

ANNUAL REVIEW
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Abstract

This report has reviewed the current Human Resources for Health (HRH) status in the targeted countries by mainly focusing on health education and training, distribution and retention of health workers, community health workers. Eighteen countries have been included in the report: Bangladesh; Cambodia; China; Fiji; India; Indonesia; Lao PDR; Myanmar; Nepal; Philippines; Papua New Guinea; Samoa; Sri Lanka; Thailand; Vietnam; Thailand; Australia; New Zealand and Mongolia.

The first section of the report has firstly reviewed each country's characteristics and development by analyzing the demographic and socioeconomic statistics, as well as the development of health status and health system. The results have shown that the region has experienced enormous advance in all those three fields. The following baseline analysis has summarized HRH challenges that the region is facing now, and further reviewed the quantity of HRH in the region by analyzing the health professionals' densities and ratio of nurse to doctor in each country.

The pre-service health education in the region is still lagging behind when considering required educational and curricular changes during times of scientific and technological advances, epidemiological and social transitions and healthcare changes. It also lacks financial resources, and, in some countries, faces inadequate student intake. The pre-service health education systems in the countries of the region are diverse, but normally students in the targeted countries will take 4-6 years to complete a regular medical undergraduate course, and will be licensed when 1 year internship is completed after their graduation. It was also found that only few countries have certain agreements with others in the recognition on medical education and qualification. The continuing health education also faces many challenges and obstacles, but there have already been some programs provided by certain countries for strengthening the status of continuing health education nationally and regionally.

To achieve better HRH distribution and retention, especially in the rural and remote areas, compulsory services for doctors have been employed in Indonesia, Thailand, Myanmar and Mongolia. However, the results are mixed. The service due in Indonesia is considered to be too short and lack of continuation. In Thailand the heavy fine for contract violation resulted in raising the number of rural doctors between 1980 and 1990 but less effective afterwards. Health graduates in Myanmar and Mongolia have to work in rural area or public sector for certain period for getting their licenses.

Financial and compensation incentives have been adopted in Australia, New Zealand, Indonesia, Philippines and Mongolia. In order to get more subsidies, some anomalies in the "Rural Ranking Scale" in New Zealand are beginning to appear. In response, a review of criteria that underpin the "Rural Ranking Scale" has been undertaken. On the other hand, the fund rates offered for nurses' services are usually lower than that for GPs for the same services. This has caused a disincentive to independent nurse-led clinics. In Indonesia, since the financial incentives are only given to those works in the "very remote areas", those defined only as "remote areas" become even less attractive, which led to a worse shortage

of health workers than before. Starting from 2004, Ministry of Public Health in Thailand has further developed the special incentives for health workers into three levels. However the total fine for graduates to breach the contract has not been changed as the graduates could easily pay the fine. In response, the government of Thailand has equipped with the new financial management system for moderating the bonding contract.

The social strategies have been applied in Thailand, China and Vietnam, which are mainly attributed to increasing social acceptance and recognition of rural health professionals by creating social awards and support groups for rural health workers. However the award winners and nominees in China have been designated for many other responsibilities (such as administrative management) instead of service provision.

Regarding the community health workers (CHWs) in the region, many countries have scaled up and deployed large number of CHWs as a response to critical HRH shortages. CHWs in different countries have similar characteristics: young, female, literate, recruited from local communities, received a short term training and willing to provide services. CHWs in Sri Lanka helped improve the country's maternal and child healthcare; that in Bangladesh were well structured but lack of financial incentives; China was renowned with its "barefoot doctors", while the quality of the workforce is still at low level; CHWs in Thailand and New Zealand are also experiencing certain defects caused either politically or professionally.

I. Introduction

Despite the spectacular health advance achieved in the last few decades, the challenges facing the Human Resources for Health (HRH) in the Asia-pacific region are still great. The unfinished agenda of providing high-quality healthcare for many, particular for the poor and most vulnerable has been further complicated by the growing burden of chronic disease, outbreaks of emerging and re-emerging disease such as SARS, avian influenza, large-scale natural disasters and growing consumer expectations.

According to the World Health Organization (WHO), almost all the countries in the Asia-pacific region are facing several common health workforce-related problems and challenges including workforce shortage, skill-mix imbalance, mal-distributions, poor work environment, and weak developing and managing capacities and knowledge bases. Those issues are currently limiting the progress towards the Millennium Development Goals (MDGs), and limiting access to effective and high-quality health services for many people.

This report reviews HRH issues and problems facing the countries in the Asia-pacific region by identifying regional HRH situations and key challenges, for better perceiving the HRH status, targeting the HRH priorities and facilitating the HRH management and development.

Eighteen countries have been included in the report: Bangladesh, Cambodia, China, Fiji, India, Indonesia, Lao PDR, Myanmar, Nepal, Philippines, Papua New Guinea, Samoa, Sri Lanka, Vietnam, Thailand, Australia, New Zealand and Mongolia. The first 15 are currently the members of Asia-Pacific Action Alliance on Human Resources for Health (AAAH). The last 3 countries were included for the purpose of comparison.

The report contains six parts. In part I and II, introduction and baseline analysis of targeted countries' characteristics and development have been included. In Part III, IV and V, the current HRH situations in the targeted countries have been reviewed by focusing on health education and training, distribution and retention of health workers, and community health workers respectively. The report concludes in Part VI. The Annexes provide background data on health system and health workforce as well as demographic and socioeconomic information in the 18 countries.

II. Country Characteristics and Development

The 18 countries reviewed by this report are all from the Asia-pacific region. However, there is a big diversity between these countries in many aspects. This section describes the basic geography, demographic, and socioeconomic statistics of the countries as well as their population's health status and their health systems.

2.1 Geography, Demographic and Socioeconomic Statistics

2.1.1 Country Geography

Of 18 countries, five are in the Pacific region (Fiji, Samoa, Australia, Papua New Guinea, and New Zealand). China and Mongolia are in West Pacific Region. Cambodia, Indonesia, Laos, Myanmar, Philippines, Thailand, and Vietnam are in South-east Asia. India, Sri Lanka, Bangladesh, Nepal are in South Asia.

The land areas of the 18 countries range from 18.33 thousand square kilo meters (Km²) in Fiji up to 9,600 thousand Km² in China. Australia is the second largest country in West-pacific region after China; while India has the largest area among the countries in the South and South-east Asia region. The combined land area of China, Australia and India accounts for 74% of the total area of 18 countries (See Annex 1).

2.1.2 Population Size and Annual Growth Rate

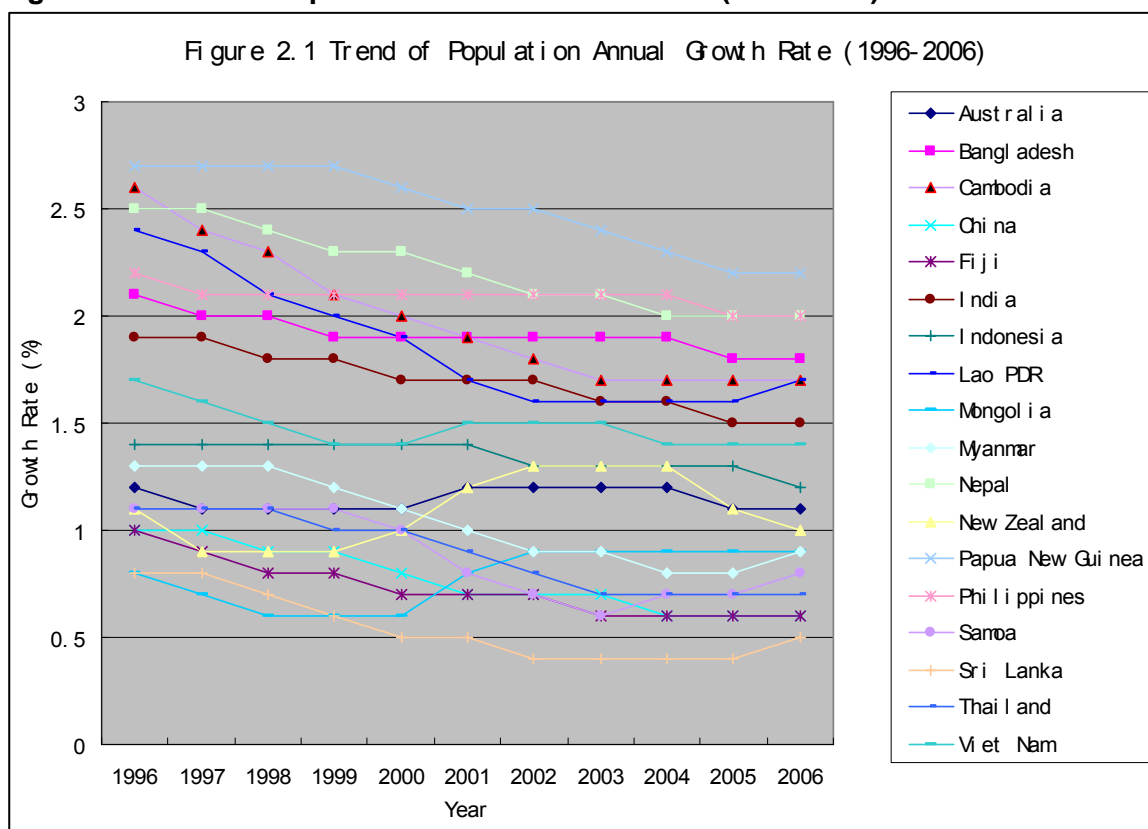
China has the largest number of population among the 18 countries, followed by India and then Indonesia. The three countries' population accounted for 83% of the total population of 18 countries (See Annex 1).

In 2006, the total population annual growth rates in the 18 countries are between 0.5% and 2.2%. Nepal, Philippines and Papua New Guinea are the countries with the annual growth rate equal or above 2%. The rates in Sri Lanka, China, Fiji, Thailand, Samoa, Mongolia and Myanmar are all below 1%.

It has been found that Samoa was the only country whose population annual growth rate had a slight increase from 0.8% in 1996 to 0.9% in 2006. The rate in the rest of 17 countries had tended to be gradually declining from 1996 to 2006, despite the wave found from New Zealand's curve during 2000-02 (See Figure 2.1). Cambodia had the greatest decline as the population annual growth rate had dropped by 0.9% from 1996 to 2006, followed by Lao PDR whose rate had dropped by 0.7%, then Nepal and Papua New Guinea, the rate in each of those two countries had dropped by 0.5% respectively. The smallest change in the population annual growth rate had been found in the two OECD countries-Australia and New Zealand, as the rate within each country had only declined by 0.1% respectively from 1996 to 2006.

According to the *World Health Statistics 2008*, the average annual growth rates of population among the targeted countries in 1986-1996 were unanimously higher than that in 1996-2006, except the slight increase found in Samoa (Table 2.1). The results have proved that the increasing speed of the amount of population in Asia-pacific region has been slowing down.

Figure 2.1 Trend of Population Annual Growth Rate (1996-2006)



Source: World Health Statistics 2008, <http://www.who.int/whosis/>, accessed on 25 July 2008.

Table 2.1 Population Annual Growth rate

Country	Average Annual Growth Rate in Decade (%)		Difference between 1996-2006 and 1986-1996 (%)
	1986-1996	1996-2006	
Samoa	0.8	0.9	0.1
Fiji	0.8	0.7	-0.1
Papua New Guinea	2.6	2.5	-0.1
Philippines	2.3	2.1	-0.2
Nepal	2.4	2.2	-0.2
Australia	1.4	1.2	-0.2
New Zealand	1.3	1.1	-0.2
Thailand	1.2	0.9	-0.3
Indonesia	1.6	1.3	-0.3
Bangladesh	2.2	1.9	-0.3
China	1.2	0.8	-0.4
India	2.1	1.7	-0.4
Myanmar	1.5	1	-0.5
Sri Lanka	1.2	0.5	-0.7
Viet Nam	2.1	1.4	-0.7
Lao PDR	2.8	1.8	-1
Mongolia	2	0.8	-1.2
Cambodia	3.3	1.9	-1.4

Source: World Health Statistics 2008, <http://www.who.int/whosis/>, accessed on 25 July 2008.

2.1.3 Urbanization

Approximately only 37% of the population in the 18 countries are living in urban areas. Only 5 out of 18 countries had the urban population more than 50% of the total in 2006, including Australia and New Zealand-the two of most modernized countries. Papua New Guinea, Sri Lanka and Cambodia have the urban population less than 20% of the total respectively (See Annex 1).

During the period of 1990-2006, many countries in the Asia-pacific region had been aggressively urbanized, as the number of population living in the urban area had been sharply increased. The percentage of urban population in Indonesia had increased by 18% from 31% in 1990 to 49% in 2006, followed by China and Philippines whose rates increased by 14% respectively (See Annex 1). The increased percentage of urban population in each of rest countries except Sri Lanka, Mongolia and Papua New Guinea ranged from 1% to 9%. It has also been found that the percentage of urban population in Sri Lanka had been decreased by 2%, while the figure in Mongolia and Papua New Guinea had remained the same during the period of 1990-2006.

2.1.4 Economic Status

The share of population living below the poverty line (less than US\$1 per day) in 18 countries have been enormously decreased in the past 30 years. For example, in China, the poverty-stricken had decreased from 250 million in 1978 (31% of the rural population) to 24 million in 2005 (3% of the rural population), China alone has accounted for over 75% of poverty reduction in the developing world over the last 30 years⁵⁴.

The Annex 1 shows that the levels of gross domestic product (GDP) per capita of the 18 countries in 2007 ranged from \$1,200 in Nepal to \$36,300 in Australia. The 18 countries' annual growth rates of GDP per capita during 1990-2005 were higher than those in the period of 1975-2005, except Cambodia, Indonesia, Papua New Guinea and Thailand. This means the economy of the Asia-pacific region had been undergone comparatively fast development during 1990-2005. Some major economy in the region, such as China, the GDP per capita had witnessed an average real annual growth of 8.8% in 1990-2005. Furthermore, the gross national income (GNI) per capita in all of 18 countries except Myanmar had at least increased by 4.49% from 2000 to 2006 (See Annex 1). However, the national income levels in the countries of the region were still at a comparatively low level when applying the World Bank country classification. Only two countries - Australia and New Zealand are considered as high income countries. The remaining 16 countries are all lower middle income (Fiji, China, India, Indonesia, Mongolia, Philippines, Samoa, Sri Lanka and Thailand) or low income countries (Bangladesh, Cambodia, Lao PDR, Myanmar, Nepal, Papua New Guinea and Vietnam)⁵⁵.

2.2 Health Status

The population health in the Asia-pacific region had undergone enormous improvement in the period of 1900-2006. The increases of life expectancy at birth among the 18 countries range from 3 years in Cambodia, Fiji, Myanmar, Philippines and Thailand respectively, to 8 years in Indonesia, Lao PDR and Nepal (See Annex 2).

In 2006, Australia and New Zealand have high life expectancy at birth of 82 years and 80 years respectively. China, Sri Lanka, Thailand, and Vietnam have life expectancy beyond 70 years while the remaining countries are between 60 years and 70 years.

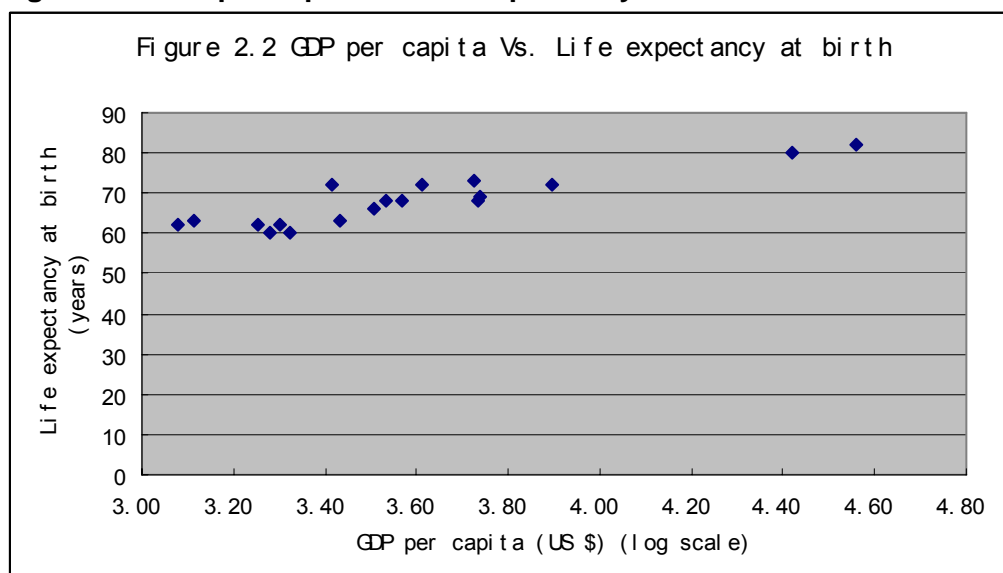
When considering their respective national income level, only 3 out of 9 countries (China, Sri Lanka and Thailand) performed better than the average global life expectancy of lower middle income countries (71 years) according to WHO. On the other hand, all the remaining 7 low income countries have higher life expectancy at birth than the low income countries' global average level (69 years)⁵⁶.

It has been found that the adult mortality rate in Mongolia and Thailand had increased by 44‰ and 16‰ respectively from 1990 to 2006. Apart from that, the adult mortality rates in the rest countries had all been decreased by at least 6‰ in Cambodia and at most 75‰ in Sri Lanka. China was the only lower middle income country that had the adult mortality rate lower than the global average level of adult mortality rate in lower middle income countries (151‰). However, 5 out of 7 low income countries had passed the global average level of low income countries (283‰)⁵⁶(See Annex 2).

Furthermore, infant mortality rate and under-5 mortality rate in the region had also dropped largely in 1990-2006. It has been found that during 1990 and 2006 Lao PDR was the country with the greatest decline in both rates (61‰ in infant mortality rate and 88‰ in under-5 mortality rate), followed by Nepal and then Bangladesh. On the other hand, Australia has the smallest decline in both rates, followed by Fiji and then New Zealand. (See Annex 2).

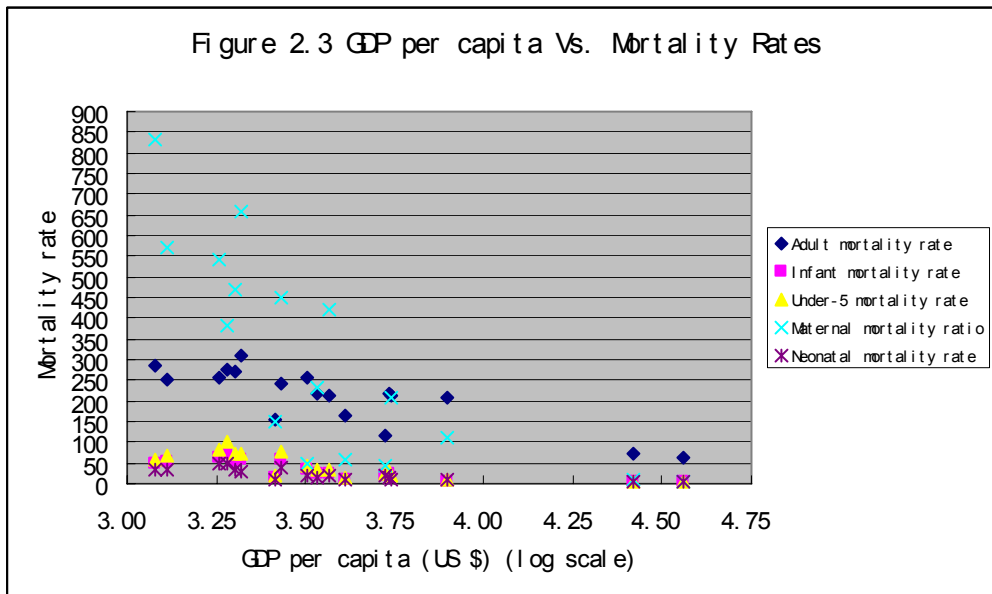
Figure 2.2 and 2.3 show the pattern of population health statistics in relation to the countries' economic status. Countries with higher GDP per capita tend to have longer life expectancy and lower rate in adult mortality, infant mortality, under-5 mortality, maternal mortality and neonatal mortality than those with lower GDP per capita.

Figure 2.2 GDP per capita Vs. Life expectancy at birth



Source: World Health Statistics 2008, <http://www.who.int/whosis/>, accessed on 25 July 2008.

Figure 2.3 GDP capita Vs. Mortality Rates



Source: World Health Statistics 2008, <http://www.who.int/whosis/>, accessed on 25 July 2008.

2.3 Health System

When looking at health spending, the level of health spending per capita in the 18 countries ranged from \$38 in Myanmar to \$3001 in Australia in 2005. Excepting Australia and New Zealand, the per capita health spending in Thailand (\$323) was the highest among the rest. Lao PDR, Indonesia, Nepal, Bangladesh and Myanmar have the per capita health spending below \$100. In relation to GDP, total expenditure on health as percentage of GDP among 18 countries ranged from 2.1% to 8.9% in 2005. Richer countries tend to spend more on health as Australia and New Zealand spending 8.8% and 8.9% of their GDP respectively. Indonesia and Myanmar are low spenders with 2.1 and 2.2% respectively. The remaining spent between 3.2% and 6.4% of GDP.

Except Bangladesh, Philippines, Fiji, Mongolia and Samoa, the total expenditures on health as percentage of GDP in the rest of the countries had all been increased from 2000 to 2005. The highest raise had been found in New Zealand, the share of health expenditure in GDP had increased by 0.8%, followed by India (0.7%), and then Cambodia, Papua New Guinea and Viet Nam (0.6% respectively). The biggest drop had been found in Mongolia as the share of health expenditure had declined by 1.3%. Half countries' general government expenditure on health had been found over 40% of the national total expenditure on health in 2005.

In regard to the source of health spending, the pacific islands countries—Papua New Guinea, Samoa and Fiji, as well as Mongolia and New Zealand all had over 70% of total health expenditure from government health expenditure. On the contrary, India, Myanmar had more than 80% of total health spending from private source.

The share of total government health expenditure spending on health in the 18 countries varied from 1% to 18% in 2005. Australia and New Zealand spend more share of their government budget on health at 17% and 18% respectively followed by Cambodia, Samoa, Thailand at 11-12%, Four countries spent less than 5% of their government budgets on health. They are: China (1%) Myanmar (1.1%), India (3.5%) and Laos (4.1%).

The per capita expenditure on health in 18 countries had all increased from 2000 to 2005,

and the per capita government expenditure on health in 18 countries had all increased by at least 4.82% in Mongolia and at most 95.24% in Cambodia, except the no change in Lao PDR and Myanmar, and decline in Philippines in 2005 (See Annex 3).

III. Baseline Analysis of HRH Situation

The health workforce systems in the Asia-pacific region still face many challenges. As presented in the WHO regional strategic plans for South East Asia and Western Pacific^{2,6}, the problems facing health workforce system in the Asia-Pacific region are summarized in Box I below.

Box 1: Health Workforce Challenges in the Asia-pacific Region

- **Shortage:** According to WHO, the Asia-pacific region is in shortage of 2.36 million health workers in total. The causes for the shortage vary from country to country. Some of those are lack of clear human resource policies; lack of updated norms and standards for health workforce planning; insufficient capacity for health workforce training; inadequate budgets for training and unjustified control of health workforce production by professional organization.
- **Mal-distribution:** There is a great imbalance of HRH between rural and urban areas in the countries of the region. This geographic imbalance is aggravated by the unplanned migration of health workers. The pull of higher salaries in industrialized countries and the push of poor working conditions at home drive thousands of health professionals, particularly doctors, to jobs abroad each year. Migration of skilled workers within as well as from member countries had led to a brain drain resulting in a net loss to the rural public health sector.
- **Skill mix imbalances:** Training in the Region is heavily tipped towards the production of physicians and nurses at the expense of public health and management cadres. Community health workers comprise a 'third workforce' that is largely untapped. Unfortunately, ministries of health usually have limited influence on the number and types of health workers to be trained.
- **Inadequate production capacity:** Unlike other inputs, it takes decades to build up a qualified health workforce. Many countries in the Region lack the means to train an adequate health workforce. Furthermore, teaching methods and materials tend to be outdated and irrelevant. Private schools have emerged as a growth industry, largely outside the national regulatory framework.
- **Lack of appropriate knowledge and skills:** Lack of standardization in training quality and lack of adequate facilities for continuing education have deprived many health care workers from acquiring appropriate level of knowledge, skills and positive attitudes to respond to the growing consumer expectations.
- **Lack of public health orientation:** South-East Asia has only five percent of public health schools in the world. Weak incentive and management policies and practices: Insufficient incentive systems and effective management policies and practices lead to attrition and low productivity of the health workforce.
- **Dual employment:** To compensate for unrealistically low salaries, health workers in many countries in the Region usually combine salaried public sector jobs with fee-for-service private practice at the detriment of the public health sector.
- **Ineffective regulatory oversight of the private sector:** While no single regulatory approach to the private sector is appropriate for all countries in the Region, countries often lack the capacity, skills and resources, to develop and enforce regulatory strategies that protect the public from market abuses and contribute to the efficiency, quality and equity goals of the health system.

Source: WHO Regional Strategic Plan for Health Workforce Development in the South-East Asia Region and WHO Regional Strategy on Human Resource for Health 2006-2015, Manila, 2007.

To evaluate the situation of health workforce in the region, this section of the report presents the findings from the analyses of densities and skill mix situation of workforce. The results from HRH Policy reviews are also described.

3.1 Densities of Health Professionals

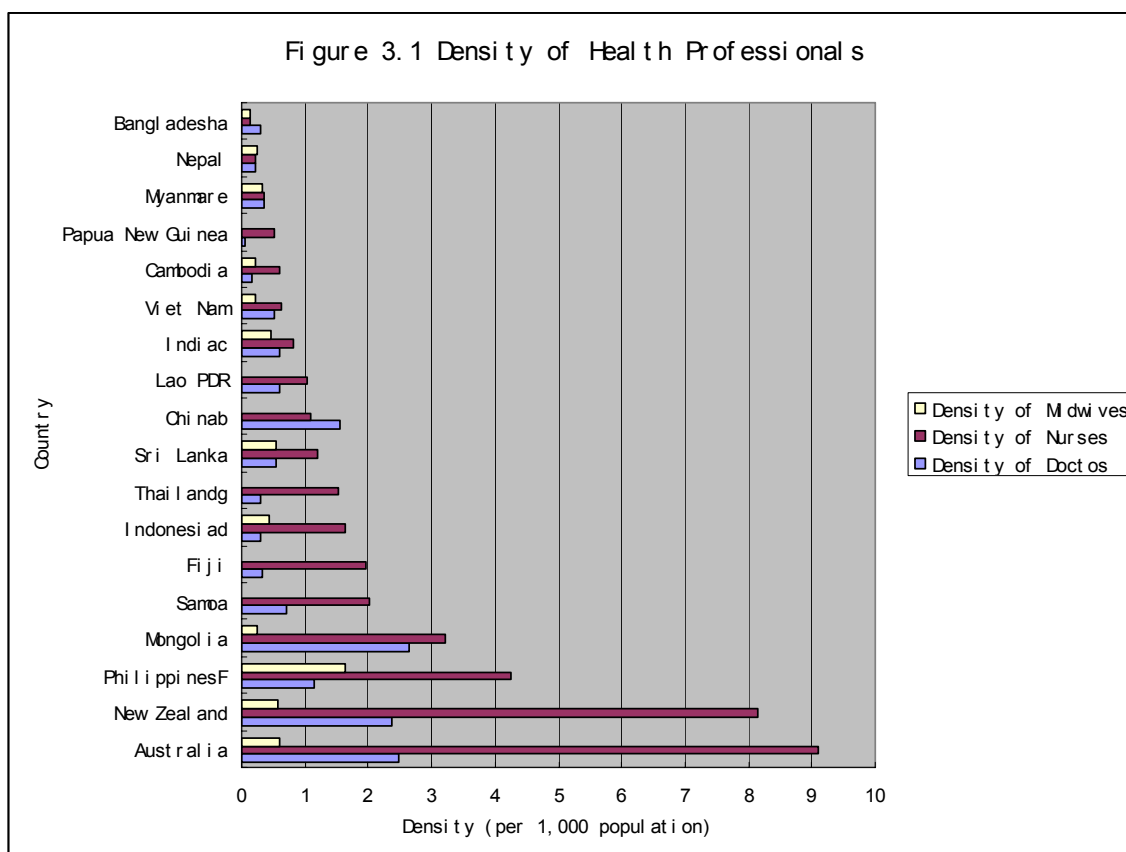
WHO estimated that there is shortage of 1,164,001 doctors, nurses and midwives in South-East Asia and 32,560 in Western Pacific Region. In absolute terms, the greatest shortage occurs in South-East Asia, dominated by the needs of Bangladesh, India and Indonesia¹.

While there are no absolute norms on the right ratio of health workers to population, WHO has identified 2.28 per 1000 population as the “threshold” density of doctors, nurses and midwives with 2.02 to 2.54 allowing for uncertainty. Countries that fall down that threshold are very unlikely to achieve 80% coverage of measles immunization, skilled attendance at birth, and reducing maternal, infant and under-5 mortality rates and to meet the health related Millennium Development Goals (MDGs)^{2,6,25,57}.

The densities of doctors, nurses and midwives among the 18 target countries ranged from the highest 10.910 per 1,000 in New Zealand to the lowest 0.559 per 1,000 in Bangladesh. Eight countries are above the “threshold” density, among which only Indonesia was from South-East Asia Region. 9 countries can be considered in shortage based on the “threshold” density and they are India, Thailand, Lao PDR, Viet Nam, Myanmar, Cambodia, Nepal, Papua New Guinea and Bangladesh. (See Annex 4).

Even though the titles of those three health professionals are the same in all countries, it is important to be aware of that the actual skills and qualifications of these professions may be different in different countries as the standards for professional classification may be different. This will be further discussed in the later section.

Figure 3.1 Density of Health Professionals



Source: *World Health Statistics 2008*, <http://www.who.int/whosis/>, accessed on 25 July 2008.

Lao PDR and Viet Nam have no data on dentist density. Among others, 15 out of 16 countries had less than 1 dentist per 1,000 population. Only Australia had the density of dentist at 1.1 per 1,000 population.

The density of pharmacists among the 16 countries (excepting Lao PDR and Papua New Guinea) was ranged from the lowest 0.01‰ in Nepal to the highest 0.92 ‰ in New Zealand (See Annex 4).

3.2 Ratio of Nurse to Doctor

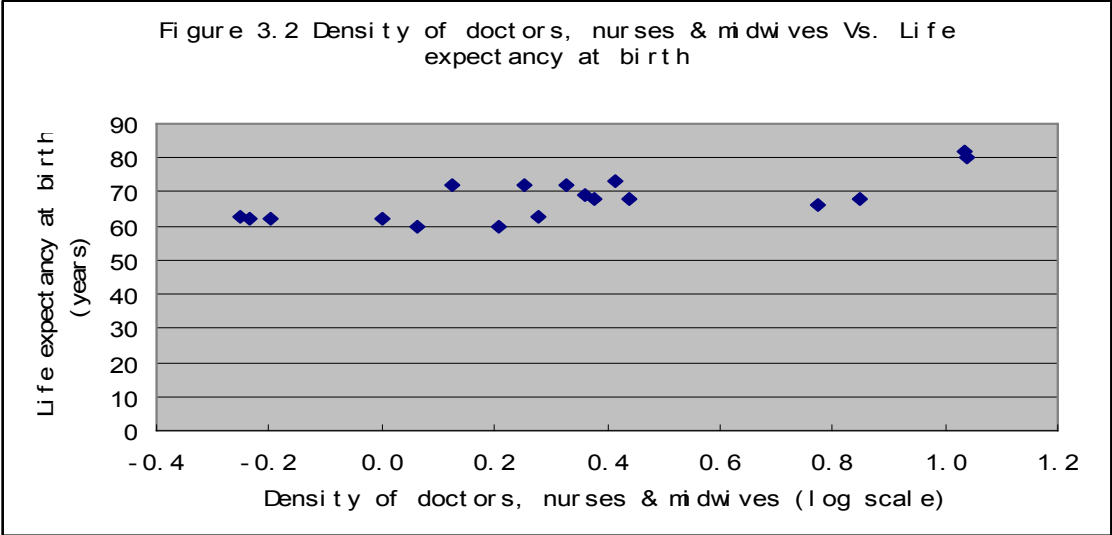
The ratio of nurse to doctor is one possible indicator of the skill mix situation within a country. There is no standard ratio for nurse to doctor⁴. However, the 1993 World Bank's World Development Report suggested that, as a rule of thumb, that the ratio of nurse to doctor should be at least 2:1 with 4:1 or higher considered more satisfactory for cost-effective and quality care^{4,5}.

As shown in Annex 4, 3 out 18 countries 1 doctor is equipped with less than 1 nurse - 0.496 in Bangladesh; 0.715 in China and 0.986 in Myanmar. Taking the World Bank's threshold in consideration, inappropriate skill mix in one dimension of health workforce in Bangladesh, China and Myanmar can be easily perceived.

3.3 HRH Densities and Population Health Status

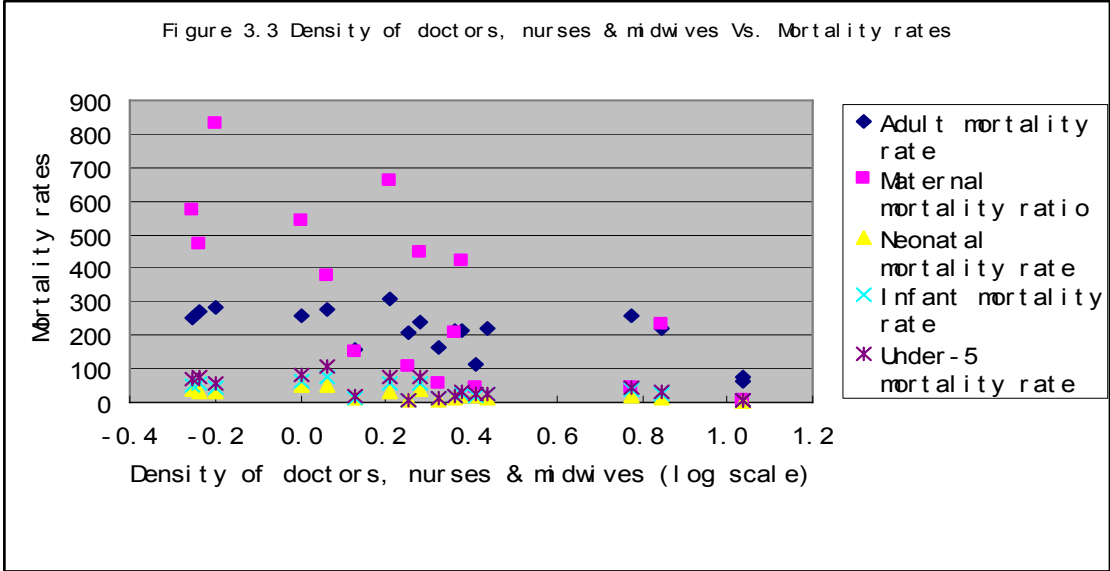
According to Figure 3.2 and 3.3, there seems to be a trend that countries with higher density of doctors, nurses and midwives have longer life expectancy and lower rate in adult mortality, infant mortality, under-5 mortality, maternal mortality and neonatal mortality than those with lower density of doctors, nurses and midwives.

Figure 3.2 Density of doctors, nurses and midwives Vs. Life expectancy at birth



Source: World Health Statistics 2008, <http://www.who.int/whosis/>, accessed on 25 July 2008.

Figure 3.3 Density of doctors, nurses and midwives Vs. Mortality rates



Source: World Health Statistics 2008, <http://www.who.int/whosis/>, accessed on 25 July 2008.

3.4 Key HRH-related Policies Review

In addition to the baseline analysis, the key policies/regulations/guidelines/frameworks relating to HRH in each country have been reviewed and summarized in Box 2. The results help in perceiving the status, propriety works and future development direction of HRH in every of 18 countries.

Box 2 Key HRH-related Policies Review

Country	Key HRH-related Policies/ Regulations/Guidelines/ Frameworks etc.	Core HRH-related content/objectives
1 Australia	The National Health Workforce Strategic Framework ⁶³	The framework embodies 7 core principles: 1) Australia should focus on achieving, at a minimum, national self sufficiency in health workforce supply, whilst acknowledging it is part of a global market. 2) Distribution of the health workforce should optimize equitable access to health care for all Australians, and recognize the specific requirements of people and communities with greatest need. 3) All health care environments regardless of role, function, size or location should be places in which people want to work and develop; where the workforce is valued and supported and operates in an environment of mutual collaboration. 4) Cohesive action is required among the health, education, vocational training and regulatory sectors to promote an Australian health workforce that is knowledgeable, skilled, competent, engaged in life long learning and distributed to optimize equitable health outcomes. 5) To make optimal use of workforce skills and ensure best health outcomes, it is recognized that a complementary realignment of existing workforce roles or the creation of new roles may be necessary. Any workplace redesign will address health needs, the provision of sustainable quality care and the required competencies to meet service needs. 6) Health workforce policy and planning should be population and consumer focused, linked to broader health care and health systems planning and informed by the best available evidence. 7) Australian health workforce policy development and planning will be most effective when undertaken collaboratively involving all stakeholders ⁶³ .
2 Bangladesh	Master Plan (2010-2040) ⁶⁴	The philosophy of the master plan is to create right number of nurses and paramedics with right skills and motivation, so that they could be rightly placed to render satisfactory services to the nation. The goal is to minimize acute shortage of HRH in particular nurses and paramedics. The objectives are: to increase the number of nurses/paramedics; to increase enrolment; to upgrade quality of services, and to improve quality of education ⁶⁴ .
3 Cambodia	National Strategic Plan (2003-2007) ⁶⁵	HRH-related objectives: 1) to improve the quality of care in both public and private health sectors; 2) to improve the distribution of staff particularly midwives in the health sector; 3) to improve reproductive and adolescent health services ⁶⁵ .

4	China	China Human Resources for Health Development Plan 2001-2015 ⁶⁶	Main objectives include: 1) to increase the number of health workers from the 5.591 million people in 2000 to 6.575 million. The total number of health professionals need to be increased from 4.4908 million people to 5.2601 million. By 2015, per 1,000 populations will have 3.64 health technicians, 1.26 practicing physicians, and 1.26 practicing nurses; 2) to strengthen the construction of academic leaders, and cultivate a group of young academic leaders in the new century; 3) to improve the quality of professional personnel. Eliminate those without professional qualifications till 2005. By 2005 the doctors will be all demanded at least college diploma and the number of nurses who have a college education are not less than 30% of total; 4) to increase the number of community general practitioners. By 2015, the share of General practitioners should not be less than 30% of community doctors; 5) to promote the continuous health professional education, the rate for receiving the continuous education should reach 95% of total health professionals by 2015, and the village doctor in the rural areas must at least have a secondary diploma for their education background by 2015 ⁶⁶ .
5	Fiji	Health Strategic Plan 2005-2008 ⁶⁷	HRH-related goals: 1) to develop and retain a valued, skilled and high performance workforce to enhance the delivery of quality health services; 2) to develop and use financial (FMIS), human resource (HRIS) and health information (HIS, PATIS) systems to maximize resources and promote continuous improvement at all levels of health service delivery ⁶⁷ .
6	India	National Rural Health Mission (2005-2012) ⁶⁸	HRH related core strategies: 1) strengthening sub-centre through an untied to enable local planning and action and more Multi Purpose Workers (MPWs); 2) strengthening existing PHCs and CHCs, and provision of 30-50 bedded CHC per lakh population for improved curative care to a normative standard (Indian Public Health Standards defining personnel, equipment and management standards); 3) formulation of transparent policies for deployment and career development of Human Resources for Health; 4) regulation of private sector including the informal rural practitioners to ensure availability of quality service to citizens at reasonable cost; 5) every village/large habitat will have a female Accredited Social Health Activist (ASHA) – chosen by and accountable to the panchayat – to act as the interface between the community and public health system. States to choose State specific models, Standing Mentoring Group shall guide and oversee the implementation of ASHA initiative; 6) reorienting health/medical education to support rural health issues; 7) for development manpower system – recruitment (induction of MBAs/CAs.MCAs), training and curriculum development, revitalization of existing institutions and partnerships with NGO and private sector ⁶⁸ .
7	Indonesia	Policy of HRH Development 2000-2010 ⁶⁹	The basic principles are: 1) production of HRH covering number, types and qualification based on the need and demand of the local and international markets. 2) appropriate utilization of HRH concerning particular attention to the equity, welfare and fairness aspects of HRH. 3) improvement of the HRH quality which are focused on the advancement of health knowledge and technologies, moral and performance based on the religion and professional ethics. 4) career development should be carried out objectively and transparency based on their working performances ⁶⁹ .

8	Lao PDR	Unknown	Unknown
9	Mongolia	Health Sector Strategic Master Plan 2006-2015 ⁷⁰	HRH-related objectives: 1) to establish human resource database and information system with links to other important personnel databases and managed by trained personnel; 2) to train health and health related workers, with appropriate attitude, relevant skills and adequate knowledge to meet community health needs and job requirements; 3) to provide ongoing, regular and relevant continuing education and in-service training provided for all cadres of health workers with special emphasis on middle level health workers; 4) to establish incentives and motivation scheme developed and applied to all health workers in the sector with special emphasis on retaining doctors and health specialists in rural areas reducing rural urban disparities ⁷⁰ .
10	Myanmar	National Health Policy and Myanmar Health Vision 2030 ⁷¹	HRH-related objectives: 1) to produce sufficient as well as efficient human resource for health locally in the context of broad framework of long term health development plan; 2) to train and produce all categories of human resources for health within the country ⁷¹ .
11	Nepal	8 th 5-year plan ⁷²	HRH-related objective: to provide appropriate training to health workers and influential people or stakeholders ⁷² .
12	New Zealand	Public Health Workforce Development Plan ^{73,74}	HRH-related objectives: 1) to develop an effective and sustainable public health workforce; 2) to support public health environments to grow and develop the public health workforce ^{73,74} .
13	Papua New Guinea	Unknown	Unknown
14	Philippines	Human Resources for Health Master Plan 2005-2030 ⁷⁵	The 25 year strategic plan was developed in three phases with corresponding plan components: Phase 1 – Short term plan for 2005-2010 that will focus on: workforce planning implementation (redistribution and rationalization of health workers), management of HRH domestic deployment and international migration and institutionalization of HRH management units. Phase 2 – Medium term plan for 2011-2020 that will emphasize the need to: institutionalize HRH Retention Schemes; encourage public-private partnerships in increasing investments for health and health related purposes; generate critical HR information and establish quality management systems for HRH. Phase 3 – Long term plan for 2021-2030 that will ensure that: functional HRH management systems are in place to ensure productive and satisfied workforce; the results of the monitoring and evaluation of the master plan are used to refine established HRH systems and transition into next HRH plan ⁷⁵ .
15	Samoa	Unknown	Unknown
16	Sri Lanka	Health Master Plan 2007-2016 ⁷⁶	HRH-related objectives: 1) to expand functions and strengthen capacities of national and provincial ministries of health in human resource development and management; 2) to rationalize the development

			and management of human resources for health; to improve management, clinical and public health competencies of health staff ⁷⁶ .
17	Thailand	National Health Development Plan under the 9 th National Economic and Social Development Plan (2002-2006) ⁷⁷	HRH-related objectives:1) to establish an agency or a ministerial/central committee to be responsible for monitoring and setting up mechanisms, criteria, principles, and conditions for developing policies and plans on the production, development, and management of health workforce; 2) to establish and develop a central database of health workforce of the Ministry of Public Health in such a way that it is of good quality, accurate and up to date, covering all agencies concerned, and having linkages with all other central local databases; 3) to support the production of health personnel so that the categories, quantities, qualities, and specific qualifications are consistent with the needs and necessity for the health service system reform of the country; 4) to revise the personnel management system so that it is more flexible and efficient; 5) to develop a personnel development plan aimed at raising the knowledge, capability, skills, righteousness, morality, attitudes, and values for service provision consistent with continuous health service system development efforts; 6) to create and support the building of new knowledge as well as technology suitable for the changing health problems and situations; 7) to provide technical advice to agencies and healthcare facilities in the health system as well as to the communities and localities ⁷⁷ .
18	Viet Nam	Unknown	Unknown

IV. Education and Training for Health Workers

It has been agreed that one of the best ways to resolve the potential crisis in staffing of health services is through education and training, together with human resource management policies and incentives. However, according to the WHO the health workforce education and training system in the Asia-pacific region is still weak^{2,6}.

Box 3: Issues concerning the education and training of health workers in the Asia-pacific region

- Lack of clear linkages between health-service needs and health professional education and training, leading to inappropriate educational content and training outcomes;
- Lagging behind of educational and curricular change during times of scientific and technological advances, epidemiological and social transitions and health care changes. Educational innovations and experiments are not quite evident in this region as seen in other parts of the world;
- Low student intake into some training programs--particularly in nursing and midwifery and other allied health disciplines (such as medical technology, pharmacy, social workers and counselors) and poor quality of training and teaching, and learning content;
- Lack of financial resources, suitable training institutions and adequate technical expertise (particularly in the advanced and specialized technical fields) to meeting health professionals' training needs and requirement. Even when there are in-country health professional training institutions, faculty often have little or no formal preparation in educational methodologies;
- Students struggle and do not complete their programs of study because their prior education is based on rote-learning, without texts, which provides them with an insufficient foundation in science, mathematics and writing skills.

Source: WHO Regional Strategic Plan for Health Workforce Development in the South-East Asia Region and WHO Regional Strategy on Human Resource for Health 2006-2015, Manila, 2007.

This section of the report discusses two areas of education and training for health workforce. The first part addresses the issue of pre-service education. The second part describes the continuing education.

4.1 Pre-service Education

The pre-service health education systems in the countries of Asia-pacific region are diverse. This report focuses on the pattern of medical education in the 18 countries. It is expected that the education of other health professions will be included in future reviews.

Medical schools in many countries have traditionally followed their colonial roots: British (Singapore, Malaysia), French (Vietnam, Lao PDR and Cambodia), North American (Philippines), and Dutch and German (parts of Indonesia)⁵⁸. As shown in table 1 of Annex 5, the duration for studying medical degree course among the 18 countries range from 3 to 8 years. 4 to 6 years after secondary education are the common period of time for obtaining the basic medical degree in most of the countries.

Despite the various description on the title of academic degree in different countries, 8 countries will award the student with Bachelor of Medicine and Bachelor of Surgery after the basic degree study, others except Bangladesh and Samoa will offer the title of "doctor of medicine" or "doctor" to the students.

Medical registration and license to practice are obligatory in all countries where data exist (information unavailable for Bangladesh and Papua New Guinea). Medical graduates in each country are required to register with the health ministries, national medical councils or professional associations in their own country. The licenses for medical practice are issued to the qualified graduates after their 1-year internship in an approved teaching hospital in Australia, China, Fiji, India, Myanmar, Nepal, Philippines and Sri Lanka. Successfully passing specific examinations for medical license are required in China and Mongolia.

The license in Philippines must be renewed every 5 years. Compulsory service in the government health institutions after graduation is obligatory in Cambodia, Fiji, Lao PDR, Mongolia, Myanmar, Samoa, Thailand and Viet Nam. The length of compulsory service varies ranging from 1 year in Cambodia to 5 years in Viet Nam.

Half of the countries (including Australia, China, Fiji, India, Lao PDR, New Zealand, Philippines, Sri Lanka and Thailand) allow foreign professionals to practice medicine for short period of time under the condition that the professional qualification of the foreigners were recognized by the authorities. In addition, a number of countries have mutual agreements on medical degree recognition. For example, Nepal has agreements on the recognition on medical education and qualification with Bangladesh, India, Pakistan and Sri Lanka. Although Samoa has no medical schools, the country automatically recognizes the medical degree from commonwealth countries and United States. Similar agreement also exists between Australia and New Zealand. Medical graduates of New Zealand accredited by the Australian Medical Council (AMC) are entitled to unconditional registration in Australia.

Due to limited information, the education systems for nurses and other professionals were not reviewed in this annual report. They are expected to be analyzed in the near future. Limited information is shown in Table 2 of Annex 5. The numbers of nursing schools among the 18 countries are various from 1 in Fiji and Lao PDR and Sri Lanka respectively to 2,466 in India. Note that Myanmar and Nepal have fewer nursing schools than medical schools.

4.2 Continuing Education

This section reviews evidence on continuing education activities for health workers in the Asia-pacific region. The findings are mostly related to medical education as the information on continuing education for other health professions is limited.

4.2.1 Current Situation

In most of the 18 countries, professional colleges and associations supervise a variety of continuing medical education programs but there is no revalidation process and no system of awarding credits for educational activities. For example, in India, despite the necessary for providing the continuing medical education to the doctors for keeping them up to date with the latest drugs, equipment and medical practices, there is limited advancement in the continuing education system. Although the Medical Council of India established a code of ethics stating that members should complete 30 hours of continuing medical education every five years in order to re-register as doctors, but according to reports only about 20% of India's doctors follow this rule as it is not legally binding. Apparently, delays in related legislation process have slowed the progress of continuing health education in the country. In Sri Lanka, the revalidation of the continuing health education is not acceptable to all stakeholders, resulting in the lack of accreditations of the continuing health education programs^{2,6,59}.

There is still lacking of related resources for undertaking the proper amount of continuing health education programs^{2,6}. For example, it has been found in Mongolia that to improve the quality of medical care for rural populations, special in-service training and continuing education in clinical and management areas for Soum-level (medium-sized sub national administrative–territorial unit) staff were carried out as part of the Soum Hospital Development Program to improve their diagnostic, treatment and management skills¹⁶. However, outside the program, continuing professional development and training of health care personnel are rare¹⁵.

Quality control is another area of weakness in the continuing health education system in this region. The appropriate assessment tools and the standards for evaluation are not properly defined and not uniformly applied. Many training programs rely on outmoded assessment, such as essays and long cases, and are rarely subjected to external review or internal quality control. The effectiveness of these programs are therefore questionable. For example, in China, many continuing health education programs are funded or supported by the commercial industries so the agenda and content of the training courses have been influenced to some extent by the industries. While there is yet no clear legal restriction, the quality of those training programs is with possible risk of conflict of interests. On the other hand, many other training programmes held by educational institutions are likely to be “pay as you go”, the trainees could easily get the credits or certificate from those training class if they could fully pay the tuition³⁷.

The continuing training programs in most of the 18 countries are not properly distributed to the health professionals who need them the most. In China, within the year of 2005, 940,000 clinic residencies have completed their compulsory standardization training, accounting for 26% of the total number of residencies in the country. However, among which, only 3% of residencies in the hospitals at primary level have received their training. It has been found that the lower rank of the level the health institutions had, the less proportion of residencies completed their standardization training. In India, lacking opportunities of access to good quality continuing education is claimed to be a reason for the doctors being resistance to continuing health education^{3,59}.

4.2.2 Response to The Challenges

To combat the challenges mentioned above, to constantly improve the professional capabilities of health workforce, and to contemporarily keep the health professionals updated with the advanced knowledge, skills and ideas aiming to be in junction with the pace of health development and deal with peoples’ growing demand in health, a number of countries in the Asia-pacific region have initiated many programs in the field of continuing health education.

In China, the central government has release a series of policies, regulations and notification to further improve the quality of the entire health workforce of the country, especially through education and training. Many compulsory continuing education program or in-services training have been initiated, such as “Standardization Training of Clinic Residencies”, “Standardization Training of General Practitioners” and “In-service Training of Health Administrative Cadres”³.

In Australia, during 2006–2007, the Department of Health and Aging implemented key health workforce reforms aimed at increasing the capacity of the health workforce for the future. The reforms are part of the Government’s contribution to the Council of Australian Governments (COAG) Health Workforce Package and focus on improving the overall capacity of the health system. Those reforms also aim to improve the coverage and quality of training arrangements and enhance workforce practice, flexibility and quality¹⁷. The Department also continues to support the national network of rural training facilities

established under the Rural Clinical Schools and University Departments of Rural Health initiatives. Three new rural clinical schools were established in 2006–2007, bringing the number of schools to 14 across the country, operated by 12 different universities¹⁰.

In New Zealand, The Health Practitioners Competence Assurance Act 2003 requires the Medical Council of New Zealand to ensure that practicing doctors maintain their level of competence within their scope of practice throughout their career¹¹. Professional colleges and societies have maintenance of professional standards (MOPS) or continuing professional development (CPD) program, which are approved by the Medical Council for recertification. CPD program must include peer review, clinical audit, cultural competence (under development) and educational conferences/courses. All doctors are required to participate in CPD activities to practice in New Zealand. Doctors registered within the general scope must also have a collegial relationship with a doctor registered within a similar vocational scope or be credentialed by a district health boards (DHB) or hospital credentialing committee^{11,19}.

In the pacific region, the pacific island countries have founded the Pacific Open Learning Health Net (POLHN)--an initiative aimed at supporting continuing education of health personnel in the region through open and distance learning modalities while they remain at their workplaces. The main components of POLHN include establishment of learning centres equipped with necessary facilities and technology, development of health courses, and conducting pilot courses through the network⁶¹. POLHN has been a successful initiative based on the evaluation report done in 2004. The pilot open learning courses were well received by health professionals and the learning centres, equipped with information, communication, technology (ICT) for open learning and health educational resources, were being used by countries for their health professional training and continuing education, including ICT skills trainings. There was a strong interest among the participating countries to contribute to the long-term sustainability of the POLHN and a desire for greater ownership by the countries, of the open learning centres. The POLHN demonstrated that it is feasible to set up an ICT open learning program even in very challenging settings, such as remote and scattered islands that have underdeveloped telecommunications infrastructure. It has been a successful pilot e-learning initiative and there is lots of potential for expansion in the future due to increase interest in its courses⁶¹.

Figure 4.1 Members of POLHN



Source: POLHN Website <http://www.polhn.org/node/48>, accessed on 25 July 2008.

V. HRH Management

Human resources management is an important component of a health workforce system. It covers various action areas including workforce planning, recruitment, hiring and deployment; the work environment and conditions; the health workforce information system; and the performance management⁶². In this section, evidence on the utilization of financial incentives, compulsory requirements, and social strategy for distribution and retention of health workers in the Asia-pacific countries is presented. The experience from various countries on their community health worker programs is also discussed.

5.1 Distribution and Retention of Health Workers

The problem of mal-distribution of health workers exists almost in every country in the Asia-pacific region. Among which, the geographic imbalance of HRH between rural and urban is the most serious one, as there is a severe shortage of health workers in rural and remote areas. And the situation has become even worse when considering the aggravation of skill mix imbalance, unplanned migration of health professionals and other HRH crises. To overcome the mal-distribution of HRH, various kinds of measures have been applied by different countries in the region as summarized in table 5.1. The achievement and setbacks of these measures are presented in this section.

Table 5.1 Measures against Maldistribution of HRH

Country	Requirement of compulsory services	Financial & compensation incentives	Social strategy
Australia	Unknown	Yes	Unknown
Bangladesh	Unknown	Unknown	Unknown
Cambodia	Unknown	Unknown	Unknown
China	Unknown	Unknown	Yes
Fiji	Unknown	Unknown	Unknown
India	Unknown	Unknown	Unknown
Indonesia	Yes	Yes	Unknown
Lao PDR	Unknown	Unknown	Unknown
Mongolia	Yes	Yes	Unknown
Myanmar	Yes	Unknown	Unknown
Nepal	Unknown	Unknown	Unknown
New Zealand	Unknown	Yes	Unknown
Papua New Guinea	Unknown	Unknown	Unknown
Philippines	Unknown	Yes	Unknown
Samoa	Unknown	Unknown	Unknown
Sri Lanka	Unknown	Unknown	Unknown
Thailand	Yes	Yes	Yes
Viet Nam	Unknown	Unknown	Yes

Source: reference No. 3, 15, 20, 22, 30, 42, 43, 44, 45, 46, 50, 52.

5.1.1 Requirement of Compulsory Services

The establishment of rural field residencies or internships as a requirement in medical training has been implemented as a strategy in a number of countries to prevent the mobile of health workers from rural to urban and from public to private sector and ensuring the accessibility of health care services in those areas.

- **Indonesia**

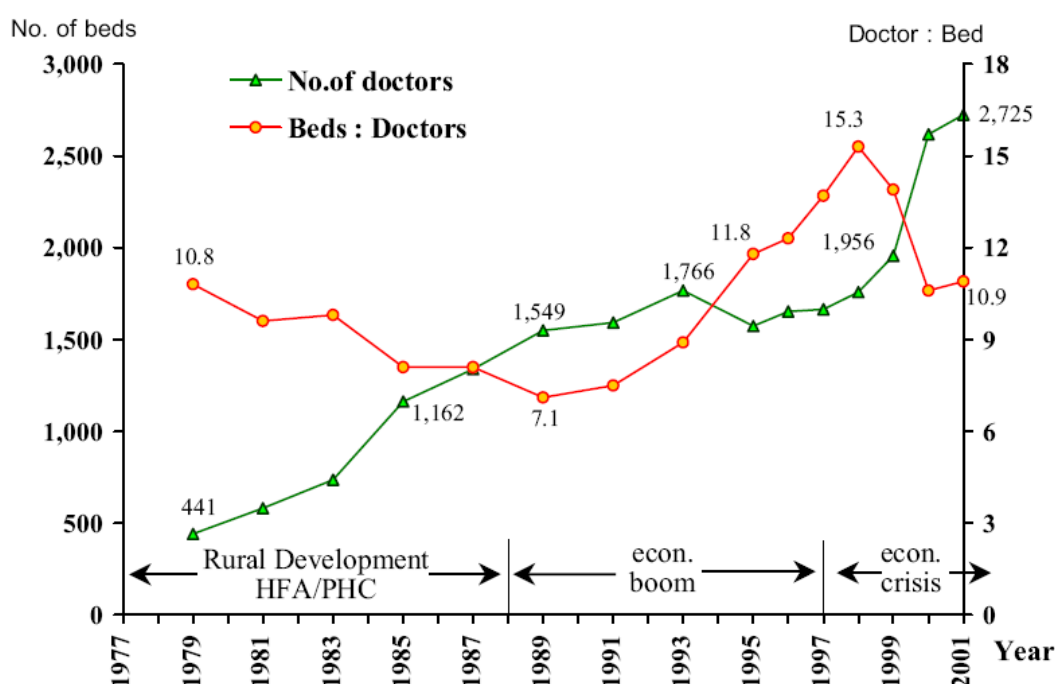
To improve the shortage in medical specialist in the rural district hospitals all over the country, a special HRH intervention program initiated in 2006 by the Ministry of Health of the Republic of Indonesia (MoHRI) has been under operation. Senior residents have been posted in the class C district hospitals to provide the four “basic” specialist services for the period of at least 3 months as a requirement and part of their medical education process⁴³. Local government in the province provides accommodation and local transport, whereas the MoHRI provides additional financial incentive. Although the assignment of 3 month period is considered by hospitals as too short, the program has benefited the hospitals. In 2007, this initiative has been expanded to cover 8 provinces in eastern region of Indonesia and disaster-prone regions in western region with the total of 88 district hospitals. The program is planned for at least 4-5 years involving 9 medical schools’ participation and 4 basic specialties with possibility of 3 additional (supporting) specialties, which will give time for long-term HRH interventions such as the increase in new specialist production to take effect⁴³.

Despite its early success, some shortfalls in the implementation of the program have been found⁴³ including: time constraint; lack in legal backup; budgetary constraint; changes of MoHRI organizational structure (new personnel); agreements with universities were not to be obtained, and the pilot project has not been fully in line with other programs (provision of equipment, local supports, etc).

- **Thailand**

In Thailand, starting from 1972, all new graduated doctors who finished from public medical schools must work in public hospitals, particularly in rural district hospitals for their first 3 years after graduation or pay a high fine up to 10,000 US Dollars. Because almost all the medical schools are public (only one private medical school since 1989), most medical students were binded by the contract, resulting in the rapid increase in the number of rural doctors, and the reduced gap of doctor density between urban and rural areas during the decade between 1980 and 1990.^{22, 45} (See Figure 5.1).

Figure 5.1: Number of Doctors and Ratio of Beds to Doctors



Source: Thailand Health Profile 1999-2000.

Note: econ.= economy

- **Myanmar**

From 1994, a system was set up, within the system only medical doctors who serve in government services are given registration number which is required for private practice. The new medical graduates are given two choices: 1) to serve in areas outside big cities as temporary public staff for three years, after which they are released from the public service and can serve in the private sector or migrate abroad; 2) to join the public sector as permanent public staff. In addition, postgraduate studies are allowed only after two years of service and those served in rural areas are given priority. In 2005, there is an increase in percentage (about 80%) of those who applied for government service after graduation. Since similar problems are also being encountered by the nurse profession with similar push-pull factors, nursing students are also required to work for a minimum of 3 years after graduation otherwise their licenses for practice will be withheld⁴⁶.

- **Mongolia**

In Mongolia, in order to increase the number of physicians working in the soums, the Mongolian government has amended its Health Act in January 2006 in order to require all final year medical graduates to work under the supervision of soum and intersoum (unit caters for the population of two or more soums) doctors for at least two years prior to completing their formal medical training and obtaining their diplomas. Without adequate data, the consequences of this new regulation have not been studied¹⁵.

Nevertheless, it has been cited that two points should not be neglected in producing such bonding contract measures: 1) since there are not any compulsory services in other careers, this measure is perceived as unfair to the graduates, which may lead talented individuals away from medical education; 2) The effectiveness of strategies of compulsory "social

service" after graduation in less attractive regions must be assessed. If the process of posting is not transparent, it opens the door to corruption and becomes ineffective²².

5.1.2 Financial and Compensation Incentives

Multiple financial and non financial incentives to make working in unattractive areas more appealing have been commonly applied for years in many countries in the Asia-pacific region. Generous benefits, such as special hardship allowances, non-private practice allowance and work load related payments for non-official hour services, are the most commonly used incentives. Other benefits may include career advancement, tuition reimbursement, flexible work hours, bonuses based on experience or length of commitment, study and recreation leaves, employment opportunities for doctor's spouses, better accommodation facilities, access to child care and education social recognition and community esteem^{22,47}.

- **Australia**

In Australia, Department of Health and Aging supports a broad range of programs to improve the distribution of Australia's health workforce which involves providing ongoing funding to the "Nurse Scholarship Program", the "Rural Allied Health Undergraduate Scheme" and the "Australian Rural and Remote Health Professional Scheme"³⁰. The latter initiative provided students, practicing nurses or allied health professionals with financial assistance to undertake undergraduate or postgraduate study, attend conferences, update skills and qualifications or re-enter the nursing workforce. All three programs continued to be very popular with high ongoing interest within the rural and remote communities of Australia³⁰. In 2006-2007, 110 undergraduate nursing and 65 undergraduate allied health scholarships were awarded. In addition, the proportion of government supported medical school places that are bonded under the "Bonded Medical Places Scheme" increased to 25% of all students commencing studies from 1 January 2007 and each annual intake thereafter. Currently there are a total of 1,260 medical students participating in the scheme, of which 535 commenced their medical studies in 2007³⁰. "Bonded Medical Places Scheme" requires participants to work in districts of workforce shortage in outer metropolitan, rural or remote areas for six continuous years on successful completion of their fellowship training³⁰.

- **New Zealand**

In New Zealand, as the latest movement during the year of 2004-2005, \$12.9 million in funding was made available from the primary health care funding path for rural primary health care. This is specifically to assist district health boards (DHBs) and primary health organizations (PHOs) to retain and recruit suitably qualified primary health care professionals²⁰. Part of the funding goes to support 'reasonable roster' arrangements and to partly support scholarships for rural nurses. However, a significant proportion is available to the DHBs and PHOs to attract and retain their rural workforce²⁰.

Rural General Practitioners (RGPs) also qualify for a rural bonus payment if they score sufficiently high on the Rural Ranking Scale (a scoring system used to define the "rurality" of a RGP and to calculate Rural Bonus payments and Rural Retention payments⁴⁸). In 2004-2005, 417 GPs received annual rural bonuses, ranging from \$3,000 to \$25,000. As rural demographics change, and the "Primary Health Care Strategy" brings about a shift in the way primary health care is delivered, some anomalies in the rural ranking are beginning to appear. In response to this, the criteria for the "Rural Ranking Scale" are being reviewed⁴⁹. However, without any other force equipped with in improving the quality of health care

services at community level, the efforts of providing incentives may be reversed. For example, the employer-employee relationship that exists between the RGP (the employer) and the practice nurses (the employee) may make it difficult for an effective and equitable professional partnership to exist between them in PHOs. In addition, when there is a targeted funding for nurses, the rates offered are usually lower than that for RGP for the same services. This has been reported as a disincentive to independent nurse-led clinics, given the financial investment and risks²⁰.

- **Indonesia**

In Indonesia, PTT service (contractual doctors and midwives known as Pegawai Tetap/PTT) is one of requirements for medical doctors who want to obtain practice license or enter the civil service recruitment⁵⁰. Since May 2006 the Ministry of Health of the Republic of Indonesia (MoHRI) has further introduced new policies such as shortening service period and higher financial incentive for PTT, in its attempt to attract more health workers serving remote and very remote areas. The minimum service period for PTT doctors and dentists in very remote areas is 6 months while in remote areas is 1 year. The financial incentive is only given to those working in very remote areas.

However, after the policy being implemented for more than one year, the number of health workers in the rural healthcare centers has not been remarkably improved. In addition, the assumption made from the doctors' application for PTT scheme has indicated that the health centers in remote areas experienced even worse shortage of doctors than before⁵⁰.

The reason for that is mainly due to the criteria for remoteness classification which were not established nationally but locally. Different interpretation of areas with similar characteristic is found in various local governments⁵⁰. For example, two areas of similar characteristic are considered differently as remote or very remote areas by the local authorities, but the area considered very remote will obviously attract more PTTs than those with same conditions but considered as remote.

In addition, the policy has not been coupled with strong monitoring mechanism due to the financial constraint in the local governments. Therefore, it may produce uncertain quality healthcare services and inaccurate data of the availability of doctors⁵⁰. Furthermore, as the policy is only applicable to selected types of health workers, social jealousy and dissatisfaction could easily be generated among other health workers who work in the same location, which may affect the stabilization and consolidation of the entire health system⁵⁰.

- **Thailand**

Starting from 2004, Ministry of Public Health in Thailand has further developed the special incentives for health workers into three levels based on the type of professionals and the hardship of the workplaces.⁴⁵ The trend of increase in level of remuneration for new medical graduates is shown in Table 5.2. New medical doctors graduated in 2005 who choose to work in remote areas received up to 50% more than their colleagues. The main source of such increase comes from additional payments as special allowances for rural hospital practices while the baseline salary are the same (Table 5.3).

Table 5.2: Total Income of New Medical Graduate (Include Average Work – Related

Incentive)

	1975	1985	1995	2005
Community hospital				
Non remote	150	200	735	890
Remote	170	225	755	1,080-1,330
Provincial hospital	90	150	680	830

The exchange rate is 1 US\$ = 40 Baht

Source: Thinakorn Noree, Harin Chokchaichan and Veerasak Mongkolporn⁴³

Table 5.3: Remuneration for MoPH doctors in Thailand, 2002

Remuneration	Rate(USD) (per month)	Remarks
Salary(new graduate)	203	Standard salary for PC** 4 level 3
Non-private practice allowance	250	Anyone without private practice
On-call payment (general)	250-300	USD20 per shift (more than 8 hours)
Payment for special procedures during non official hours	72-126	Rate depends on number and kind of procedures; provincial hospital doctors usually receive much more, sometimes up to USD1,500
Special allowance for rare** specialties	100	e.g Pathologist
Professional allowance**	90-250	For medical profession PC level 7 up
Special allowance for rural district hospital doctors	50-500	USD50-55 for regular districts (532districts) USD250 for remote districts (127 districts) USD 500 for the remotest and most difficult districts(69 districts)

Source: Bureau of Health Policy and Plan, MoPH, 2002 The exchange rate is USD1 =THB40*PC= Position Classification** Not for new graduates.

It should be noted that, in spite of the progress in the HRH retention the strategies of compulsory services and financial incentives have made in Thailand, the problem of inequitable distribution of doctors still exists and at some point even become more severe. For example, while the amount of financial incentives to new medical graduate has risen for several times in the past two decades, the total fine for breaching the three-year contract is still staying steady at \$10,000⁴³. This may lead to a possibility for the graduates to easily pay the fine, break the bonding contract and leave the rural earlier for urban living and private practices where a fresh medical graduate could earn at least \$1,500 per month^{42,43}. In addition, the three levels of special allowance to medical graduates also created many inequities as some district hospitals that are only 10 kilo meters to 20 kilo meters apart from each other may experience a 5-fold to 10-fold allowance differential. The examples unveiled the demerit of the strategies in fragmented, ad hoc, uncoordinated and to a certain extent even conflicting⁴⁵.

In order to optimize those strategies, in December 2001, a new decentralized financial management system under the “Universal Health Insurance Policy” has been employed by the Thai government. As a requirement, all Thai citizens who are not covered by a health insurance scheme must register with a hospital. The hospital will be paid a flat rate of \$30 per enrollee per year⁴⁴. The salaries of the staff also come from this budget. It is believed that this new financial scheme would create a strong incentive for more equitable redistribution of human resources following better distribution of health care budgets. After implementation, some big hospitals in the city that formerly were overstaffed refused to take more contracted new graduates. Those in the more populated poor regions, which used to be understaffed, now say they have enough money to hire more⁴⁴.

- **Philippines and Mongolia**

In the Philippines, the Magna Carta for public health workers was created with the intention of making rural positions more attractive. The package offered an increase in salaries and benefits, particularly for physicians. The program was further strengthened in 1993 with the launch of the "Doctors of the Barrios" program, which doubled the benefits for doctors willing to relocate to remote areas. With the 1993 devolution of health services, most local governments found themselves unable to hire at the prevailing high salary levels. As a result, professionals started moving back to urban areas and applying for work through the national agency instead of local government offices⁵¹.

Similar situation could also be found in Mongolia where the government pays the tuition fees for doctors' postgraduate training courses after they working in the rural hospital for at least three years. Monetary incentives are also provided equal to six months' salary for every five years of service in the rural area. Nevertheless, these incentives are currently insufficient to motivate enough doctors to move to rural areas¹⁵.

5.1.3 Social Strategy

In addition to the financial and non financial incentives, strategies that include efforts to increase social acceptance and recognition of rural health professionals have often been successful in HRH distribution. Examples include the creation of social recognition awards and support groups for rural practitioners. Social movements towards acceptance and appreciation of rural health personnel can effectively improve staff morale and retention in rural areas. Examples from Thailand, China, and Viet Nam are presented here.

- **Thailand**

Apart from the creation of Rural Doctor Society and Rural Doctor Foundation, several public recognition awards were also established. An annual hardship award is given to the best rural doctor in the most remote area in commemoration of one very good rural doctor who lost his life during his dedicated services in a border district in 1985. The oldest medical school, Siriraj hospital, established a special annual prize for "the best rural doctor of the year" in 1976. The medical association and medical council also award the same recognition. Several medical schools also give special recognition for their alumni performing outstanding work in the rural districts. Many rural doctors are invited to become part time and full time lecturers in medical schools, mainly in the community medicine departments. Some of them also receive honorable Master or Ph.D. degrees from universities. Some of the rural doctors are recognized at the national level as "the model Thai of the year".

All these social movements and supports improve the morale of rural doctors and allow them to stay happily in the rural districts⁵².

- **China**

In China, the "Outstanding Contribution Award of Rural Health", "Life Achievement Award of Rural Health" and "Annual Outstanding Rural Doctors" have been established by the Ministry of Health for many years to reward those health cadres who devote themselves to primary health care in rural and deprived areas. Those awards have been highly valued and strongly supported by the Chinese government with an aim to create positive images and to motivate young graduates to envisage such postings³.

The award winners and nominees are usually medical physicians or nurses who are successful in providing primary health services in local health facilities. On the other hand, as the backbone of the local health workforce, those health professionals are also designated for many other tasks rather than service provision, such as in charge of local health facilities, which may affect the effort of their energy in improving rural primary health.

- **Viet Nam**

In Viet Nam, awards in the form of money, certificates or other tokens are given to people who are assessed as excellent workers. Although its value has decreased over the years, the award system is still appreciated by the health workers. Outside the award system, strategies to motivate staff are not common. For commune and district health workers, recognition from their managers, colleagues and clients is considered great importance. Feed back from the community appears to be important to health workers in rural Viet Nam as appreciation by the community of the performance of health workers is seen as an important motivating factor⁵³.

5.2 Community Health Workers

As countries shift toward stronger primary health care systems in attend to pursue the objective of “health for all (HFA)” declared on the Alma-Ata Conference, innovative approaches that rely on minimally trained health workers have gained increasing interest. Scaling up and effectively deploying large numbers of community health workers (CHWs) as a common response to critical HRH shortages have been widely applied in many Asia countries²². With CHWs’ full involvement in undertaking diverse health actions at the community level, many public health programs have been successfully implemented, especially in disease elimination and eradication campaigns, health promotion and community health education, treatment of minor ailments and provision of water and sanitation, and even lately in prompt response to emergencies such as recent tsunami and Asian earthquakes^{22-25,26}. As being assigned to various kinds of responsibilities in those areas, CHWs are called by different names, such as Shasthya Sebika (SS) in Bangladesh²⁷, Accredited Social Health Activist (ASHA)²³ and Female Community Health Volunteer (FCHV) in Nepal²³ etc. Despite the various names, similar characteristics could be found among those CHWs²⁸(See table 5.4):

- A large part of them are female normally aged over 25²⁷⁻³⁰, mainly recruited from the local communities, literate, willing to provide services and acceptable to the community they serve²⁷⁻³⁰.
- They normally received short term (in weeks) residential trainings in the field of basic curative care, health promotion and education and family planning. One worker normally provides the service in considerable coverage ranging from 100 to 1,000 people^{23, 29, 30}.
- Some of CHWs are voluntary, most receive modest stipends. Whether voluntary or salaried, community health workers are both in the public health system and in private and not-for-profit programs²³.

Table 5.4: Community Health Workers in Asia

Country	Type of work	Duration of training	Percentage of female	Number trained (thousands)
India	Village health guide	3 months	25	417

Indonesia	Health cadre	3 days	100	1,800
Myanmar	Community health worker	4 weeks	5	36
	Ten-household health worker	7 days	90	42
Nepal	Female village health volunteer	12 days; 3 day yearly refresher	100	32

Note: Data are as 1991 for Indonesia, 1994 for India, Myanmar and Nepal.

Source: WHO Regional Office for South-East Asia 1996²³.

The reasons for preferring and relying on these workers in poor communities are straightforward:

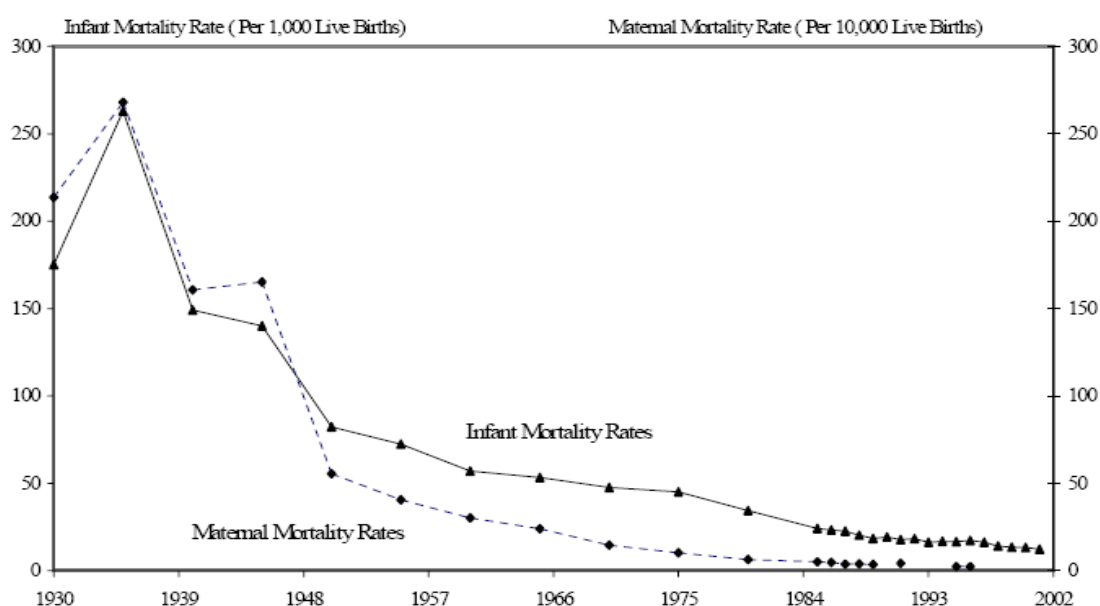
- They offer physical access to services not provided by modern system;
- They are present in communities unserved or underserved by formal health care system²³.

To demonstrate the roles of community health workers in the Asia-pacific region, the cases from Sri Lanka, Bangladesh, China, Thailand, New Zealand are presented here.

• Sri Lanka

Benefiting from the well structured CHWs system in the country, Sri Lanka has done well in health care delivery within the region, as it leads to a low infant mortality and maternal rates and other indicators in health when comparing to other countries with similar per capita income in the Asia-pacific region³¹. The maternal mortality ratio (MMR) dropped from 265 in 1935 to 5.3 per 10000 live births in 2003 and infant mortality rate (IMR) from 263 in 1935 to 11.2 per 1000 live births in 2003³² (Figure 5.2).

Figure 5.2: Trends in Maternal and Infant Mortality Rates in Sri Lanka, 1930-2002



Source: Pubudu de Silva³²

In Sri Lanka, Health Unit System (MOH – Medical Officer of Health System) is the basic concept for delivering primary health care at the community level. At community level, the primary health care services are delivered through the MOH Office. MOH heads the team with Public Health Midwife (PHM) and Public Health Inspector (PHI) as the grass root level primary health care workers. A MOH area is divided into several PHM and PHI areas. One PHI area should ideally contain three PHM areas. MOH is assisted by Public Health Nursing Sisters (PHNS) and Supervising Public Health Midwife (SPHM) for supervision of PHM, while Supervising Public Health Inspector (SPHI) for supervision of PHI³².

PHM provides both field and domiciliary services, the field services are offered at antenatal clinics, well baby clinics and family planning clinic; the domiciliary care are offered at visiting households to recruit, examine, conduct investigations, provide health education and motivate to utilize primary health care services. On the other hand, PHI acts his/her roles in epidemiological surveillance, water and sanitation, monitor on disease incidence, early epidemics delectating and disease prevention, as well as supervising and assisting in the construction of latrines³².

The reasons for the system's success could be summarized as followed:

1. All primary health care services are delivered through PHM and PHI, thus having only two categories of community health workers at grass root level. Even vertical programs of special campaigns targeting prevention of communicable diseases such as antimalaria, antifilaria, and antirabies campaigns function through PHM and PHI rather than creating additional community health worker categories³².
2. It is important to continue domiciliary care as a main component of the primary health care delivery system because the community health care workers can reach people who really need the services and those who are ignoring the services. Even introduction of mechanisms to counteract new challenges should also contain domiciliary care as a main component. The challenge would be to maintain and ensure such domiciliary care of acceptable quality³².
3. The favorable government policies which had been continuously present since the inception of primary health care system in Sri Lanka. Some of the key policy decisions that helped for present accomplishments are: the delivery of an integrated maternal and child health (MCH) package through health units, replacement of traditional birth attendants (TBA) by trained midwives, discontinuation of TBA training, promotion of institutional deliveries, family planning and population policies (Family planning & MCH integration) and human resource deployment policies³².

Despite the merits above, there are still some setbacks the Sri Lankan government needs to overcome:

1. Presence of a satisfactory monitoring and supervision system integrated into the service delivery system is equally important for the success of a primary health care system. The present monitoring and supervision system is inadequately utilized and needs to be further strengthened. Training the middle level managers of MOH system (eg. MOH, PHNS, SPHM, SPHI and district level managers such as Medical Officer and Regional Epidemiologist) on monitoring and supervision, and developing a computerized database at MOH level to utilize primary health care information would be some aspects to consider³².
2. Application of methods to increase the community participation is needed³².

- **Bangladesh**

The CHWs in Bangladesh are called Shasthya Sebika (SS)²⁷, who are a group of females aged 25 years or above, married with children not below two years old. The SS receives a three weeks residential training in one of BRAC's (an indigenous Bangladeshi Non Governmental Organization) regional offices across the country^{27, 33}. The key content of the training includes maternal and child health and nutrition, immunization, family planning, water and sanitation, communicable disease control, and basic curative care for some common illnesses (e.g., diarrhea and worm infestation etc.)²⁷. For specific programs, the SSs are given additional training when necessary. Each SS will cover 250 households and usually visits 15 households daily, so each household will be visited at least once a month. During the visit, the SS will disseminate health and nutrition messages, promotes family planning and child immunization, and mobilizes for tube-wells and sanitary latrines installation. She also identifies pregnancy and TB suspects, and sells health commodities produced by BRAC²⁷.

The provision of services by the SSs is supported and supervised by the Shasthya Kormis (SKs) who are paid health workers of BRAC with minimum ten years of professional schooling³³. Each SK looks after the activity of ten SSs. The SK makes home visits three days a week, during the visit the SKs will review the activities of the SSs with respect to different services and help SSs to properly perform their duties²⁷. The SSs will be gathered once a month in the BRAC regional office for a day-long refreshment. During the refreshment, problems faced during service provision by the SS as well as those observed by the SKs during field visits are discussed, followed by probable management. Also, this monthly session is used for discussion of new health and nutrition issues, making work-plan for the next month, and accounting activities related to sale proceeds of the health commodities and essential medicines during the month by the SSs.

The SSs are not paid workers of BRAC. But they are expected to earn from the sales of essential medicines, health commodities and some charges for specific services provided in the community. Income earned by a SS depends on a number of factors: experience, seasonality, remoteness from local health infrastructure, competition from other types of providers, interpersonal communication skills and reputation²⁷ and community acceptability²⁷. In addition, SSs are allowed to get a second loan over the current loan she has got for income-generating activities²⁷. However, there is still around 10-15% annual drop-out among the SSs³⁴. The drop-outs occur mainly due to dissatisfaction from inadequate monetary return against the time and labour invested^{34, 27}. Other causes of drop-outs are: time constraints for household chores, disapproval from husband and other family members, criticism from neighbors on religious ground, people's unwillingness to pay for services and their preference for an 'educated' doctor to an uneducated SS etc^{34, 27}. Now the BRAC is trying to address this problem by adherence to the selection criteria during recruitment, devising incentive mechanisms to reward better performance, and providing non-monetary incentives (e.g., providing a dress and a bag with BRAC insignia on it which is regarded as a license for practice) to improve their status and acceptability in the community^{34, 27}.

- **China**

The most crucial CHWs in China are the village doctors who are famously known as "barefoot doctors". Since 1984, the title of "barefoot doctor" has been abolished, the title of "village doctor" has been established. Those "barefoot doctors" who passed the local health examination were nominated as village doctors; those failed in the examination were classified as health assistants^{35, 36}. To be employed at village clinics, the village health workers are recommended by villager committees. After the assessment from township health centers, they need to get approval from the township governments with registration

to the county's health bureau³⁵. Besides providing basic curative care, the village doctors are also responsible for epidemic situation surveillance, health promotion, maternal and children care, chronic disease control, health information recording³⁷. It was reported that 53.5% of total patients in villages go for treatment in village clinics, which means basic healthcare services are mainly provided by the village doctors. At the end of 2006, there were 957,479 village health workers. 94.7 percent of them, that is 906,340, had passed the qualification examination to become village doctors. In general, the workforce of village doctors was described as having weak professional background and skills with severe shortage in numbers³⁵.

By realizing the current status of village doctors, the central government in China has provided more funds than ever before for development of the quality of health workforce in rural and remote area³⁸. Statistical data in 2005 showed that total investment on six rural health programs was RMB 1.233 billion (equivalent to 150 million US Dollars). The government have also developed a series of policies and taken measures to provide education and technical support to village doctors. After 1990, two ten-year village doctors education plans were implemented all over of China³. In 2006, 507,000 of rural health workers have completed their training in various fields (eg. epidemical disease control and institutional management). In 2004, MOH promulgated Basic Requirements on the Post Training for Village Doctors, which brought forward requirements for village doctors on the medical ethic and medical skills etc³⁵.

It was found that between 1995 and 2005, the number of village clinics and doctors had been decreasing, as the number of clinics reduced by 221,000, and number of village doctors and assistants decreased by 414,000 or nearly one third. This is due to four main causes: 1) along with the institutional reform held in China, many townships (composed by few villages) have been urbanized resulting in a reduction in the number of villages; 2) cooperate medical scheme has been abolished in certain districts; 3) due to economic hardship, many villagers in very remote areas have left for employment in urban cities; 4) the merger of city and township in many provinces results in village clinics being replaced by community health centers^{3,39-41}.

- **Thailand**

Village Health Volunteers (VHV) are considered an extremely valuable health resource in Thailand. There are totally 791,383 VHVs in Thailand in 2006, more than 35% of them were recruited in less than five years. The male to female ratio of VHVs rose from 1:1.7 in 1993 to 1:2.34 in 2006. This shift toward feminization of volunteer workforce points to a new possibility of potential areas of work such as prevention of domestic violence, alcohol consumption control, and caring of the elderly. 86.9% of the VHVs have no more than basic primary school education. Only 7.3% of them were college graduates and 1% holds a bachelor degree. 51.1% were farmer and 13.4% worked as waged labor⁴².

VHVs were found to perform comparatively well on short-termed task such as health survey, periodic collecting data or disease prevention campaign. On the other hand, they did not do fare well, in the areas of work that need long-term, continuing dedication, such as caring of chronically ill patients. This may due to the fact that the majority of volunteers were economically constrained⁴².

At present, with dwindling support and endorsement from national and international organizations, VHV is no longer an area of high recognition. Currently the only major task of the Office of Primary Health Care seemed to be the maintenance of its patronistic relationship with certain fractions of volunteers. Furthermore, despite the fact that political development in Thailand in general has opened up various public spaces and moved

progressively toward democratic governance, VHVs have been increasingly politicized as various political entities vie for village health volunteer as their political power base. The changing administrative system and decentralization has also resulted in VHVs being increasingly implicated in local and national politics. The resulting bureaucratic and political clientelism greatly impeded the development of civic consciousness. Such a patronistic relationship and the politicization of village health volunteer poses the risk of volunteers being co-opted as mere instruments of politicians rather than being an independent, non-partisan entity working in collaboration with political bodies while pursuing their own communities' agenda⁴².

- **New Zealand**

In recognition of shortages of doctors in rural areas and the need to develop better resourcing in primary care, the Ministry of Health in New Zealand has promoted the concept of the nurse practitioner²⁰. Nurse practitioners are educated through a clinically focused Masters Degree program and must meet the competencies set out by the Nursing Council of New Zealand. These include being able to articulate and advance the scope of their nursing practice, showing expert practice and working collaboratively with other disciplines as well as across settings. Competencies also include demonstration of leadership in specialty community clinics, or independent primary health care nursing practices that offer a range of assessment, diagnostic, treatment and support services, and manage clinical caseloads in acute settings, as well as active development and influence on policy and nursing practice. In New Zealand, registered nurse practitioners can legally prescribe 'prescription only' medicines. These health practitioners are regarded as having 'independent prescribing rights'; that is, they can prescribe prescription medicines to consumer groups who have conditions that fall within particular parameters. These parameters include: scope of practice; client/age group; disease conditions and setting²⁰. Nurse practitioners have been trained but are not being utilized to the extent envisaged. This may be due to: 1) Other health professionals and regulatory systems have not actively supported the role of nurse practitioner; 2) nurse practitioners are self-selecting, there is potential for a mismatch between required scopes of practice and the scopes of practice of available nurse practitioners; 3) it has been a concern that the nurse practitioner role will reduce the work and status of medical practitioners²⁰.

VI. Conclusion

As a response to the call for better understanding HRH crisis in Asia-pacific region, this report reviewed the current HRH status, health education and training, and health workforce management (mainly focusing on distribution health workers and community health workers) in 18 countries in the region. Valuable lessons have been learnt from the advanced experiences in education and training for health workers, HRH distribution and retention, and management of community health workers, which will be helpful in perceiving the HRH status, targeting the HRH priorities and facilitating the HRH management and development. The key findings are summarized as followed:

The Asia-pacific region has undergone an exceptional development in social, economy and health in the last 10-15 years. The increasing speed of the number of population in Asia-pacific region has been slowing down. Economy has been developed faster in 1990-2005 than ever before, however most of the 18 countries are still categorized in low income or lower middle income country. Most countries' health expenditure as percentage of GDP had all been increased, as the richer countries tend to spend more on health than the poor.

Regarding to the HRH in the region, the key challenges faced with the sector include shortage, mal-distribution, skill mix imbalance, inadequate production capacity, lack of appropriate knowledge and skills, lack of public health orientation, dual employment and ineffective regulatory oversight of the private sector. It has been found that 9 countries can be considered in shortage of doctors, nurses and midwives based on the "threshold" density and they are India, Thailand, Lao PDR, Viet Nam, Myanmar, Cambodia, Nepal, Papua New Guinea and Bangladesh. The inappropriate skill mix in one dimension of health workforce in Bangladesh, China and Myanmar can be easily perceived when taking the World Bank's threshold on the ratio of nurse to doctor in consideration. There seems to be a trend that countries with higher density of doctors, nurses and midwives have longer life expectancy and lower rate in adult mortality, infant mortality, under-5 mortality, maternal mortality and neonatal mortality than those with lower density of doctors, nurses and midwives. Furthermore, most of the countries have their own HRH-related policies/regulations/guidelines with clear objectives for pursuing and strategies for implementing.

Issues concerning the education and training of health workers in the Asia-pacific region include: lack of clear linkages between health-service and health professional education; lagging behind of educational and curricular change; low student intake into some programs; lack of financial resources and insufficient education and training methods. In regard with pre-service education, the duration for studying medical degree course among the 18 countries ranged from 3 to 8 years. 4 to 6 years after secondary education are the common period of time for obtaining the basic medical degree in most of the countries, and medical registration and license to practice are obligatory in most of the countries. Certain countries have established mutual agreements on medical degree recognition. In the field of continuing education, in most of the countries: there is no revalidation process and no system of awarding credits for continuing educational activities; there is still lacking of related resources for undertaking the proper amount of continuing health education programs; low quality; are not properly distributed to the health professionals who need them the most. As the response to those problems, efforts in improving the quality of health professionals in Australia, China, New Zealand and the pacific island countries have been presented in the report.

To combat with the mal-distribution of health workers, various kinds of measures have been applied by different countries, such as requirement of compulsory services (Indonesia, Thailand, Myanmar and Mongolia), financial and compensation incentives (Australia, New Zealand, Indonesia, Thailand, Philippines and Mongolia) and social strategy (Thailand, China and Viet Nam). When implementing compulsory services, it is necessary to take a fully consideration in implementation time, legal backup, budget and agreement with educational institutions, consistency with other programs and the fairness to the health professionals; when implementing financial and compensation incentives, the remoteness classification and bonding contract could be the important factors to be valued; regarding to the social strategy, the award winners and nominees are usually medical physicians or nurses who are successful in providing primary health services in local health facilities. On the other hand, as the backbone of the local health workforce, those health professionals are also designated for many other tasks rather than service provision, such as in charge of local health facilities, which may affect the effort of their energy in improving rural primary health.

The community health workers (CHWs) have made great effort in promoting people's health in the Asia-pacific region. Most of CHWs in the region are young, female, literate, recruited from local communities, with short term training and willing to provide services.

The well structured CHWs system in Sri Lanka has done well in health care delivery within

the region, as it leads to a low infant mortality and maternal rates and other indicators in health when comparing to other countries of similar per capita income in the Asia-Pacific region. Reasons for the system's success could be summarized as: simple primary healthcare providing system; concept of continue domiciliary care and favorable government policies. In Bangladesh, there is 10-15% annual drop-put among the CHWs. The drop-outs occur mainly due to dissatisfaction from inadequate monetary return against the time and labour invested, and other reasons. Now the BRAC is trying to solve the problem by devising incentive mechanism and non-monetary incentives. In China, the central government has provided more funds than ever before for developing of the quality of health workforce in rural and remote area. However, the number of village doctors in 1995-2005 had been decreased due to the health institutional reform; implementation of new medical insurance scheme; economic hardship and the merger of city and township. CHWs in Thailand have been increasingly politicized in recent years, it may due to the changing administrative system and decentralization. In New Zealand, the government faced the difficulties in introducing the new health professionals (nurse practitioners) in the rural health facilities, such as lack of support from regular health professionals; unclear defined role of nurse practitioners and mismatch of required practice scope and practice of nurse practitioners.

Nevertheless, there are still some limitations in the result of this report:

- Instead of primary data, secondary data has been utilized in the report, some results of the analysis may not be able to fully represent the latest HRH situation in the targeted countries.
- Literature review has only been conducted basing on limited resources. To some countries, especially those pacific countries, the HRH status and related latest movements have not been fully described.

For further research, it is important to apply the primary and integrated data as the basis of the analysis. The research will be comprehensive if the coverage of the research could be expended in the future, for instance in the number of countries, and the categories of health professions.

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Annex 1: Demographic and Socioeconomic Status

	Country	Area (000 Square Km)	Year	Population (000) total in 2006	Population Total Annual Growth Rate (%)										
					1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
1	Australia	7692.02	2007	20530	1.2	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.1	1.1
2	Bangladesh	144.00	2002	155991	2.1	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.9	1.8	1.8
3	Cambodia	181.04	2004	14197	2.6	2.4	2.3	2.1	2.0	1.9	1.8	1.7	1.7	1.7	1.7
4	China	9600.00	2006	1328474	1.0	1.0	0.9	0.9	0.8	0.7	0.7	0.7	0.6	0.6	0.6
5	Fiji	18.33	2006	833	1.0	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6
6	India	3287.59	2002	1151751	1.9	1.9	1.8	1.8	1.7	1.7	1.7	1.6	1.6	1.5	1.5
7	Indonesia	1919.44	2002	228864	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.2
8	Lao PDR	236.80	2005	5759	2.4	2.3	2.1	2.0	1.9	1.7	1.6	1.6	1.6	1.6	1.7
9	Mongolia	330.25	2006	2605	0.8	0.7	0.6	0.6	0.6	0.8	0.9	0.9	0.9	0.9	0.9
10	Myanmar	1567.00	2006	48379	1.3	1.3	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.8	0.9
11	Nepal	678.50	2000	27641	2.5	2.5	2.4	2.3	2.3	2.2	2.1	2.1	2.0	2.0	2.0
12	New Zealand	140.80	2002	4140	1.1	0.9	0.9	0.9	1.0	1.2	1.3	1.3	1.3	1.1	1.0
13	Papua New Guinea	270.69	2006	6202	2.7	2.7	2.7	2.7	2.6	2.5	2.5	2.4	2.3	2.2	2.2
14	Philippines	462.84	2006	86264	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.0	2.0
15	Samoa	300.00	2006	185	1.1	1.1	1.1	1.1	1.0	0.8	0.7	0.6	0.7	0.7	0.8
16	Sri Lanka	65.61	2002	19207	0.8	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.5
17	Thailand	514.00	2002	63444	1.1	1.1	1.1	1.0	1.0	0.9	0.8	0.7	0.7	0.7	0.7
18	Viet Nam	329.56	2002	86206	1.7	1.6	1.5	1.4	1.4	1.5	1.5	1.5	1.4	1.4	1.4

Country	Population in urban areas (%)			Population living below the poverty line (% living on < US\$1 per day)		GDP Per Capita (PPP Int. US\$)		
	1990	2000	2006	Share of Total Population	Year	GDP Per Capita (PPP US\$) in 2007	Average Annual Growth Rate (%) in 1975-2005	Average Annual Growth Rate (%) in 1990-2005
1 Australia	85	87	88	...	...	36300	2.0	2.5
2 Bangladesh	20	23	25	41.3	2000	1300	2.0	2.9
3 Cambodia	13	17	20	66	2004	1800	...	5.5
4 China	28	36	42	9.9	2004	5300	8.4	8.8
5 Fiji	42	48	51	...	...	5500	0.9*	1.4
6 India	26	28	29	34.3	2004	2700	3.4	4.2
7 Indonesia	31	42	49	7.5	2002	3700	3.9	2.1
8 Lao PDR	15	19	21	27	2002	2100	3.4*	3.8
9 Mongolia	57	57	57	10.8	2002	3200	1.2*	2.2
10 Myanmar	25	28	31	...	...	1900	2.6*	6.6
11 Nepal	9	13	16	24.1	2004	1200	2.0	2.0
12 New Zealand	85	86	86	...	...	26400	1.1	2.1
13 Papua New Guinea	13	13	13	...	...	2000	0.5	0.2
14 Philippines	49	59	63	14.8	2003	3400	0.4	1.6
15 Samoa	21	22	23	...	...	5400	1.4*	2.5
16 Sri Lanka	17	16	15	5.6	2002	4100	3.2	3.7
17 Thailand	29	31	33	<2.0	2000	7900	4.9	2.7
18 Viet Nam	20	24	27	...	...	2600	5.2*	5.9

	Country	GNI Per Capita (PPP Int. US\$)		
		2000	2006	Dif. Between 2006 & 2000
1	Australia	26660	33940	7280
2	Bangladesh	830	1230	400
3	Cambodia	860	1550	690
4	China	2340	4660	2320
5	Fiji	3540	4450	910
6	India	1500	2460	960
7	Indonesia	2260	3310	1050
8	Lao PDR	1240	1740	500
9	Mongolia	1790	2810	1020
10	Myanmar	510	...	...
11	Nepal	800	1010	210
12	New Zealand	18420	25750	7330
13	Papua New Guinea	1560	1630	70
14	Philippines	2490	3430	940
15	Samoa	3660	5090	1430
16	Sri Lanka	2490	3730	1240
17	Thailand	5000	7440	2440
18	Viet Nam	1400	2310	910

*Data refer to a period shorter than that specified

Note: Dif.=Difference

Definitions:

- Population living below the poverty line (% living on < US\$1 per day) -

<http://extfeeds.worldbank.org/extfeedbuilder/ContentMdk?mdk=21543584&source=DEC&format=HTML>

- GDP Per Capita (PPP Int. US\$) - http://ddp-ext.worldbank.org/ext/GMIS/gdmis.do?siteId=1&contentId=Content_1&menuId=LNAV01HOME2

- GNI Per Capita (PPP Int. US\$) -

<http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20420458~menuPK:64133156~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html>

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Annex 2: Health Status

Country	Life expectancy at birth (years), both sexes				Healthy life expectancy (HALE) at birth (years), both sexes, 2003	Adult mortality rate (probability of dying between 15 to 60 years per 1,000 population), both sexes			
	1990	2000	2006	Dif. Between 2006 & 1990		1990	2000	2006	
1	Australia	77	80	82	5	73	96	76	65
2	Bangladesh	55	61	63	8	54	319	254	254
3	Cambodia	59	58	62	3	48	263	307	257
4	China	68	71	73	5	64	172	135	116
5	Fiji	66	68	69	3	59	272	240	212
6	India	58	61	63	5	53	278	258	241
7	Indonesia	60	66	68	8	58	275	232	212
8	Lao PDR	52	58	60	8	47	369	328	308
9	Mongolia	62	64	66	4	56	211	262	255
10	Myanmar	57	59	60	3	52	283	281	276
11	Nepal	54	60	62	8	52	350	300	286
12	New Zealand	75	79	80	5	71	119	86	75
13	Papua New Guinea	58	61	62	4	52	319	286	273
14	Philippines	65	67	68	3	59	234	223	219
15	Samoa	63	67	68	5	60	282	220	220
16	Sri Lanka	67	69	72	5	62	241	217	166
17	Thailand	69	70	72	3	60	194	215	210
18	Viet Nam	66	70	72	6	61	202	169	155

Country	Maternal mortality ratio (per 100,000 live births), 2005	Neonatal mortality rate (per 1,000 live births), 2004	Infant mortality rate (per 1,000 live births), both sexes			Under-5 mortality rate (probability of dying by age 5 per 1,000 live births), both sexes		
			1990	2000	2006	1990	2000	2006
1 Australia	4	3	8	5	5	9	6	6
2 Bangladesh	570	36	100	66	52	149	92	69
3 Cambodia	540	48	85	78	65	116	104	82
4 China	45	18	37	30	20	46	37	24
5 Fiji	210	10	19	16	16	22	18	18
6 India	450	39	82	66	57	115	89	76
7 Indonesia	420	17	60	36	26	91	48	34
8 Lao PDR	660	30	120	77	59	163	101	75
9 Mongolia	46	18	80	48	35	108	61	42
10 Myanmar	380	49	91	78	74	130	110	104
11 Nepal	830	32	99	64	46	142	86	59
12 New Zealand	9	3	9	6	5	11	8	6
13 Papua New Guinea	470	32	69	60	54	94	80	73
14 Philippines	230	15	41	30	24	62	40	32
15 Samoa		14	40	28	23	50	34	28
16 Sri Lanka	58	8	26	16	11	32	19	13
17 Thailand	110	9	26	11	7	31	13	8
18 Viet Nam	150	12	38	23	15	53	30	17

Note: Dif.=Difference

Definitions:

- Healthy life expectancy (HALE) at birth (years) both sexes - <http://www.who.int/whosis/indicators/compendium/2008/1hat>
- Infant mortality rate (per 1 000 live births) both sexes - <http://www.who.int/whosis/indicators/compendium/2008/3mr5>

- Life expectancy at birth (years) both sexes - <http://www.who.int/whosis/indicators/compendium/2008/2let>
- Maternal mortality ratio (per 100 000 live births) - <http://www.who.int/whosis/indicators/compendium/2008/3mrf>
- Neonatal mortality rate (per 1 000 live births) - <http://www.who.int/whosis/indicators/compendium/2008/4mrn>
- Probability of dying (per 1 000 live births) under five years of age (under-5 mortality rate) both sexes [<http://www.who.int/whosis/indicators/compendium/2008/3mr5>]
- Probability of dying (per 1 000 population) between 15 and 60 years (adult mortality rate) both sexes [<http://www.who.int/whosis/indicators/compendium/2008/1mru>]

Source:

World Health Statistics 2008, <http://www.who.int/whosis/>, accessed on 25 July 2008.

Annex 3: Health System and Resources

Country	Total expenditure on health as percentage of gross domestic product		General government expenditure on health as percentage of total expenditure on health		General government expenditure on health as percentage of total government expenditure, 2005	
	2000	2005	2000	2005		
1	Australia	8.3	8.8	67	67	17
2	Bangladesh	3.1	2.8	26.5	29.1	5.5
3	Cambodia	5.8	6.4	22.5	24.2	12
4	China	4.6	4.7	38.3	38.8	1
5	Fiji	4.7	4.1	69	70.9	9.6
6	India	4.3	5	22.2	19	3.5
7	Indonesia	1.7	2.1	38.5	46.6	5.1
8	Lao PDR	3.2	3.6	32.6	20.6	4.1
9	Mongolia	5.6	4.3	80.1	77.5	11
10	Myanmar	2.1	2.2	13.4	10.6	1.1
11	Nepal	5.4	5.8	24.9	28.1	8.4
12	New Zealand	8.1	8.9	79.1	77.4	18
13	Papua New Guinea	3.6	4.2	81.7	86.2	9.6
14	Philippines	3.5	3.2	47.6	36.6	5.5
15	Samoa	5.5	4.9	70.9	80.7	11.6
16	Sri Lanka	3.7	4.1	47.9	46.2	7.8
17	Thailand	3.4	3.5	56.1	63.9	11.3
18	Viet Nam	5.4	6	30.1	25.7	5.1

Country	Per capita total expenditure on health (PPP int. \$)		Per capita government expenditure on health (PPP int. \$)	
	2000	2005	2000	2005
1 Australia	2265	3001	1518	2012
2 Bangladesh	49	57	13	17
3 Cambodia	93	167	21	41
4 China	183	315	70	122
5 Fiji	245	271	169	192
6 India	60	100	13	19
7 Indonesia	48	78	19	36
8 Lao PDR	49	78	16	16
9 Mongolia	104	113	83	87
10 Myanmar	29	38	4	4
11 Nepal	62	76	15	21
12 New Zealand	1686	2223	1333	1720
13 Papua New Guinea	129	172	105	148
14 Philippines	170	199	81	73
15 Samoa	186	218	132	175
16 Sri Lanka	127	189	61	88
17 Thailand	226	323	127	207
18 Viet Nam	132	221	40	57

Note: Dif.=Difference

Definitions:

- General government expenditure on health as percentage of total expenditure on health - <http://www.who.int/whosis/indicators/compendium/2008/3exo>

Source: World Health Statistics 2008, <http://www.who.int/whosis/>, accessed on 25 July 2008.

Annex 4: Human resources for health

Country	HRH ^h		Doctors			Nurses			Doctor to Nurse Ratio
	Density of doctors, nurses and midwives(per 1,000 pop)	year	Number	Density (per 1,000 pop)	Year	Number	Density (per 1,000 pop)	Year	
1 Bangladesh ^a	0.559	2007	43315	0.291	2007	21476	0.144	2007	1:0.496
2 Cambodia	1.000	2000	2047	0.160	2000	8085	0.610	2000	1:3.950
3 China ^b	2.585	2006	1994854	1.540	2006	1426339	1.100	2006	1:0.715
4 Fiji	2.300	1999	271	0.340	1999	1576	1.960	1999	1:5.815
5 India ^c	1.895	2005	660801	0.599	2005	908962	0.824	2005	1:1.376
6 Indonesia ^d	2.394	2007	65722	0.290	2007	369321	1.640	2007	1:5.619
7 Lao PDR	1.620	1996	2812	0.59	1996	4931 ⁱ	1.03	1996	1:1.754
8 Myanmar ^e	1.151	2007	20402	0.360	2007	20124	0.357	2007	1:0.986
9 Nepal	0.634	2004	5384	0.210	2004	5664	0.220	2004	1:1.052
10 Papua New Guinea	0.580	2000	275	0.050	2000	2841	0.530	2000	1:10.331
11 Philippines ^F	7.044	2004	93862	1.135	2004	352398	4.263	2004	1:3.754
12 Samoa	2.740	1999	120	0.700	1999	346	2.020	1999	1:2.883
13 Sri Lanka	2.117	2004	10479	0.550	2004	23030	1.200	2004	1:2.198
14 Thailand ^g	1.800	2004	18918	0.300	2004	95834	1.530	2004	1:5.066
15 Viet Nam	1.339	2005	42327	0.530	2005	52115	0.619	2005	1:1.231
16 Australia	10.840	2001	47875	2.470	2001	176188	9.100	2001	1:3.680
17 Mongolia	5.950	2002	6732	2.630	2002	8214	3.210	2002	1:1.220
18 New Zealand	10.910	2001	9027	2.370	2001	31128	8.160	2001	1:3.448

Country	Midwives			Dentists			Pharmacists		
	Number	Density (per 1,000 population)	Year	Number	Density (per 1,000 population)	Year	Number	Density (per 1,000 population)	Year
1 Bangladesh ^a	18516	0.124	2007	2742	0.018	2007	9411	0.063	2007
2 Cambodia	3040	0.23	2000	209	0.02	2000	564	0.04	2000
3 China ^b	42000	0.03	2001	51012	0.039	2005	349533	0.267	2005
4 Fiji	...	...		32	0.04	1999	59	0.07	1999
5 India ^c	521593	0.473	2005	78096	0.071	2006	578179	0.524	2006
6 Indonesia ^d	96341	0.430	2007	13709	0.060	2007	31242	0.140	2007
7 Lao PDR	...	...		...	...		...	...
8 Myanmar ^e	17607	0.315	2007	1570	0.028	2007	680	0.012	2007
9 Nepal	6161	0.240	2004	359	0.010	2004	358	0.010	2004
10 Papua New Guinea	...	...		90	0.020	2000	...	...
11 Philippines ^f	136036	1.646	2004	45903	0.555	2004	49667	0.601	2004
12 Samoa	3	0.020	1999	30	0.180	1999	5	0.030	1999
13 Sri Lanka	10401	0.540	2004	1245	0.060	2004	1066	0.060	2004
14 Thailand ^g	872	0.010	2000	4129	0.070	2004	7413	0.120	2004
15 Viet Nam	18313	0.217	2005	...	...		10669	0.127	2005
16 Australia	11649	0.600	2001	21296	1.100	2001	13956	0.720	2001
17 Mongolia	612	0.240	2002	337	0.130	2002	1093	0.430	2002
18 New Zealand	2121	0.560	2001	2586	0.680	2001	3495	0.920	2001

Country	Public and environmental health workers			Community health workers			Laboratory health workers		
	Number	Density (per 1,000 pop)	Year	Number	Density (per 1,000 pop)	Year	Number	Density (per 1,000 pop)	Year
1 Bangladesh ^a	5743	0.04	2004	48692	0.367	2007	3794	0.03	2004
2 Cambodia	...	...		...	...		...	...
3 China ^b	318028	0.243	2005	1638616	1.253	2005	211495	0.162	2005
4 Fiji	...	...		...	...		...	...
5 India ^c	...	...		50715	0.050	2005	...	...
6 Indonesia ^d	6493	0.030	2003	...	0.000	2003	8882	0.040	2003
7 Lao PDR	...	...		...	...		...	...
8 Myanmar ^e	1757	0.040	2004	49284	0.872	2007	2241	0.040	2004
9 Nepal	172	0.010	2004	16206	0.630	2004	3209	0.120	2004
10 Papua New Guinea	...	...		...	...		...	...
11 Philippines ^f	...	...		...	...		...	...
12 Samoa	...	...		...	...		...	...
13 Sri Lanka	1541	0.080	2004	...	...		1252	0.070	2004
14 Thailand ^g	2151	0.040	2000	39780	0.650	2000	...	...
15 Viet Nam	...	...		92223	1.095	2005	...	...
16 Australia	...	...		3812	0.200	2001	8326	0.430	2001
17 Mongolia	85	0.030	2002	3758	1.470	2002	...	...
18 New Zealand	...	...		30987	8.120	2001	3696	0.970	2001

Country	Other health workers			Health management and support workers		
	Number	Density (per 1,000 population)	Year	Number	Density (per 1,000 population)	Year
1	Bangladesh ^a	5847	0.04	2004	...	...
2	Cambodia	...	...	...	...	...
3	China ^b	225697	0.173	2005	740967	0.567
4	Fiji	...	...	...	...	...
5	India ^c	1101485	1.030	2003	...	...
6	Indonesia ^d	20981	0.100	2003	228095	1.040
7	Lao PDR	...	...	...	...	...
8	Myanmar ^e	2077	0.040	2004	49661	0.990
9	Nepal	1892	0.070	2004	...	...
10	Papua New Guinea	...	...	...	...	...
11	Philippines ^f	90788	1.200	2000	...	...
12	Samoa	...	...	...	...	...
13	Sri Lanka	1546	0.080	2004	112	0.010
14	Thailand ^g	14117	0.230	2000	117384	1.930
15	Viet Nam	...	...	...	...	...
16	Australia	38339	1.980	2001	488313	25.230
17	Mongolia	3389	1.320	2002	...	...
18	New Zealand	17013	4.460	2001	...	...

Main Source: The World Health Report 2006; World Health Statistics 2007; Regional Guidelines for Country HRH Strategic Planning Situational Analysis Worksheets □ Human Resources for Health — Overcoming the crisis

... Data not available or not applicable

^a **Source:** HRDU, MOH

^b the number of dentists totaled the Doctors in stomatology division; Public and environmental health workers mean the health workers in public health institutions, such as Disease control and prevention center, Health supervision institutes, Specialized disease prevention and treatment institutes, etc. Community health workers includes health workers in primary institutions, such as Community health service center, Health stations, etc. Source: Health Statistical Yearbook of China.

^c **Source:** National Health Profile, 2005-06; Health Information of India, 2004, 2005, 2006; National Commission on Macroeconomics and Health, 2005.

^d **Source:** Based on the Ministry of health Degree no.81 year 2004. Such as NO. of doctors year 2004=data year2003+ no. Medical Faculty Graduates year 2003 and number of specialist graduates year 2003(data from MONE). The related forms will follow the same way.

^e **Source:** Register of Nepal Council, Nepal Nursing Council and Nepal Pharmacy Council.

^f **Source:** CHIPS 2006

^g **Source:** Annual health workforces survey by Bureau of Policy and Strategy, MoPH.

^h counting only doctors, nurses and midwives Because the data had to be assembled from a variety of sources for which the quality of information, the manner of collection and the criteria for coding and categorizing are highly variable. In addition, there are differences in definitions between countries not only regarding health workers in general but also on specific health occupations. (Source: Counting health workers: definitions, data, methods and global results)

ⁱ Number of Nurse= number of Nurse + number of Midwives in 1996

Annex 5: Health Schools

Table 1 Medical Schools

Country	Medical Schools		Duration of Basic Medical Degree Course (include Practical Training)in Years	Title of Degree Awarded	Medical Registration/License to Practice
	No.	Year			
1 Australia	10	2001	4-6	Bachelor of Medicine and Bachelor of Surgery	Registered with State Authorities; Licensed by Medical Schools Accredited by Medical Council
2 Bangladesh	47	2007	5	Unknown	Unknown
3 Cambodia	1	2000	7	Doctor of Medicine	Registered with & Licensed by MOH
4 China	1552	2003	3-8	Doctor of Medicine	Registered with Local Health Department & Licensed by MOH
5 Fiji	1	1999	6	Bachelor of Medicine and Bachelor of Surgery	Registered with and licensed by Medical Council
6 India	271	2007	4-6 (plus 1 year internship)	Bachelor of Medicine and Bachelor of Surgery	Registered with and licensed by Medical Council
7 Indonesia	51	2006	6-8	Doctor	Registered with MOH; licensed by provincial authorities
8 Lao PDR	1	1996	6	Doctor of Medicine	Registered with & Licensed by MOH
9 Mongolia	2	2002	5 or 6	Physician	Registered with licensed by MOH
10 Myanmar	3	2000	6.5	Bachelor of Medicine and Bachelor of Surgery	Registered with and licensed by Medical Council
11 Nepal	4	2001	5.5	Bachelor of Medicine and Bachelor of Surgery	Registered with and licensed by Medical Council
12 New Zealand	2	2001	6	Bachelor of Medicine and Bachelor of Surgery	Licensed by Medical Council
13 Papua New Guinea	1	2007	6	Bachelor of Medicine and Bachelor of Surgery	Unknown
14 Philippines	28	2002	4-7	Doctor of Medicine	Registered with and licensed by Professional Regulation Commission through Exam
15 Samoa	None	1995	None	None	Registered with and Licensed by Medical Association
16 Sri Lanka	6	2001	5	Bachelor of Medicine and Bachelor of Surgery	Registered with and licensed by Medical Council
17 Thailand	17	2007	5 or 6	Doctor of Medicine	Registered with and licensed by Medical Council
18 Viet Nam	13	2007	6	Doctor of Medicine	Registered with and licensed by Provincial Authorities

Country	Work in Government Service after Graduation	Permission for Foreigners' practice	Agreement with Other Countries
1 Australia	Not Obligatory (5 years)	Yes	New Zealand
2 Bangladesh	Unknown	Unknown	Unknown
3 Cambodia	Obligatory (1 Year)	Unknown	None
4 China	Not Obligatory	Yes	None
5 Fiji	Obligatory	Yes	Unknown
6 India	Not Obligatory	Yes	Unknown
7 Indonesia	Unknown	Unknown	Unknown
8 Lao PDR	Obligatory	Yes	Unknown
9 Mongolia	Obligatory	No	Unknown
10 Myanmar	Obligatory (3 Years)	No	None
11 Nepal	Not Obligatory	Unknown	Agreement with Bangladesh, India, Pakistan & Sri Lanka
12 New Zealand	Not Obligatory	Yes	Australia
13 Papua New Guinea	Unknown	Unknown	Unknown
14 Philippines	Not Obligatory	Yes	Unknown
15 Samoa	Obligatory (3 years)	Unknown	Agreement with Commonwealth Countries and USA
16 Sri Lanka	Not Obligatory	Yes	Unknown
17 Thailand	Obligatory (3 years in rural area)	Yes	None
18 Viet Nam	Obligatory (5 years)	Unknown	Unknown

Source:

1. World Health Statistics 2008, <http://www.who.int/whosis/>, accessed on 25 July 2008.
2. *Human Resources for Health—Overcoming the crisis*, Joint Learning Initiatives, 2004.
3. *World Directory of Medical Schools 7th edition*, World Health Organization, 2000.

Table 2 Other Health Professional Schools

Country		Nursing SCHOOLS					
		Number of Schools	Year	Number of 1st Year Enrollees	Year	Number of Graduates	Year
1	Bangladesh ^a	54	2007	1585	2006-2007	1130	2007
2	Cambodia	5	2000	...		...
3	China ^b	...		...		...
4	Fiji	1	1999	...		...
5	India ^c	2466	2007	...		...
6	Indonesia ^d	336	2005	29952	2005-2006	24267	2005
7	Lao PDR	1	1996	...		...
8	Myanmar	2	2000	...		...
9	Nepal	3	2001	...		...
10	Papua New Guinea	7	2007	...		...
11	Philippines	192	2002	...		...
12	Samoa	...		...		...
13	Sri Lanka	1	2001	...		...
14	Thailand ^e	64	2004	5885	2006-2007	4180	2006
15	Viet Nam	53	2007	7984	2006-2007	6006	2007
16	Australia	45	2001	...		...
17	Mongolia	4	2002	...		...
18	New Zealand	16	2001	...		...
Country		Dental SCHOOLS					
		Number of Schools	Year	Number of 1st Year Enrollees	Year	Number of Graduates	Year
1	Bangladesh ^a	11	2007	560	2006-2007	320	2007
2	Cambodia	...		...		...
3	China ^b	...		...		...
4	Fiji	...		...		...
5	India ^c	268	2007	...		...
6	Indonesia ^d	17	2006	5080	2005-2006	...	
7	Lao PDR	...		...		...

8	Myanmar	...		...		...
9	Nepal	...		...		...
10	Papua New Guinea	1	2007	...		...
11	Philippines	...		...		...
12	Samoa	...		...		...
13	Sri Lanka	...		...		...
14	Thailand ^e	8	2001	713	2006-2007	462	2006
15	Viet Nam	...		...		...
16	Australia	...		...		...
17	Mongolia	...		...		...
18	New Zealand	...		...		...
		PHARMACY SCHOOLS					
Country		Number of Schools	Year	Number of 1st Year Enrollees	Year	Number of Graduates	Year
1	Bangladesh ^a	1	2007	290	2006-2007	210	2007
2	Cambodia	...		...		...
3	China ^b	...		...		...
4	Fiji	...		...		...
5	India ^c	278	2007	...		...
6	Indonesia ^d	74	2005	6228	2005-2006	4131	2005
7	Lao PDR	...		...		...
8	Myanmar	...		...		...
9	Nepal	...		...		...
10	Papua New Guinea	1	2007	...		...
11	Philippines	...		...		...
12	Samoa	...		...		...
13	Sri Lanka	...		...		...
14	Thailand ^e	13	2001	1802	2005-2006	1499	2006
15	Viet Nam	...		...		...
16	Australia	...		...		...
17	Mongolia	...		...		...
18	New Zealand	...		...		...
Country		MIDWIFERY SCHOOLS					

		Number of Schools	Year	Number of 1st Year Enrollees	Year	Number of Graduates	Year
1	Bangladesh ^a	44	2007	1890	2006-2007	1300	2007
2	Cambodia	...		...		...
3	China	...		...		...
4	Fiji	...		...		...
5	India	271	2006	...		...
6	Indonesia ^d	122	2005	9997	2005-2006	5951	2005
7	Lao PDR	...		...		...
8	Myanmar	...		...		...
9	Nepal	...		...		...
10	Papua New Guinea	4	2007	...		...
11	Philippines	...		...		...
12	Samoa	...		...		...
13	Sri Lanka	...		...		...
14	Thailand	...		...		...
15	Viet Nam	...		...		...
16	Australia	...		...		...
17	Mongolia	...		...		...
18	New Zealand	...		...		...

Main Source: Regional Guidelines for Country HRH Strategic Planning Situational Analysis Worksheets

... Data not available or not applicable

^a Source: BMDC

^b Source: Education Statistical Yearbook of China.

^c Source: National Commission on Macroeconomics and Health, 2005; Medical Council of India, 2007; Nursing Council of India; Dental Council of India; Health Information of India.

^d Source: www.depdknas. Go. Id; Health Workforce Training Profile, 2005.

^e Source: Thailand Health Profile 2001-2004.