4. Physical and human resources

4.1 Section summary

The number of primary care clinics and dental clinics has increased in both public and private sectors, as have the number of hospital beds, although the population ratio of beds has declined slightly since 1980. The supply of health professionals, however, remains seriously below the required number, although the government has increased the number of training places.

4.2 Physical resources

4.2.1 Capital stock and investments

Most beds (77%) are in government hospitals and the remainder are in private hospitals (Table 4-1). While the 209 private hospitals outnumber the 143 government hospitals, they generally are smaller and contribute only 11 000 beds. The Ministry of Health development budget struggles to maintain ageing hospitals and maintenance and infrastructure failings have in the past resulted in the shutting down of government hospital wings (Quek, 2009). Investment in the private sector has increased, particularly with the growth of medical tourism and global corporations. For example, some profit-making hospitals have been taken over by large companies, such as Parkway Holdings, Pantai and KPJ Healthcare – the latter, a state corporation (Chee & Barraclough, 2007b). The Columbia group, based in Seattle, runs Columbia Asia in four Asian countries, including several hospitals in Malaysia. Public-private partnerships also are being formed, such as the private Putra Specialist Hospital in which the Melaka state government has a large stake.

Table 4–1 Secondary care health facilities, 2008

Secondary care health facility	No.	Beds	% total beds
MOH hospitals	130	33 004	61.7
MOH special medical institutions	6	5 000	9.4
Non-MOH government hospitals	7	3 245	6.1
Private hospitals	209	11 689	21.9
Private maternity homes	22	174	0.3
Private nursing homes	12	274	0.5
Private hospice	3	28	0.1
Total	**389**	**53 414**	**100**

Source: Ministry of Health Malaysia, 2008c

4.2.2 Infrastructure

Acute care public hospital beds increased between 1970 and 1980 when large MOH hospitals were built, but have experienced slower growth since then (Table 4-2). The big increase is in private sector beds, a 170% increase between 1990 and 2009. The number of private hospitals grew from 10 in 1980 to 128 in 2003 (Chee & Barraclough, 2007b) and now number 209. These include several not-for-profit-making hospitals, such as the Penang Adventist Hospital and the 700-bed Lam Wah Ee Hospital in Penang, established by the Chinese community in the 19th century, which offers traditional Chinese medicine plus western medicine.

Beds (public and private) per 1000 persons have declined from 2.4 beds per 1000 in 1980 to 1.8 beds per 1000 in 2009, as the supply has not kept pace with population growth. Malaysia intends to provide more day surgery facilities, however, rather than significantly expand public hospital inpatient beds.

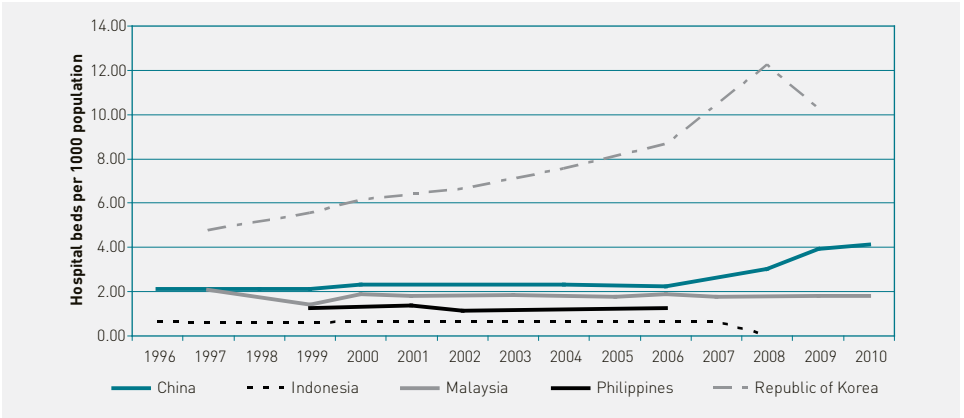
Table 4-2 Number of beds in acute care hospitals, 1970–2009

Hospital beds	1970	1980	1990	2000	2009
Public sector (MOH) acute hospital beds	17 063	33 901	33 400	34 573	38 057
Private sector acute hospital beds	...	...	4 675	9 547	12 619
Total	**17 063**	**33 901**	**38 075**	**44 120**	**50 676**
Beds per 1000 persons	1.6	2.4	2.1	1.9	1.8

Source: Ministry of Health 1972a; 1990; 2000b; 2009b

The most current ratio of hospital beds per 1000 population is lower than that of 3.6 for upper middle-income countries internationally (WHO, 2011). Bed ratios differ considerably across countries, however, depending on the priority given to inpatient versus ambulatory care. The population ratio of beds in Malaysia is similar to several other countries in the WHO Western Pacific region; the Republic of Korea is an outlier with its high ratio of beds (Figure 4-1).

Figure 4-1 Ratio of hospital beds per 1000 population, 1995–2010



Source: WHO Regional Office for the Western Pacific;, Health indicators database; and Indonesia Health Profile reports.

Most primary health care is offered in the private sector in urban areas, while the public primary health care facilities are mainly located in rural areas. There are 6371 private clinics compared to 802 Ministry of Health clinics (Table 4-3), although the private clinics are mainly small practices with single practitioner or a few with small group arrangements.

Table 4–3 Primary care health facilities, 2008

Primary care health facility	MOH	Private
Health clinics	802	6371
Community clinics	1927	...
Maternal & child health clinics	95	...
Dental clinics	1707[a]	1435

Source: Ministry of Health, 2008d
[a]community and school-based

MOH dental facilities have grown steadily since 1970 (Table 4-4) located in health facilities, schools and as stand-alone centres. Private dental clinics mostly (80%) are single-practitioner practices. About 45% of private dental clinics are in the urbanized states of Selangor and the Federal Territories of Kuala Lumpur and Putrajaya.

Government pharmaceutical services are located in hospitals and health clinics. The majority of the 1700 or so private retail pharmacies are concentrated in the major towns (Table 4-5).

Table 4-4 Dental facilities, Ministry of Health, 1970–2009

Hospital beds	Year					
	1970	1980	1990	2000	2007	2009
Dental specialist clinic	14	16	19	38	109	129
Main dental clinic	48	87	119	138	128	93
Community dental clinic	190	329	395	425	440	518
School dental clinic	120	431	636	787	901	921
School dental centre	6	13	22	21	17	16
Mobile dental clinic	13	13	10	8	21	20
Mobile dental team	0	49	100	204	417	404
Preschool mobile dental team	-	-	16	65	102	136
Others[a]	7	14	39	47	33	39
Total	**398**	**952**	**1356**	**173**	**2168**	**2276**

Source: Ministry of Health, 2010b
[a] 'Others' includes dental clinics in institutions and Maternal and Child Health Clinics.

Table 4–5 Distribution of retail pharmacies by state, 2007–2008

State	Number of community pharmacies (2008)	Number of pharmacies in capital of state (2007)
Perlis	12	10 (Kangar)
Kedah	125	25 (Alor Sar)
P. Pinang	280	76 (Georgetown)
Perak	146	71 (Ipoh)
Kelantan	70	40 (Kota Bharu)
Terengganu	25	10 (Kuala Terengganu)
Pahang	55	23 (Kuantan)
Selangor	365	24 (Klang)
Melaka	50	44 (Melaka)
N. Sembilan	51	27 (Seremban)
Johor	148	26 (Johor Bahru)
Sabah	106	69 (Kota Kinabalu)
Sarawak	161	31 (Kuching)
W.P Kuala Lumpur	169	166 (Kuala Lumpur)
W.P Labuan	6	6 (Labuan)
Total	**1 769**	**648**

Source: Ministry of Health, 2008d

4.2.3 Medical equipment

The Ministry of Health procures major pieces of medical technology centrally through development funds and smaller devices through recurrent budgets. Very expensive equipment is concentrated in large hospitals. The National Medical Devices Survey in both public and private sectors in 2007 found 2 Magnetic Resonance Imaging (MRI) machines per million population and 4 per million Computerized Tomography (CT) scanners, (Ministry of Health, 2007a). These represent lower ratios than most OECD countries (OECD, 2011). However, the private hospital sector has a much higher ratio of expensive scanners. The government is keen not to duplicate expensive diagnostic and imaging facilities already available in private hospitals in close proximity to public hospitals.

4.2.4 Information technology

The MOH is gradually converting its facilities from paper-based information to an electronic system (see Section 2.7.1). Computerized information systems are being installed in government hospitals (14 out of 138 in 2010) and in government dental clinics. No information is available on IT use in the private sector. In seeking to improve health literacy and service access, the Ministry of Health additionally has adopted an E-health strategy, given the country's expanding internet penetration from 15% of the population in 2000 to nearly 65% in 2010 (Internet World Statistics, 2010). Telehealth technology is an emerging strategy in Asian countries that aims to increase population access to health care and to provide clinical decision support to primary care practitioners (Durrani & Khoja, 2009). There are three examples of information communication technology (ICT) use in Malaysia: Teleprimary Care; Teleprimary Care Kiosks; and e-KL.

Teleprimary Care is an electronic clinic management and information system that links primary and secondary care, enables primary providers to consult specialists and facilitates staff access to clinical guidelines. By December 2009, it had been implemented in five states (Johor, Sarawak, Perlis, Selangor, the Federal Territory of Kuala Lumpur).

A Teleprimary Care Kiosk is a terminal installed in Ministry of Health primary care clinics that offers information to patients on clinic services and offers access to an offline version of the MyHealth portal, the Ministry of Health web-based patient education module. Pilot kiosks were installed in 2007 in Johor (three clinics), Sarawak (eight clinics), Perlis (five clinics) and Selangor (18 clinics).

The eKL project, implemented in the Federal Territory of Kuala Lumpur in 2007, enables the population in the Klang Valley to change and check appointments online in an e-appointment system.

4.3 Human resources

Registered nurses are the largest group of health professionals, numbering over 75 000, including community and dental nurses (Table 4-6). A larger number of doctors work in the public than in the private sector, but mostly in hospitals, since only 1192 of public sector doctors (about 7%) work in primary health care. Likewise, family medicine specialists are few despite the Ministry of Health goal of expanding primary health care to undertake a larger role in treatment. For example, the MOH has only 162 family medicine specialists in primary health care in 2008 (Table 4-7). The employment of dental nurses (therapists) is restricted to the public sector under the Dental Act 1971, where they mostly deliver oral health care to schoolchildren under the supervision of dentists. Nevertheless, their role is supported by other members of the primary health care team, including doctors, nurses, etc. in the various health clinics.

Table 4-6 Health professionals in the public and private sector, 2008

Health professionals	Public	Private	Total	Provider: population ratio
Doctors	15 096	10 006	25 102	1:1 105
Dentists	1 692	1 673	3 365	1:7 618
Pharmacists	3 070	3 327	6 397	1:4 335
Opticians	...	2 514	2 514	1:11 030
Optometrists	159	532	691	1:40 128
Asst. Medical Officers	8 310	768	9 078	1:3 054
Asst Pharmacy Officers	2 778	...	2 778	1:9 982
Asst. Environmental Health Officers	2 566	...	2 566	1:10 806
Medical Lab Technologists	4 039	...	4 039	1:6 865
Occupational therapists	426	...	426	1:1:65 091
Physiotherapists	593	...	593	1:46 760
Radiographers	1 518	...	1 518	1:18 267
Nurses	38 575	15 633	54 208	1:512
Dental nurses[a]	2 679	...	2 679	1 :3 105[b]
Community nurses	18 143	500	18 643	1:1 487
Dental technicians	772	704	1 476	1:18 786
Dental surgery assistants	2 970	...	2 970	1:9 336
Complementary medicine practitioners	...	...	873	1:3 173

Source: Ministry of Health, 2009b
[a]Dental nurses, equivalent to Dental Therapists, provide public sector services for population under 18 years of age
[b]Based on population aged under 18 years

Table 4-7 Categories of health professionals in primary health care employed by the Ministry of Health, 2008

Category of personnel	Number
Family medicine specialists	162
Medical and health officers	1 030
Dentists (Public/MOH)	1 507
Pharmacists	262
Nurses	5 337
Dental nurses (only MOH)	2 679
Assistant medical officers	2 388
Lab technicians	803
Dental technologists (MOH)	702
Community nurses	9 922
Radiographers	155
Assistant pharmacy officers	1 046
Dental surgery assistants (MOH)	2 722
Total	**28 604**

Source: Ministry of Health, 2009b

4.3.1 Health workforce trends

The Malaysian health system, and the public sector in particular, is being seriously constrained by shortages of health professionals, as in many South-East Asian countries (Kanchanachitra et al 2011). Malaysia has 0.9 physicians per 1000 population compared to 2.2 in upper middle income-countries internationally (WHO, 2011). Malaysia has fewer doctors for its population than the Philippines, but more than Thailand (Figure 4-2).

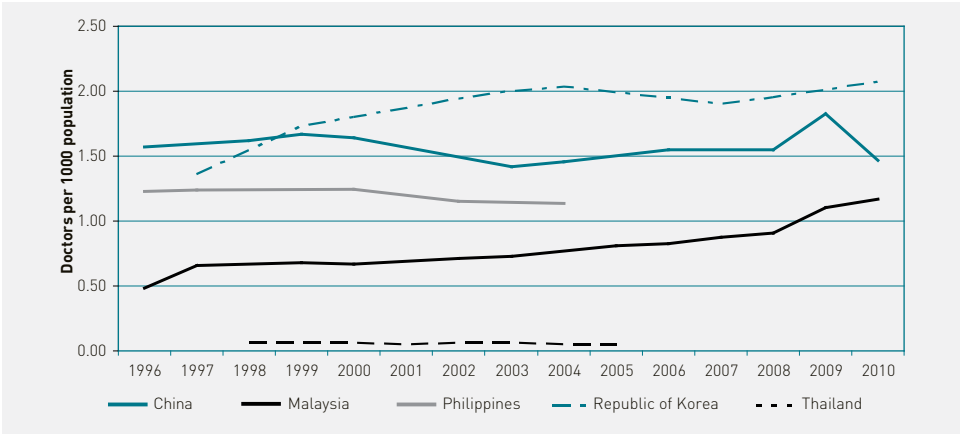
Malaysia has 2.45 registered nurses per 1000 population (Ministry of Health, 2010c) or 2.73 nurses and midwifery personnel combined (WHO, 2011), compared to the average of 4.4 nurses and midwifery personnel for upper middle-income countries (WHO, 2011). The ratio is largerthan Thailand, but smaller than the Philippines, with over 4 per 1000 (Figure 4-3).

Malaysia has 0.14 dentists per 1000 population, compared to 0.7 for upper middle-income countries (WHO, 2011). The ratio is smaller than Thailand and the Philippines (Figure 4-4).

Malaysia has 2.10 registered nurses for every one doctor, although most countries in the WHO Western Pacific Region have a higher ratio of nurses

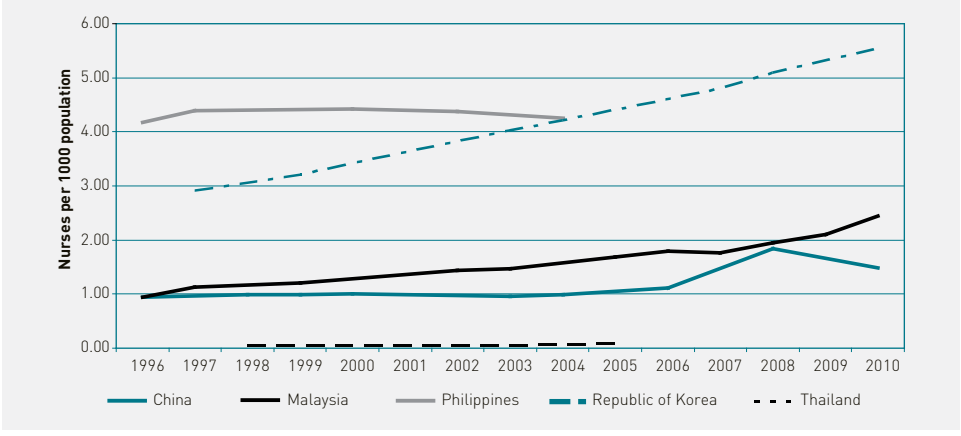
to doctors (Figure 4-5). For example, the Philippines has 3.75 nurses to one doctor and the Republic of Korea has 2.66. Malaysia, however, also has a large number of assistant medical officers (over 9000) that carry out some tasks performed by nurses in other countries.

Figure 4-2 Ratio of doctors per 1000 population, 1996–2010



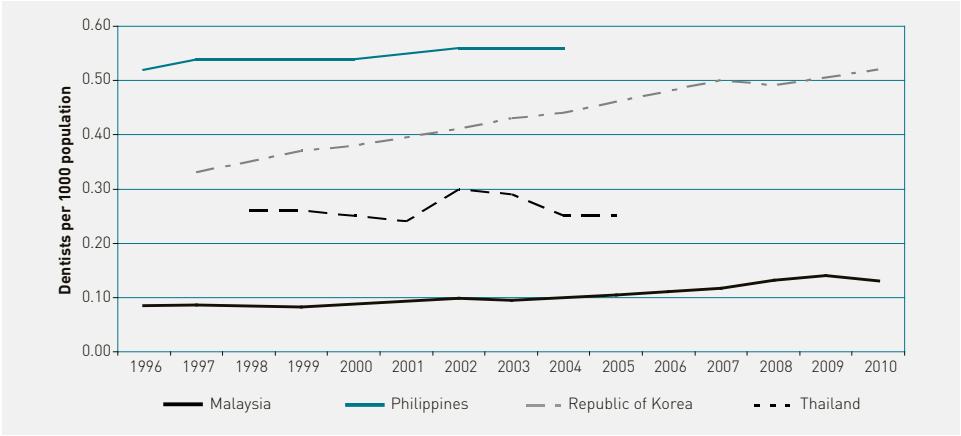
Source: WHO Regional Office for the Western Pacific, Health indicators database; and Thailand Health Profile reports.

Figure 4-3 Ratio of nurses per 1000 population, 1996–2010



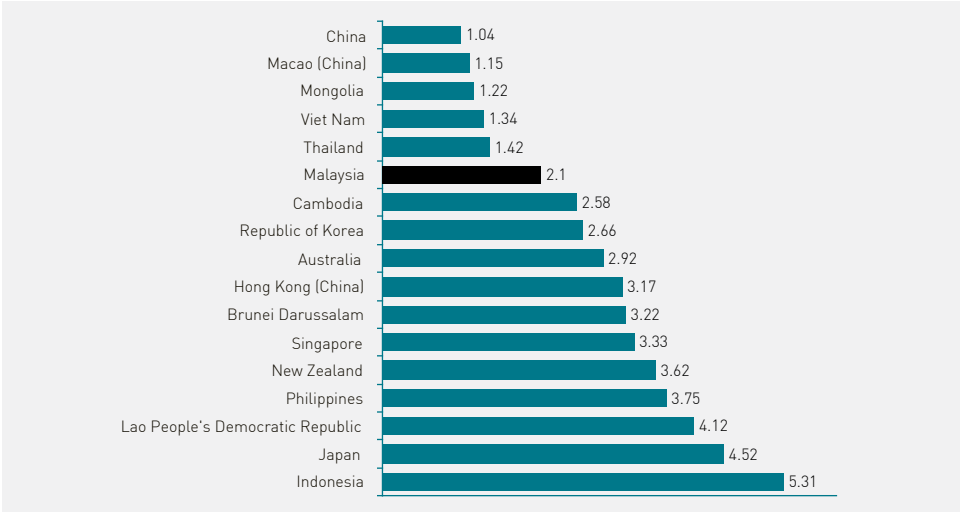
Source: WHO Regional Office for the Western Pacific, Health indicators database; and Thailand Health Profile reports.

Figure 4-4 Ratio of dentists per 1000 population, 1996–2010



Source: WHO Regional Office for the Western Pacific, Health indicators database; and Thailand Health Profile reports.

Figure 4-5 Ratio of nurses to doctors, countries of the Western Pacific, 2004–2010



Source: Western pacific country health information profiles 2011 revision. Manila, World Health Organization Regional Office for the Western Pacific, 2011; Indonesia Health Profile 2010, MOH; and Thailand Health Profile reports.

The Ministry of Health was able to fill only 64% of positions for doctors in 2009, 60% for dentists and 77% for pharmacists. In particular, in primary health care, only 55% of posts were filled for family medicine specialists, 40% for doctors, 57% for pharmacists, 79% for assistant medical officers and 85% for nurses. The Ministry of Health expects shortages of doctors and dentists to continue through to 2020. Health systems generally find it difficult to recruit and retain physicians in primary health care, given its

lower status than hospital practice and its location in rural versus urban areas (WHO, 2010c).

Malaysia is experiencing a 'brain drain' of highly-educated people across many sectors of the economy, many of whom are moving to OECD countries (Schellekens, 2011). Within Malaysia's public health sector, shortages also are due to the fact that health professionals move to better-paid private sector positions. Several strategies are underway to try to curb this. First, compulsory service in the government sector was introduced in the 1970s for newly-registered doctors, who must complete three years in the public sector before being allowed to work in the private sector. This was initiated for dental graduates beginning in 2001 and for pharmacy graduates from 2004. Mandatory posting to rural areas upon graduation is a common strategy in many countries to improve access, although health personnel generally return to urban areas upon completion of their posting (WHO, 2008a). Second, the Ministry of Health now offers short-term contracts to 4.7% of its professionals overall and to 12% of its specialists (Ministry of Health, 2008c) and contracts some services from private practitioners. Third, the retirement age for civil servants has been increased gradually from 55 to 58 years (compared to 65 years or older in many OECD countries).

Fourth, the government is increasing the number of places in both public and private training colleges. Finally, financial strategies have been initiated to counter pull factors from private sector and overseas employment. The Ministry of Health permits some doctors to do locum work when not on duty in public facilities. Doctors in public hospitals with private wards can retain part of the fee for treating private patients. Salaries were increased in 2002 and 2007, but a proposal to establish a separate, more competitive salary scheme for health personnel within the civil service was not accepted. Governments in some other countries offer higher salaries to retain doctors in the public sector.

4.3.2 Distribution of health workers

There were 20 192 doctors in the public sector and 10 344 (one-third of total doctors) in the private sector in 2009. The number of doctors in both the public and private sector has grown since 1970 (Table 4-8). In fact, despite concern about a shift from the public to the private sector, the number of doctors in the public sector actually has grown faster than that of the private sector. The steep rise in public medical officers between

2000 and 2009 is the result of an increase in production within the country together with a marked increase in medical graduates from overseas.

Table 4-8 Distribution of medical doctors, 1970–2009

Medical doctor	1970	1980	1990	2000	2009
Public	807	1 797	3 021	8 410	20 192
Private	1 563	1 717	3 991	7 209	10 344
Total	**2 370**	**3 514**	**7 012**	**15 619**	**30 536**
% of doctors in private sector	65.9	48.9	56.9	46.1	33.8

Source: Ministry of Health, 1972a; 1980; 1990; 2000b; 2009b
1970 figures do not include doctors in Sabah and Sarawak

Slightly more dental practitioners work in the public than the private sector (1692 compared to 1673) (Table 4-9). The number of tertiary-trained dentists (Division I dentists) has kept pace with population growth, with a dentist to population ratio of 1 to 8240 in 2008. Division II practitioners who trained under the local apprenticeship system and registered prior to 1972 have dropped steadily with retirements.

Table 4-9 Distribution of dental practitioners, 1970–2008

Year	Division I Practictioners					Division II Practitioners
	Public sector		Private sector		Total	
	No.	%	No.	%		
1970	155	59.8	104	40.2	259	359
1980	387	59.9	259	40.1	646	365
1990	655	46.8	746	53.2	1401	236
2000	750	35.0	1394	65.0	2144	101
2008	1692	50.3	1673	49.7	3365	45

Source: Ministry of Health, 2009a

4.3.3 Training of health care workers

The Ministry of Higher Education has increased the acceptance of medical students into approved universities and training colleges and the Ministry of Health has accredited more "houseman" (two-year training period) places in hospitals. Medical courses are offered in both public and private training institutions (30 in total) (Table 4-10). In addition, the government and government-linked bodies subsidize students to study overseas, while some students pay privately to attend foreign medical schools. Dental programmes (five-year degrees) are offered in 6 public and 5 private universities and about 30 dental graduates return each year after

training abroad. Pharmacists are trained at 15 (5 public and 10 private) universities and colleges.

Table 4-10 Distribution of health care workers by training institutions, 2008

Category	Training institution		Annual graduates (2006)	Total number in training (2008)
	Public	Private		
Physicians	8	8	3459	25 102
Dentists	6	5	-	288 (undergrad) 40 (postgrad)
Nurses	16	35	2206	54 208
Community nurses	12	...	1126	18 643
Assistant medical officers	4	1	500	9078
Pharmacists	5	10	500	

Source: Ministry of Health, 2009b

Post-basic training is conducted by universities, allied health colleges and the Public Health Institute. Doctors and dentists who finish postgraduate studies go through a further period of supervision before they are conferred the title of specialist. The quota of doctors and dentists undertaking specialty training in local and overseas institutions has increased from 400 to 600 per year. Given increasing requirements for specialty training, the number of Ministry of Health personnel in PhD and Masters level programmes is expected to increase from 2800 in 2008 to over 3400 in 2015.

Paramedical and auxiliary training is located in public hospitals. In 2008, 37 government training schools provided basic, post-basic and in-service training and several private hospitals and university hospitals conduct courses based on a Ministry of Health syllabus and approved by respective professional boards. Approved programmes include three-year diploma programmes for allied health occupations, certificate programmes (6 -12 months or more) for post-basic training for nurses and medical assistants and a two-year certificate programme for dental surgery assistants (Table 4-11). In addition, the Ministry of Health runs in-service training and induction programmes.

Nurses graduate with a three-year diploma or a four-year degree, with more now opting for a degree given its better career prospects. The

nursing diploma is offered by 16 colleges under the Ministry of Health and over 50 private colleges. All colleges are accredited by the Ministry of Higher Education and approved by the Nursing Board. Community nurses undertake a two-year certificate course. Midwives and assistant nurses are being phased out or retrained as nurses.

Table 4-11 Number of admissions for basic training, 2007

Profession	No. of admissions
Nurses	2481
Community nurses	1322
Assistant medical officers	664
Assistant pharmacy officers	112
Assistant environmental health officers	224
Medical laboratory technologists	273
Radiographers	121
Dental nurses	118
Dental technologists	46
Physiotherapists	77
Occupational therapists	78
Dental surgery assistants	141
Public health assistants	264
Total	**5921**

Source: Ministry of Health, 2009b

Assistant Medical Officers (AMOs) are similar to physician assistants or nurse practitioners in other countries. The three-year diploma is offered in five training colleges under the Ministry of Health and six private colleges. Their basic diagnostic and curative skills enable them to assist doctors, initiate care plans for minor ailments and emergency care and carry out simple procedures. In rural areas with no resident doctors, AMOs provide basic primary care for the population. In hospitals and urban clinics, they assist doctors by triaging cases and by carrying out basic procedures. AMOs can undertake post-basic training as diabetes educators, in such disciplines as orthopaedics, and in procedures such as haemodialysis.

Dental nurses and technologists are trained at the Dental Training College in Penang for a three-year diploma and dental technologists also are trained in one private institution. Dental technologists make and repair dental prostheses and appliances and maintain dental equipment.

Some are trained in the fabrication of special prostheses for oro-maxillofacial reconstruction. Dental surgery assistants (DSAs) undertake a two-year certificate at the Dental Training College and in two private training institutions. Dental auxiliaries perform basic procedures to assist the clinical dental specialist.

Assistant pharmacy officers are trained in a diploma-level course by the College of Allied Health Sciences. They manage dispensaries in government hospitals and rural health clinics and dispense medicines to patients with supervision by district pharmacists.

4.3.4 Continuing professional development

Malaysia promotes continuous professional development (CPD) to ensure that the knowledge and skills of its health care workforce are up-to-date. CPD is mandatory for Ministry of Health staff but voluntary for private professionals. However, many professional boards now require CPD for renewing professional registration. Doctors, pharmacists, dentists and allied health personnel must attain a certain number of credit points each year through CPD programmes, which include formal courses and various professional activities. Professional boards issue an Annual Practicing Certificate based on a required number of CPD credit points. A website for online monitoring of CPD activities, *myCPD*, was set up in 2007.

The Ministry of Health is in the process of integrating CPD with the Malaysian Civil Service 'competency level assessment' that evaluates personnel on core competencies.

4.3.5 Career paths for doctors, dentists and pharmacists

In 2009, the Ministry of Health announced a five-step career pathway for doctors. The two-year "houseman" training period is followed by automatic promotion from UD41 to UD44 grade ("UD" is the public service grading system) and those who complete their two-year compulsory public service are offered an automatic promotion to UD48. After three years, doctors can apply for promotion to UD52 and after another three years, to UD54 level based on work performance. Doctors who pass their postgraduate specialist examination are promoted to the UD48 grade and are advanced to UD52 when they receive the title of specialist. After two more years, they can apply for promotion to UD54 and those who complete sub-specialty training are promoted to UD54 even from a UD48 grade.

Dental officers (beginning at U41 grade) may choose to specialize in clinical or public health disciplines and seek promotion to senior clinical or administrative positions (grade U52 and above). A dental or medical officer in the Armed Forces holds the initial rank of captain and after four years is automatically promoted to Major.

Pharmacists in the Ministry of Health do not yet have an established career pathway for specialization as in medicine and dentistry.

4.3.6 Other health workers' career paths

Career paths for paramedics are being upgraded to differentiate staff with degree or diploma level qualifications. The Ministry of Health has upgraded the posts of nurses (as universities now offer degrees in nursing) and other paramedics into the professional scheme.