Human Resources for Health Country Profiles

MALAYSIA

World Health Organization
Western Pacific Region

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Executive summary

Human resources for health (HRH) supply and trends

Malaysia aspires to achieve "developed" country status by 2020. In this context, the current supply of human resources for health (HRH) is low. For example, the number of nurses increased rapidly throughout the last decade and the numbers of doctors, dental practitioners and pharmacists kept pace with population growth during the first half of the decade and increased rapidly during the second half. However, the ratios of the two key categories, doctors and nurses, to population are still lower than in OECD countries.

Malaysia does not rely on expatriate HRH except as a short-term measure to fill specific skill gaps. The shift in the epidemiological picture towards noncommunicable diseases and increasing longevity has led to a growing emphasis on higher-level skills in the HRH workforce. For example, there is a recent focus on multi-skilled team approaches that require an increased focus on the health professional workforce.

HRH distribution

Several features of the HRH distribution have policy and planning implications. First, key categories in the HRH workforce are becoming increasingly feminized. In many OECD countries, higher proportions of females in the health workforce have led to demands for part-time employment and job-sharing. The trend in Malaysia has implications for planning for the future development of HRH. Second, until recently, the "brain-drain" of professionals from the public to the private sector has been a concern. Recently, however, doctors, dental practitioners and pharmacists in the public sector have outnumbered those in the private sector. This is due to the rapid rise in newly qualified professionals, all of whom are required to serve a period of compulsory public sector service. It is difficult to predict trends in the immediate future. As for nurses, those in the public sector outnumber those in the private sector, but the private sector has been increasing in recent years. Third, disparities in regional distribution are evident, although they are being reduced gradually, and to some extent are aligned with the disparities in the regional distribution of health-care facilities. Fourth, routine data on age distribution are not collated and hence analysis is limited. However, cross-sectional data on the age distribution of doctors in hospitals suggest that doctors spend the early years of their careers in the public sector and then move to the private sector after age 40. This raises the concern that it is the experienced senior doctors who move to the private sector, resulting in a heavy load of clinical work, as well as teaching and mentoring of junior doctors, for those senior doctors who remain in the public sector.

Health professional education

Strong systems are in place to govern the basic professional education of health personnel including:

- clearly articulated policies and strategies;
- systematically designed training processes and quality mechanisms;
- good linkages and partnerships between relevant stakeholders; and
- systematic in-service and continuous professional education (CPE).

However, the recent rapid increase in the number of training institutions and education programmes for HRH, and the resultant rapid increase in the number of graduates has overburdened:

- training capacity, especially for practical clinical training;
- the capacity of the system to monitor and ensure compliance with agreed quality standards; and
- the capacity of the health services to absorb the new graduates, who need a period of guided apprenticeship.

There is a need for a better coordinated system for decision-making regarding the production of HRH, including the capacity of the health-care system to support training and absorb graduates.

HRH utilization

In the public sector, several key HRH management functions, such as recruitment, wage structures and career development and deployment, are highly centralized, either in the Public Services Commission (PSC) and Public Service Department (PSD) or the federal Ministry of Health. A special feature of Malaysian HRH management is the strategy of an initial period of one to two years of compulsory public sector service to address shortages of critical

categories, such as doctors. This feature is currently evolving into a period of guided apprenticeship, as evidenced for nurses, doctors, dental practitioners and pharmacists. In general, the attrition rate for HRH in the Ministry of Health is low and motivation rates are satisfactory, except for specialist medical practitioners and other senior staff, who feel undervalued as well as stressed due to an unfair overload of work.

HRH financing

HRH wages constitute about 50% of the Ministry of Health operating budget. The basic wage structure in the public sector is based largely on the requisite educational qualifications for entry into any particular scheme, while a range of generous allowances increases the take-home wage of most professionals. HRH basic wage scales and allowances are not very different from those of other professional groups that have similar entry qualifications. Critical categories of HRH, such as doctors, dental practitioners, pharmacists and nurses, have additional incentive allowances that are quite substantive. There is little information on the income of HRH in the private sector. Unofficial ('under-the-counter') payments made by the public to obtain health care in the public sector are not a problem.

Governance of HRH

Malaysia has well articulated HRH policies, strategies and plans, and there is good involvement of stakeholders at different levels of the planning process. Appropriate legislation has been in place for many years for key categories, and recent initiatives are in progress to encompass all other categories. However, the HRH information system has several problems. First, HR information is collected through several overlapping systems. There is inadequate coordination between these systems, resulting in (a) unresolved conflicts between data sets, (b) gaps in data about the private sector, and (c) inadequate routine analysis of data that is essential to support sectorwide planning and policy-making.

Second, the data obtained and maintained by statutory licensing agencies for HRH professionals are incomplete. The system of licensing and issuing of annual practice certificates needs to be strengthened and modernized to ensure better compliance. This also will contribute to more reliable data on HRH in both the public and private sectors. Third, there is no information on market demand or unemployment for various categories of HRH. Periodic tracking studies would be invaluable in contributing to HRH planning. And fourth, no single agency has the responsibility and capacity to analyse the HRH situation and make HRH projections based on national needs.

The Training Division of the Ministry of Health makes HR projections for three categories of health personnel (doctors, dental practitioners and pharmacists) based on simple population ratios. This does not include any estimate of needs. Some programme divisions in the Ministry make their own HR projections, but have difficulty translating them into actionable plans.

Future development

The future development of human resources for health requires:

1. suitable organizational arrangements that define and specify responsibility for comprehensive planning that integrates the HRH needs of all sectors in the country;
2. adequate and timely HRH information that includes integrated data from all sectors supplemented, where relevant, with survey information;
3. adequate capacity to analyse the HR data so as to provide input for immediate, as well as medium-term planning for HRH production, deployment and utilization; and
4. sufficient linkages between data analysts and policy-makers to enable evidence-based policy-making for HRH.

1. Introduction[1]

1.1 Demography

Malaysia covers an area of about 330 803 sq km and consists of 11 states and two federal territories in Peninsular Malaysia and two states and a federal territory on the island of Borneo. The country lies entirely in the equatorial zone and has an average daily temperature varying from 21˚C to 32˚C throughout. It is a multi-ethnic country, with a population of 28.9 million in 2011 and a population density of about 88 persons per sq km. About 70% of the population is urban, the rate of urbanization being about 2.4% per annum. Approximately 49.4% of the population are female, and the population growth rate is 2.2% per annum. About 27% of the population are under 15 years, 68% are aged 15–64, and 5% are 65 and above. The principal ethnic groups are Malay, Chinese and Indian. Other significant groups are the indigenous people of Sabah and Sarawak, including Kadazan, Dusun, Bajau, Murut, Iban, Bidayuh and Melanau.

Malaysia practices a system of parliamentary democracy, with constitutional monarchy. It has three branches of government: the Executive, the Legislature and the Judiciary.

1.2 Economic situation

Malaysia has sustained strong economic growth for the past three decades and achieved a real gross domestic product (GDP) of MYR 588 million (US$ 182 million) in 2011. In the same year, the GDP growth rate was estimated at 5.0% – 5.5% and per capita income was MYR 28 725 (US$ 8907). Poverty rates have declined dramatically, from 50% in 1970 to 3.8 % in 2009. The GINI coefficient was 0.44 in 2010. The unemployment rate is 3.1%, with female unemployment standing at 3.6%.

1.3 Summary of health indicators

The country has achieved significant success in reducing infant, child and maternal mortality and in controlling communicable diseases, although some lingering challenges continue to persist. The leading contributors to the burden of disease are cardiovascular and cerebrovascular diseases, cancer and road accidents. High rates of obesity and uncontrolled diabetes mellitus are major risk factors. Table 1 provides a summary of key health indicators.

1.4 Health system

Health expenditure accounts for a comparatively low 4.96% of GDP, with public expenditure being 54.6% of total health expenditure. Health was allocated 7.1% of the national budget in 2011 compared with 16.7 % for Education, 5.9 % for Higher Education, which includes the production of most categories of human resources for health, and 6.5% for Defense (Ministry of Finance, 2011).

Health strategies, objectives and legislation

Malaysia's current health plan is outlined in its Country Health Plan (10th Malaysia Plan) 2011–2015 (Economic Planning Unit, 2012). The main goals are

1 This section includes data and information gathered from *Malaysian quality of life 2011*. Putrajaya, Economic Planning Unit, Prime Minister's Department, 2012. Available at: www.epu.gov.my/en/kualiti-hidup-malaysia-2011.

Table 1. Selected health indicators

		Year
Total expenditure on health[1]	4.96% of GDP	2009
Life expectancy at birth[1]	71.9 males, 77.0 females	2010
Infant mortality rate (per 1000 live births)[1]	6.8 (males 7.5 females 6.1)	2010
Under-5 mortality rate (per 1000 live births)[1]	8.5	2010
Maternal mortality ratio (per 100 000 live births)[1]	27.3	2010
Adult mortality rate[2] (probability of a 15-year-old dying before age 60 if subject to current age-sex mortality rate)	137 (males 175; females 95)	2009

Sources: [1] Ministry of Health, 2013b.
[2] World Health Organization, 2011.

to improve the quality of health-care services and to provide universal access. Several strategies have been identified, such as:

- transforming the delivery of the health-care system;
- increasing the quality, capacity and coverage of the health-care infrastructure;
- shifting towards wellness and disease prevention; and
- increasing the quality of human resources for health.

The Ministry of Health has overall responsibility for the health sector including: formulating policies, legislation, strategic planning, resource mobilization and allocation, monitoring, evaluation, research, training, and coordination of external aid.

Long- and medium-term strategic plans have been formulated to address specific diseases. For example, the National Strategic Plan on Non-Communicable Diseases (2010–2014) identifies seven strategies to prevent, manage and monitor NCDs. Other relevant plans include the National Strategic and Action Plan for Suicide Prevention (2012–2016) and the National Plan of Action for Nutrition of Malaysia 2006–2015. Main legislation includes the Private Healthcare Facilities and Services Act (1998); the Medical Act (1971), which is currently being revised; the Medical Device Act (2012); the Food Act (1983); the Poisons Act 1952 (Revised – 1989); the Sale of Drugs Act 1952 (Revised – 1989); the Persons with Disabilities Act (2008); the Mental Health Act 2001; and the Mental Regulation 2010.

Service delivery model

The Malaysian health sector is served by both public and private providers, who deliver a range of services that complement each other. The public system, which is funded through general taxation, provides universal health-care coverage to the population and delivers most of the highly subsidized hospital services, primary health-care services, health promotion and disease prevention services.

The private sector delivers mainly personal and curative services and private facilities are concentrated in urban areas. They are funded through a fee-for-service mechanism, mainly by individuals, private health insurance or corporations. Participation in voluntary private health insurance is becoming more prevalent. Data from the World Health Survey 2003 (World Health Organization, 2012) showed that 19.7% of households subscribed to voluntary private health insurance.

Planners and implementers use an interagency collaborative platform to communicate issues and share information to improve the delivery of health-care services. Consumers participate in improving service delivery through representation on hospital boards of visitors and advisory panels for health clinics in the public sector. The general public also use the news media and local representatives of political parties to provide feedback, which is reviewed and responded to by managers at different levels of the health-care system.

The provider network

The public sector delivers a range of primary care services through health and community clinics, including outreach services to remote villages through mobile clinics. It also delivers secondary and tertiary care through hospitals. The private sector delivers health services through medical and dental clinics and hospitals. Palliative and hospice care are also provided in some facilities of the public and private for profit and not-for-profit sectors.

2. Health workforce supply and trends

2.1 Human resources for health (HRH) supply

The sources of information used for this section include: the Health Informatics Centre (HIC) of the Ministry of Health; registers maintained by statutory councils or boards of different health professions (public and private sectors); the Human Resource Division of the Ministry of Health (mostly public sector information); programme divisions in the Ministry of Health; workforce surveys conducted by the Clinical Research Centre in 2008–2009 and 2010, which covered all public and private hospitals (except Armed Forces) and a sample of primary care facilities in the country; data from the Ministry of Higher Education and the Malaysian Qualifications Agency (MQA); interviews with key informants in the Ministries of Health[2], Higher Education, and Defense, and the

2 See Annex H. Interviews

Table 2. HRH supply and trends for professions requiring compulsory licenses to practise

Health occupational categories/ cadres	2002		2005		2008		2011	
	Number	HW per 10 000 pop	Number	HW per 10 000 pop	Number	HW per 10 000 pop	Number	HW per 10 000 pop
Medical practitioners (All doctors including trainee doctors and specialist medical practitioners)[1]	17 442	7.1	20 105	7.6	25 102	9.1	36 607	12.6
Trainee doctors (house officers)[2]	997	0.4	1049	0.4	2325	0.8	9413	3.2
Specialist medical practitioners[3]	-	-	-	-	6355[2009]	2.3[2009]	-	-
Dental practitioners	2297	0.9	2751	1.1	3640	1.3	4253	1.5
Pharmacists[1]	2828	1.2	4012	1.5	6397	2.3	8632	3.0
Nurses[1]	35 280	14.4	44 120	16.9	54 208	19.5	74 788	25.8
Community nurses[1]	9210	3.8	15 618	5.9	18 643	6.8	22 266	7.7
Assistant nurses[4]	-	-	5281	2.3	4616	1.7	3136	1.1
Assistant medical officers[1]	-	-	6709	2.6	9078	3.3	11 162	3.9
Optometrists[1]	-	-	-	-	691	0.2	899	0.3

Note: The large increase of trainee doctors in 2008 was due to the lengthening of the trainee period from one to two years. The large increase in 2011 was due to the rapid increase in the production of medical graduates (please see the section on HRH education for discussion of this issue).

Sources:
[1] Ministry of Health, 2013b.
[2] Human Resource Division, Ministry of Health Malaysia (unpublished).
[3] Additional analysis of data from Clinical Research Centre (2009b); Public Health Specialist data from the Ministry of Health, 2009 (personal communication).
[4] Nursing Division, Ministry of Health (unpublished).

Malaysian Quality Agency (MQA); and a desk review of relevant materials from published and unpublished sources. All HRH data sources available in Malaysia are mentioned in Section 7.3.

Tables 2, 3 and 4 provide information on the current (2011) supply of HRH, as well as for selected years at three-year intervals from 2002 until 2011. The 2011 supply shown in Table 2 and some in Table 3 are those categories that have been the focus of expansion

Table 3. Current supply and trend of selected health personnel

Health occupational categories/cadres	Year 2008		Year 2011	
	Number	HW per 100 000 pop	Number	HW per 100 000 pop
Dental nurses[a]	2287	8.25	2528	8.73
Dental surgery assistants[a]	2970	10.71	3279	11.32
Dental technologists[a]	1476	5.32	1559	5.38
Traditional and complimentary medicial practitioners[c]	8739	31.52	13 202	45.58
Environmental health officers[a]	48	0.17	131	0.45
Assistant environmental health officers[a]	2566	9.25	3394	11.72
Radiographers[a]	1518	5.47	2167	7.48
Physiotherapists[a]	593	2.14	818	2.82
Occupational therapists[a]	426	1.54	663	2.29
Medical laboratory technologists[a]	4039	14.57	5310	18.33
Community nurses and midwives[b]	18 643	67.23	34 785	120.10

[a] Includes only Ministry of Health personnel.
[b] Midwives includes all Community nurses plus Registered Nurses who have one year additional training in midwifery. Midwifery for normal deliveries only is part of the basic training for community nurses.
[c] Includes only those practitioners who have chosen to register voluntarily with the Ministry of Health.

Source: Ministry of Health, 2013b.

Table 4. Current supply of other health personnel

Other health personnel	2008		2011		Other health personnel	2008		2011	
	Number	HW per 100 000	Number	Hw per 100 000		Number	HW per 100 000	Number	Hw per 100 000
Audiologists	56	0.20	95	0.33	Health education officers	128	0.46	148	0.51
Clinical psychologists	1	0.00	3	0.01	Medical physicists	77	0.28	125	0.43
Biochemists	202	0.72	351	1.22	Medical social officers	160	0.57	184	0.64
Biomedical scientists	1	0.00	54	0.19	Nutritionists	143	0.51	252	0.88
Embryologists	2	0.01	5	0.02	Radiation therapists	146	0.52	184	0.64
Medical geneticists	6	0.02	9	0.03	Speech language therapists	41	0.15	59	0.20
Microbiologists	202	0.72	299	1.04	Optometrists	156	0.56	203	0.71
Diagnostic radiographers	1395	4.98	1978	6.87	Counselors	72	0.26	100	0.35
Dieticians	194	0.69	265	0.92	Food technologists	221	0.79	389	1.35
Entomologists	73	0.26	81	0.28	Assistant food technologists	133	0.48	163	0.57
Forensic scientists	22	0.08	32	0.11	Medical records officers	320	1.14	376	1.31
Health-care food service officers	164	0.59	166	0.58	Assistant pharmacists	2778	9.92	3493	12.13

Source: Allied Health Division, Ministry of Health (unpublished).

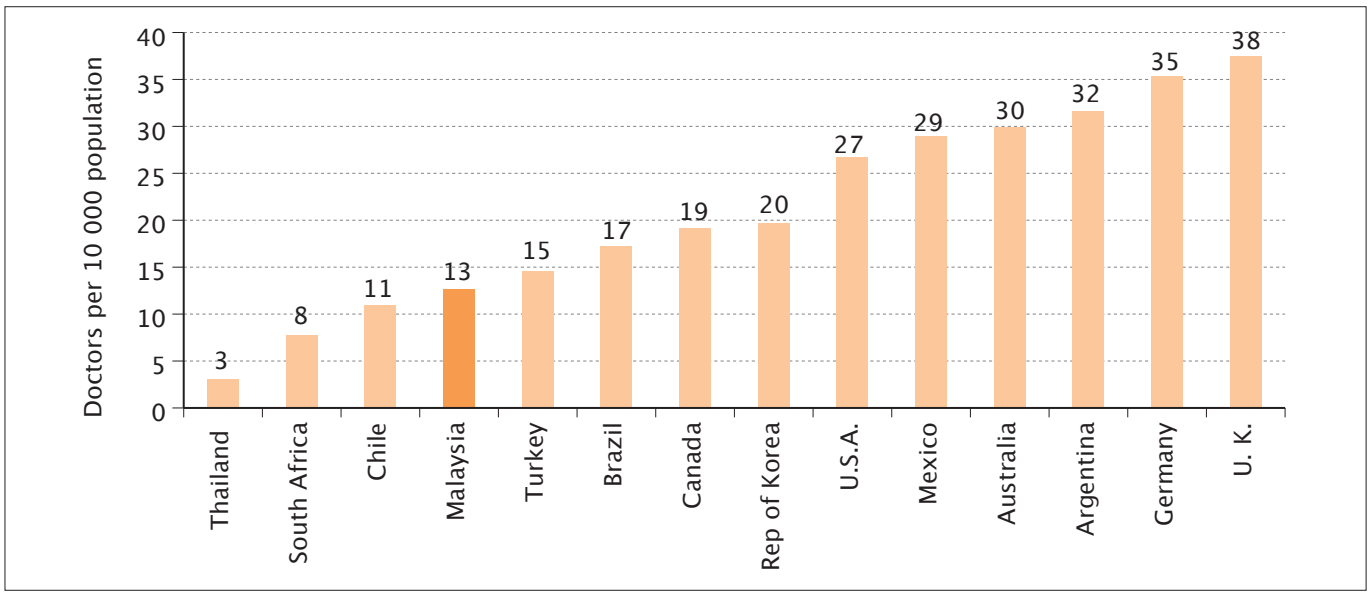
during the past few decades. Most of the categories in Table 4 have been given attention only during more recent years.

In the context that Malaysia aims to achieve "developed" country status by the year 2020, the Malaysian profile of HRH supply can be compared with two groups of countries. First are those countries that have a per capita income (in purchasing power parity (PPP) international $) similar to Malaysia. Examples are Argentina, Brazil, Chile, Mexico, South Africa and Turkey. Second are selected OECD countries, such as Australia, Canada, Germany, the United Kingdom and the United States of America, and high-income "developed" Asian countries, such as the Republic of Korea and Singapore. Figure 1 shows the comparative doctor density and Figure 2 the comparative nursing personnel density. Similarly, Figures 3 and 4 show the comparative supplies of dental practitioners and pharmacists. The current supply of key HRH categories to population ratio is low compared with developed countries.

From analysis of the current HRH supply, the following conclusions can be extracted:

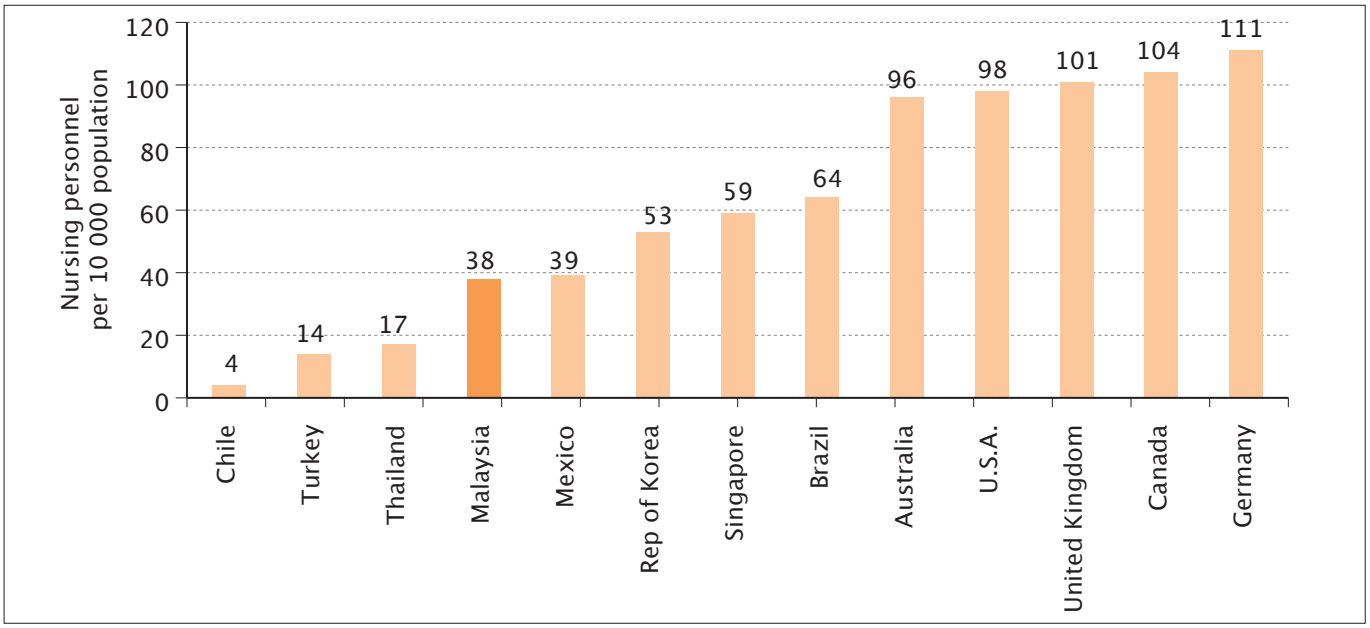
- The HRH density for key categories, such as doctors, nurses, pharmacists and dental practitioners, is relatively low in Malaysia compared with "developed" countries.
- Malaysia does not rely on expatriate HRH, except as a short-term measure to fill specific skill gaps.
- The skill mix reflects the growing emphasis on higher-level skills in the HRH workforce.

Figure 1. Comparative doctor density



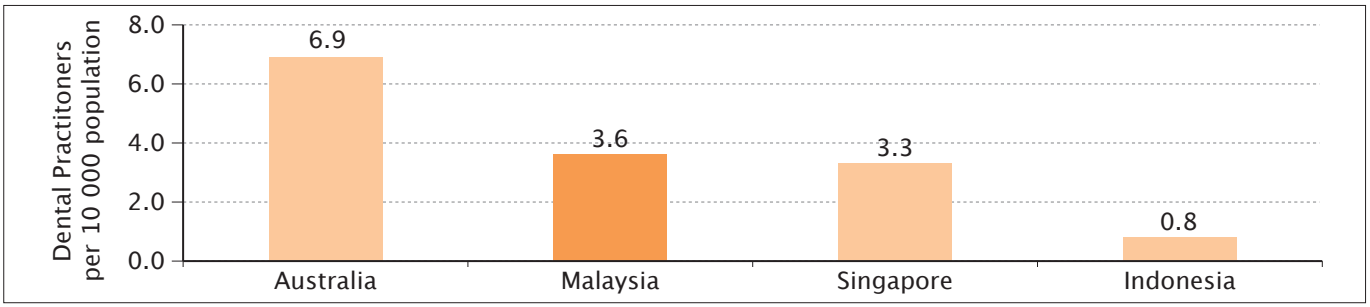
Source: World Health Organization, 2013a.

Figure 2. Comparative nursing personnel density



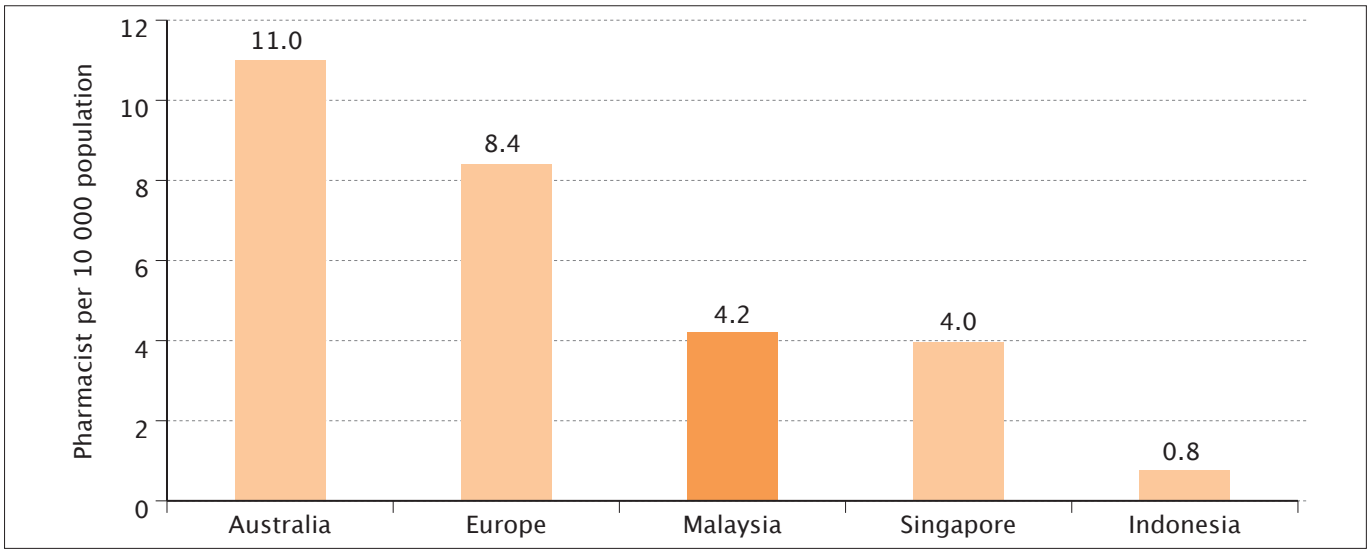
Note: Nursing personnel includes registered nurses, community nurses, midwives and assistant nurses.
Source: World Health Organization, 2013a.

Figure 3. Comparative supply of dental practitioners



Source: World Health Organization, 2013b.

Figure 4. Comparative supply of pharmacists



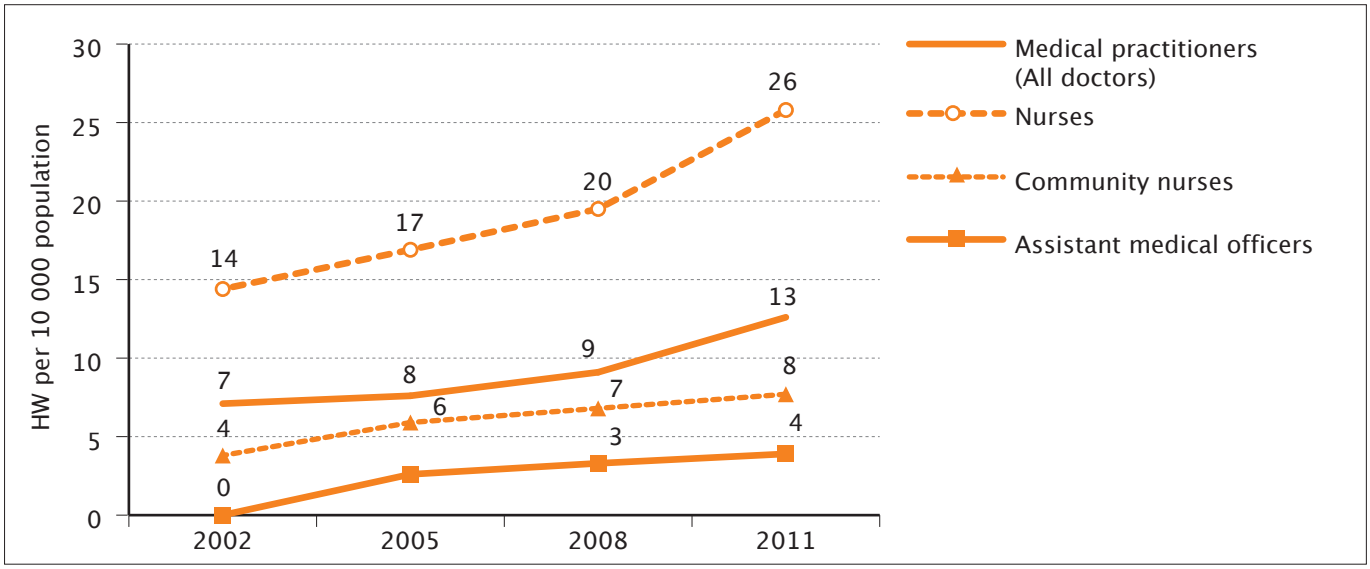
Source: World Health Organization, 2013b.

2.2 Recent trends

During the first half of the past decade, the increase in number of medical practitioners barely kept pace with population growth, while the numbers of nurses, community nurses and assistant medical officers increased significantly. However, during the second half of the decade, the number of medical practitioners increased rapidly, and the number of nurses grew even faster, while the growth in numbers of community nurses and assistant medical officers slowed (Figure 5). During the past decade, the ratio of nurses to medical practitioners has ranged between 2.1 in 2003 and 3.0 in 2005, and was 2.7 in 2011.

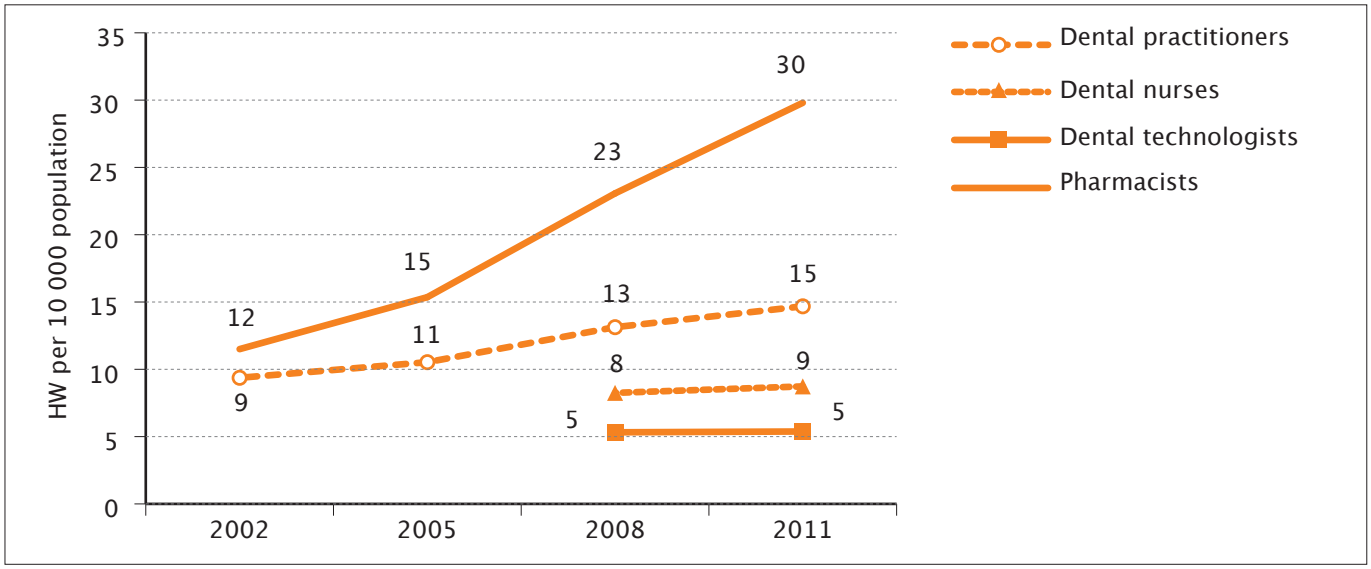
Similar to medical practitioners, numbers of dental practitioners and pharmacists increased rapidly after 2005, but dental health professionals have merely kept pace with population growth (Figure 6). The increase in pharmacists in the public sector was due to the introduction in 2008 of compulsory service (one year of provisional service followed by three years of compulsory service).

Figure 5. Trends in medical practitioner and nurse density



Source: Ministry of Health, 2013b.

Figure 6. Trends in dental health workers and pharmacist density



Source: Ministry of Health, 2013b.

The trends observed in the development of HRH in Malaysia point to the fact that the number of nurses increased rapidly throughout the decade, while numbers of doctors, dental practitioners and pharmacists kept pace with population growth during the first half of the decade and increased rapidly during the second half.

3. Health workforce distribution

3.1 Gender distribution

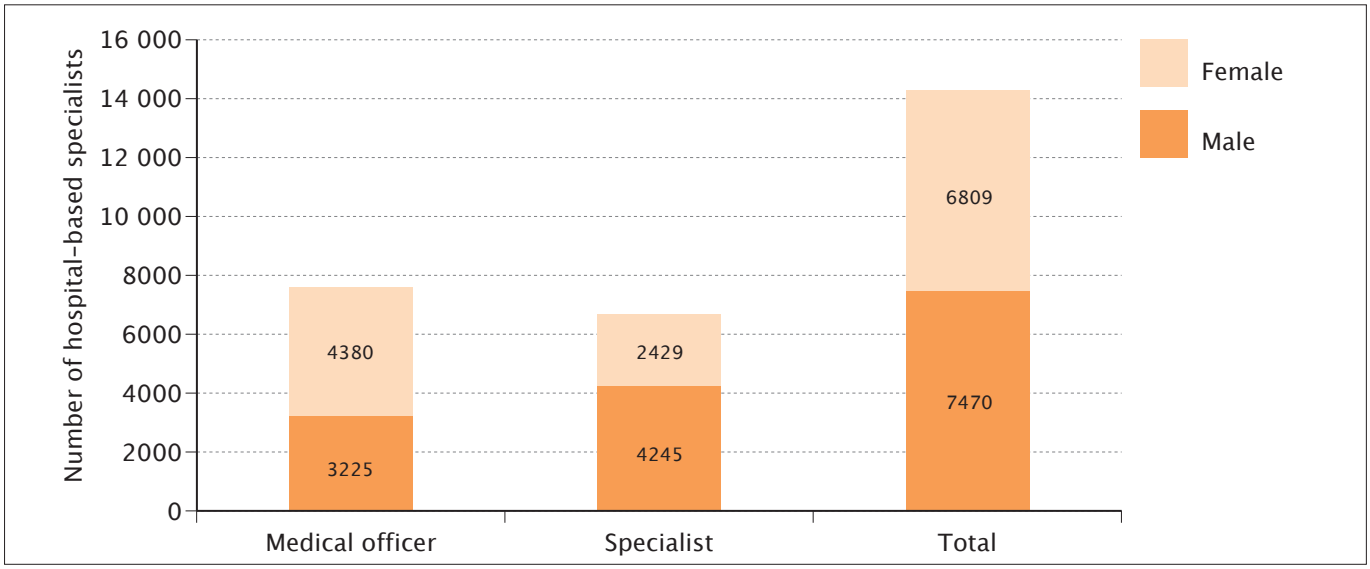
The proportion of females in the Malaysian health workforce is high (Table 5). In the case of medical practitioners it increased from 42.4% in 2008 to 45.7% in 2011. Unlike in other countries, there is no provision as yet for part-time work, and males and females have equivalent working hours. Since institutions of higher learning have more female than male students, the proportion of health workers who are female is likely to increase in the future. This could lead to a demand for part-time work and job-sharing arrangements. This in turn would affect HRH projections for the future.

Table 5. Gender distribution of selected categories/cadres of health personnel

Occupational categories/cadres	Year 2011	
	% Male	% Female
Doctors[1]	54.3	45.7
Dental practitioners[2]	36.8	63.2
Pharmacists[2]	30.2	69.8
Assistant medical officers[2]	96.4	3.6[a]
Registered nurses, JM and AN[2]	1.8[b]	98.2
Environmental health officers[2]	80%	20%

Note: [a] The first batch of female assistant medical officers was registered in August 2009.
[b] The first batch of male nurses was registered in January 2008.
Sources: [1] Malaysian Medical Council. APC issued (unpublished).
[2] Oral Health, Pharmaceutical Services, Allied Health and Nursing Divisions, Ministry of Health (unpublished).

Figure 7. Gender distribution among hospital-based specialists, 2010



Source: Additional analysis of data from Clinical Research Centre, 2010a.

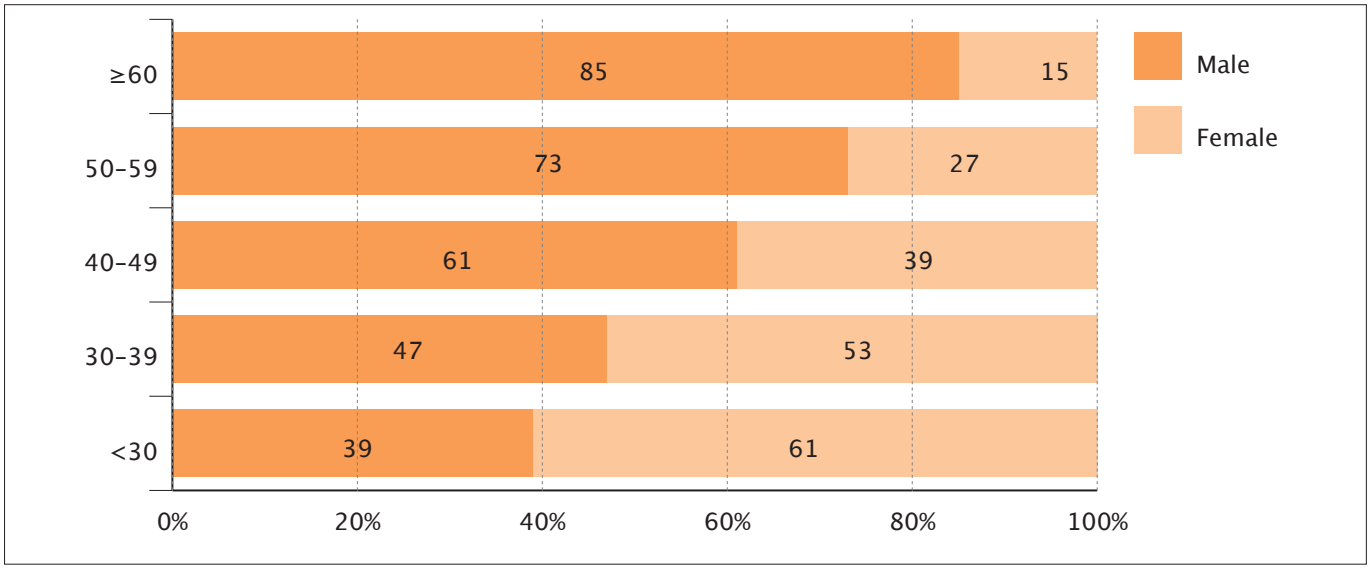
Among hospital-based general and specialist medical practitioners (public and private), the gender distribution, as illustrated in Figure 7, is skewed towards female non-specialist doctors and male specialist doctors.

The pattern might be because the proportion of female doctors is higher in the lower age groups (Figure 8), reflecting the relatively recent increase in the proportion of female medical graduates entering the workforce. Since specialization only occurs after several years of postgraduate service, the gender distribution of specialists would be influenced partly by the age distribution of the medical workforce during periods more than about 10 years previously. There are no data on the current gender distribution of medical officers undergoing postgraduate training for specialization.

3.2 Age distribution

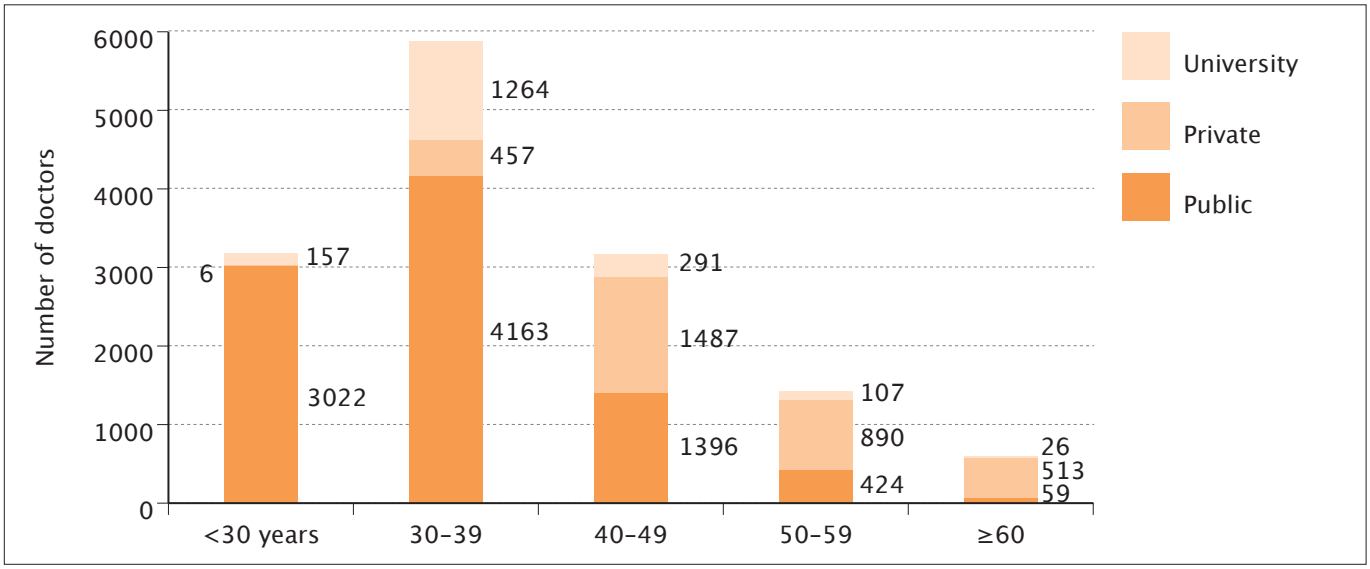
Data on age distribution is not compiled routinely for any category. However, the 2009 health workforce survey of medical doctors working in hospitals does

Figure 8. Gender and age distribution of hospital-based specialists, 2010



Source: Additional analysis of data from Clinical Research Centre, 2010a.

Figure 9. Age group and public/private distribution of hospital-based doctors, 2010



Source: Additional analysis of data from Clinical Research Centre, 2010a.

provide age-specific data on about two-thirds of all medical practitioners who were in active practice at that time, and illustrates one of the key HRH issues in the country. The balance of distribution of medical practitioners between public and private sectors shifts towards the private sector for doctors after the age of 40 (Figure 9).

This profile can be explained by the regulations and conditions governing medical practice. After graduation, medical practitioners are required to complete two years of housemanship in the public sector. During this time they are provisionally registered with the Malaysian Medical Council (MMC), and this period is regarded as supervised clinical experience that has to be completed successfully. Subsequently, they obtain full registration with the MMC. Once they obtain full registration, medical practitioners are required to serve in the public sector for a further period of two years (compulsory service). After this period, doctors are allowed to move to the private sector if they wish. The compulsory service provision was introduced to reduce the shortage of medical practitioners in the public sector.

The issue that has arisen is that inexperienced doctors serve in the public sector and, after gaining experience, significant numbers move to the private sector after age 40, thereby depriving the public sector of their experience and expertise. Since about 70% of inpatient care is provided by the public sector (Institute of Health, 2011), senior doctors in the public sector face a heavy burden. Furthermore, the experienced doctors who do remain in the public sector face the additional burden or training and supervising the large numbers of junior doctors who join the service every year. Conversely, the skills of specialist medical practitioners in the private sector are underutilized (Wong SL, Mohan AJ, Suleiman AB, 1998).

3.3 Geographic distribution

The West Coast states of Peninsular Malaysia (Johor, Negeri Sembilan, Melaka, Selangor, Perak, Penang, Kedah, Perlis and the federal territories of Kuala Lumpur and Putrajaya) are the most developed regions of the country. The East Coast states of Kelantan, Terengganu and Pahang and the states of Sabah and Sarawak are considered less developed. There have been continuing efforts to ensure better distribution of health resources, including human resources, for the less-developed regions. The impact of these efforts is shown in Tables 6–13.

During the period from 2003 to 2010, the ratios of doctors, nurses and assistant medical officers to population have improved greatly in the 'less-developed' regions (Table 6). For example, for doctors the gap between Sabah and West Coast states narrowed from 2.5:10 to 3.5:10, and for nurses from 4.3:10 to 5.7:10. The gap with other regions also narrowed, although to a lesser extent.

Table 6. Regional distribution of doctors, nurses and assistant medical officers, 2003 and 2010

Region	Health workers per 10 000 population							
	Doctors[1]		Family medicine specialists[2]		Nurses[1]		Assistant medical officers[1]	
	2003	2010	2003	2010	2003	2010	2003	2010
Peninsular Malaysia West Coast states	7.1	9.8	0.23	0.33	11.0	15.3	2.2	3.4
Peninsular Malaysia East Coast states	4.4	6.7	0.13	0.27	12.8	12.8	2.6	4.3
Sabah	1.7	3.4	0.05	0.05	4.7	8.5	2.1	3.1
Sarawak	2.9	4.0	0.01	0.04	8.9	10.0	4.2	5.3

Sources: [1] Ministry of Health, 2013b.
[2] Additional analysis of data from Clinical Research Centre, 2010a.

For dental health personnel, regional disparity persists for dental practitioners, but to some extent is balanced by higher proportions of dental nurses, who provide the bulk of the school dental services (Table 7).

The West Coast states have a much better pharmacist/pharmacy assistant to population ratio than the other regions, and the gap did not narrow during the period from 2003 to 2010 (Table 8).

Table 7. Regional distribution of dental health personnel, 2003 and 2010

Region	Health workers per 10 000 population					
	Dental practitioners		Dental nurses		Dental surgery assistants	
	2003	2010	2003	2010	2003	2010
Peninsular Malaysia West Coast states	1.2	1.6	0.6	0.7	0.7	0.9
Peninsular Malaysia East Coast states	0.8	1.3	1.0	1.2	1.1	1.6
Sabah	0.4	0.6	0.8	1.0	0.6	0.9
Sarawak	0.5	0.8	1.4	1.6	0.8	1.2

Source: Ministry of Health, 2013a.

Table 8. Regional distribution of pharmacists and pharmacy assistants, 2003 and 2010

Region	Health workers per 10 000 population			
	Pharmacists		Pharmacy assistants	
	2003	2010	2003	2010
Peninsular Malaysian West Coast states	1.6	3.1	0.9	0.9
Peninsular Malaysian East Coast states	0.7	2.0	1.3	1.3
Sabah	0.4	1.7	1.2	1.2
Sarawak	0.8	2.2	1.3	1.3

Source: Ministry of Health, 2013a.

Table 9. Regional distribution of medical laboratory technologists, radiographers and physiotherapists employed by the Ministry of Health, 2003 and 2010

Region	Health worker per 10 000 population					
	Medical laboratory technologists		Radiographers		Physiotherapists	
	2003	2010	2003	2010	2003	2010
Peninsular Malaysia West Coast states	1.02	1.03	0.26	0.26	0.2	0.3
Peninsular Malaysia East Coast states	0.66	0.98	0.12	0.15	0.1	0.3
Sabah	0.43	0.66	0.05	0.06	0.2	0.3
Sarawak	0.13	0.18	0.10	0.07	0.2	0.4

Source: Ministry of Health, 2013a.

Table 10. Regional distribution of specialist medical practitioners in 2010

Region	Health workers per 10 000 population					
	Anaesthesiology	Surgery	Orthopaedic surgery	Medicine	Paediatrics	Obstetrics and gynaecology
Pen Malaysia West Coast states	0.30	0.38	0.23	0.56	0.28	0.33
Pen Malaysia East Coast states	0.16	0.21	0.17	0.28	0.15	0.15
Sarawak	0.14	0.1	0.11	0.27	0.14	0.018
Sabah	0.08	0.1	0.05	0.18	0.07	0.01

Source: Additional analysis of data from Clinical Research Centre, 2010.

For medical laboratory technologists (MLTs), radiographers and physiotherapists, data are available only for staff employed by the Ministry of Health because data are not collected routinely from the private sector. All regions have similar densities of physiotherapists, but the other two categories are better represented in the West Coast states (Table 9).

Regional discrepancies are most marked in the distribution of medical specialists (Table 10). In 2009, taking into consideration both public and private sector specialists working in hospitals, the West Coast states had about twice as many specialists in the core disciplines of medicine, surgery, anaesthesiology, orthopaedic surgery and obstetrics and gynaecology compared with the East Coast states, and almost three times as many as Sarawak and Sabah.

3.4 Sectoral distribution

In 2011, the distribution of doctors between the public and private sectors was about equal, while there were more specialist medical practitioners, dental practitioners, pharmacists and nurses in the public than the private sector. Some categories of other health personnel (dental nurses) are allowed to work only in the public sector, while others are predominantly employed in the public sector (assistant environment health officers, environmental health officers, community nurses) (Table 11). For other categories, data are available only for those employed in the Ministry of Health, because those in the private sector have no legal requirement to register with any central agency.

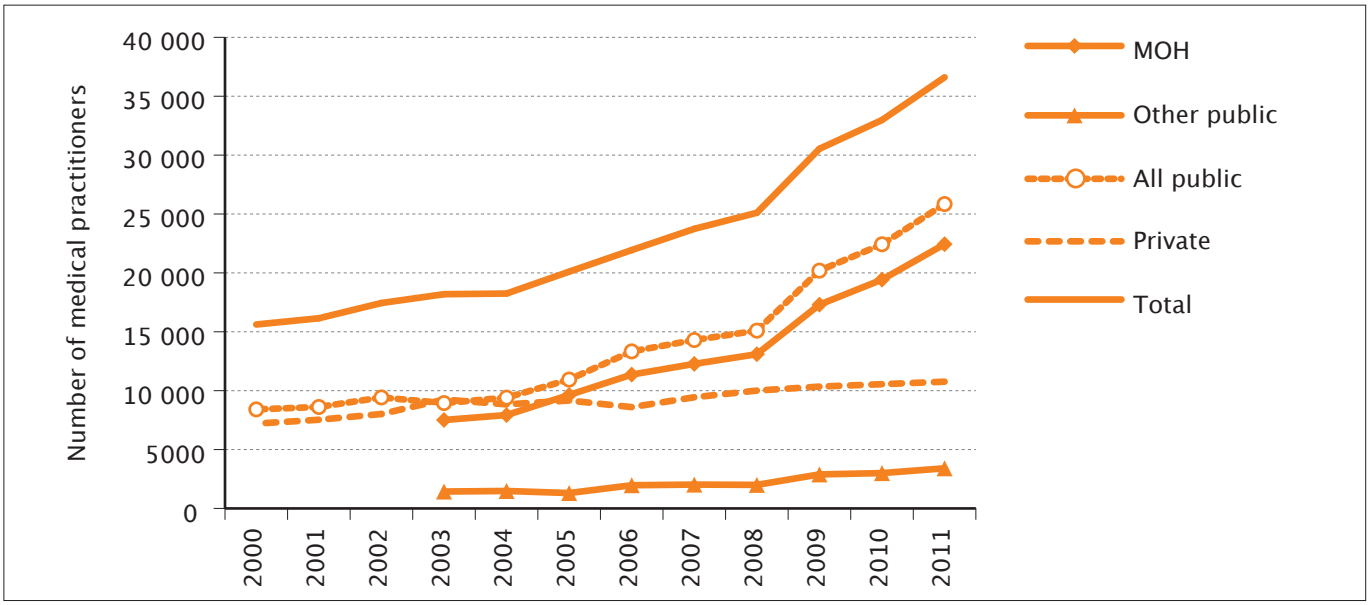
During the period from 2005 to 2011, the public/private distribution of medical practitioners (doctors) and dental practitioners shifted gradually towards the public sector (Table 11, Figure 10). Similarly, the number of pharmacists in the public sector escalated rapidly during this period (Figure 11). This is a reflection of the recent rapid increase in the number of fresh graduates entering the workforce, all of whom are obliged to serve in the public sector for an initial

Table 11. Ratio of public sector HRH to private sector HRH

	2005			2008			2011		
	Public sector	Private sector	Ratio public to private	Public sector	Private sector	Ratio public to private	Public sector	Private sector	Ratio public to private
Doctors[1]	10 943	9162	5.4 : 4.6	15 096	10 006	6.0 : 4.0	25 845	10 762	7.0 : 3.0
Specialist medical practitioners in clinical settings[2] (2009)	–	–	–	3517*	2159*	6.2 : 3.8*	–	–	–
Dental practitioners[1]	1263	1488	4.5 : 5.5	1922	1718	5.2 : 4.8	2452	1801	5.7 : 4.3
Pharmacists[1]	955	3057	1.9 : 8.1	3070	3327	4.2 : 5.8	5288	3344	6.2 : 3.8
Nurses[1]	32 580	11 540	7.4 : 2.8	38 575	15 633	7.1 : 2.9	50 063	24 725	6.7 : 3.3
Community nurses[1]	15 408	210	9.8 : 0.2	18 143	500	9.7 : 0.3	21 928	338	9.8 : 0.2
Assistant nurses[1]	3107	2174	5.9 : 4.1	2289	2327	5.0 : 5.0	1009	2127	3.2 : 6.8
Dental nurses [1]	–	–	–	2287	0	all public	2528	0	all public

Note: * There were 698 specialists in public universities with teaching hospitals i.e. about 11% of all specialists. Some of these would have been public sector and others private sector universities and these have been excluded from the data in the table.
Sources: [1] Ministry of Health, 2013b.
[2] Additional analysis of data from Clinical Research Centre, 2009b.

Figure 10. Distribution of medical practitioners (including trainee doctors i.e. house-officers) by sector, 2000-2011

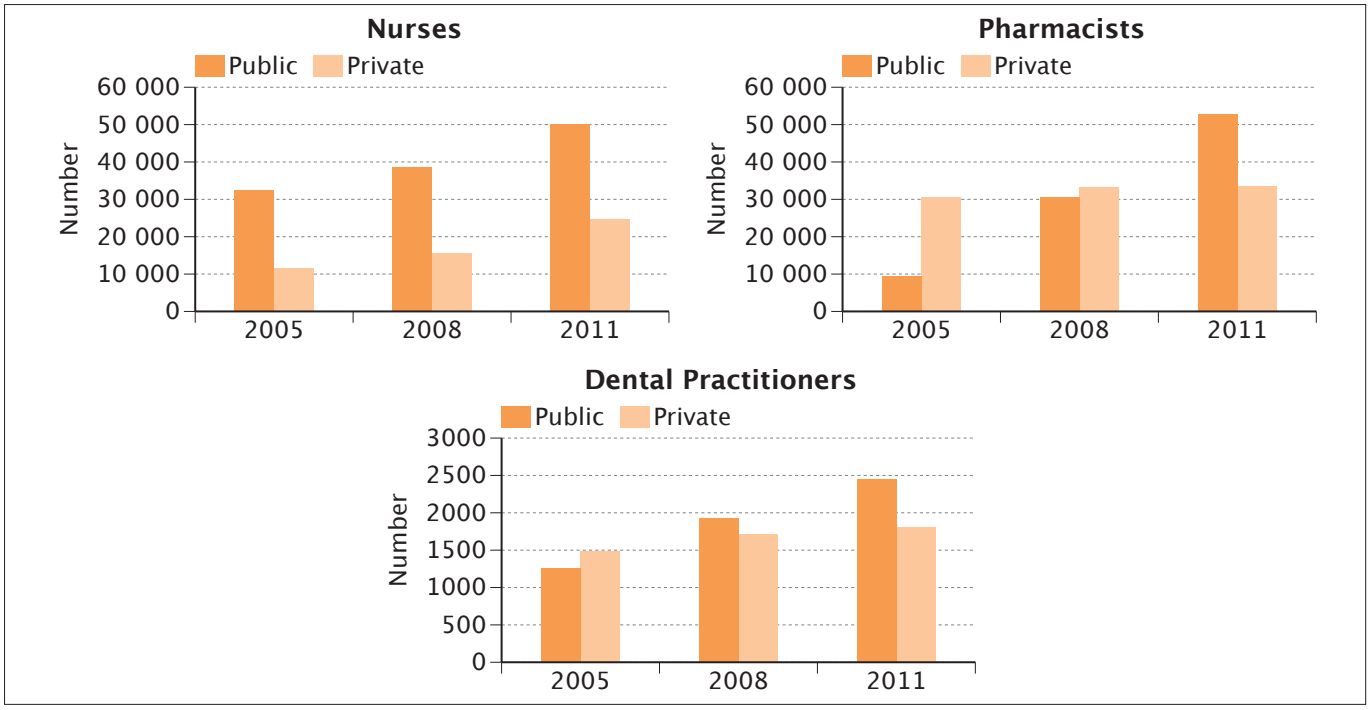


Source: Ministry of Health, 2013b.

period. With this large increase in entrants into the workforce, it is as yet unclear whether the trend of movement from the public to the private sector will continue.

Conversely, the proportion of nurses in the private sector increased after 2005 (Figure 11). This was due initially to relaxation in conditions that allowed a rapid inflow of expatriates to meet the demands of a very active private sector. Subsequently, graduates from the large number of newly established local institutions of nursing education began to enter the market, and further increased the nurse workforce.

Figure 11. Distribution of nurses, pharmacists and dental practitioners by sector, 2005-2011



Source: Ministry of Health, 2013b.

Table 12. Total number of health workers by category and number of expatriates in each category

Health occupational categories/cadres	Year 2005			Year 2008			Year 2011		
	Total[1]	Expats[2]	% expats	Total[1]	Expats[2]	% expats	Total[1]	Expats[2]	% expats
Doctors	20 105	295	0.97	25 102	1613	6.43	36 607	1793	4.75
Dental practitioners	2751	82	2.90	3640	147	4.00	4253	240	5.30
Nurses	44 120	555	1.26	54 208	1052	1.94	74 788	852	1.14
Audiologists	-	-	-	-	-	-	191	7	3.66
Occupational therapists	-	-	-	426	-	-	907	17	1.87
Physiotherapists	-	-	-	-	-	-	17	0	0.00

Sources: [1] Ministry of Health, 2013b.
[2] Respective boards/councils and Ministry of Health.

Table 13. Ratios of medical and dental practitioners and pharmacists to nursing and laboratory personnel, 2011

Doctors to nursing personnel	1 : 5.3
Dental practitioners to dental nursing personnel	1 : 2.3
Pharmacists to assistant pharmacists	1 : 0.4
Doctors to medical laboratory technologists	1 : 0.1
Dental practitioners to dental technologists	1 : 0.8

Note: The skill mix for other health personnel is given in Annex A.
Source: Analysis of data from the Health Informatics Centre, Ministry of Health, (unpublished).

3.5 Distribution by citizenship

The proportion of health professionals who are expatriates is very small (Table 12). However, both the total number of expatriates and their proportion over the total number in each category increased during the period 2005–2011.

3.6 Skill Mix

The current skill mix is shown in Table 13. There is no strong empirical evidence on the optimal ratio of doctors or dental practitioners to nurses (Buchan J, Dal Poz MR, 2002). The training time and costs for nurses is much lower than for doctors and, historically, Malaysia has relied on producing nurses and assistant medical officers (previously known as medical assistants) to provide essential services until more doctors became available. In more recent years, there has been a trend for both doctors and nurses to acquire specialized skills to meet the changing demands of technological advances and community expectations. The skill mix in Malaysia is governed to some extent by the facility staffing norms used in the public sector.

From the study of the HRH distribution in Malaysia the following can be concluded:

- Key categories in the HRH workforce are becoming increasingly feminized.
- Doctors, dental practitioners and pharmacists in the public sector have recently outnumbered those in the private sector due to the rapid rise in new entrants, all of whom are required to serve a period of compulsory public sector service.
- Public sector nurses outnumber those in the private sector, but the number in the private sector has been increasing in recent years.
- Disparities in regional distribution are evident, although they are being reduced gradually, and to some extent are aligned with the disparities in regional distribution of health-care facilities.
- Routine data on age distribution are not collated. However, cross-sectional data on the age distribution of doctors in hospitals suggest that doctors spend the early years of their career in the public sector, then move to the private sector after age 40.

4. Health professions education[3]

4.1 Governance of health professions education

Existing policies and strategies on health professional education

General policies on higher education are established by the Ministry of Higher Education within the context of national vision, policies and strategies. The *National Higher Education Strategic Plan: Beyond 2020* (Ministry of Higher Education, 2007) aims to "transform higher education within the context of establishing Malaysia as an international hub of excellence for higher education". The Plan includes thrust areas to increase access to tertiary education and to improve the quality of higher education. Policies and strategies specific to health professional education programmes are developed collaboratively between the Ministry of Health and the Ministry of Higher Education, with input from professional bodies. The Malaysian Qualifications Agency (MQA) was established under the Malaysian Qualifications Act 2007 to implement one of the primary objectives of the Strategic Plan: ensuring quality in higher education. In accordance with its mandate, the MQA has produced and implements the Malaysian Qualifications Framework (MQF) (Malaysian Qualifications Agency, 2008a), which classifies qualifications based on a set of criteria that are approved nationally and benchmarked against international best practices. The MQF clarifies academic levels, learning outcomes for study areas and credit systems, and provides educational pathways linked systematically to qualifications (the framework is available online at http://www.mqa.gov.my). The legislation also provides for a Malaysian Qualifications Register (MQR), which is also available online and contains information on programmes, qualifications and higher education providers who are accredited under the legislation.

Provision of pre-service education for health professionals: responsibilities and regulations

Pre-service education is provided by universities and colleges in the public and private sectors. Public sector universities and colleges are funded by the Government and regulated under the Universities and Colleges Act 1971. Most of them are under the purview of the Ministry of Higher Education, while some that cater for specific categories of staff are under the purview of the Ministry of Health or the Ministry of Defense. Private sector universities, university colleges and non-degree-granting institutions are not funded or maintained by the Government and

Table 14. Training institutions for HRH, 2011

Health occupational categories/cadres	Public		Private		All
	colleges	universities	colleges	universities	
Medicine	0	11	0	22	33
Dentistry	0	6	0	6	12
Pharmacy	0	5	0	11	16
Nursing	6	16	60	8	90
Midwifery	23	2	2	0	27
Assistant medical officer	6	0	3	0	9
Pharmacy assistant	2	0	22	0	24
Dental therapist (nurse)	1	0	0	0	1
Dental technologist	1	0	2	0	3
Dental surgery assistant	1	0	2	0	3
Traditional and complementary medicine	0	3	0	4	7
Other health sciences	See Annex C				

Sources: Malaysian Qualifications Agency, 2013 (unpublished); Ministry of Higher Education, 2013 (unpublished); various divisions of the Ministry of Health Malaysia and respective boards, 2013 (unpublished).

3 This section includes data and information gathered from interviews with representatives of the Ministry of Health, Ministry of Higher Education and Ministry of Defence, as detailed in Annex H.

Table 15. Basic education programmes for HRH

Health occupational categories/cadres	Public				Private				Total progs
	Cert.	Dip.	Degree	Sub-total progs	Cert.	Dip.	Degree	Sub-total progs	
Medicine	0	0	14	14	0	0	30	30	44
Dentistry	0	0	6	6	0	0	6	6	12
Pharmacy	0	0	5	5	0	0	12	12	17
Pharmacy assistant	0	2	0	2	0	36	0	36	38
Nursing	11	19	6	36	0	72	30	102	138
Midwifery	11	13	0	24	0	2	0	2	26
Assistant medical officer	0	6	0	6	0	3	0	3	9
Dental therapist (nurse)	0	1	0	1	0	0	0	0	1
Dental technologist	0	1	0	1	1	1	0	2	3
Dental surgery assistant	1	0	0	1	3	0	0	3	4
Other health sciences	See Annex C								

Sources: Malaysian Qualifications Agency, 2013 (unpublished); Ministry of Higher Education, 2013 (unpublished); various divisions of the Ministry of Health Malaysia and respective boards, 2013 (unpublished).

are regulated under the Private Higher Educational Institutions Act 1996, which is implemented by the Ministry of Higher Education.

4.2 Educational capacities

Institutions involved in the process of health professional education

The distribution of public and private institutions of higher education providing basic education programmes for HRH is shown in Table 14.

Some institutions provide more than one programme and therefore there is a total of 393 basic education programmes for health professionals, 230 of them in the private sector (Table 15). Nursing, pharmacy and medicine have the highest numbers of training programmes. Comparatively, the number of training programmes seems to be very high—for example, Malaysia, with a population of 28 million, has 33 medical programmes, compared with Australia, with a population of 22 million, where there are 18 medical schools. The recent rapid proliferation of education programmes for HRH has resulted in a rapid increase in the number of graduates.

4.3 Training processes and quality assurance mechanisms

Decisions on establishing new institutions and programmes

Applications for establishment and accreditation of new programmes are made to the MQA. The application process is described on the MQA website (www.mqa.gov.my). Programme assessment is guided by several quality assurance documents including *Programme standards for medical and health sciences* (Malaysian Qualifications Agency, 2010). The Accreditation Committee Meeting (MJA) is responsible for assessing applications and making recommendations to the Ministry of Higher Education, which has ultimate responsibility for approval. The evaluation is generally referred to the MJA, the Joint Technical Committee (JTC) and the Higher Education Committee (JKPT), which involves representatives from key stakeholders related to the application, including relevant ministries and professional bodies. Criteria for evaluation include: financial viability; HRH capacity within the institution, including its level of reliance on foreign staff; educational resources, such as lecture halls, library and skills laboratory; and self-assessment criteria and capacity. If the programme requires establishment of a new institution, the evaluation includes the employment potential of graduates (including whether new posts are likely to be created in the public sector). However, in terms of assessing the employability of graduates, particularly for private sector institutions, the Evaluation Committee is reliant on the opinions of expert members. There are no explicit criteria yet. The recommendations of the MQA are forwarded to the Ministry of Higher Education, who makes the final decision.

Accreditation, standards and linkages

All programmes conducted by higher education institutions (HEIs) must be approved by the Minister

of Higher Education, and the approval must be based on recommendations by the MQA. The MQA has produced a *Code of Practice for Programme Accreditation* (COPPA) (Malaysian Qualifications Agency, 2008a), a *Code of Practice for Institutional Audit* (COPIA) (Malaysian Qualifications Agency, 2008b) and *Guidelines for Programme Standards* (Malaysian Qualifications Agency, 2010). The evaluation is both quantitative and qualitative. Accreditation is not mandatory. However, many agencies that recruit staff, notably the Public Service Commission, which employs graduates for the public sector, require qualifications to be from accredited programmes.

The MQA has three committees that are critical in developing and implementing quality standards: Accreditation, Equivalency and Standards. Through these committees, quality standards for education programmes are developed and monitored. For education programmes for health professionals, namely Medicine, Dentistry, Pharmacy, Nursing, Optometry, Assistant Medical Officer, Traditional and Complementary Medicine, the JTC has representation from the Ministry of Health, professional bodies, practitioners and academicians. The task of the JTC includes setting standards for programme accreditation; training and selecting assessors; making recommendations for approvals; and jointly deciding on accreditation of local and foreign programmes. The process of evaluation includes site visits. There are nine evaluation areas:

(1) Vision, mission and learning outcomes;
(2) Curriculum design and delivery;
(3) Student selection and support services;
(4) Assessment of students;
(5) Academic staff;
(6) Educational resources;
(7) Programme monitoring and review;
(8) Leadership, governance and administration; and
(9) Continual quality improvement.

Two levels of standards are used: benchmarked and enhanced. The *Code of Practice for Programme Accreditation* provides detailed guidance on the evaluation areas and the two levels of standards. Standards and quality criteria were developed by the MQA and its predecessors, the National Accreditation Board and the Quality Assurance Department of the Ministry of Higher Education, and professional bodies. The standards and quality criteria are based on international and national best practices.

Student achievements are measured by learning outcomes that distinguish the varying competencies in what a student will be able to do at the end of a period of study. Learning outcomes are based on eight domains:

(1) Knowledge;
(2) Practical skills;
(3) Social skills and responsibilities;
(4) Values, attitudes and professionalism;
(5) Communication, leadership and team skills;
(6) Problem-solving and scientific skills;
(7) Information management and lifelong learning skills; and
(8) Managerial and entrepreneurial skills.

Learning outcomes are linked to the credit system, which gives value to all student learning-time and are not based merely on the contact hours between lecturers and students.

The standards for Medicine, Dentistry, Pharmacy, Nursing, Optometry and Assistant Medical Officer programmes are prescribed by the councils or boards established under the respective legislation for those professions. Programme standards for other health sciences were developed by the MQA with involvement of academicians and industry players and enforced from January 2013 (MQA Circular No. 2/2012). The standards contain considerable detail, including requirements such as:

- Programme aims;
- Learning outcomes;
- Curriculum;
- Student assessment;
- Student selection (entry criteria);
- Minimum qualification for academic staff;
- Staff-student ratios (for lectures, problem-based learning, clinical teaching, laboratory teaching etc.);
- Educational resources, including:
  - o physical resources (rooms for lectures, seminars, and tutorials; basic science laboratories; computer laboratory; library and skill/simulation laboratories);
  - o clinical practice, with access to related departments in hospitals and health-care facilities;
  - o practical attachments; and
  - o online educational database;
- Programme monitoring and review processes;
- Leadership, governance and administration; and
- Continual quality improvement.

For each programme, the programme structure is outlined, together with suggestions on the number of credits for each part of the programme.

Table 16. Sample minimum criteria for an education programme

	Duration of course	Examples of some of the entry qualification for students	Academic staff (minimum qualification)	Staff/student ratio	Graduating minimum number of credits or qualifications
Medical practitioners (non-specialists)	5 years + 2 yrs housemanship	SPM or GCE O levels: 5 Bs in 3 Science, Mathematics and one other subject plus STPM or GCE A levels BBB, ABC, or AAC in Chemistry Biology & Maths or Physics	For Basic medical science; a basic degree in Medicine or a Masters in the relevant subject. For Clinical sciences, adequately qualified staff in the core clinical disciplines registered and credentialed to practise.	Tutorials 1: 16 students. Problem-based group learning 1:12 per group Skills lab 1:10. Bedside clinical teaching 1:8	Establish principles and methods for the evaluation of student achievement. Clear demonstration of the satisfactory achievement of the objectives of all components of the course by a variety of assessment methods.

Note: There are further specifications for each item shown in this table. There are also several other areas for which minimum standards have been developed. Please see Annex C for a more detailed description of the items listed in this table.
Source: Malaysian Medical Council, 2011.

Curriculum review

Higher education providers are required to have quality assurance mechanisms that include institutional audits. The institutional audit has two components: a self-review followed by evaluation by an audit panel, which is an external independent peer panel. The internal audit includes information on how the institution has carried out curriculum review and a review of student assessment processes, as well as the other items listed in the nine areas of evaluation. Institutions in the Ministry of Health carry out a curriculum review at least every five years, or more frequently when required by the needs of technical programmes or in order to bring a programme into compliance with MQA guidelines.

Minimum standards

Table 16 shows an illustrative sample of minimum requirements for medical undergraduate programmes. The standards were developed by the Malaysian Medical Council in coordination with MQA.

Similar programme standards have been developed for education programmes for other categories of health personnel. Table 17 gives a brief summary of illustrative standards, which demonstrate how criteria and standards have been coordinated across professions. The information provided in Table 17 is intended merely to be illustrative. For each item, there are several other specified standards and there are other items for which standards have been developed. The complete information on programme standards is available on the MQA website (http://www.mqa.gov.my).

Annex C gives similar information on other health education programmes.

Student selection and recruitment

There are four distinct processes through which students enter basic training programmes for HRH. The process is determined by the type of institution:

(1) Institutions within the Ministry of Health;
(2) Public sector institutions under the purview of the Ministry of Higher Education;
(3) Private sector institutions under the purview of the Ministry of Higher Education; or
(4) Institutions in other countries, for which students might be:
    (a) sponsored by the Government or government-linked agencies; or
    (b) not sponsored by any official agency.

For education programmes in the Ministry of Health, students apply to the Public Services Commission (PSC) for trainee positions. Selection is done by a PSC committee that has representation from the Ministry. The annual intake is determined by the capacity of the Ministry institutions and the expected requirements. Students who are selected are provided with subsidies and ensured job placement in the public sector.

For HEIs in the public sector, students apply for selection to a centralized student admission unit of the Ministry of Higher Education. Selection is competitive and influenced by implicit and as well as explicit criteria, which include academic performance. All students in public sector HEIs are subsidized by the

Table 17. Comparable minimum criteria for basic education programmes for selected HRH categories

	Duration of course	Examples of some of the entry qualification for students	Academic staff (minimum qualification)	Staff/student ratio	Graduating minimum credits or qualification
Dental practitioner	5 years	See Malaysian Dental Council (2012)	Lecturers must have a postgraduate qualification recognizable by the Ministry of Health/Dental Specialist Register. If not, at least the basic degree recognized by MDC. See Malaysian Dental Council (2011).	Academic staff to student ratio: ▪ Preclinical training 1:10 ▪ Clinical training 1:4 See Malaysian Dental Council (2011).	Not available
Pharmacist	4 years + 1 year provisional registration	See Pharmacy Board, Malaysia (2007).	Masters degree in relevant subject	Classroom 1:10 Clinical 1:8	Degree in Pharmacy
Assistant medical officer	3 years	SPM 5 credits incl Maths, Science and Malay	B.Sc with Diploma in Medical Assistant with a teaching certificate	1:20 Public 1:25 Private	Assistant Medical Officers' Diploma
Nurse (certificate)	2–4 yrs	See Nursing Board, Malaysia (2010).	Registered nurse with a teaching certificate	Classroom 1:20–30 Clinical 1:10–15 full-time	Certificate in Nursing 60–85 credits Registered Nurse
Nurse (diploma)	3–5 yrs		Registered Nurse with degree and 3 yrs experience and teaching certificate	Classroom 1:20–30 Clinical 1:10–15 full-time	Diploma in Nursing 90–100 credits Registered Nurse
Nurse (degree)	4–6 yrs		Registered nurse with degree and 5 yrs experience or Masters degree and 3 yrs experience and a teaching certificate	Classroom 1:20–30 Clinical 1:10–15 full-time	Bachelors degree in Nursing 120–140 credits Registered Nurse
Community nurse	30 months	Curriculum includes general nursing, community nursing and midwifery for normal deliveries only			Registered as community nurse
Nurse-midwife	1 year	Registered nurse	Registered nurse with midwifery and 3 yrs clinical experience	Classroom 1:20 Clinical 1:8	Registered as nurse midwife

Sources: Malaysian Dental Council (2011); Malaysian Dental Council (2012); Pharmacy Board, Malaysia (2007); Nursing Board, Malaysia (2010); Assistant Medical Officers' Board of Malaysia, (unpublished).

Government and a significant proportion of students also receive scholarships.

For private sector HEIs, students apply directly to the institution of their choice. The institutions are expected to adhere to the minimum standards for selection, as specified in the COPPA Guidelines. A variety of scholarships are provided by government-linked agencies, as well as private sector foundations. For foreign institutions, students apply to the respective sponsoring agencies.

Entrants, graduates and fees for selected programmes
Table 18 compares the numbers of entrants and graduates in selected health professions with those in engineering and law.

The Ministry of Higher Education does not routinely compile data on programme drop-out rates, although individual institutions keep track of their own rates. Table 19 provides information on the drop-out rate in training institutions under the Ministry of Health.

Table 20 gives information on the average fee subsidy provided per HRH student for selected courses and for a few other professional courses. For public sector HEIs, the lower fee illustrates the subsidy provided by the Government. There are no compiled data on the overall training cost per graduate.

Partnerships
Several HEIs have partnerships with international institutions. However, in terms of public-private partnerships, the outstanding examples for HRH are in (1) clinical bedside training, and (2) development and implementation of programme standards and guidelines.

Table 18. Entrants and graduates of selected programmes under the Ministry of Higher Education

Programme	Entrants		Programme	Graduates	
	2008	2011		2008	2011
Medicine (Degree 5 years)	2096	2717	Medicine	1239	1321
Dentistry (Degree 5 years)	433	392	Dentistry	147	179
Pharmacy (Degree 4 years)	841	392	Pharmacy	542	492
Nursing (Diploma 3 years)	22 996	2473	Nursing diploma	5887	1366
Nursing (Degree 4 years)	1365	1726	Nursing degree	421	1045
Engineering (Degree 4 years)	15 327	19 330	Engineering	13 864	12 780
Law (Degree 4 years)	3828	3136	Law	2226	1690

Source: Data Management Unit, Planning and Research Division, Ministry of Higher Education, (unpublished).

Table 19. Drop-out rate in Ministry of Health training institutions by discipline, 2009

Category	Intake	Drop-out rate (%)
Nurses	3325	1.9
Assistant medical officers	958	0.5
Pharmacy assistants	161	4.4
Medical laboratory technologists	380	2.0
Physiotherapists	104	3.1
Occupational therapists	105	1.3
Radiographers – diagnostic	46	1.9
Radiographers – therapy	106	1.9
Assistant environmental health officers	407	3.3
Dental nurses	69	2.9
Dental technologists	47	2.1
Community nurses	2009	3.1
Dental surgery assistants	254	1.5
Public health assistants	423	2.3

Source: Training Management Division, Ministry of Health, (unpublished).

Table 20. Fees for selected basic education programmes

Health occupational categories/cadres	Duration	Malaysian	
		Public sector	Private sector
Medical degree	5 years	RM 10 200 – 21 470	RM 250 000 – 450 000
Dental degree	5 years	RM 9700 – 13 905	RM 260 000 – 612 000
Pharmacy degree	4 years	RM 8976 – 19 411	RM 80 000 – 150 000
Nursing diploma	3 years	RM 4320 – 18 783	RM 18 000 – 60 000
Nursing degree	4 years	RM 6240 – 18 783	RM 30 000 – 90 000
Engineering degree	4 years	RM 6560 – 18 787	RM 51 000 – 95 680
Law degree	4 years	RM 5360 – 17 779	RM 41 200 – 75 200
Ministry of Health Allied Health Diploma	3 years	RM 23 7256	n.a.
Ministry of Health Allied Health Certificate	1 1/2 years	RM 19 930.00	n.a.

n.a, not applicable.
Source: Governance Division, Public Higher Education institutions (HEIs), Ministry of Higher Education, 2013 (unpublished).

Very few HEIs own health-care facilities and therefore the vast majority need to form partnerships with hospitals to provide the facilities needed for clinical training. Private sector health-care providers are reluctant to provide facilities for clinical teaching. Therefore institutions need to form partnerships with the larger hospitals of the Ministry of Health and the Ministry of Defense that have sufficient numbers of the range of patients and beds suitable to provide facilities for clinical training. Thus HEIs in the public as well as the private sector form partnerships with public-sector hospitals. Such partnerships are based on a Memorandum of Understanding that includes the role of each partner and the payment to be made by the HEI. An interesting partnership arrangement formed between private sector HEIs and the Ministry

of Defense concerns the provision of a clinical training site at the Ministry of Defense hospital in exchange for student placements in the private HEI for candidates from the Ministry. Another example of public-private partnerships is in pharmacy, where private sector pharmacies and institutions that meet agreed criteria are gazetted under the law to provide training for provisionally registered pharmacists. On achieving full registration, such pharmacists are expected to serve the specified private institution for a defined period. Another type of partnership is the twinning arrangements between several Malaysian HEIs and those in countries such as Australia, the United Kingdom and the United States of America. Such twinning arrangements allow for exchange of staff and special expertise, as well as opportunities for students to do part of their course in a foreign university.

4.4 In-service training and continuing professional education (CPE)

In-service education

The Ministry of Health organizes and funds in-service education for its staff. Currently there are about 54 courses, ranging from six- to twelve-month duration. Such courses are approved by the Board of Education in the Ministry of Health, require full-time attendance and include practical or clinical training by specialists in the relevant field of study. An issue specific to health professionals is the budgetary limitations for in-service and post-basic education. The 32 categories of health professional share the same limited budget. Yet the growing importance of noncommunicable diseases and the trend towards medical specialization and the growth of sub-specialties and super-specialties requires the relevant health professionals to gain newer and higher-level competencies. Such development is hampered by limited budget availability for short in-service courses, as well as for entry to courses for higher-level qualifications, such as Masters degrees or Doctorates.

For staff in HEIs, opportunities for in-service education vary in different institutions, although most are able to obtain sabbatical leave. In addition, staff are encouraged to undergo further education and aim for higher qualifications in specific fields. Scholarships are available on a competitive basis from the Public Services Department and specific agencies in the public sector, such as MARA, as well as various foundations in the private sector.

Continuing professional education

Continuing professional education (CPE) is organized and funded by the Ministry of Health, professional bodies and by some private sector HEIs and health-care providers (hospitals). Some CPE is also funded by private sector entities, such as pharmaceutical firms. Professional bodies like the Malaysian Medical Association also provide opportunities for their members to link with distance-learning programmes conducted by sister organizations, such as the British Medical Association. Most CPE courses provide credit points to those who attend.

The continuing professional development (CPD) programme for personnel working in the Ministry of Health was established in 2008 for doctors, dental practitioners and pharmacists, and was later expanded to other categories, such as nurses and other health professionals. Initially, the CPD programme was involved in competency assessments, but it has since been used for other purposes, such as renewal of annual practising certificates for some categories (all categories are expected to complete seven compulsory days of training). There is an online CPD monitoring system to enable health-care professionals to claim CPD points.

4.5 Licensing and re-licensing procedures

Registration

Medical and dental practitioners, pharmacists, nurses, assistant medical officers, optometrists and opticians, food analysts and counsellors are required by law to register with their respective Council/Board prior to obtaining licences to practise. The criteria for registration are specified in the relevant legislation. For HRH working in the areas of medicine, dentistry and pharmacy there is a period of provisional registration, which is considered part of the training. Evidence of satisfactory completion of the training conditions related to provisional registration is required prior to full registration.

Re-licensure

Licences to practise are renewed annually. For pharmacists, nurses and assistant medical officers, re-licensure requires a minimum number of CPE credit points. For example, the annual minimum numbers of credit points for nurses, as recommended by the Nursing Board of Malaysia, are as follows:

Nursing matrons and Nursing sisters	:	35–40 points/year
Staff nurses	:	25–30 points/year
Community nurses	:	15–20 points/year

Table 21. Nurses and assistant medical officers credentialed during 2007–2012

Type of credential	Nurses	Assistant medical officers
Emergency and trauma	207	217
Perioperative care	1519	7
Intensive care	1362	0
Ophthalmology	233	22

Source: Credentialing Secretariat for Allied Health, Allied Health Division, Ministry of Health (unpublished).

All nurses are required to earn a certain number of CPD points to be able to renew their annual practising certificates. These CPD points can be obtained by attending courses, workshops, seminars or conferences; doing research; writing publications; giving talks; or being involved in committees or as project managers (Nursing Division, Ministry of Health).

The Pharmacy Board of Malaysia has proposed 30 credit points per year for re-licensure of their members, while assistant medical officers require 30–40 credit points, depending on their grade of service.

Medicine and Dentistry are in the process of creating systems to implement a system of credit points for annual re-licensure. For example, in the new Dental Bill, it has been proposed that "all registered practitioners who intend to renew their Annual Practicing Certificate need to have a minimum of 30 points of CPE. This is still unregulated." (Oral Health Division, Ministry of Health)

Credentialing

Credentialing is viewed as the essential mechanism to ensure that health professionals are competent in their chosen fields of specialty based on pre-determined professional training requirements and experience. Currently, medical practitioners, nurses and assistant medical officers have specified processes for credentialing.

In 2008, the Malaysian Medical Council set guidelines for credentialing of medical practitioners to perform highly specialized procedures that require specialist skills. The Ministry of Health has developed a set of guidelines for the process of credentialing and privileging, standards for clinical competence, and identification of procedures in which providers should be proficient. The process of credentialing has been developed and refined during the past few years, and is expected to be finalized in the form of a National Specialist Register (NSR) that will be established under the Medical Act. A holder of a relevant postgraduate qualification, irrespective of whether in the public or private sector, will be required to apply to the NSR for recognition before he/she can practice as a specialist. In the Ministry of Health, a doctor, on obtaining a recognized postgraduate qualification, is required to undergo a minimum of six months as a probationary period before he/she is recommended to be gazetted as a specialist. This time frame is taken to be the minimum period required to assess a candidate's capability to assume independent responsibility as a specialist[4]. Specialists who have been gazetted in their respective disciplines will also be automatically credentialed in the core procedures of that specialty (Ministry of Health, 2011).

For nurses and assistant medical officers, credentialing covers specialized procedures in four areas: intensive care; perioperative care; ophthalmology; and emergency medicine and trauma care. Specific criteria for being credentialed include two years of prior experience in the discipline and maintaining a special logbook during the period. The logbook records training and competence in the performance of specific procedures. The head of department and the Hospital Credentialing Committee attest to the successful completion of the logbook, and approval is given by the National Credentialing Committee in the Ministry of Health. Credentialing has to be renewed every two years. The number of nurses and assistant medical officers credentialed in various specialties from 2007 to 2012 is given in Table 21. Other health professionals are in the process of developing a credentialing system.

4.6 Issues and challenges

Issues arising during the period of basic professional education

The Ministry of Higher Education, the Ministry of Health and the MQA perceive the most critical issue in basic

4 In line with the *General Order, Chapter F (Medicine), Part V – Miscellaneous, Clause 27 (a) and (b) – Appointment as specialist*, the Director-General of Health, on the recommendation of three senior consultants, can appoint a doctor as a specialist if he has fulfilled all the requirements.

education of HRH to be the recent rapid expansion in the number of higher education providers who, between them, have greatly increased the number of enrolled students. The undesirable consequences include: (1) a shortage of clinical training sites and overcrowding of existing sites, resulting in inadequate clinical training; (2) a shortage of suitable teaching staff, especially for clinical training; (3) insufficient equipment in some private sector institutions (PHEIs); (4) admission of students with inadequate academic abilities, despite the minimum standards that are prescribed in the MQA guidelines; (5) production of sub-standard graduates who have low employability; (6) complaints from employers that graduates do not have the desired competence; (7) lack of explicit criteria for establishment of new institutions; and (8) in some PHEIs, employment of staff with questionable credentials and poor work ethics (including absenteeism).

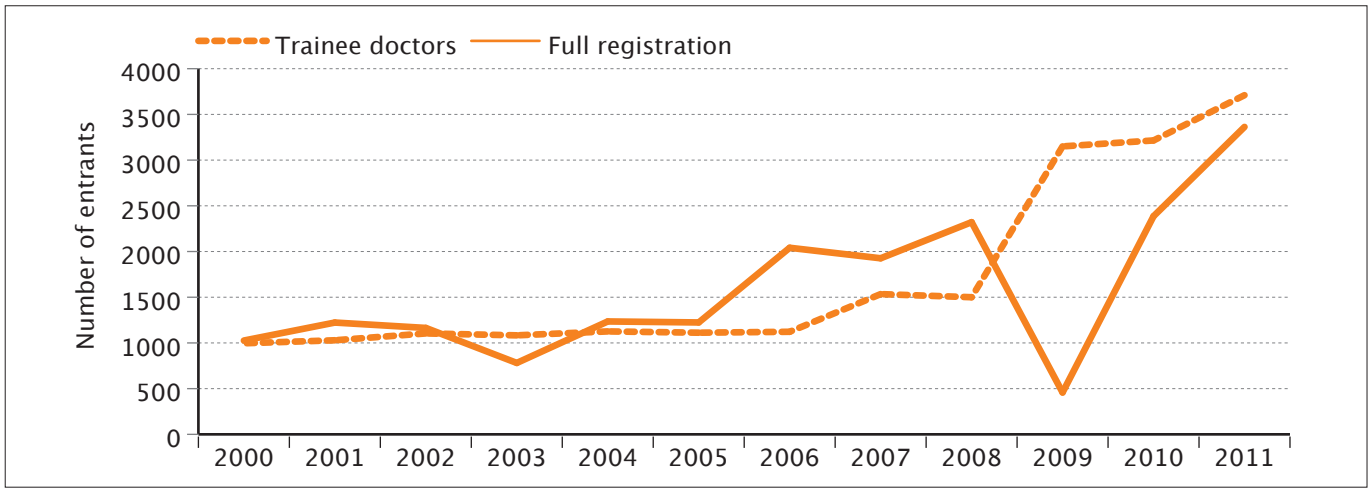
The Ministry of Higher Education is also concerned whether the country is heading towards an oversupply of graduates in all fields of science, including health sciences. Therefore, on 1 July 2010, the Ministry implemented a moratorium on nursing courses at diploma level in PHEIs until further notice, which applies to private institutions registered under the Private Higher Educational Institutions Act 1996 [Act 555]. Similarly, a five-year moratorium on new medical programmes was put in place, starting December 2010.

Issues arising on entry into the workforce as trainees after completion of basic professional education

The trends and profile of medical graduates entering the workforce provides an illustration of some of the key issues affecting HRH in Malaysia, particularly medical and dental practitioners and pharmacists. In order to enter the workforce, medical graduates are required to undergo a two-year trainee period, known as housemanship, during which time they have provisional registration with the Medical Council. This includes local graduates as well as foreign graduates who have returned to do their housemanship locally. On successful completion of the training period, the trainee doctor is placed on the Medical Register as "fully registered". New fully registered practitioners are required to serve a compulsory two years in the public sector, except for a few who are given exemption from this condition for specific reasons. (There is an additional number who complete their medical course and housemanship in foreign countries and then obtain full registration to work in Malaysia, but this is relatively a small number). Figure 12 shows the rapid increase in the number of entrants to the workforce during the period 2008–2011.

The recent influx of large numbers of graduates has overburdened the system. Senior doctors and professional bodies complain of inability to provide sufficient supervision and guidance to the new graduates, and there are fears that, in the near future, the public sector will no longer be able to absorb all the graduates who are produced. The Ministry of Health is also facing the issue of overburdening of their senior staff by the rapid increase in students and fresh graduates who need supervision. For example, medical specialists in the public sector are expected to supervise and train house-officers during their two-year housemanship period. However, the recent rapid increase in the number of graduates resulted

Figure 12. Trainee doctors and fully registered medical graduates entering the workforce, 2000–2011



Note: The period for housemanship (trainee doctors) was increased from one to two years in 2008, resulting in a dip in the number eligible for full registration in 2009.
Source: Malaysian Medical Council, 2006, 2008 and 2010/11.

in a rise in the ratio of hospital-based specialists to house-officers from approximately 1.9:2.3 in 2008 to about 1:3.13 in 2011[5]. A similar situation is being experienced with pharmacists. Specialists carry a heavy clinical load and have a range of other responsibilities, including clinical training for postgraduates and other categories of staff, and management of their clinical departments.

In December 2010, a moratorium was placed on the creation of any new medical programme. The country has 33 medical schools for its population of 28 million, compared, for example, with 18 schools in Australia, which has a population of 22 million. Additionally, Malaysia provides scholarships to significant numbers of students to study medicine in foreign countries, and these students are required to return to serve the country.

This situation has to be balanced by the tremendous demand for places in medical schools. This demand translates into political pressure at the beginning of each academic year. It appears that Malaysia will soon be joining many developed countries in having to deal with cyclical situations of glut and shortage of medical graduates (Rberfroid D, Leonard C, Stordeur S, 2009).

5 Analysis of data from the Division of Human Resources, Ministry of Health.

Similar situations affect the disciplines of Dentistry and Pharmacy.

The main conclusions from a study of the current health professional education system in Malaysia are:

1. Strong systems are in place to govern the basic professional education of health professionals including:
   (1) clearly articulated policies and strategies;
   (2) systematically designed training processes and quality mechanisms;
   (3) good linkages and partnerships between relevant stakeholders; and
   (4) systematic in-service and CPE.
2. The recent rapid increase in the numbers of training institutions and education programmes for HRH, and the resultant rapid increase in numbers of graduates, has overburdened:
   (1) training capacity, especially for practical clinical training;
   (2) the capacity of the system to monitor and ensure compliance with agreed quality standards; and
   (3) the capacity of the health services to absorb the new graduates who need a period of guided apprenticeship.

5. HRH utilization[6]

5.1 Recruitment for the public sector

The Public Services Commission (PSC) is responsible for recruitment of staff for the public sector. The recruitment process has four components: registration online, which enables screening for compliance with the minimum criteria for the specific scheme of service and post; an examination to assess general knowledge, knowledge in the specific field, interest, problem-solving capacity and language ability; a competency assessment for more in-depth probing; and an interview. For HRH, the PSC hires officers and professional staff who are on Grade 17 and above. For support staff who are at Grades 1 – 16, the power to hire has been delegated to the Ministry of Health.

6 This section includes data and information gathered from interviews with representatives of Ministry of Health, as detailed in Annex H.

Compulsory service

Data on the proportion of HRH who are recruited to the public sector are not available. However, for doctors, a period of compulsory service is required prior to full registration. The compulsory service has to be in the public sector and therefore 100% of graduates begin service in that sector. For dental practitioners and pharmacists, compulsory service takes place after full registration. For dental practitioners it is in the public sector, while for pharmacists it might be in the public sector or in specific private sector pharmaceutical establishments that have been gazetted as eligible to receive compulsory service practitioners.

Graduates of all training institutions that are managed by the Ministry of Health and the Ministry of Defense are required to serve those respective ministries for a period of four years or more after graduation. Similarly, public sector scholarship holders who graduate from

local or foreign HEIs are expected to serve in the public sector for periods defined in their scholarships. For medical and dental graduates the period is 10 years, while for pharmacists it is six years.

5.2 Deployment and distribution policies, mechanisms and career pathways

Within the public sector, deployment and distribution is managed by the federal Ministry of Health and the State Health Departments. For staff in professional categories, the federal Ministry of Health deploys staff to a state, and the State Health Department deploys the allocated staff to health-care facilities and districts within the state. Vacancies and workloads are the factors that determine distribution.

Wage levels are prescribed by the Public Services Department. In general, progression is up the steps of a time-based ladder, with provision for fast-tracking in exceptional cases. There are specified points at which promotional exercises take place. The promotional exercises are both time-based and competitive, and are also dependant on the number of promotional posts that are available.

For medical and dental professionals, a post-basic degree is needed to become a specialist practitioner. However, for other categories, post-basic qualifications do not translate into promotional opportunities or progress up the career development pathway within their own professional category.

The Malaysian Qualifications Register (MQR) enables professionals to move from a particular category to a higher category by recognizing specific professional qualifications as entry criteria for enrolling in basic training programmes for higher-level qualifications in the same or related fields.

5.3 Staff turnover

The highest percentage of vacant posts in the Ministry of Health is among dental specialists and medical prosthetic technicians, followed by medical practitioners (both specialist and non-specialist) and physiotherapists (Table 22). However, for some categories of HRH, vacant posts in the Ministry of Health are illustrative of internal administrative issues rather than turnover or demand/supply relationships. Medical prosthetic technicians have the next highest vacancy position, but this is because production of this category in Ministry of Health training institutions has stopped and there are very poor career development opportunities with the Ministry. Additionally, for those categories (doctors, dental practitioners, pharmacists)

Table 22. Vacant posts in the Ministry of Health in 2011

Health occupational categories	Total	Percent of all posts
Generalist medical practitioners	5773	24
Specialist medical practitioners	787	20
Assistant medical officers	1067	10
Nurses	2912	6
Dental practitioners	45	2
Dental specialists	80	36
Pharmacists	392	7
Environmental health officers/Assistant environment health officers	384	10
Occupational therapists	7	11
Physiotherapists	16	25
Optometrists / opticians	44	18
Medical imaging technicians	472	18
Medical and pathology laboratory technicians (MLT)	456	8
Medical prosthetic technicians	19	44
Dental technologists	122	13
Community nurses	2450	11
Other health professionals (details see Annex C)	3192	12
Health management workers/Skilled administrative staff (PTD, PTM, statisticians, accountants, auditors, lawyers)	109	17
Other health support staff (attendants, autoclave operators)	1658	13
TOTAL	**16 825**	

Source: Human Resources Division and Allied Health Division, Ministry of Health, 2013 (unpublished).

Table 23. Motivation levels among HRH staff of the Ministry of Health during 2009

		% satisfied
Satisfied with job		85–90
Experience heavy workload	All categories combined	38
	Specialist medical officers	70
	Non-specialist medical officers	53
	Nurses	37
Stress at workplace	All categories combined	20
	Non-specialist medical officers	30
	Specialist medical officers	28
	Nurses	20
Fairness of wages	All categories combined	80
	Specialist medical officers	46
	Non-specialist medical officers	49
	Nurses	81
Intend early retirement	All categories combined	16
	Non-specialist medical officers	41
	Pharmacists	38
	Specialist medical officers	36

Source: Institute of Health Management, 2009.

where all graduates are required by law to fulfill a period of housemanship in designated hospitals prior to full registration, the Ministry creates posts in response to the number of new graduates seeking such positions. The vacancy position, however, does illustrate the supply/demand situation in the Ministry of Health for specialist medical and dental practitioners.

5.4 Motivation

A study (Institute of Health Management, 2009) in 2009 investigated motivational factors among almost 84 000 staff of the Ministry of Health through a self-administered questionnaire. Table 23 provides a summary of some of the key findings. The general level of job satisfaction was high. However, medical practitioners, both specialist and non-specialist, felt they had heavy workloads and higher stress levels, and did not feel the wage structure was fair. They intended early retirement. In contrast, nurses' perceptions were close to the average levels on all indicators. However, anecdotal evidence suggests that nurses in relatively senior and supervisory positions do report considerable stress and experience a significant level of drop-out.

The majority of those intending early retirement had been offered jobs in the private sector.

It is interesting that perceptions of workload, stress in the workplace and fairness in promotion did not correlate with statements of job satisfaction. The study also found that heavy workload seemed to be related to staff shortages, incompetence and indiscipline among some workers, resulting in heavy burdens for others and too heavy administrative burdens for technical staff. A related study among medical practitioners who had moved from the public to the private sector had similar findings, with reasons for leaving the public sector being related largely to

Table 24. Attrition rate among Ministry of Health staff, 2011

Post	Increase (%)	Attrition %
Medical officers*	16.3	2.3
Dental practitioners**	19.6	4
Pharmacists	15.9	3.9
Nurses	5.6	0.2

* Includes general and specialist medical officers.
** Includes dental practitioners and dental specialists.
Source: Human Resource Division, Ministry of Health, (unpublished).

Table 25. Percentage of specialist medical and dental practitioners resigned and retired from the Ministry of Health

Year	Specialist medical practitioners			Specialist dental practitioners		
	Number In service	Resigned percentage	Retired percentage	Number in service	Resigned percentage	Retired percentage
2006	1792	3.3	1.1	82	2.4	1.2
2007	1897	2.4	0.5	109	0	2.7
2008	1900	1.9	0.9	106	2.8	2.8
2009	2281	2.3	0.4	118	0.8	0
2010	2608	3.8	0.4	123	0	1.6
2011	3128	4.2	0.6	142	2.1	1.4

Source: Human Resources Division and Oral Health Division, Ministry of Health, (unpublished).

human resource management issues that left them feeling overworked and underappreciated (Wong SL, Mohan AJ, Suleiman AB, 1998).

5.5 Attrition

Overall, attrition rates among key HRH in the Ministry of Health are not high (Table 24) except for certain categories, such as dental specialists (Table 25). However, there is continued concern that those who leave, particularly among medical and dental specialist practitioners, are the more experienced staff, leaving behind younger inexperienced staff who need supervision and guidance (see Section 3.2 on age distribution).

Based on the former, the utilization of HRH in Malaysia is characterized by the following:

- In the public sector, several key HRH management functions, such as recruitment, wage structures and career development and deployment, are highly centralized, either in the Public Services Commission and Public Service Department or the federal Ministry of Health.
- A special feature of Malaysian HRH management is the strategy of requiring an initial period of one to two years of compulsory public sector service to address shortages in critical HRH categories, such as doctors. This feature is currently evolving into a period of guided apprenticeship, as evidenced for nurses, doctors, dental practitioners and pharmacists.
- In general, the attrition rate for HRH in the Ministry of Health is low.
- However, a few critical categories, such as dental specialists, have extremely high attrition rates.
- In general, motivation rates are satisfactory, except for specialist medical practitioners and other senior staff who feel undervalued as well as stressed due to overwork and unfair overload of work.

6. Financing HRH[7]

Throughout the period from 1997 to 2009, the median total wages paid to employees of the Ministry of Health represented about 51% of total Ministry expenditure (Ministry of Health, 2009).[7] The ratio of HRH wages to GDP per capita is about 1:2 (Department of Statistics Malaysia, 2011).

Public sector

In the public sector, monthly wages are paid through budget allocations from national tax-based revenue.

Basic wages are prescribed in accordance with:

(1) 19 classifications, which specify the professional field (such as "Medical and Health" or "Education" or "Law and Justice" etc.) and the category within that field (such as "Professional and Managerial" or "Support services") ; and

(2) within each grade, specified salary grades (such as U41 – U54).

In addition, public sector employees are entitled to several allowances, as listed below:

(1) Housing, service and cost-of-living allowances for managerial, professional and support cat-

7 This section includes data and information gathered from interviews with representatives of the Ministry of Health, as detailed in Annex H.

egories in all classifications, and entertainment allowances for certain higher categories.

(2) Incentive allowances for 'critical services', which include doctors, dental practitioners, pharmacists, nurses and assistant medical officers, as well as other categories, such as lawyers and engineers.

(3) Additional incentive allowances for:
   (a) doctors serving as public health officers at district level;
   (b) doctors serving as hospital managers (directors); and
   (c) doctors who are clinical specialists (all disciplines).

(4) Incentive allowances for working in remote situations that lack basic amenities, such as lacking electricity, piped water supply, public transport, telephone services and basic medical services.

(5) Hazard allowances, for example, for health workers working with radiation equipment.

Tables 26, 27 and 28 provide a comparison of the wage structures for selected categories of HRH and non-HRH personnel in the public sector. Progression up the wage scale is time-based (or fast-tracked for selected individuals) up to level 54. For higher levels, promotion is based on the availability of posts and various implicit criteria. A postgraduate qualification is a pre-requisite for certain posts, such as specialist medical practitioners.

The main differentiating features for different categories between the wage scales and the take-home wage are the starting level and highest levels, which are determined by the level of basic qualification (certificate, diploma or degree), the availability of promoted posts, and eligibility for different allowances.

Non-cash benefits for all public sector workers include:

(1) Highly subsidized lifetime medical care in public sector facilities for the employee, spouse and dependent children.

(2) Vacation leave, medical leave and maternity and paternity leave.

(3) Travel allowances for official duty.

(4) Free pre-service education and living allowances during their enrollment for those enrolled in Ministry of Health training institutions.

Private sector

The income of doctors in the private sector (both general practitioners and specialists) is mainly on a

Table 26. Emoluments for public sector medical, dental, pharmacy and other health professionals (OHP), in Malaysian Ringgit

Grade		Doctors	Dental practitioners	Pharmacists	OHP
29	Basic	Not applicable	Not applicable	Not applicable	1311
	Allowances				340
	Total				**1651**
41	Basic	2777	2674	2570	1939
	Allowances	1500	1500	1500	550
	Total	**4277**	**4174**	**4070**	**2489**
54	Basic	5941	5941	5941	1939
	Allowances	2750	2750	2750	550
	Total	**8691**	**8691**	**8691**	**2489**
Special grade (starting)	Basic	7190	7190	7190	-
	Allowances	6716	6716	6716	-
	Total	**13 906**	**13 906**	**13 906**	-
Special grade (highest)	Basic	13 265	13 265	13 265	-
	Allowances	10 416	10 416	10 416	-
	Total	**23 681**	**23 681**	**23 681**	-
Specialist allowances (additional to other allowances)	Minimum	**1600** starting level for dental specialists and hospital management)		-	-
	Maximum	**3100** (highest level for clinical specialist doctors)		-	-

Source: Human Resources Division, Ministry of Health, 2013 (unpublished).

Table 27. Emoluments for public sector nurses and assistant medical officers (AMO), in Malaysian Ringgit

Grade		Nurses	AMO
29	Basic	1688	1688
	Allowances	893	893
	Total	**2581**	**2581**
48	Basic	7547	7547
	Allowances	2000	1700
	Total	**9547**	**9247**
54	Basic	5941	Not applicable
	Allowances	2297	
	Total	**8238**	

Source: Human Resources Division, Ministry of Health, 2013 (unpublished).

Table 28. Emoluments for public sector teachers, lawyers and engineers, in Malaysian Ringgit

Grade		Teachers	Assistant lawyers	Assistant engineers
29	Basic	1588	1664	1,826
	Allowances	640	640	640
	Total	**2228**	**2304**	**2466**
		Teachers	**Lawyers**	**Engineers**
41	Basic	2223	2248	2359
	Allowances	850	962	967
	Total	**3073**	**3210**	**3326**
54	Basic	5839	5886	5938
	Allowances	2000	2294	2296
	Total	**7839**	**8180**	**8234**
Special grade (starting)	Basic	7189	7189	7189
	Allowances	5966	6326	6326
	Total	**13 155**	**13 515**	**13 515**

Source: Human Resources Division, Ministry of Health, 2013 (unpublished).

'fee-for-service' basis. Professional associations provide guidance through a recommended fee schedule. General medical officers and other categories of medical and nursing staff who work in private hospitals are paid monthly wages, the rate of which is determined by the individual hospitals and varies in accordance with market forces. Although there are no recent data on the income of private sector health workers, it is worth noting that the special incentive allowance for doctors and nurses in the public sector is a recent initiative to reduce the outflow of doctors and nurses from the public to the private sector. Employers and employees contribute to the Employees Provident Fund. Other benefits, such as leave, insurance and medical insurance, vary on an individual basis.

Unofficial payments to health workers

There is strong empirical evidence from household surveys that there are no unofficial payments to health workers in the public sector. Four rounds of National Health and Morbidity surveys (Institute of Health, 2011) all of which had large sample sizes, showed that the payments reported by households were very consistent with the official fees for outpatient and inpatient health care in the public sector.

The key aspects of the HRH financing system in Malaysia may be summarized as follows:

(1) HRH wages constitute about 50% of the Ministry of Health operational budget.
(2) The basic wage structure in the public sector is based largely on the level of basic education qualification at entry level. A range of generous allowances increase the take-home wages of most professionals.
(3) HRH basic wage scales and allowances are not very different from those of other professional groups that have similar entry qualifications.
(4) Critical categories of HRH, such as doctors, dental practitioners, pharmacists and nurses, have additional incentive allowances that are quite substantive.
(5) There is little information on the income of HRH in the private sector.
(6) Unofficial payments by the public for obtaining health care in the public sector are not a problem.

7. Governance of HRH[8]

7.1 HRH policies and plans

Malaysia's HRH policies and strategies are laid out in five-year development plans (Economic Planning Unit, 2006; Economic Planning Unit, 2010). Key policies include:

The Ninth Malaysia Plan 2006–2010:
"The economy will become more centered on human capital ... In education, measures will be intensified to promote Malaysia as a regional centre of excellence for tertiary education. ... In health services, Malaysia will be promoted as a regional health tourism centre. ...Employers will be encouraged to redesign and improve selected job functions and work conditions to attract local workers, including women, retirees and disabled persons. In addition, laws and regulations relating to human resources will be reviewed and streamlined to enhance the efficiency and productivity of the labour force. ... The public and private sector will increase collaboration, particularly in the areas of R&D and human capital development. Human resource development will be given high priority to reduce acute shortages in various categories of medical and health personnel. In this regard, training for medical health personnel will be enhanced and expanded. Continuing professional development initiatives will also be increased to meet the need for higher levels of care and in new areas of specialization. The Government will improve the terms and conditions of service to continue attracting and retaining health personnel. Relevant health legislation will be reviewed and new legislation formulated to better regulate the health sector including with respect to safe practice of traditional and complementary medicine."

The Tenth Malaysia Plan 2011–2015:
"Investments in human resources for health (HRH) remain a central component of the health-care system.

- .....improved specialist training;
- .....improving and expanding post-basic training for nurses and allied health-care personnel; .....
- Addressing personnel retention through provision of better remuneration, promotional opportunities and steps to provide greater job satisfaction; and
- Improving the quality of private health-care professionals through credentialing, privileging and structured training."

7.2 Development of policies, strategies and plans: process and stakeholders

HRH policies, strategies and plans are developed as part of the five-yearly national process for developmental policies. The process is coordinated by the Economic Planning Unit in the Prime Minister's Department and involves a wide range of stakeholders. For health issues, including HRH, the federal Ministry of Health coordinates an iterative process involving state and district levels, as well as professional bodies, academia and civil society, including consumer groups. Monitoring and evaluation data as well as situational analyses are used in the process. Strategies are developed within the broader framework of national priorities and directions. Subsequent stages of the process include coordination and collaboration with relevant ministries, such as the Ministry of Higher Education, the Ministry of Finance and the Public Services Department. In the Ministry of Health, the lead division for the entire process is the Planning Division.

For human resource development in general, the Economic Planning Unit is responsible for macro-policies, and the Ministry of Higher Education is expected to develop national strategies and plans with input from other ministries. In practice, HRH is viewed as a highly complex area, and therefore the Ministry of Higher Education implicitly looks to the Ministry of Health to take the lead in developing national strategies and plans, with input from agencies such as the Public Services Department, the Economic Planning Unit, the Ministry of Higher Education and the MQA.

Implementation of policies and plans
Throughout the past decades, the major feature of HRH has been a continuing shortage in most categories. The Ministry of Health uses population-based standards to formulate HRH requirements. Standards for desired population ratios for medical and dental practitioners,

8 This section includes data and information gathered from interviews with representatives of Ministry of Health, Ministry of Higher Education, and Ministry of Human Resources, as detailed in Annex H.

pharmacists and nurses have been based traditionally on WHO recommendations or, more lately, comparison with selected (more developed) countries. Additionally, construction of new health-care facilities and setting up of new services or upgraded services provide another basis for assessing HRH requirements in terms of numbers and categories of staff. When production of HRH has been insufficient, particularly for critical services, expatriate staff are recruited to serve for limited periods until qualified Malaysian resources become available.

7.3 HRH information system

A computerized human resource management information system (HRMIS) is in place in the public sector. It encompasses the Ministry of Health at federal level and in state health departments. It maintains information on personnel service records, including posting and promotions, wages, leave and disciplinary actions.

Within the Ministry of Health, the Division of Human Resources maintains records of posts, wages, postings, promotions, and retirement of staff in the Ministry. The HR Division of the Ministry of Health does not capture HRH information from other agencies in the public or private sector, nor does it include information from surveys and censuses or from the legally required professional registers maintained by the statutory professional bodies.

The Health Informatics Centre (HIC) of the Ministry of Health is primarily responsible for collating information on health status and is the officially designated source of all health information from the Ministry. HRH information is provided to the HIC by the respective programme divisions of the Ministry of Health and by the Human Resources Division of the Ministry.

All the legally constituted statutory bodies that govern HRH have secretariats that are housed in the Ministry of Health under the respective programme divisions, such as Medical Care, Nursing, Pharmacy, Dental and Allied Health. These secretariats maintain their own computerized data on those HRH who are required by law to be placed on a professional register before they are legally permitted to practice. Such data are national and include the public and private sectors, including other government agencies and institutions of higher education. The secretariats also have information on basic education programmes that have been accredited by the MQA. The Training Division of the Ministry of Health maintains data on Ministry basic training institutions and their students.

Registers are maintained under various laws by statutory councils or boards that register and provide practicing licenses to eight of the health professions: Medical, Dental, Pharmaceutical, Nursing and Midwifery, Assistant Medical Officers, Optical, Food Analysis and Counselling. The data cover both the public and private sectors.

The Ministry of Higher Education and the MQA maintain data on institutions of higher education for all professionals, including those in the health sector. Information on basic education programmes for HRH is available from the MQA and is online. The MQA is able to provide information on entrants and graduates of such programmes. The information includes public and private sector institutions of higher education, but excludes those in the Ministry of Health. Information on unemployment is monitored by the Ministry of Human Resources, but is not analysed specifically for HRH. National information on wages and income is collected periodically through surveys carried out by the Department of Statistics.

There are specific surveys containing information on HRH, such as two workforce surveys conducted by the Clinical Research Centre in 2008–2009 and 2010, which covered all public and private hospitals (except Armed Forces hospitals) and a sample of primary care facilities in the country. Those surveys provided data on several items that are not included in the routine data systems, such as specialist medical practitioners.

Currently, no single agency is responsible for compiling, collating and monitoring all relevant information on nationwide HRH production, utilization and financing from all sources.

7.4 Recent developments that affect HRH

Wage scales

Complaints of overwork, inadequate remuneration and delays in promotion have long been a feature of health professionals in the public sector, which suffers a continued shortage of qualified and more experienced medical and health staff. In response, one recent development has been the introduction of time-based movement up the wage scale. This replaces the former system whereby movement up the scale would depend on the availability of vacant posts at the higher level. Also, a new wage scale was introduced for all public sector employees in 2011; in the new scheme, the

special allowances were increased greatly for certain categories of health worker, such as specialist medical practitioners, and other health professionals became eligible for post-basic allowances. In 2012, wages for all public sector staff were increased by 7%–13%.

Quality concerns
In line with the national policy of expanding higher education, policies covering the establishment of higher education institutions, particularly in the private sector, have been 'liberalized', resulting in a recent rapid expansion in the number of institutions that produce human resources for health. The output of graduates has taken a leap. As noted earlier, this sudden increase has been accompanied by issues relating to quality of graduates and limited opportunities for clinical training. The Nursing Board has responded by enforcing a higher entry qualification for nursing education programmes. Several other categories are expected to face a similar dilemma in the near future.

Specialist Register
The Medical Act 1971 has been amended to provide for a register of specialist medical practitioners. Thus, credentialing described earlier has become enforceable by law.

Liberalization of pharmacy
On 14 September 2011, the Cabinet agreed that the period of compulsory service for pharmacists in the Ministry of Health should be reduced from three years to one year to balance the need for pharmacists in the public and private sectors. Four types of private facility are proposed as training facilities for provisionally registered pharmacists:

- Patient-facing settings – Private hospitals and community pharmacies
- Non-patient-facing settings – Pharmaceutical industry and institutions of higher education (research and development)

Allied health professionals
Recognizing the need to upgrade and coordinate the development of 'allied' [9] health professionals, a Division of Allied Health Sciences was created in 2008 to take over responsibility for allied health professionals (32 categories of professionals, including 12 clinical, 7 laboratory and 4 public health) from the Division of Medical Services. A draft Allied Health Services Act has been prepared that will regulate the practitioners in 23 of the allied health professions.

Allied health professionals who have separate Acts governing them are food analysts, counsellors, optometrists and assistant medical practitioners. Assistant food technologists, assistant pharmacists and dental nurses/therapists are expected to be regulated under their respective existing legislation. Medical records officers and tutors are not expected to be covered in any pending legislation.

Most allied health professionals in the Ministry of Health are hospital-based. Allied health professionals are essential members in team-based approaches to deal with leading health challenges, such as NCDs and cancer. One of the challenges facing these professionals is for system changes that would enable them to gain competence and acceptance in settings that would increase their effectiveness in disease prevention and health promotion. It has already been recognized that the production of some allied health professionals, such as speech therapists and audiologists, is very small compared with current demand.

Traditional and complementary medicine practitioners
Traditional and complementary medicine (TCM) practitioners practice predominantly in the private sector. They include practitioners of traditional Malay medicine, traditional Chinese medicine and traditional Indian medicine, homeopathy and complementary therapies. In 2007, a National TCM policy was articulated. Strategies and guidelines have been formulated, and legislation has been drafted to regulate and upgrade the practice of TCM. The draft Act had its first reading in Parliament in 2012. Expatriates who wish to practice in Malaysia are required to register with the Ministry of Health, but local practitioners are not, as yet, legally required to register. However, practitioners are being encouraged to register with their respective recognized practitioner bodies.

7.5 Management responsibility for HRH

The Human Resource Division of the Ministry of Health is responsible for the internal management of Ministry staff. The Division does not take a national perspective. However, two factors impinge on this rather limited role. First, the Ministry is the major employer of HRH in the country. Second, medical and dental practitioners and pharmacists are required by law to serve the Ministry for a period of two to three years after graduation before they are entitled to be

9 Tables 3 and 4 show the professions classified as 'allied' by Malaysia.

fully registered practitioners. Therefore the entire annual addition to the HRH supply for these categories is managed within the Ministry of Health.

The Training Management Division has three major responsibilities:

(1) pre-service education;
(2) in-service education; and
(3) post-basic education.

The Division manages pre-service (basic) professional education for 13 categories of health professional. This function is implemented through a number of training institutions situated in various states, and includes organizing funding, curriculum review and certification of successful graduates. For in-service education, short courses of less than three months duration are organized and funded through the Division. For post-basic education, health professionals are sponsored for training in specialized topics, several of which are awarded certificates or advanced diplomas on completion.

The human capacity in the Divisions that have a dedicated HRH management role at the federal level is shown in Table 29.

Programme Divisions, such as Medical Care, Nursing, Pharmacy and Allied Health, also have HRH management functions, such as planning, deployment, monitoring and quality improvement, and CPE, and collaborate closely with the dedicated HR Division. In addition, the HR Division and the Programme Divisions are replicated in smaller numbers at state and hospital levels, where several HRH management functions are implemented.

7.6 HRH management functions and decentralization

Recruitment

Some HRH management functions are centralized in the Public Services Commission (PSC), the Public Services Department and the Ministry of Health, while others have been decentralized to state or hospital level. Hiring of staff at Grade 17 and above is done by the Public Service Department; for Grades 1 – 16 it is done by the federal Ministry of Health. The power to fire staff at Grades 41 and above rests with the PSC, while the Ministry of Health has authority to fire support staff.

Disciplinary action

Disciplinary action involves various levels. The immediate supervisor is responsible for taking the first steps and providing evidence and recommendations. The Disciplinary Committee at district, hospital or state level reviews the report and decides whether action is warranted and the type of action needed. Warning letters are given by the head of the department. Sterner actions, such as a freeze of promotions or increments, are the responsibility of the state and federal Human Resource Divisions. Demotions and suspensions are the responsibility of the PSC.

Evaluation of worker performance

The first level of evaluation is done by the immediate supervisor and then reviewed by the next-level of supervisor. Several evaluation methods are used. For example, in Nursing, there is a mentor-mentee system for new graduates and freshly transferred staff that requires formal evaluation to be done at specified intervals and encompass specified topics. Additionally, there is a National Nursing Audit, and a National Operating Room Nursing Audit. Supervisory professional staff from national and state levels make regular supervisory visits to hospitals and the district level.

Professional regulation

Eight categories of health professional are governed by Laws and Regulations that are administered by a statutory body in the form of a council or board (Table 30 and Annex H for the sources). Each of these bodies has specified functions under the law including: setting standards for professional education

Table 29. Human resource capacity in HRH management in the Ministry of Health

Division		Professional management	Support staff	Total personnel
Human Resource Division		69	189	258
Competency Division		12	42	54
Training Division	Common user*	26	105	168
	Technical **	37	0	37
Ministry of Health training institutions	Common user*	2	1001	1003
	Technical **	761	309	1070

*Common user refers to staff not specific to the health sector and includes those at the level of policy-making and management and administrative staff. Such staff are transferable to other sectors.
** Technical refers to tutors and clinical personnel specific to the health sector.
Source: Human Resources Division, Ministry of Health, 2013 (unpublished).

Table 30. Key legislation regarding HRH

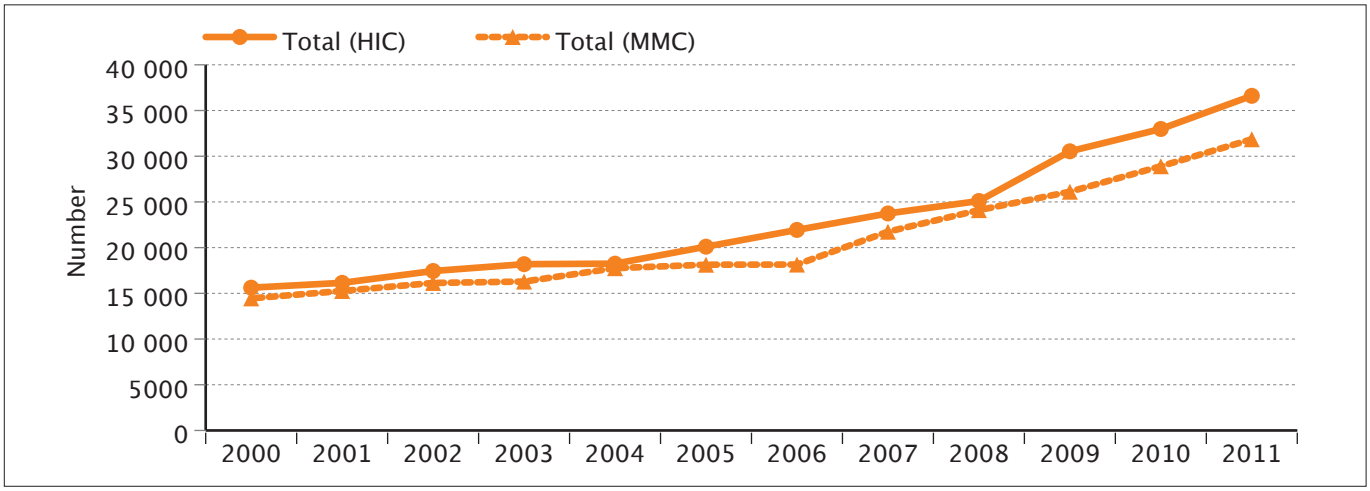
Professionals	Key legislation	Statutory body
Medical practitioners	Medical Act 1971 and subsequent amendments and regulations under the Act	Malaysian Medical Council
Dental practitioners	Dental Act 1971 and subsequent amendments and regulations	Malaysian Dental Council
Pharmacists	Registration of pharmacist Act 1951 and regulations under the Act	Pharmacy Board of Malaysia
Nurses, midwives, community nurses and assistant nurses	Nurses Act 1950 and Nurses Regulations 1985 Midwives Act 1966 and Midwives Registration 1990 (fees)	Nursing Board of Malaysia
Assistant medical officers	Assistant Medical Officers Act 1977 and subsequent amendments and regulations under the Act	Assistant Medical Officers Board of Malaysia
Opticians and optometrists	Optical Act of Malaysia 1991 and regulations under the Act	Malaysian Optical Council
Food analysts	Food Analysts Act 2011 and Food Analysts Regulations 2013	Malaysian Food Analysts Council
Counsellors	Malaysian Counsellors Act 1998	Board of Counselors

Source: Dr Indra Pathmanathan, 2013 (personal communication).

programmes, licensing and issuing annual practising certificates, maintaining the Register of licensed and active practitioners, and investigating complaints of malpractice and taking disciplinary action that could include suspension of the practicing license or removal from the Register.

The councils/boards are dependent on feedback and complaints to identify people who flout the law, and therefore experience difficulty in maintaining updated registers of practitioners. For example, there is significant difference between the total number of medical practitioners reported to have licenses and the number compiled by the Human Resources Division of the Ministry of Health, who use data on doctors in the public sector from the HR personnel records combined with the number of practising certificates issued to the private sector by the MMC (Figure 13). Reportedly, the difference is because many doctors actively practising in the public sector do not apply for annual licenses, applications for provisional licenses for trainee doctors are incomplete, and the issue of licenses by the MMC is long delayed. It is likely that the same problem affects the private sector, and therefore the numbers reported are probably an underestimate. Similar problems affect all councils/boards.

Figure 13. Comparison of number of doctors recorded by the Malaysian Medical Council (MMC) and the Health Informatics Centre (HIC), Ministry of Health



Sources: Ministry of Health, 2013b.
Malaysian Medical Council, 2006, 2008, 2010/11.

The system of registration and annual licensing needs to be strengthened and modernized to encourage full compliance and enforcement of penalties for non-compliance for all sectors, including the public sector.

7.7 Health workforce requirements and projections

Currently, the Training Management Division of the Ministry of Health, as well as most key programme divisions, undertakes HRH projections and planning. However, each division uses it as an internal exercise. The proposed norms and methods used have not been shared and discussed within the Ministry and are not yet officially accepted.

Requirements of staff for new health-care facilities in the Ministry of Health are based on facility-based staffing norms. Projections for HRH employed by the Ministry are made based on information regarding existing and new facilities, taking into account the projected attrition rate according to historical trends.

However, in order to make budget estimates, the divisions use the Workload Indicator of Staffing Needs (WISN) (World Health Organization, 2010) methodology, which is based on actual workloads in existing facilities. In this approach, the current workload of each category in various types of facility is obtained through sample studies in a few facilities. Using this information on workload, the gap in terms of HRH is identified.

The planning exercise is very limited because it does not take into account the requirements of other public sector agencies, such as the Ministry of Defense, the Occupational Health and Safety Division of the Ministry of Human Resources and local authorities, or the requirements/demands of the private sector. Neither does it take into account epidemiological changes and technological developments. In addition, there is no information on market demand and unemployment.

Characteristics of HRH governance in Malaysia:

(1) Malaysia has well-articulated macro-policies, strategies and plans for HRH, but needs a sectorwide approach to planning and projections.
(2) There is good involvement of stakeholders at different levels of the planning process.
(3) Appropriate legislation has been in place for many years for key categories, and recent initiatives are in progress to encompass all other categories.
(4) There are good examples of systems for registration, licensing and issuing of annual practising certificates by the relevant professional statutory bodies and these can be replicated for all other health professionals.
(5) However, the systems, particularly for monitoring and ensuring good data quality, need to be strengthened and modernized to ensure better compliance. This will also contribute to more reliable HRH records in both the public and private sectors.
(6) HR information is collected through several overlapping systems and is inadequate for:
    (a) private sector information;
    (b) routinely collating and analysing nationwide information on HRH to support macro-planning and policy-making; and
    (c) information on market demand and unemployment rates.
(7) There is a need to develop a mechanism for sectorwide HRH planning and policy-making. To this end, it is necessary to:
    (a) clarify the responsible division/agency/unit;
    (b) clarify the scope of responsibility;
    (c) develop sufficient technical capacity for making and updating HRH projections;
    (d) strengthen HRH information for sectorwide policy-making and planning; and
    (e) maintain strong linkages with policy-makers in health and education to move from projections to policies and plans.

8. Concluding remarks

The numbers and categories of HRH needed are influenced by a complex mixture of factors. Demographic, epidemiological, medical technological and pharmaceutical advances and socioeconomic changes, as well as changes in the structure and functions within the health system influence the need for different categories of HRH. The Malaysian health system is dichotomous, with the public and private sectors competing for HRH from the same pool of workers. Therefore, integrated HRH planning is essential. Additionally, policies such as those relating to health tourism, as well as emigration and immigration, affect the pool of available HRH.

Planners, policy-makers and politicians need to balance opposing factors in making evidence-based decisions. Examples include: finding a balance between the desire of the population for more access to more sophisticated medical technology against the ability and willingness of the country and the people to bear the cost; or the desire to have better health outcomes at optimal cost (including a balance between health promotion and prevention of illness and high-cost curative or rehabilitative interventions); or the desire of HRH who have higher qualifications to have a better quality of life for themselves in terms of income and working conditions.

The capacity to produce, retain and utilize various categories of HRH should be the determining factor as regards policies on basic and further education for HRH, requirements governing licensing practices, wage structures and working conditions.

Based on the findings of this document, the future development of human resources for health requires:

(1) suitable organizational arrangements, with defined responsibility to undertake comprehensive planning that integrates the HRH needs of all sectors in the country;
(2) adequate and timely HRH information that includes integrated data from all sectors supplemented, where relevant, by survey information;
(3) adequate capacity to analyse HR data to provide input for immediate as well as medium-term planning for HRH production, deployment and utilization; and
(4) sufficient linkages between data analysts and policy-makers to enable evidence-based policy-making for HRH.

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Annexes

Annex A. Skill mix: ratio of specialist professionals to other health professionals

Otorhinolaryngologist to audiologist	1:1
Otorhinolaryngologist to speech language therapist	1:1
Ophthalmologist to optometrist	1:1
Psychiatrist to clinical psychologist	1:0.02
Pathologist to medical laboratory technologist	1:40
Forensic pathologist to forensic science officer	1:2
Chemical pathologist to clinical scientist (biochemist)	1:19
Histopathologist, cytopathologist and haematologist to clinical scientist (biomedical scientist)	1:0.4
Gynaecologist to clinical scientist (embryologist)	1:0.02
Medical microbiologist to clinical scientist (microbiologist)	1:10
Radiologist to diagnostic radiographer	1:12
Radiologist to medical physicist	1:1
Oncologist to medical physicist	1:7
Oncologist to radiation therapist	1:11
Nuclear medicine physician to medical physicist	1:25
Public health physician to entomologist	1:0.2
Doctor to dietician	1:0.01
Doctor to health education officer	1:0.004
Doctor to environmental health officer	1:0.1
Doctor to medical social officer	1:0.01
Doctor to counsellor	1:0.003
Dietician to health-care food service officer	1:1
Family health physician to nutritionist	1:1
Medical rehabilitation specialist to occupational therapist	1:35
Medical rehabilitation specialist to physiotherapist	1:42
Medical rehabilitation specialist to speech language therapist	1:3
Food technologist to assistant food technologist	1:0.4

Source: Human Resources Division, Ministry of Health Malaysia, 2013 (unpublished).

Annex B. Regional distribution of selected health professionals by total number and per 100 000 population

	2003			2010		
	Peninsular Malaysia	Sabah	Sarawak	Peninsular Malaysia	Sabah	Sarawak
Audiologist	23	1	2	80	7	3
per 100 000 population	0.12	0.04	0.09	0.35	0.22	0.12
Clinical psychologist	0	0	0	3	0	0
per 100 000 population	0	0	0	0.01	0	0
Clinical scientist (biochemist)	139	11	7	284	30	30
per 100 000 population	0.70	0.39	0.32	1.26	0.94	1.21
Clinical scientist (biomedical scientist)	0	0	0	51	3	2
per 100 000 population	0	0	0	0.23	0.09	0.08
Clinical scientist (embryologist)	0	0	0	4	0	0
per 100 000 population	0	0	0	0.02	0	0
Clinical scientist (medical geneticist)	1	0	0	9	0	0
per 100 000 population	0.01	0.00	0.00	0.04	0	0
Clinical scientist (microbiologist)	108	13	6	238	29	18
per 100 000 population	0.54	0.47	0.27	1.05	0.90	0.73
Dental technologist	449	31	71	605	57	87
per 100 000 population	2.25	1.11	3.21	2.68	1.78	3.52
Diagnostic radiographer	664	54	74	1468	186	196
per 100 000 population	3.33	1.93	3.34	6.50	5.80	7.93
Dietitian	82	9	7	216	23	21
per 100 000 population	0.41	0.32	0.32	0.96	0.72	0.85
Entomologist	30	6	8	61	9	12
per 100 000 population	0.15	0.21	0.36	0.27	0.28	0.49
Environmental health officer	1364	220	235	2408	415	451
per 100 000 population	6.83	7.87	10.61	10.67	12.94	18.25
Forensic science officer	-	-	-	26	3	3
per 100 000 population	0	0	0	0.12	0.09	0.12
Health-care food service officer	98	8	8	188	30	16
per 100 000 population	0.49	0.29	0.36	0.83	0.94	0.65
Health education officer	100	13	11	123	13	13
per 100 000 population	0.50	0.47	0.50	0.54	0.41	0.53
Medical laboratory technologist	2200	279	406	3731	591	652
per 100 000 population	11.02	9.98	18.34	16.53	18.43	26.38
Medical physicist	46	1	5	110	3	12
per 100 000 population	0.23	0.04	0.23	0.49	0.09	0.49
Medical social officer	59	7	8	137	15	22
per 100 000 population	0.30	0.25	0.36	0.61	0.47	0.89
Nutritionist	41.00	7.00	7.00	185.00	25.00	19.00
per 100 000 population	0.21	0.25	0.32	0.82	0.78	0.77
Occupational therapist	173.00	22.00	22.00	485.00	75.00	73.00
per 100 000 population	0.87	0.79	0.99	2.15	2.34	2.95
Physiotherapist	266.00	40.00	38.00	570.00	108.00	97.00
per 100 000 population	1.33	1.43	1.72	2.53	3.37	3.93

	2003			2010		
	Peninsular Malaysia	Sabah	Sarawak	Peninsular Malaysia	Sabah	Sarawak
Radiation therapist	62	0	22	128	13	44
per 100 000 population	0.31	0.00	0.99	0.57	0.41	1.78
Speech/language therapist	15.00	1.00	1.00	51.00	4.00	4.00
per 100 000 population	0.08	0.04	0.05	0.23	0.12	0.16
Optometrist	62.00	3.00	4.00	171.00	14.00	13.00
per 100 000 population	0.31	0.11	0.18	0.76	0.44	0.53
Counsellor	34.00	2.00	5.00	81.00	7.00	10.00
per 100 000 population	0.17	0.07	0.23	0.36	0.22	0.40
Food technologist	80	9	5	288	32	18
per 100 000 population	0.40	0.32	0.23	1.28	1.00	0.73
Assistant food technologist	75	8	9	96	17	9
per 100 000 population	0.38	0.29	0.41	0.43	0.53	0.36
Medical record officer	154	23	23	296	36	30
per 100 000 population	0.77	0.82	1.04	1.31	1.12	1.21
Assistant pharmacist	1787	320	296	2485	436	391
per 100 000 population	8.95	11.45	13.37	11.01	13.60	15.82
Dental nurse	1340	161	302	1771	314	400
per 100 000 population	6.71	5.76	13.64	7.85	9.79	16.19

Source: Human Resources Division, Ministry of Health Malaysia, 2013 (unpublished).

Annex C. Training programmes by public and private higher education providers, 2011

Training programs	Public HEP			Private HEP			Total no. of programmes/ no. of institutions
	Diploma	Degree	Subtotal programmes/ no. of institutions	Diploma	Degree	Subtotal programmes/ no. of institutions	
Assistant food technologist	2	-	2/2	-	-	-	2/2
Audiologist	-	3	3/3	-	-	-	3/3
Biochemist	-	3	3/3	-	1	1/1	4/4
Biomedical scientist	-	6	6/6	-	2	2/2	8/8
Clinical psychologist	-	3	3/3	-	-	-	3/3
Counsellor	-	7	7/7	-	1	1/1	8/8
Diagnostic radiographer	2	3	5/3	6	1	7/7	12/10
Dietician	-	6	6/6	-	-	-	6/6
Entomologist	-	1	1/1	-	-	-	1/1
Environmental health officer / assistant environmental health officer	3	3	6/5	2	-	2/2	8/7
Food technologist	-	12	12/12	-	2	2/2	14/14
Forensic science officer	-	2	2/2	-	-	-	2/2
Health education officer	-	9	9/9	-	-	-	9/9
Health-care food service officer	1	3	4/3	-	-	-	4/3
Medical geneticist	-	2	2/2	-	-	-	2/2
Medical laboratory technologist	6	1	7/5	7	1	8/8	15/15
Medical physicist	-	4	4/4	-	-	-	4/4
Medical record officer	-	1	1/1	-	-	-	1/1
Medical social officer	-	6	6/6	-	-	-	6/6
Microbiologist	-	4	4/4	-	1	1/1	5/5
Nutritionist	-	4	4/4	-	-	-	4/4
Occupational therapist	2	2	4/3	2	2	4/4	8/7
Optician	-	-	-	1	-	1/1	1/1
Optometrist	-	3	3/3	-	4	4/4	7/7
Physiotherapist	2	2	4/3	15	-	15/15	19/18
Radiation therapist	1	1	2/2	4	1	5/4	7/6
Speech therapist	-	2	2/2	-	-	-	2/2

Source: Malaysian Qualifications Agency, Ministry of Higher Education, various divisions of the Ministry of Health; and respective boards.

Annex D. Extracts from programme standards for Malaysian undergraduate medical education programmes

Basic Medical Sciences

Basic medical sciences are best taught by an academic staff with a basic degree in medicine. When this is not possible, other suitably-qualified staff in other areas of medical science are accepted provided that the teaching objectives relevant to the desired curriculum are met satisfactorily. Examples of suitably-qualified staff are those with their first degree in Biomedical Sciences and a higher degree in the same at Masters or PhD level.

Clinical Sciences

The clinical medical degree course must be supported by a critical mass of appropriately qualified faculty in each of the major disciplines of medicine and in the clinical sciences, with an appropriate mix of teaching experiences. It is fundamental that the core clinical disciplines of Internal Medicine, Surgery, Paediatrics, Psychiatry, Family Medicine and O&G have a sufficient number of academic staff for the total number of students undergoing the respective clerkships. To avoid medico-legal problems, all clinical lecturers shall be registered with the Malaysian Medical Council and, ideally, have the privilege and be credentialed to practice in health-care facilities.

The Staff: Student Ratio

It is generally accepted that the ratio of staff to students in a faculty should be based on the activities undertaken within the period of training. Participation of every faculty member (including part-timers) should be based on individual contact hours with students and not merely on total numbers or student: staff ratio. Sharing of faculty members between medical programmes as well as with other programmes is not encouraged if their contact hours with students are compromised.

The following ratios are considered appropriate for effective teaching and are recommended:

a. Tutorials: Group size not exceeding 16 students per group;
b. Problem-based sessions: Group size not exceeding 12 students per group;
c. Clinical teaching in a Skills Lab setting: Group size not exceeding 10 students per group;
d. Bed side clinical teaching including ambulatory care: Group size not exceeding 8 students per group.

An ideal overall staff:student ratio is 1:4. In the clinical sciences, the number and kind of specialists appointed should relate to the amount of patient care activities required to conduct meaningful clinical teaching at the undergraduate level as well as for postgraduate and continuing medical education.

Doctors practising in the community should be appointed subject to expertise, commitment to medical education and availability. These doctors, appointed either on a part-time basis or as volunteers, should be effective teachers, serve as role models for students, and provide insight into contemporary methods of providing patient care.

For a school that is starting a new programme, there should be sufficient academic staff to support the first 2 (two) years of the programme. The school must have a proper plan for the progressive recruitment of qualified staff."

a. The minimum criteria and qualifications for entry into a medical programme (Adopted On 11 September 2012) can be found here: http://mmc.gov.my/v1/index.php?option=com_content&task=view&id=111&Itemid=161
b. No specific minimum credit achievement for graduation is stated in the guidelines.

"The medical school faculty must establish principles and methods for the evaluation of student achievement, including language proficiency, and guidelines for making decisions regarding progression and graduation.

There must be clear demonstration of the satisfactory achievement of the objectives of all components of the course by a variety of assessment methods and using a system of grading/marking that is fair, valid, appropriate and acceptable."

Annex E. Illustrative criteria for education programmes for selected health professionals

	Duration of course	Examples of some of the entry qualification for students	Academic Staff (minimum qualification	Staff/student ratio	Graduating minimum credits or qualification
Environmental health officer		For Diploma: SPM with 2 credits including BM and science	For Diploma courses, Bachelors	Classroom 1: 20	Diploma 90 Bachelors 129
Diagnostic radiographer	Diploma 3yrs Bachelors 4yrs	For Diploma courses: SPM or equivalent with 5 credits in Bahasa Malaysia, English, Maths and at least 1 science subject OR GCE/O levels with 5 credits as for SPM except for Bahasa. Malaysia. For Bachelors courses: Pass at STPM or Matriculation or A level or equivalent with CGPA 2.50 in Biology or Physics and Chemistry, and 5 credits at SPM level, including English, Maths and 1 science subject.	Bachelors or Diploma with 10 years experience	Classroom 1:20 Clinical 1:6	Bachelors 136
Medical physicist	4yrs		n.a.	n.a.	Bachelors (Hons) or Masters
Radiation therapist	Diploma 3yrs Bachelors 4yrs		Bachelors or Diploma with 10 years experience	Classroom 1:20 Clinical 1:6	Bachelors 136
Physiotherapist	Diploma 3yrs Bachelors 4yrs		Bachelors or Diploma with 10 years experience	Classroom 1:20 Clinical 1:6	Bachelors 129
Occupational therapist	Diploma 3yrs Bachelors 4yrs		Bachelors or Diploma with 10 years experience	Classroom 1:20 Clinical 1:6	Bachelors 136
Speech/ language therapist	4yrs		n.a.	n.a.	Bachelors (Hons)
Audiologist	4yrs		Bachelors or Diploma with 10 years experience	Classroom 1:20 Clinical 1:5	Bachelors 143
Optometrist			Masters in relevant subject with 20% staff having Doctorate or Masters with 5 years experience	Classroom 1:15 Clinical 1:4	Bachelors
Microbiologist (clinical scientist)	4yrs		Bachelors or Diploma with 10 years experience	Classroom 1:20 Clinical 1:6	Bachelors 138
Medical laboratory technologist	Diploma 3 years Bachelors 4 years		Bachelors or Diploma with 10 years experience	Classroom 1:20 Clinical 1:6	Diploma: 90 Bachelors: 136
Biochemist (clinical scientist)	4yrs		Bachelors or Diploma with 10 years experience	Classroom 1:20 Clinical 1:6	Bachelors 137
Biomedical scientist (clinical scientist)	4yrs		Bachelors or Diploma with 10 years experience	Classroom 1:20 Clinical 1:6	Bachelors 136
Counsellor	4yrs				Bachelors
Entomologist	4yrs		n.a.	n.a.	Bachelors
Forensic science officer	4yrs		Bachelors or Diploma with 10 years experience	Classroom 1:20 Clinical 1:6	Bachelors 145
Health education officer	4yrs		Bachelors or Diploma with 10 years experience	Classroom 1:20 Clinical 1:6	Bachelors 125 - 130
Nutritionist	4yrs		Bachelors or Diploma with 10 years experience	Classroom 1:20 Clinical 1:6	Bachelors 136
Food technologist	4yrs				Bachelors
Assistant food technologist	3yrs				Diploma
Dietician	4yrs		Bachelors or Diploma with 10 years experience	Classroom 1:20 Clinical 1:6	Bachelors 136
Embryologist	Masters 6 years		Bachelors or Diploma with 10 years experience	Classroom 1:20 Clinical 1:6	Bachelors 138
Clinical psychologist	Masters 6 years				Masters

* The items listed in this table are illustrative and NOT comprehensive. Please refer to the reference documents for complete information on minimum standards, including for items listed in this table.
Source: Malaysian Qualifications Agency. http://www.mqa.gov.my; and Ministry of Health Malaysia.

Annex F. Definitions of selected terms used in this report

Nurses	Individuals who have successfully completed accredited basic nursing courses at diploma or degree level and have been placed on the Nursing Register. They are known as "Registered nurses".
Community nurses	Individuals who have successfully completed an accredited basic community nursing course at certificate level and have been placed on the Nursing Register. Midwifery for normal deliveries is part of the basic education programme.
Assistant Nurse	Individuals who have successfully completed a two-year accredited nursing course at certificate level and have been placed on the Nursing Register.
Midwives	Registered nurses who have successfully completed an accredited post-basic education programme in Midwifery and are registered in Part I of the Nursing Register. Midwives also include all community nurses who have successfully completed the basic education programme for Community Nursing, which includes midwifery for normal childbirth. Such individuals are placed in Part III of the Nursing Register.
Doctors	Medical practitioners who have successfully completed an accredited basic medical education programme, have successfully completed training as a trainee medical officer, and have been placed on the Medical Register as "Fully registered". It includes those who are serving the initial two-year compulsory posting in a public sector institution.
Trainee doctors	Medical practitioners who have successfully completed an accredited basic medical education programme and are undergoing training as a trainee medical officer in a recognized institution. Most have been placed on the Medical Register as "Provisionally registered".
Dental practitioners	Individuals who have successfully completed an accredited basic dental education programme and have been placed on the Dental Register. It includes individuals who are undergoing the two-year compulsory posting in a public facility.
Specialist medical and dental practitioners	Individuals who have successfully completed defined postgraduate education programmes in defined specialties, have successfully completed defined periods of experience and have demonstrable competency in the specialty.
Pharmacists	Individuals who have successfully completed an accredited basic pharmacy education programme and have been placed on the Pharmacy Register. It includes individuals who are undergoing the one-year trainee period and those who are serving the subsequent one-year compulsory posting in a recognized public or private sector institution.
Assistant medical officers	This category was known formerly as "medical assistant". It includes individuals who have successfully completed the basic education programme for assistant medical officers and have been placed on the Register of Assistant Medical Officers.
Dental nurses	Individuals who have successfully completed the basic education programme for dental nurses. Currently all of them are employed only in the public sector. When they are being converted to Dental Therapists, and then will be eligible to be placed on the Dental Register.
Other health professionals	Categories listed in Table 4
Food analysts	Food analysts are persons who conduct food analysis in the public or private sector. They hold a degree in food science or Food Technology or Food Science and Technology from any institution of higher education or any other degree in science in any related field. These individuals are eligible to be placed on the Food Analysts Register.
Optometrists	Optometrists are persons who are registered with Malaysian Optical Council (MOC) and have obtained a degree in optometry. They are qualified to perform comprehensive eye examinations, including prescribing, dispensing and selling spectacles and contact lenses. They also give advice regarding visual problems and detect eye problems, even chronic ophthalmic conditions, before referring to a medical practitioner.
Opticians	Opticians are registered with the MOC. They hold a diploma or certificate in optometry, with one year of experience (Optical Act, 1992). In order to qualify they have to perform eye examinations, including prescribing, dispensing and selling spectacles. An optician who has three years of experience or passes the contact lens examination is allowed to prescribe and dispense contact lenses.

Health Informatics Centre (HIC)	The HIC in the federal Ministry of Health is responsible for collecting and compiling health information from all programme divisions in the Ministry of Health, the Department of Statistics and private health-care providers. Prior to 2008, it was known as the Information and Documentation System Unit (IDS). The HIC is the official source of data from the Ministry of Health.
Health facts	An annual publication produced by IDS and subsequently by HIC. It provides concise information on key health indicators. Reports for the period 2000–2012 are available online.
Monitoring indicators for Health for All	An annual publication produced by IDS. It provides concise information on health indicators required for reporting on progress towards Health for All. Reports for the period 2003–2012 are available online.
Malaysian Medical Council	This is a statutory body formed under the Medical Act 1971. It has members from the public and private sectors, is chaired by the Director General of Health and the secretariat is in the Medical Practice Division of the Ministry of Health. It maintains a computerized register of medical practitioners.
Malaysian Dental Council	This is a statutory body formed under the Dental Act. It has members from the public and private sectors, is chaired by the Director General of Health and the secretariat is in the Oral Health Regulation and Practice Division of the Ministry of Health. It maintains a computerized register of dental practitioners.
Pharmacy Board of Malaysia	This is a statutory body formed under the Registration of Pharmacists Act 1951. It has members from the public and private sectors, is chaired by the Director General of Health and the secretariat is in the Pharmacy Practice and Development Division of the Ministry of Health. It maintains a computerized register of pharmacists.
Nursing Board of Malaysia	This is a statutory body formed under the Nursing Act. It has members from the public and private sectors, is chaired by the Director General of Health and the secretariat is in the Nursing Division of the Ministry of Health. It maintains a computerized register of registered nurses, community nurses, and midwifery-trained personnel.
Allied Health Division	This is the programme division in the Ministry of Health responsible for collecting and compiling information on health personnel serving in the Ministry. HRH in the private sector are encouraged to provide information to the Allied Health Division on a voluntary basis.
Malaysian Qualifications Agency	An agency established under an Act of Parliament and situated in the Ministry of Higher Education. It maintains data on higher education institutions, HRH education programmes, students and graduates in the public and private sectors (excluding those in the Ministry of Health).
Malaysian Optical Council	This is a statutory body formed under the Optical Act 1991. It has members from the public and private sectors and is chaired by the Director General of Health. It maintains a computerized register of optometrists and opticians in the country and issues them annual practising licenses.
Malaysian Food Analysts Council	Malaysian Food Analysts Council is a statutory body formed under the Food Analysts Act 2011. It has members from the public and private sectors and is chaired by Director General of Health. It registers food analysts and regulates their practice.

Source: Dr Indra Pathmanathan, 2013.

Annex G. Links to key legislation regarding HRH

ACT	REFERENCE
Medical Act 1971	Laws of Malaysia, Act 50 Medical Act 1971, 2005 http://www.mma.org.my/Portals/0/medical%20act%201971.pdf
Dental Act 1971	Laws of Malaysia, Act 51 Dental Act 1971, 2006 http://mda.org.my/news/20121126-DentalAct2012Eng.pdf
Registration of Pharmacist Act 1951 and regulations under the Act	Laws of Malaysia, Act 371 Registration of Pharmacist 1951, 2006 http://www.agc.gov.my/Akta/Vol.%208/Act%20371.pdf
Nurses Act 1950 & Nurses Regulations 1985	Laws of Malaysia, Act 14 Nurses Act 1950, 2006 http://www.agc.gov.my/Akta/Vol.%201/Act%2014.pdf
Midwives Act 1966 & Midwives Registration 1990 (fees)	Laws of Malaysia, Act 436 Midwives Act 1966, 2006 http://www.agc.gov.my/Akta/Vol.%209/Act%20436.pdf
Assistant Medical Officers Act 1977	Laws of Malaysia, Act 180 Medical Assistants (REGISTRATION) ACT 1977 http://www.agc.gov.my/Akta/Vol.%204/Act%20180.pdf
Optical Act of Malaysia 1991 and	Laws of Malaysia, Act 469 Optical Act 1991, 2006 http://www.agc.gov.my/Akta/Vol.%2010/Act%20469.pdf
Food Analysts Act 2011 and Food Analysts Regulations 2013	Laws of Malaysia, Act 727 Food Analyst Act 2011 http://www.federalgazette.agc.gov.my/outputaktap/20110602_727_BI_Food%20Analysts%20Act%202011.pdf
Malaysian Counsellors Act 1998	Laws of Malaysia, Act 580 Counsellors Act 1998, 2006 http://www.agc.gov.my/Akta/Vol.%2012/Act%20580.pdf

Source: Dr Indra Pathmanathan, 2013.

Annex H. Interviews

Interviewees	Reference	Date of Interviews
Group interviews with representatives of various divisions in the Ministry of Health: Allied Health Sciences Division, Medical Practice Division (Secretariat to the Assistant Medical Officers Board), Clinical Research Centre, Oral Health Services (Secretariat to the Malaysian Dental Council), Family Health, Development, Food Safety and Quality, Human Resources Management, Health Informatics Centre, Health Inspectorate and Enforcement Unit, Public Health Programme, Secretariat to the Malaysian Medical Council, Nursing Division (Secretariat to the Malaysia Nursing Board), Medical Practice Division (Secretariat to the Malaysian Optical Council), Pharmacy Division (Secretariat to the Pharmacy Board of Malaysia), Training Management Division, Traditional and Complementary Medicine Division.	These interviews provided important information on HRH regional distribution (Section 3: HRH distribution); in-service and continuing professional education, licensing, accreditation, licensing, issues and difficulties (Section 4: HRH education); compulsory service, deployment and distribution (Section 5: HRH utilization); and HRH financing, policies and plans, the HRH information system, recent developments, management responsibilities, professional regulation, HRH workforce requirements and projections (Section 7: Governance of HRH)	December 2012 – February 2013
Dr Aishah Abu Bakar Director, Academic Development Management Division and team, Ministry of Higher Education	Provided valuable information on health professional education, educational capacities, training processes and quality assurance mechanisms, accreditation standards and linkages, and challenges (Section 4: Health professional education. Shared insights on education capacities, training processes and quality mechanisms, accreditations standards and linkages, issues and difficulties, as well as on the role of the Ministry of Higher Education in the production and governance of HRH (Section 7: Governance of HRH).	Dec 2012
Leftenan Jeneral Raja Datuk Mohamed Affandi bin Raja Mohamed Noor, Director General, Health Services, Ministry of Defence	Added valuable information relating to partnerships in health education (Section 4: HRH education).	12 December 2012
Pn. Norhadzirah Bt Mohd Nor. Principal Assistant Secretary, Human Resources Management Division Ministry of Human Resources	Shared important information regarding the development of policies strategies and plans, process and stakeholders and their roles (Section 7: Governance of HRH).	Dec 2012
Nursing, Dato'. Hjh. Fathilah bt hj. Abd Wahab Director of Nursing Division, Ministry of Health	Provided valuable knowledge on the regional distribution of nurses (Section 3: HRH distribution), and on continuing professional education, licensure, credentialing, issues and difficulties (Section 4: Health professional education).	19 December 2012 and 20 February 2013
Puan. Rogayah binti A. Bakar and Encik. Yusri b Razalli Ghazali Secretary, Division of Human Resources, Ministry of Health	Added important information on management responsibility for HRH (Section 7: Governance of HRH).	11 January 2013
Dato' Tan Yoke Hwa and team Director, Division of Allied Health Professionals, Ministry of Health	Contributed greatly, sharing insights on allied health professionals (Section 7: Governance of HRH).	22 February 2013
Encik. Mohd. Alwi b Mohd. Mustafa, Training division, Ministry of Health	Shared important data on HRH projections, used in section 7: Governance of HRH.	22 February 2013
Pn. Halinordina Mat Saat and En. Abdul Razak Mohamed Principal Assistant Director, Accreditation Division (Medical and Health Sciences), and her team Malaysian Qualifications Agency	The knowledge they shared directly fed Section 4: Health Professions Education Policies, on strategies, responsibilities, training processes, standards and review process, selection and recruitment, and issues and challenges.	December 2012
Dr Sheamini Sivasampu, Clinical Research Centre, Ministry of Health	Provided valuable data for Section 3: Distribution of HRH, on gender and age disaggregation.	Dec 2012

Source: Dr Indra Pathmanathan, 2013.

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