3.2 Medical and Health Technologies

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

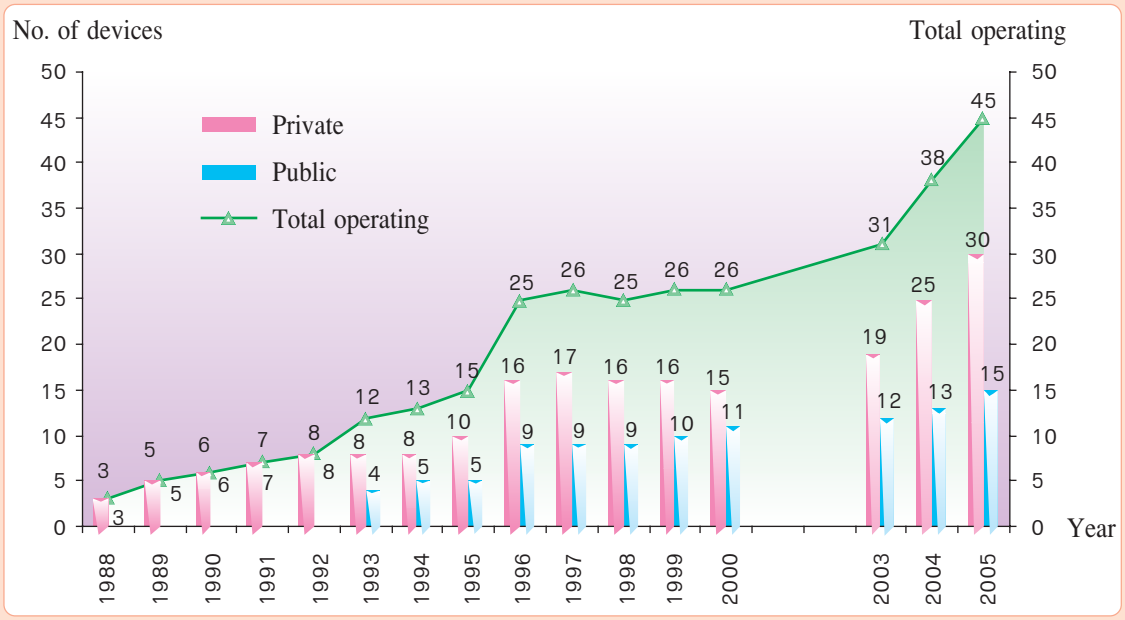
Table 6.12 Number and distribution of important medical devices

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

Sources: [1] Division of Radiology and Medical Devices, Department of Medical Services, 2006.
[2] Report on Health Resources. Bureau of Policy and Strategy, MoPH, 2007.

Note: Figures in ( ) are percentages.

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

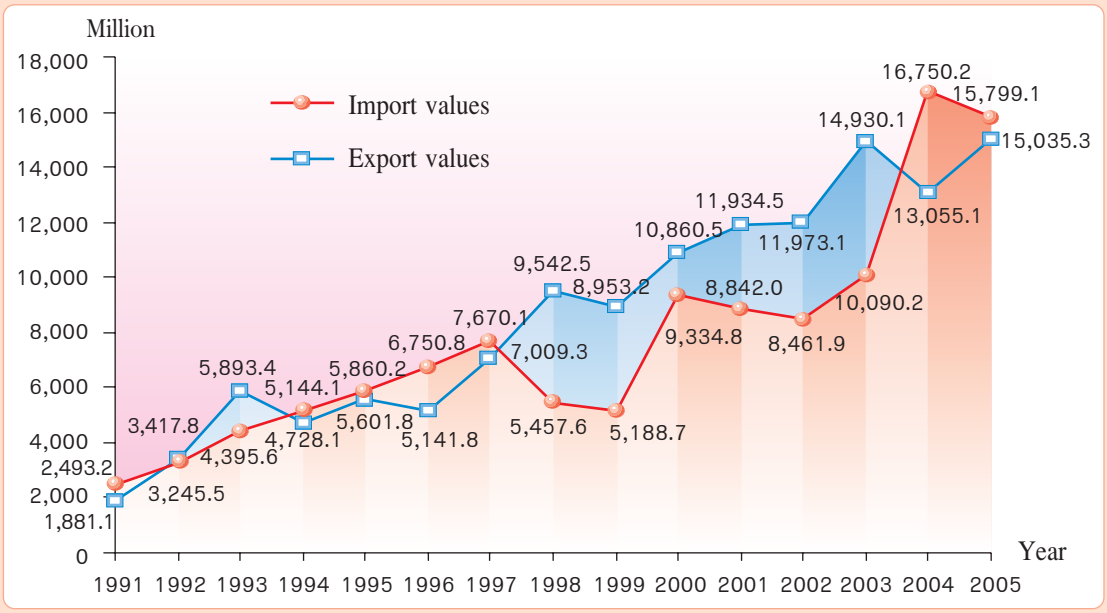


Sources: Data for 1988-1999 were derived from Piya Hanvoravongchai, 1999.
Data for 2003-2005 were derived from the Radiology and Medical Devices Division, Department of Medical Sciences, MoPH, 2006.

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

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

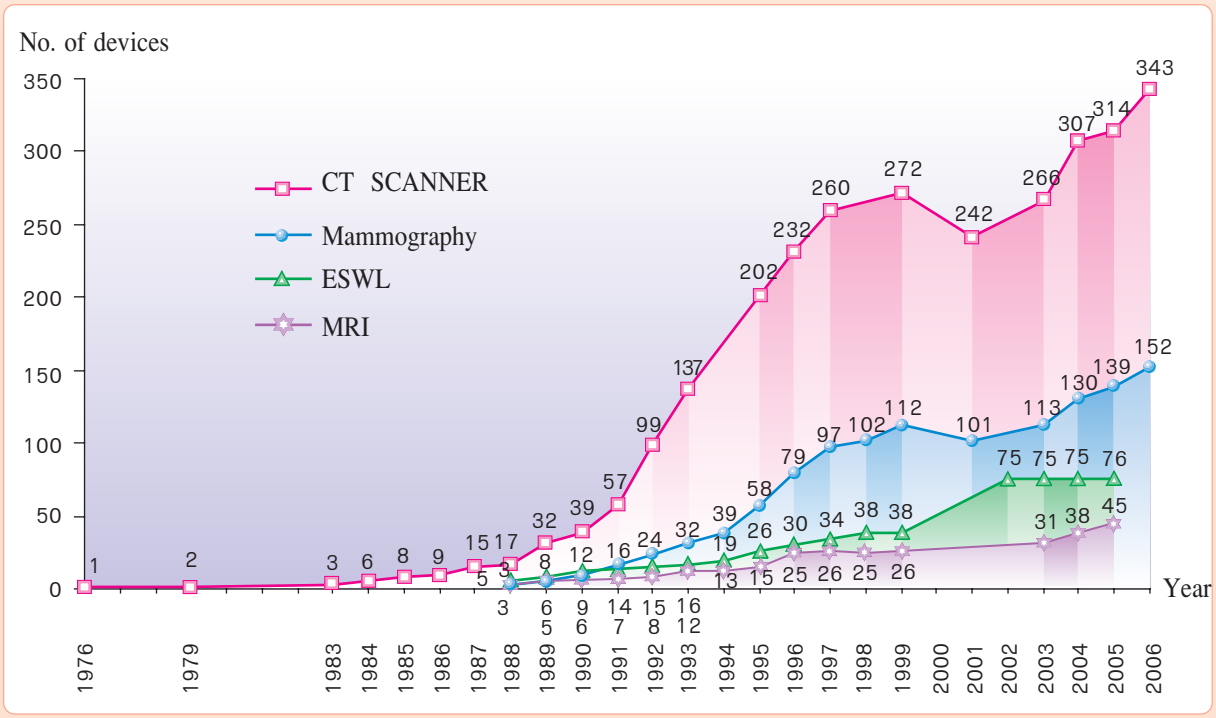
Figure 6.61 Values of imported and exported medical devices, Thailand, 1991-2005



Source: Department of Customs, Ministry of Finance.

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

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



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

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

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

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

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

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

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

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

Sources: For 1994, data were derived from Viroj Tangcharoensathien et al. Diffusion of Medical Equipment in Thailand, 1995.
For 1998 and 2003-2006, data were derived from the Division of Radiology and Medical Devices, Department of Medical Sciences.
For 1999, data were derived from Wongduern Jindawatthana et al. High-cost Medical Devices in Thailand: Distribution, Utilization and Accessibility, 1999.