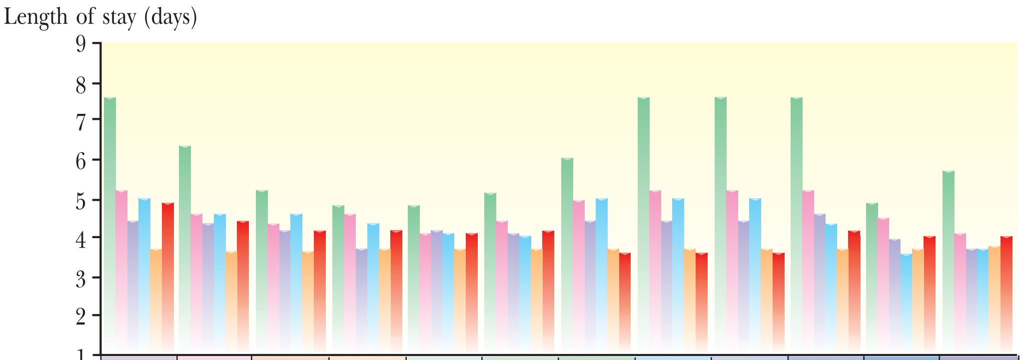
	1995	1997	1999	2001	2002	2003	2004	2005	2006	2007	2008	2009
MoPH	4.9	4.6	4.3	4.3	4.3	4.3	4.3	4.3	4.2	4.4	4.1	4.1
Ministry of Education	4.7	8.6	7.9	8.1	7.1	6.9	8.0	6.4	6.7	7.0	5.5	5.7
Ministry of Defence	6.2	8.0	5.6	6.5	4.5	5.7	8.3	6.7	7.0	7.1	5.0	6.4
Municipalities	7.5	6.8	6.0	5.7	6.1	5.7	5.5	4.8	7.3	6.1	5.6	NA
Private	4.0	3.1	3.1	2.8	2.5	3.1	2.9	3.0	2.8	2.8	3.4	3.1
Independent agencies	7.3	7.1	6.0	5.9	4.7	5.2	4.8	6.9	7.1	4.7	5.3	6.3

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

Note: Data on coverage was incomplete.

A regional analysis reveals that the length of stay for Bangkok is longest (5.5 days), while it is shortest (3.7 days) for the Northeast (Figure 6.63). Factors related to hospital capacity might make high-capacity hospitals in Bangkok admit patients with complex illnesses and longer hospitalization. The same is true for the provinces that are the centres of regions and some provinces in the Central region, the North and the South (Figure 6.64).

Figure 6.63 Average length of stay of inpatients by region 1995-2009

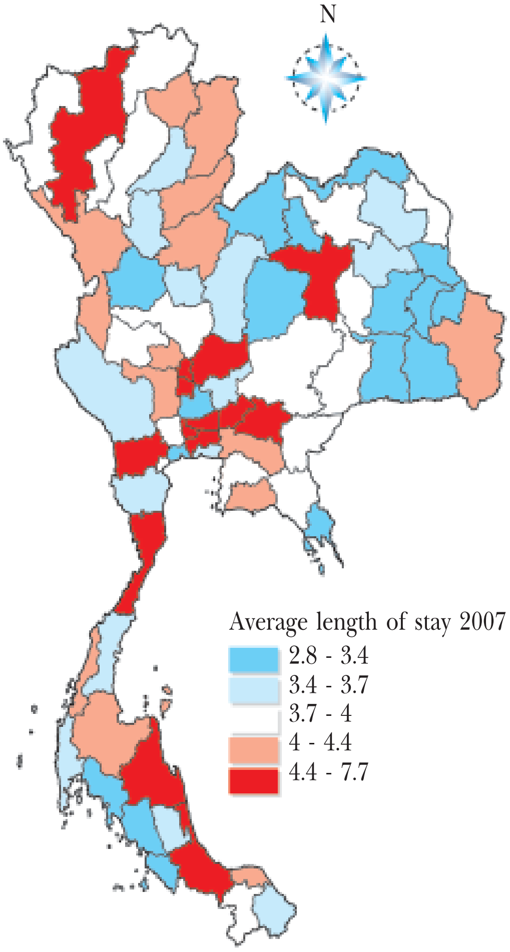


Year	1995	1997	1999	2001	2002	2003	2004	2005	2006	2007	2008	2009
Bangkok	7.6	6.3	5.2	4.8	4.8	5.1	6.0	5.1	5.4	4.6	4.9	5.7
Central	5.2	4.6	4.3	4.6	4.1	4.4	4.4	4.3	4.2	4.2	4.5	4.1
North	4.4	4.3	4.2	3.7	4.2	4.1	4.1	4.3	4.1	4.6	3.9	3.7
South	5.0	4.6	4.6	4.3	4.1	4.0	4.1	4.1	3.9	4.3	3.5	3.7
Northeast	3.7	3.6	3.6	3.7	3.7	3.7	3.6	3.7	3.7	3.7	3.7	3.8
Total	4.9	4.4	4.2	4.2	4.1	4.2	4.3	4.2	4.2	4.2	4.0	4.0

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

Note: Data on coverage was incomplete.

Figure 6.64 Geographical illustration of average length of stay by province, 2007



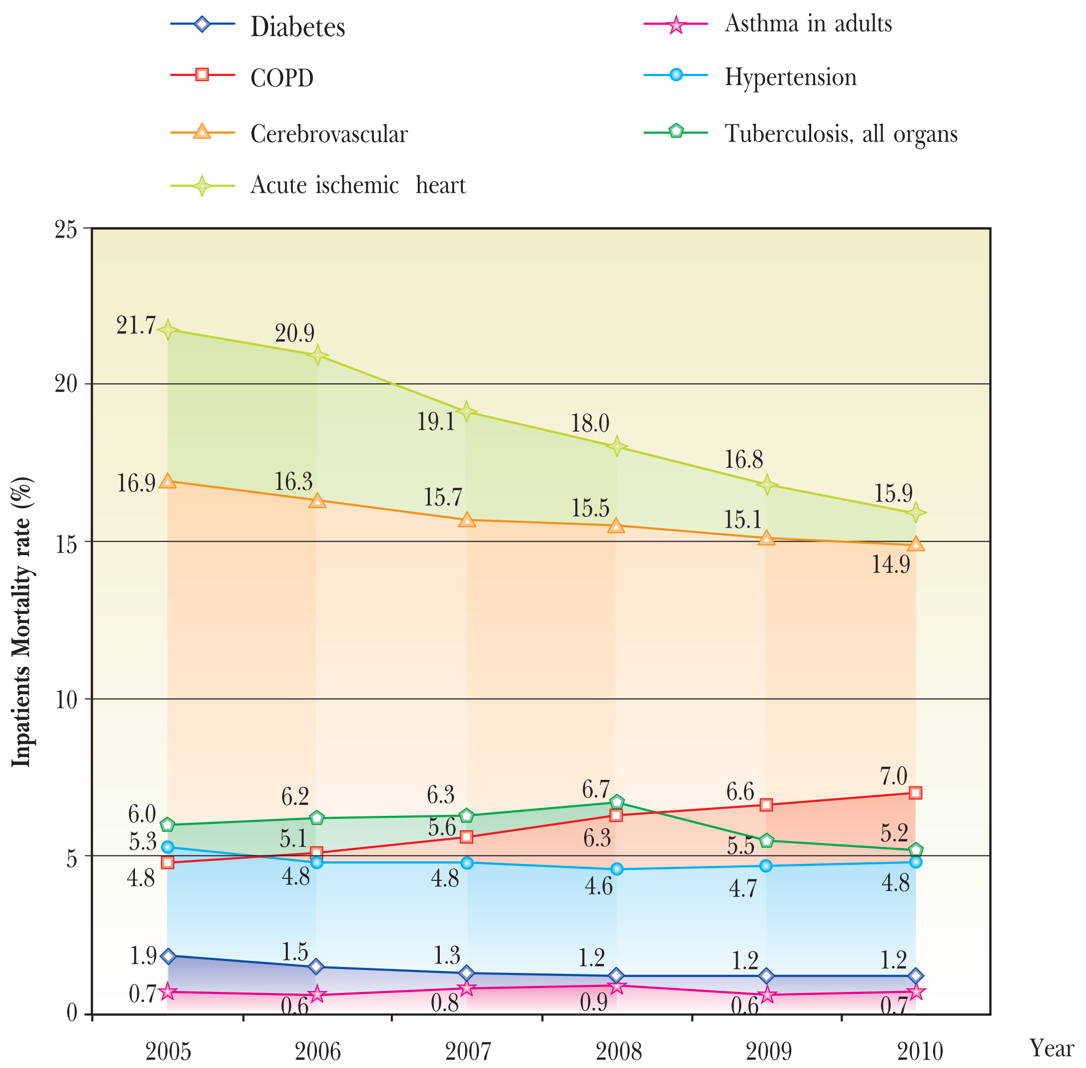
Source: Report on Health Resources, Bureau of Policy and Strategy, MoPH.

6.3 Inpatient Mortality Rate

The mortality rate of inpatients is, to a certain extent, an indicator of inpatient care quality. If there is an assumption that the level of patient severity does not change, the better quality of care will help improve the treatment outcome, i.e. a drop in patient mortality.

According to the inpatient database of the National Health Security Office, between 2005 and 2010, the mortality rate decreased for most patients with chronic diseases such as ischemic heart disease, cerebrovascular disease, chronic obstructive pulmonary disease (COPD), diabetes, reflecting a better access to and better medical care which results in a lower chance of dying (Figure 6.65).

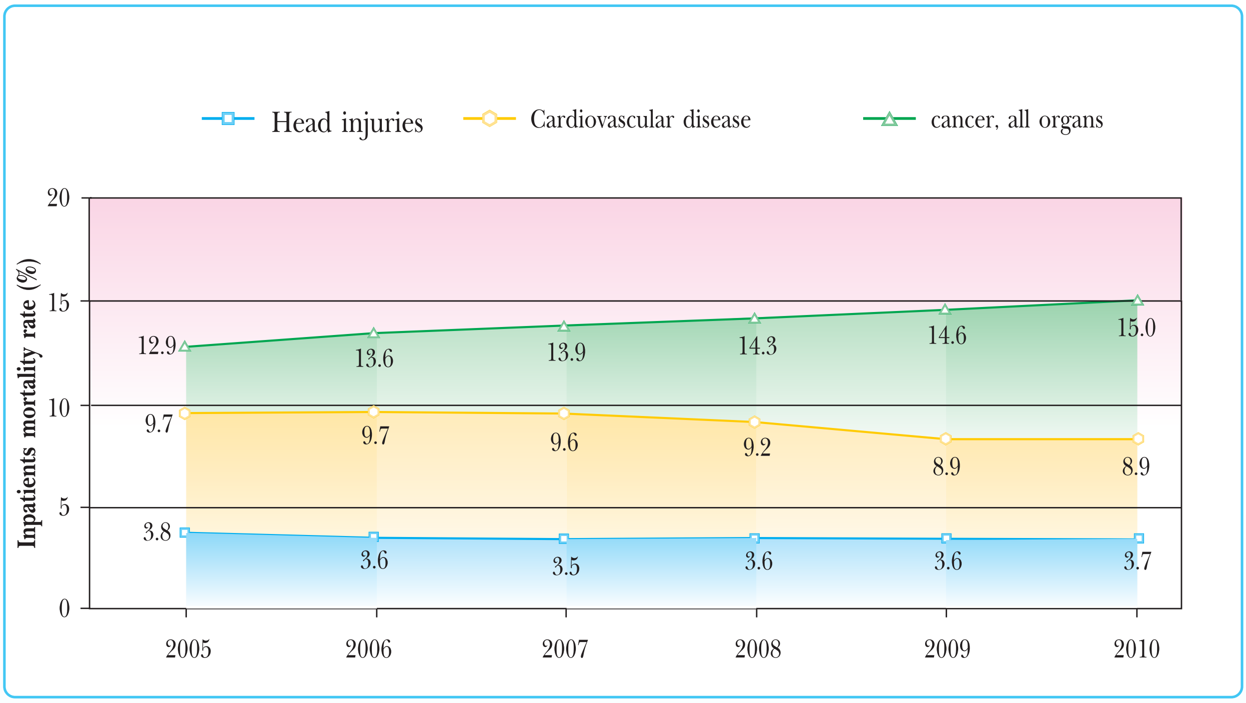
Figure 6.65 Mortality rates of inpatients with diabetes, hypertension, cerebrovascular disease, ischemic heart disease, COPD, asthma and tuberculosis, 2005–2010



Source: Inpatient database, National Health Security Office, 2005–2010.

However, for cancer, the inpatient mortality rate has been on a rising trend from 12.9% in 2005 to 15.0% in 2010, probably due to disease severity and the trend in getting hospitalization or home care for terminally ill patients. But the rates for cardiovascular disease and head injuries slightly decreased (Figure 6.66), reflecting the quality of medical care which can be further improved in parallel with the quality of disease prevention and control to prevent the illnesses from getting more severe, which will help improve the chance of survival.

Figure 6.66 Mortality rates of inpatients with head injuries, cardiovascular disease and cancer, 2005–2010



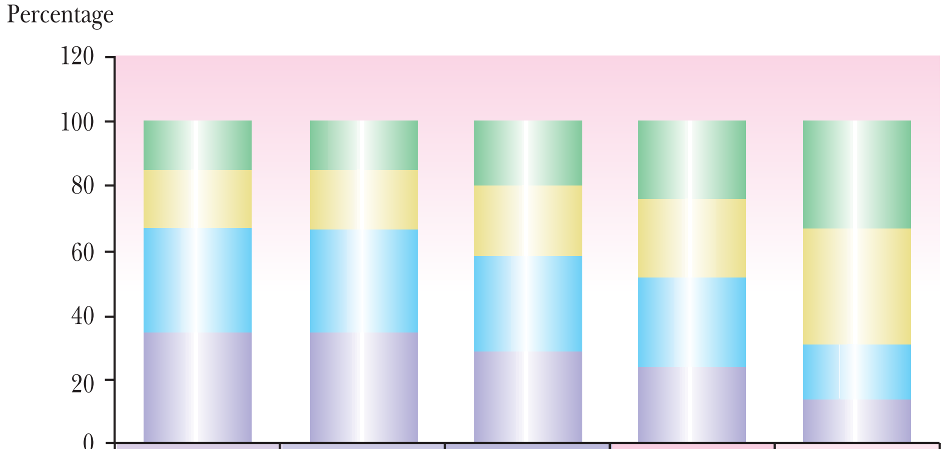
Source: Inpatient database, National Health Security Office, 2005–2010.

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 2009 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 (34%), while the richest group chose private hospitals the most (33.9%). That reflects the chances of choosing services; private hospitals are attended mostly by the high-income group and so are general/regional hospitals (Figure 6.67). The differences in the health service selection opportunity might affect the quality of services according to the capacity of health facilities, especially if the illness needs to be treated at a high-capacity facility.

Figure 6.67 Percentage of health facility selection when ill by level of household's average monthly income, 2009

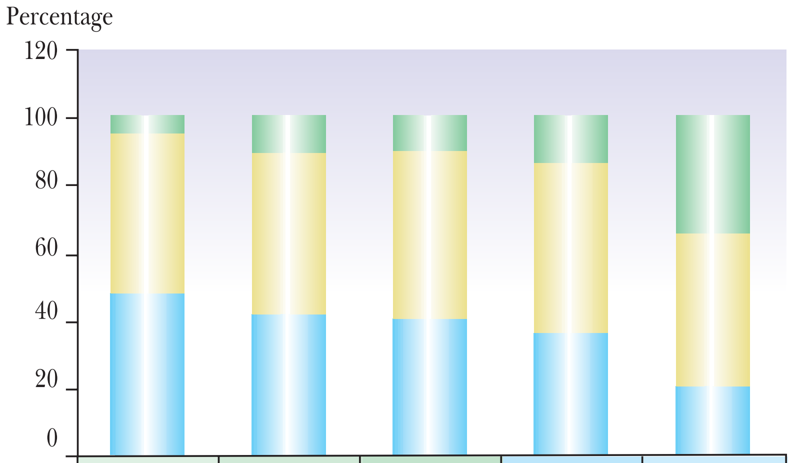


	Poorest	Poor	Middle income	Rich	Richest
Private hospitals	15.1	15.3	19.2	23.9	33.9
Other state hospitals	17.9	18.4	22.6	24.9	35.3
Community hospitals	32.6	31.7	29.0	27.4	17.2
Health Centres	34.4	34.7	29.1	23.8	13.6

Source: Suphon Limwattananond and Vuthiphan Vongmongkol. Analysis of data from Health and Welfare Survey, 2009. National Statistical Office.

For cases requiring hospitalization, the characteristics are similar, i.e. the poorest group would be admitted to community hospitals the most (48.4%), while the richest group would have the highest chance of being admitted to a private hospital (33.7%), compared with other income groups. However, hospitalization at general and regional hospitals is not much different; all income groups have a 46% to 50% chance of being hospitalized (Figure 6.68), 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 6.68 Percentage of health facility selection when hospitalized by level of household's average monthly income, 2009



	Poorest	Poor	Middle income	Rich	Richest
Private hospitals	4.4	10.0	9.4	12.9	33.7
Other state hospitals	47.2	47.7	50.3	49.9	45.6
Community hospitals	48.4	42.3	40.3	37.2	20.8

Source: Suphon Limwattananond and Vuthiphan Vongmongkol. Analysis of data from Health and Welfare Survey, 2009. National Statistical Office.

Besides, a comparison of health service utilization according to patients' entitlement reveals that the implementation of the universal health-care policy has resulted in the people's access to and attendance of health facilities when ill increasing from 49% in 1991 to 75.3% in 2005 and 68.5% in 2009. For the group without any health insurance, their chance of utilizing health facilities has increased from 47% in 1991 to 66.6% in 2005 and 55.1% in 2009; 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 6.24).

Table 6.24 Morbidity rates and proportions of utilization of health facilities by type of medical welfare scheme, 1991, 1996, 2001, 2003–2007 and 2009

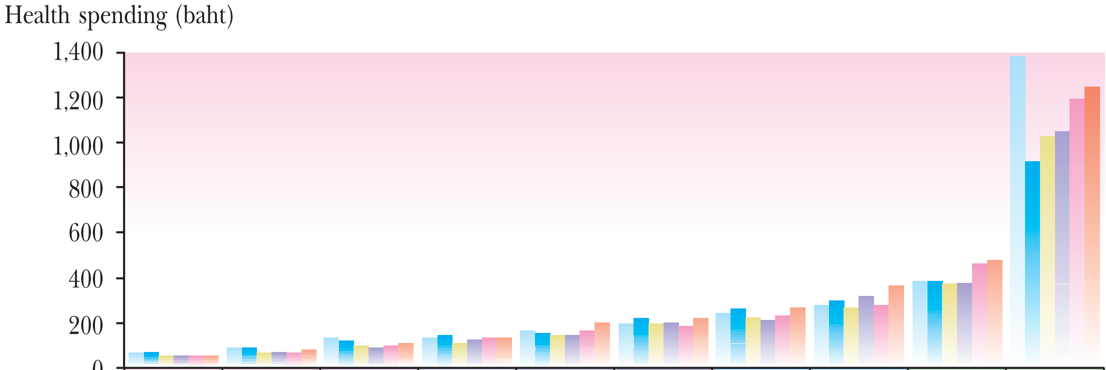
Welfare scheme	Morbidity rate (episodes/person/yr)									Percentage of utilizing health facilities								
	1991	1996	2001	2003	2004	2005	2006	2007	2009	1991	1996	2001	2003	2004	2005	2006	2007	2009
No health insurance	5.7	3.5	3.3	4.2	3.2	3.4	2.6	2.5	4.2	47	62	61	56	60.6	66.6	55.1	56.5	55.1
Universal (30-baht) health-care scheme	-	-	3.4	5.0	5.1	4.8	3.4	3.4	5.8	-	-	62	72	72.8	76.5	72.1	68.5	68.6
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	4.9	4.8	4.5	4.1	3.9	6.2	60	71	75	71	73.1	75.1	75.8	71.4	77.6
Social security	-	2.5	2.5	3.0	3.0	2.7	1.9	1.8	3.8	-	58	66	67	63.0	68.6	66.8	62.7	61.9
Private insurance	4.4	3.5	3.0	3.5	1.9	2.1	2.4	2.1	3.8	42	72	65	67	60.2	77.0	50.6	65.3	52.7
Total	**5.9**	**4.0**	**3.9**	**4.7**	**4.7**	**4.4**	**3.3**	**3.2**	**5.6**	**49**	**65**	**70**	**71**	**71.6**	**75.3**	**71.3**	**68.0**	**68.5**

Sources: Viroj Tangcharoensathien et al. An analysis of data from the Reports on Health and Welfare Surveys, 1991, 1996 and 2001–2009. National Statistical Office.

7.2 Equity in Health-care 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 health-care policy, household health spending has decreased; health spending among the poor (1st–4th decile groups) dropped by 3–27%. However, it is noteworthy that, for the richest (10th decile) group, their health spending decreased by 10% (Figure 6.69).

Figure 6.69 Comparison of average household health spending in 10 decile groups of households before and after the launch of the universal health-care scheme

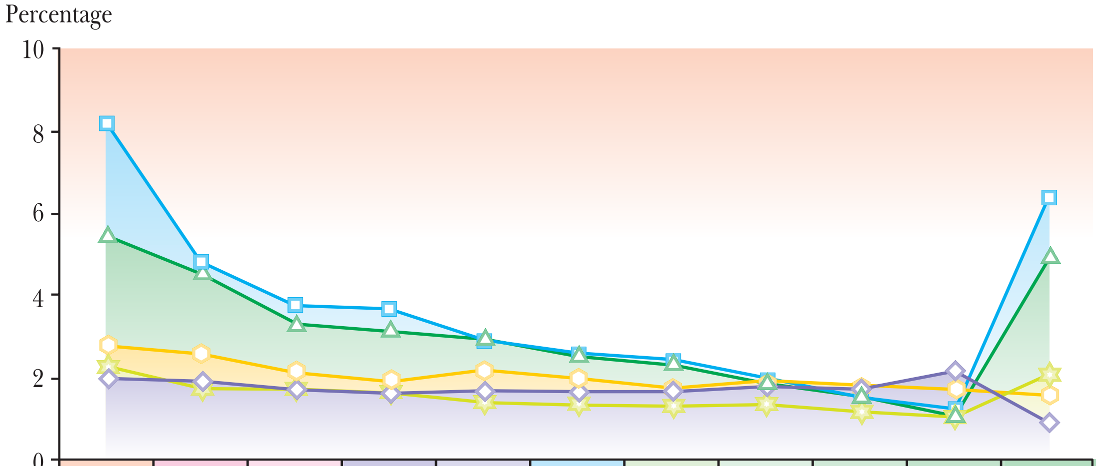


	1	2	3	4	5	6	7	8	9	10	Decile group
1996	65	90	132	135	164	191	241	274	384	1,380	
2000	65	88	117	139	155	219	255	300	382	913	
2002	45	67	93	105	139	192	217	267	373	1,024	
2004	52	68	89	125	144	200	213	318	369	1,044	
2007	44	67	97	136	161	184	224	278	457	1,190	
2009	47	79	104	138	200	215	267	366	479	1,248	

Source: Suphon Limwattananond and Vuthiphan Vongmongkol. Analysis of data from households' socio-economic survey, 1996–2009. National Statistical Office.

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 6.70). After the government launched the health insurance scheme for various groups of underprivileged people and the universal health-care 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-fold in 1992 to 0.9-fold in 2008

Figure 6.70 Percentage of health spending in relation to household income by decile group of income, 1992, 1996, 2002, 2004 and 2008

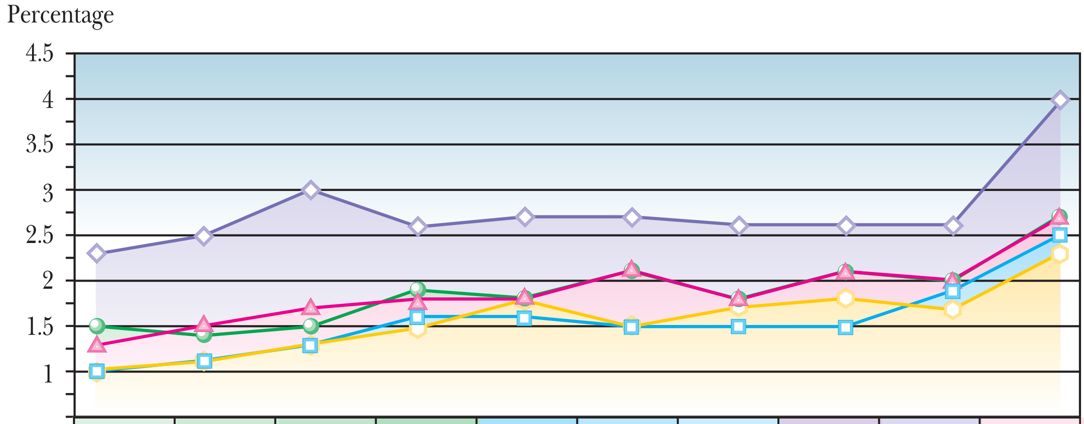


	1	2	3	4	5	6	7	8	9	10	1st-10th Decile difference
1992	8.17	4.82	3.74	3.65	2.87	2.57	2.45	1.99	1.64	1.27	6.4
1996	5.46	4.58	3.32	3.16	2.93	2.52	2.36	1.97	1.57	1.10	5.0
2002	2.77	2.59	2.14	1.90	2.20	1.98	1.74	1.92	1.83	1.71	1.6
2004	2.23	1.77	1.75	1.62	1.40	1.37	1.32	1.35	1.15	1.07	2.1
2008	2.05	1.95	1.69	1.60	1.74	1.68	1.66	1.83	1.74	2.18	0.9

Source: Suphon Limwattananond and Vuthiphan Vongmongkol. Analysis of data from households' socio-economic survey, 1992–2009. National Statistical Office.

However, an recent analysis of the differences of people's groups by their socio–economic status was undertaken based on the household spending rather than household income and a comparison was made on the proportion of their health spending with household income, i.e. the proportion of health spending in relation to household spending, rather than health spending in relation to household income. Such a method of calculation will be a comparison of the burden of health spending in relation to overall household spending. It was found that the poorest group's burden of health spending in relation to household spending was 2.3% in 1996, which decreased steadily to 1% in 2009. Similar downward trends were noted for other income groups, i.e. the richest group had a decline of health spending in relation household spending from by 4% in 1996 to 2.3% in 2009 (Figure 6.71 and Table 6.25); and the rich group had a higher proportion of health/household spending, reflecting the fact that the universal health-care scheme has created equity in spending by protecting the poor, especially when attending a health facility without a too-high health spending burden.

Figure 6.71 Percentage of health spending in relation to household spending by decile group, 1996, 2002, 2004, 2007 and 2009



Decile	1	2	3	4	5	6	7	8	9	10
1996	2.3	2.5	3.0	2.6	2.7	2.7	2.6	2.6	2.6	4.0
2002	1.3	1.5	1.7	1.8	1.8	2.1	1.8	2.1	2.0	2.7
2004	1.5	1.4	1.5	1.9	1.8	2.1	1.8	2.1	2.0	2.7
2007	1.0	1.1	1.3	1.6	1.6	1.5	1.5	1.5	1.9	2.5
2009	1.0	1.1	1.3	1.5	1.8	1.5	1.7	1.8	1.7	2.3

Source: Suphon Limwattananond and Vuthiphan Vongmongkol. Analysis of data from households' socio-economic survey, 1996–2009. National Statistical Office.

Table 6.25 Proportion of health spending in relation to household income, based on household spending, by decile group, 1996–2009

Year	Proportion of spending in various income decile group (based on household spending)										1st–10th decile group difference
	1	2	3	4	5	6	7	8	9	10	
1996	2.3	2.5	3.0	2.6	2.7	2.7	2.6	2.6	2.6	4.0	0.6
1998	1.5	1.7	2.0	2.3	2.4	2.4	2.6	2.5	3.0	2.6	0.6
2000	2.1	2.2	2.5	2.6	2.5	2.9	2.7	2.6	2.4	2.7	0.8
2002	1.3	1.5	1.7	1.8	1.8	2.1	2.0	2.0	2.1	2.9	0.4
2004	1.5	1.4	1.5	1.9	1.8	2.1	1.8	2.1	2.0	2.7	0.6
2006	1.1	1.6	1.5	1.6	1.8	1.8	1.8	1.6	2.2	2.7	0.4
2007	1.0	1.1	1.3	1.6	1.6	1.5	1.5	1.5	1.9	2.5	0.4
2008	1.0	1.1	1.3	1.5	1.4	1.6	1.4	1.5	1.6	2.2	0.5
2009	1.0	1.1	1.3	1.5	1.8	1.5	1.7	1.8	1.7	2.3	0.4

Source: Suphon Limwattananond and Vuthiphan Vongmongkol. Analysis of data from households' socio-economic survey, 1996–2009. National Statistical Office.

In addition, it was found that, in 2004, most people including the low-income group had a low proportion of health spending in relation to household income, i.e. 82% of the poorest had a health spending lower than 5% of their household income and 94% of the richest also had a health spending lower than 5% of their household income. In 2008, a larger proportion of the poorest had the health spending lower than 5%, while a smaller proportion of the richest had the health spending lower than 5%. That means the poor had a lower burden of spending; in other words, the proportion of people spending less than 5% increased and such a proportion was close to that of the richest, i.e. 90% of households in each group (Table 6.26).

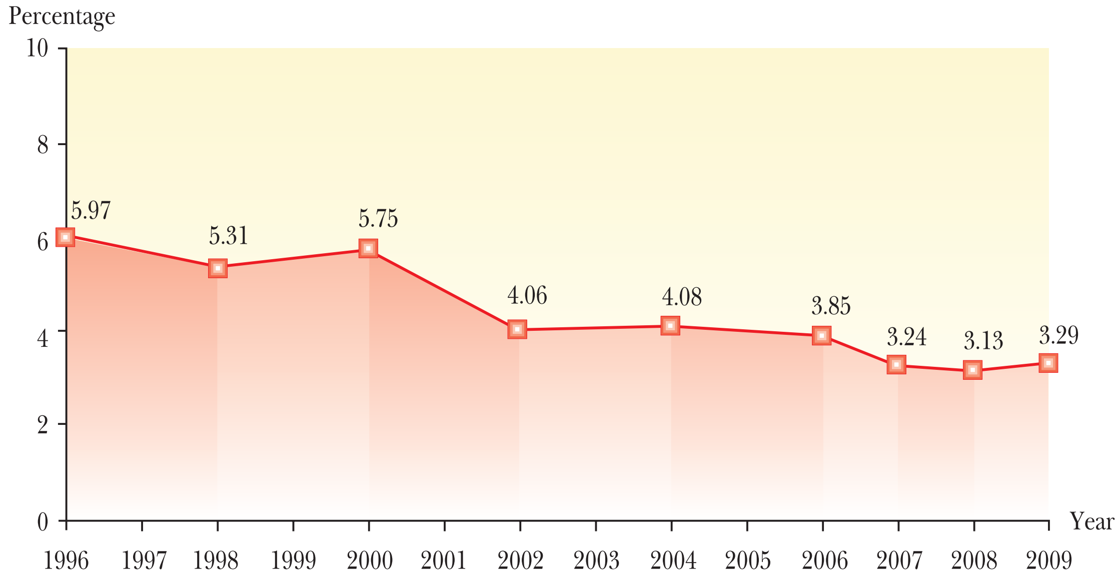
Table 6.26 Percentage of households classified by percentage of household health spending in 10 decile groups, 2004 and 2008

Decile	Health spending as percentage of household income													
	0 - 5 %		6 - 10 %		11 - 20 %		21 - 30 %		31 - 40 %		41 - 50 %		Over 50 %	
	2004	2008	2004	2008	2004	2008	2004	2008	2004	2008	2004	2008	2004	2008
1	82.2	89.1	7.3	4.5	4.7	3.7	1.2	1.4	0.3	0.7	1.0	0.3	0.8	0.3
2	91.4	89.6	5.2	5.6	1.9	2.7	0.7	1.3	0.3	0.4	0.4	0.2	0.4	0.1
3	92.2	90.9	4.6	5.2	2.2	2.7	0.3	0.6	0.1	0.5	0.1	0.1	0.5	0.0
4	92.2	90.1	5.0	6.2	1.7	2.4	0.4	0.7	0.3	0.3	0.2	0.2	0.2	0.1
5	92.2	89.7	4.8	5.8	1.9	2.2	0.4	1.2	0.3	0.5	0.2	0.3	0.2	0.2
6	92.5	91.2	4.7	5.0	1.8	2.4	0.6	0.8	0.2	0.3	0.04	0.1	0.1	0.1
7	94.2	92.3	3.1	4.2	1.7	1.7	0.4	1.1	0.2	0.5	0.03	0.2	0.4	0.2
8	94.6	91.2	2.9	5.0	2.0	2.4	0.3	0.5	0.1	0.6	0.1	0.1	0.03	0.3
9	94.5	91.0	2.8	5.1	1.6	2.8	1.0	0.5	0.02	0.3	0.0	0.2	0.1	0.2
10	94.0	89.2	3.9	5.9	1.5	2.6	0.4	0.8	0.01	0.7	0.0	0.3	0.1	0.4
Total	**92.0**	**90.4**	**4.4**	**5.3**	**2.1**	**2.6**	**0.6**	**0.9**	**0.2**	**0.5**	**0.1**	**0.2**	**0.3**	**0.2**

Source: Suphon Limwattananond and Vuthiphan Vongmongkol. Analysis of data from households' socio-economic survey, 1996–2009. National Statistical Office.

When considering the proportion of households facing catastrophic health spending (health spending more than 10% of overall household spending), it was found that, before the launch of the universal health-care scheme, such a proportion had a rising trend, but with the universal health care, such a proportion dropped from 5.97% in 1996 to 3.29% in 2009, and the disparity between the richest and the poorest households declined from 0.57-fold in 1996 to 0.25-fold in 2009 (Figure 6.72 and Table 6.27).

Figure 6.72 Proportion of households facing catastrophic health spending, 1996–2009



Source: Vuthiphan Vongmongkol. Analysis of data from households' socio-economic survey, 1996–2009. National Statistical Office.

Note: A household facing catastrophic health spending means a household that has a health spending of 10% or more of the health household spending.

Table 6.27 Proportion of households facing catastrophic health spending based on household spending by decile group, 1996–2009

Year	Income decile (based on household spending)											1st–10th decile group difference
	1	2	3	4	5	6	7	8	9	10	Total	
1996	4.62	5.28	7.27	5.15	6.06	5.63	5.85	5.92	5.72	8.07	5.90	0.57
1998	3.01	3.00	4.28	4.48	4.95	5.52	6.37	6.13	8.52	6.80	5.31	0.44
2000	5.19	4.57	5.52	5.99	5.61	6.40	6.03	6.26	4.85	7.06	5.75	0.74
2002	1.93	2.33	3.13	3.10	4.06	4.68	4.60	4.82	5.00	6.99	4.06	0.28
2004	2.87	2.25	2.53	4.23	3.75	4.59	3.74	4.54	5.14	7.17	4.08	0.40
2006	1.62	3.32	2.57	3.22	4.01	3.68	4.54	3.79	4.97	6.81	3.85	0.24
2007	1.88	1.66	2.20	2.76	3.74	3.21	3.19	3.32	4.53	5.87	3.24	0.32
2008	1.77	2.21	2.72	3.20	2.60	3.80	3.07	3.30	3.72	4.95	3.13	0.36
2009	1.37	1.52	2.54	2.97	4.50	2.96	3.72	4.00	3.91	5.41	3.29	0.25

Source: Vuthiphan Vongmongkol. Analysis of data from households' socio-economic survey, 1996–2009. National Statistical Office.

Note: A household facing catastrophic health spending means a household that has a health spending of 10% or more of the health household spending.