



# Understanding health labour markets in the Western Pacific Region



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# Introduction

Health systems that aspire to universal health coverage for their populations need to develop enabling policies and plans for human resources for health (HRH). These policies must be based on a sound understanding of the demand and the supply of staff, as well as on assessments of the investments needed to sustain current and future supply. This cannot be achieved without consideration of the dynamics of health-care labour markets.

No health sector workforce is static. The “stock” of health workers in the labour market is always subject to “inflows” and “outflows”. There is a constant flow of new workers entering the health-care sector, whilst others are leaving it, permanently or temporarily, or moving between jobs, organizations, sectors and countries. If health workforce planning is to be effective, it must be able to assess and take these patterns of mobility into account, just as HRH policies must take into account the dynamic nature of labour markets.

Labour markets in the health sector cover a broad range of workers, from highly qualified medical specialists to unskilled locally employed staff, such as cleaners and porters. Different occupational groups have varying levels of health-sector-specific skills and qualifications, and different labour-market behaviour patterns. To be effective and responsive, HRH policy must also reflect this diversity across labour markets and, in some cases, be tailored to the needs of specific occupations or geographical regions, within the broader national labour market.

There are a number of aspects of HRH policy and planning that can be informed by labour market analyses. These include:

- assessing output from training and other sources of supply of new health workers;
- optimizing the mix of different health-worker skills and competencies;
- planning for the future workforce;
- responding to changes in service demand, and the emergence of new care requirements; and
- developing effective strategies for recruitment and retention.

The aim of this report is to provide policy-makers with an understanding of the health-care labour market context in the Western Pacific Region. It sets out a framework to assist them in conducting labour market analysis that will inform more effective policy development and planning.

The report comprises three main sections: section 1 describes and defines labour markets; section 2 examines labour market characteristics in the Western Pacific Region; and section 3 describes the development and application of a framework to understand health-care labour markets in the Region.

Annex 1 gives further information on sources and resources for health-care labour market analysis; annex 2 lists the countries and areas that make up the Western Pacific Region; and annex 3 provides additional figures on the density of the health workforce in the Region.



# 1. Understanding health-care labour markets

The health sector comprises a number of different intersecting labour markets determined by occupation, mobility and geography. There are variations in how easy it is for different occupations to move in and out of the health sector, depending on their skill set, qualification and the extent to which they are geographically mobile. Understanding and taking into account the diverse and changing nature of these markets, and the way they relate to each other, is a key element in developing effective HRH strategies (Dal Poz et al., eds., 2009).

This section sets out the key aspects that need to be considered when developing an understanding of the dynamics of health-care labour markets. It addresses the issues of supply and demand, 'stocks and flow' and labour market imbalances, and discusses geographical and occupational labour markets.

## 1.1 HRH demand

The demand for HRH is broadly defined as the amount of labour that employers are willing to hire at the current level of wages (Dussault, Vujcic, 2008). In its most simple terms, the amount of labour refers to the number of workers, but productivity is also a factor. Employers may include the public sector, private sector and nongovernmental organizations (NGOs), as well as individuals who seek care from health workers. As noted by Dussault and Vujcic (2008), different factors will influence the demand from each of these types of employer: demand from the public sector will be influenced by disease priorities, assessments of health-care needs and the availability of donor support, while the level of demand from individuals will reflect household incomes, service costs, and perceptions of the availability of public sector health care.

It is also important to note that the *demand* for health workers, as defined above for the purposes of labour market analysis, will often differ from the *need* for health workers. The need for health workers reflects estimates of health labour required to meet health policy-related outcomes or health targets and does not take into account resource constraints or existing labour market limitations.

In the labour market context, demand is the number of workers that the organization or system is willing

and able to employ. This is influenced by other factors, particularly whether or not the financial resources are available to provide for workers' salaries. For this reason, it is possible for a health system to have met its estimated demand for health workers, while simultaneously having unmet needs.

### *Competitive demand*

Unless a monopsony<sup>1</sup> exists, there will always be some element of competition between employers to hire workers with certain skills and qualifications. This may come from within or beyond the health sector, and may include:

- other public sector health services;
- other public sector employers such as the civil service, government administration or the armed forces;
- private sector health-service providers;
- employers from outside health-care service delivery; or
- employers in other countries.

Every health sector organization should develop an understanding of the competitive demand for the different occupations it employs. For example, workers with information technology (IT) skills may be more likely to consider employment outside health care, while a senior health professional will be more likely to consider competing employment offers from within the health sector, but perhaps from a different region or country, or from a private health sector employer. One method of developing an understanding of the nature of competitive demand is to assess the destinations of workers who leave the organization, and the source of those who join it.

## 1.2 HRH supply

The supply of health workers is essentially the number of health workers who are willing to work in the sector at a given level of reward, which includes both wages and other terms and conditions (e.g. the provision of paid leave, working conditions, access to other

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<sup>1</sup> Monopsony is an economic term that refers to a situation where there is only one purchaser of goods or services. An example of a monopsony health labour market would be a small town where the single hospital is the only employer of workers with health-sector-specific skills. Where a monopsony exists, economic theory suggests that a health service is likely to pay lower wages than it would in a competitive market.

services). A number of factors will affect whether or not suitably qualified workers will want to take up employment, including other commitments and obligations affecting the number of hours that they can work (e.g. balancing work with caring responsibilities), alternative work opportunities (health sector and/or non-health sector), and personal preferences. Age and gender can also be factors in determining supply.

The supply of health workers with health-specific skills is also in part determined by the education sector, as it produces new workers for the labour market with health-specific qualifications, e.g. doctors, nurses, etc. The level of flow of new workers from education to the labour market is one determinant of the total number of qualified staff available to the labour market. A range of policies and funding decisions affect this part of the supply side, inasmuch as they determine the number of training places available to potential health workers. In some countries, this new supply comes only from the public sector. In others, the private education sector also trains new health workers.

The numbers of students that can be recruited into health-sector-specific training and education, and hence become the new supply after completion of training, will be affected by various factors including barriers to entry to education, such as the cost or the qualifications required to gain admission to courses, as well as the relative attractiveness of a career in health compared with other sectors of the economy.

Other supply flows will be ‘returners’ who have not been participating in the labour market (e.g. they have been in education or on a career break),

workers entering the health sector from non-health employment, or those migrating from other countries. The aggregate of these inflows determines the total new labour supply. In order to plan effectively and shape HRH policies that sustain inflow at an appropriate level, it is essential that health sector organizations develop a good understanding of the relative size of these different inflows, their variability across time and their vulnerability to change. The ability to manage the ‘security of supply’ of health workers is a key component in effective workforce planning.

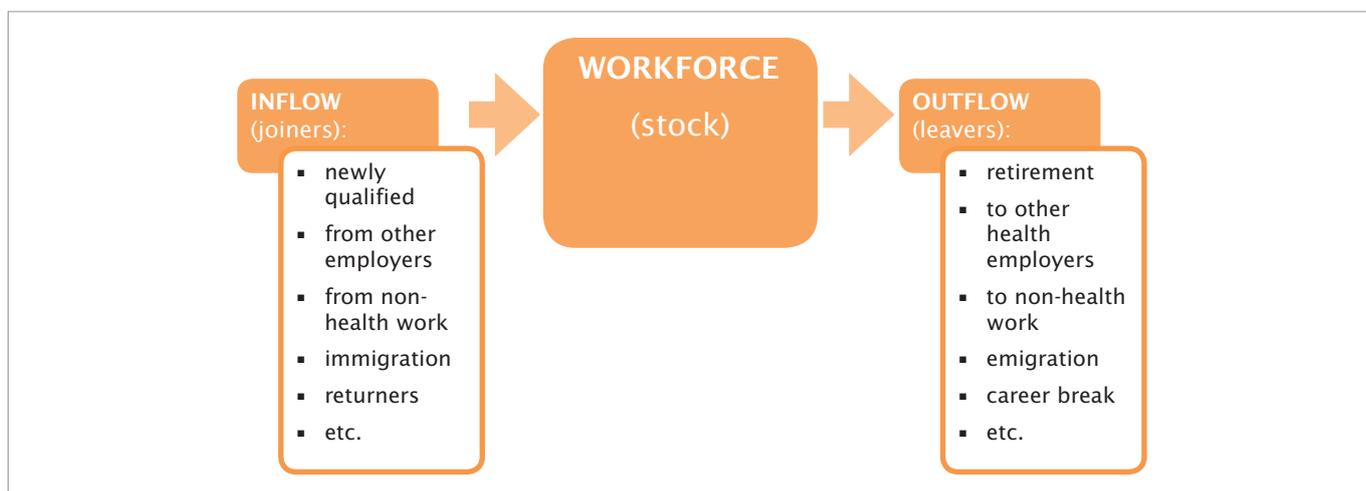
At the simplest level of analysis, the various flows of staff to and from an organization can be captured in a ‘stock and flow’ model (Figure 1). This illustrates the current workforce (the ‘stock’) as a box, with the various potential inflows, or joiners, from the external labour market into the workforce, and the outflows, or those leaving the workforce. The net effect of the various inflows and outflows will determine the future size of the workforce stock.

### 1.3 Health labour market imbalances

When there is disequilibrium between demand for labour and supply, shortages or surpluses (imbalances) of workers will be the result. There are different types of labour market imbalance, including:

- professional imbalances, for example there may be an oversupply of doctors and an undersupply of nurses;
- specialty imbalances, such as an oversupply of surgeons and an undersupply of paediatricians;
- geographical imbalances, such as a shortage of

**Figure 1.** Simple model of stocks and flows



Source: Buchan, Seccombe (2012).

health professionals in rural and remote areas and a relative oversupply in urban areas;

- institutional or service imbalances, such as between different parts of the health sector, or different facilities; and
- gender imbalances, which result in disparities in female/male representation, such as shortages in female doctors, which can have implications for workforce planning as well as access to services.

These imbalances may also be ‘static’ or ‘dynamic’ (Zurn et al., 2004). Where there is a dynamic labour market imbalance, labour market theory suggests that market forces will act to adjust that imbalance. For example, a shortage of staff will lead to a rise in wages, which in turn will bring about a greater supply of labour (initially through the re-entry into the labour force of inactive members or the return of workers to the health sector from competing industries) until the demand for labour is met.

Where there is a static imbalance, however, supply does not increase or decrease and market equilibrium is not achieved. This can occur for a range of reasons, including the existence of a monopoly or monopsony, or wage control policies. In addition, it takes time to adjust the inflow of trained health professionals, which results in a significant time lag between the identification of demand and the effective increase in supply—normally about three or four years to increase the number of nurses, or eight years or more for doctors. Responding to such imbalances also requires a good knowledge of the market, including the wages paid by competing employing organizations, and the nature and location of alternative opportunities, something which potential employees and employers may not always have (Zurn et al., 2004).

The health-care sector is notable in the extent to which market failures are evident, meaning that shortages and surpluses are more likely to result in the health labour market than in many other sectors (Zurn et al., 2004).

#### 1.4 HRH geographical and occupational labour markets

One of the key aspects in conducting labour market analysis in the health sector is the ability to define the boundaries of the labour market in a meaningful way, and to clarify where the focus of any HRH planning and policy actions should be directed. Supply and demand may be different for different occupations, and may differ in different parts of the country.

Two key dimensions to consider in defining these boundaries are geography and occupation. Consideration of these two dimensions can help clarify which parts of the workforce should be the focus of attention, and to determine which HRH policies will be appropriate and effective.

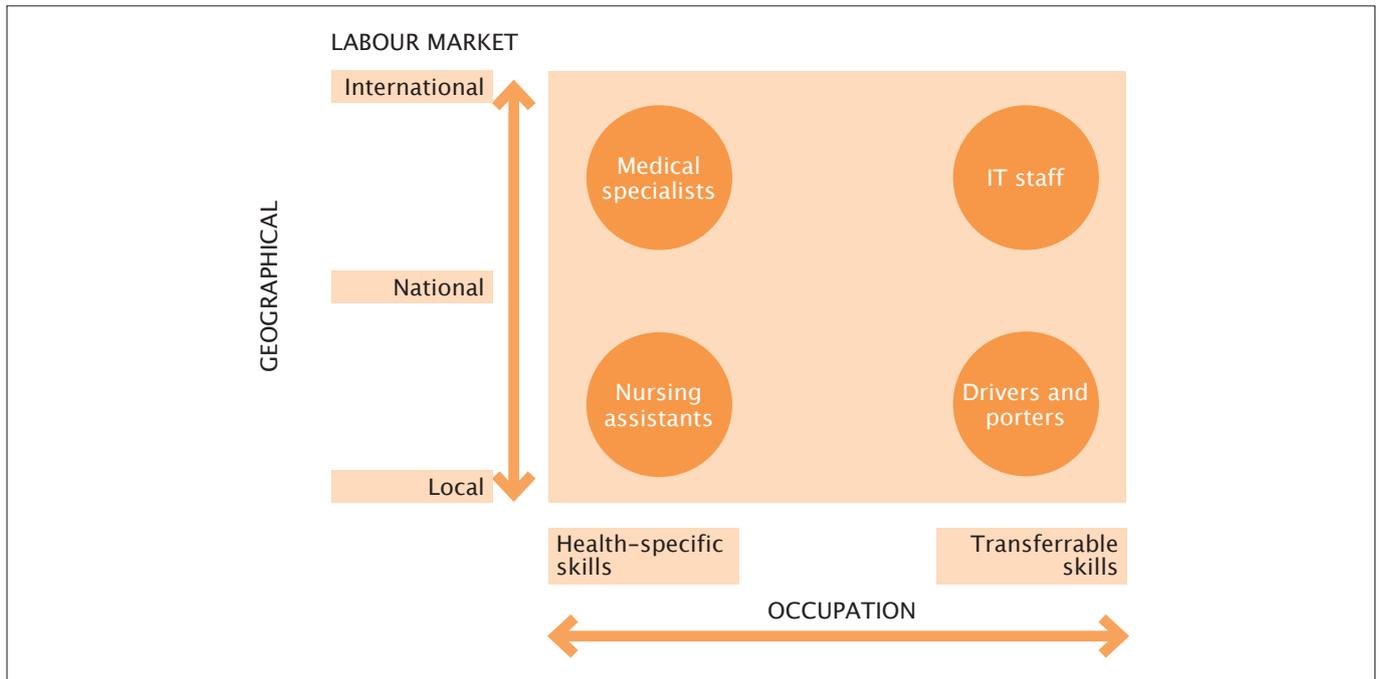
Figure 2 shows how these two dimensions interact. The horizontal axis presents a continuum of skills, with health-specific skills on the left and general/transferable skills on the right. This axis also helps delineate who ‘the competition’ will be for workers, that is, which other organizations and sectors may compete for workers with specific skills. Competing demand for staff with sector-specific health professional skills will be other health-care organizations. Competition for staff with transferable, general skills—those at the right side of the occupation continuum—will be much broader-based.

The vertical axis provides a geographical labour market continuum, from local to national and international labour markets. There is no standard definition of a local labour market, but it should normally be considered to be the geographical area that is within easy daily travel distance of the employing organization. This is sometimes referred to as the ‘travel-to-work area’. Terrain and travel infrastructure will play a part in determining its actual size and shape—this can be a significant issue in various parts of many countries in the Western Pacific Region, where health services are often located in sparsely populated areas, on isolated atolls and islands, or in other remote regions with poor travel infrastructure.

Different occupations operate in different geographical labour markets. Occupations involving a high level of training leading to specialist skills will tend to operate in national or international labour markets, in response to global demand. Conversely, unskilled jobs or those that require a low level of training are more likely to operate in a local labour market.

Figure 2 illustrates these differences in four examples. Medical specialists have high-level, sector-specific skills, and are likely to be in demand and possibly mobile across national or even international labour markets. IT staff will also be highly qualified and skilled. They will have transferable skills, and they may be mobile and in demand across different sectors at national or international levels. Nursing assistants will have some sector-specific health skills, and perhaps a health qualification, but will be mainly recruited

**Figure 2.** Geographical and occupational dimensions of labour markets in the health sector



Source: Adapted from Meager et al. (1990).

locally, and are less likely to be mobile in response to demand in other geographical labour markets. Drivers and porters may have no health sector-specific skills, will be recruited locally, and are likely to move within the local labour market.

The categorization of occupations will not always be as clear-cut as the examples provided here, but

they serve to illustrate how consideration of these two labour market dimensions can assist in defining what the competing demand will be for specific types of worker. Using the matrix can also be of help when determining which HRH policies will be most appropriate and effective for a particular type of worker.

## 2. Health labour markets in the Western Pacific

This section sets out the demographic and health workforce context for health-care labour market analysis. It gives consideration to key demographic dimensions at country level within the Western Pacific Region, and provides a backdrop to the more detailed focus on labour market analysis, that will be discussed in the next section.

### 2.1 Population size and growth

The WHO Western Pacific Region comprises 37 countries and areas and is home to more than a quarter of the world's population (Table 1). It is a geographically and economically diverse region.

It includes some of the world's least developed countries and some rapidly emerging and fast-growing economies, such as the People's Republic of China and Viet Nam, as well as highly developed member countries of the Organisation for Economic Co-operation and Development (OECD), such as Australia, Japan, New Zealand, the Republic of Korea and Singapore. It also has some of the largest and smallest countries in the world (in terms of geographical size and/or population).

Essentially, population size is a broad indicator of the demand for health services. Population age profiles and trends in population change will highlight

**Table 1.** Population, Western Pacific countries and areas ('000s)

Country	Total population ('000s)
Pitcairn Islands	0
Niue	1
Tokelau	1
Nauru	10
Tuvalu	10
Wallis and Futuna	13
Cook Islands	20
Palau	20
Marshall Islands	54
Northern Mariana Islands, Commonwealth of the	63
American Samoa	66
Kiribati	99
Tonga	104
Micronesia, Federated States of	111
Guam	181
Samoa	183
Vanuatu	240
New Caledonia	246
French Polynesia	269
Brunei Darussalam	393
Solomon Islands	538
Macao SAR	552
Fiji	861
Mongolia	2812
New Zealand	4368
Singapore	5086
Lao People's Democratic Republic	6201
Papua New Guinea	7060
Hong Kong SAR	7072
Cambodia	14 138
Australia	22 324
Malaysia	29 337
Republic of Korea	48 184
Viet Nam	87 848
Philippines	93 261
Japan	126 536
China	1 348 932

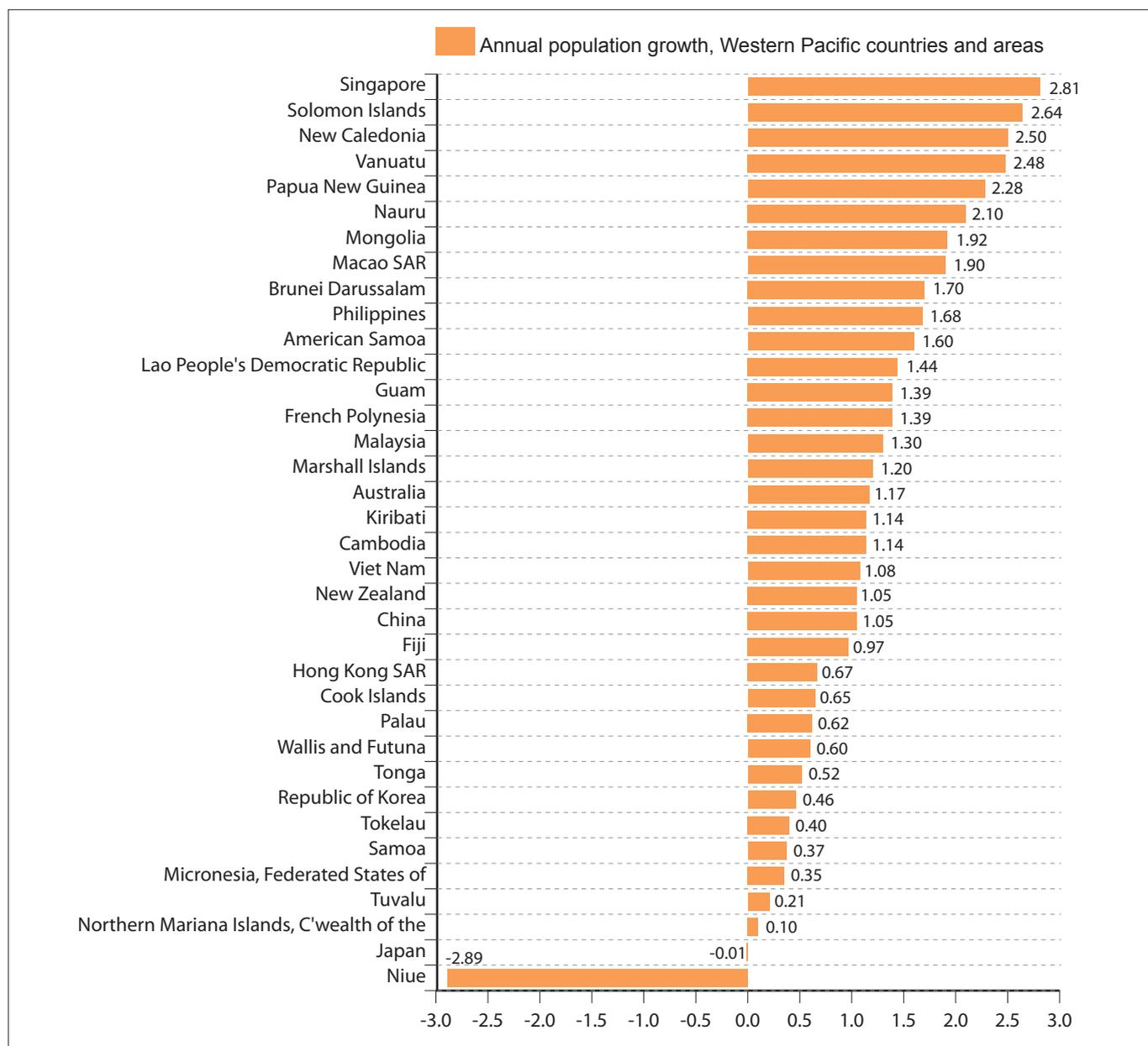
Source: WHO Regional Office for the Western Pacific (2013).

possible required changes in the types of health care being provided. These factors will also signal any need for adjustments to the supply and skills of health workers. The pattern of geographical distribution of the population will give a sense of the required distribution of health workers if there is to be equitable access to health services. These demographic factors

contribute to shaping the dimensions of health-care labour markets.

The Western Pacific Region is also notable for variations in population size: it includes countries with the largest and smallest populations in the world. Table 1 ranks the 37 countries and areas in the Region by population size. There are also varying rates of

**Figure 3.** Annual population growth (%), Western Pacific countries and areas



Source: WHO Regional Office for the Western Pacific (2013).

population growth in these countries (Figure 3), which will have significant implications for future demand for health services, and related workforce planning.

## 2.2 Population density

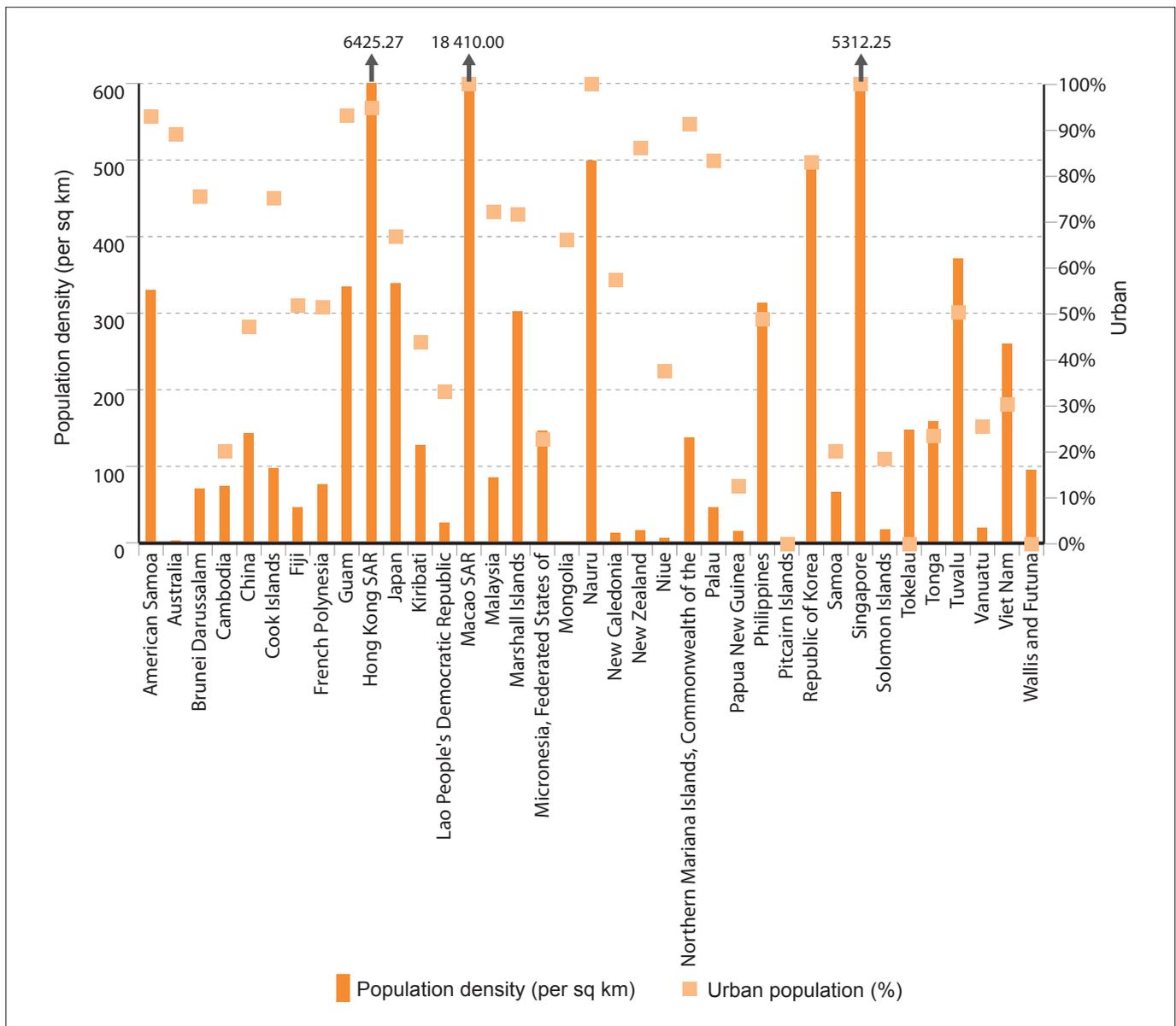
Population density can give an indication of the degree and focus of demand for health services and, in combination with geography, will be a factor to consider when examining the location and distribution of health systems and workers. Countries with high population densities are likely to require high concentrations of health workers. In contrast, countries with low population densities have different

HRH challenges, as policies must take into account the need to spread available HRH across geographical areas with relatively low demand.

As Figure 4 shows, population density is extremely variable across the Western Pacific Region, ranging from 1.25 persons per sq. km. in the Pitcairn Islands to over 18 000 per sq. km. in Macau Special Administrative Region (SAR), China. There are other notable variations.

- Some countries, such as Australia, and Mongolia, have a high proportion of their population living in urban areas, although they have a very low population density overall.

**Figure 4.** Population density (per sq. km.) and % urban population, Western Pacific countries and areas



NB, values provided for countries beyond chart scale.  
 Source: WHO Regional Office for the Western Pacific (2013).

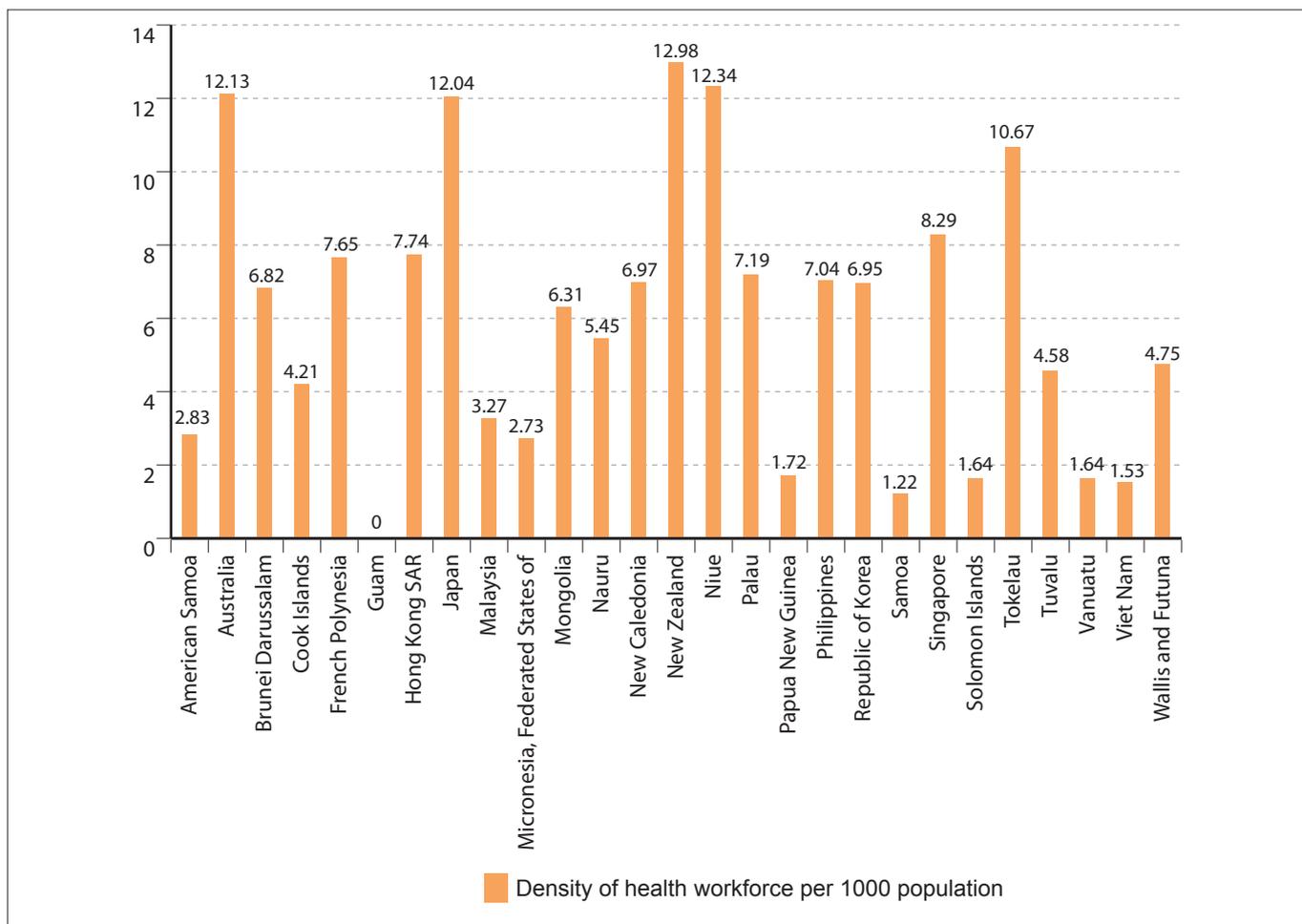
- Some small island states and territories, such as Singapore, and Hong Kong SAR and Macau SAR, China, have high-density, urban populations.

The Western Pacific Region also contains some countries in the Pacific Ocean that are extremely remote from other major population centres. For example, the Federated States of Micronesia, with a population of only 111 000, comprises 607 atolls spread over one million square miles. Other Pacific island states, such as Fiji, Solomon Islands and Vanuatu, also have populations inhabiting dozens of islands and atolls spread across a large area of ocean. This has major HRH implications for the supply and

distribution of health workers, and for the ability to retain them (Buchan, Connell, Rumsey, 2011).

Developing strategies to recruit and retain health workers in order to provide people living in very sparsely populated areas with access to health care provides a significant challenge to policy-makers and planners, as they seek to develop the best possible balance between costs, access and effectiveness. It has implications for the numbers and types of health workers required, and for the mechanisms needed to supervise and support health workers in remote and rural areas.

**Figure 5.** Health workers per 1000 population



Source: WHO Regional Office for the Western Pacific (2013).

### 2.3 HRH supply in the Western Pacific Region

The previous section highlighted how populations' profiles and geographical distributions help shape the demand for health services and, therefore, for health workers. This section looks at the supply of health workers. One indicator of HRH supply relative to population that is often used is the health workforce-to-population ratio. This can be used to illustrate variations in the level of availability of health workers in different localities, sectors and countries. There is significant variation across the Region in the stock of health workers. Figure 5 shows the variation in the reported supply (availability) of health workforce per 1000 population across different Western Pacific countries and areas.

Additional charts, showing the density of midwives, nurses and physicians, are provided in Annex 3.

### 2.4 HRH mix in the Western Pacific Region

Overall staff-to-population ratios can obscure significant variations in the composition of the workforce in different countries. Often referred to as 'skill mix', these variations are illustrated in Figure 6, which shows the density of nursing personnel, midwives and doctors per 1000 people in countries and areas in the Western Pacific Region. Whilst nursing personnel comprise the largest group of health professionals in most of the countries in the Region, there are significant variations in the relative supply of the different occupations; for example, a much higher density of physicians is evident in some countries.

In some cases, such as Cook Islands and Macau SAR, the higher density of doctors to population reflects a situation where there are small absolute numbers of workers, but also very small populations. This has to be taken into account in any cross-country comparison. However, these variations in skill mix also

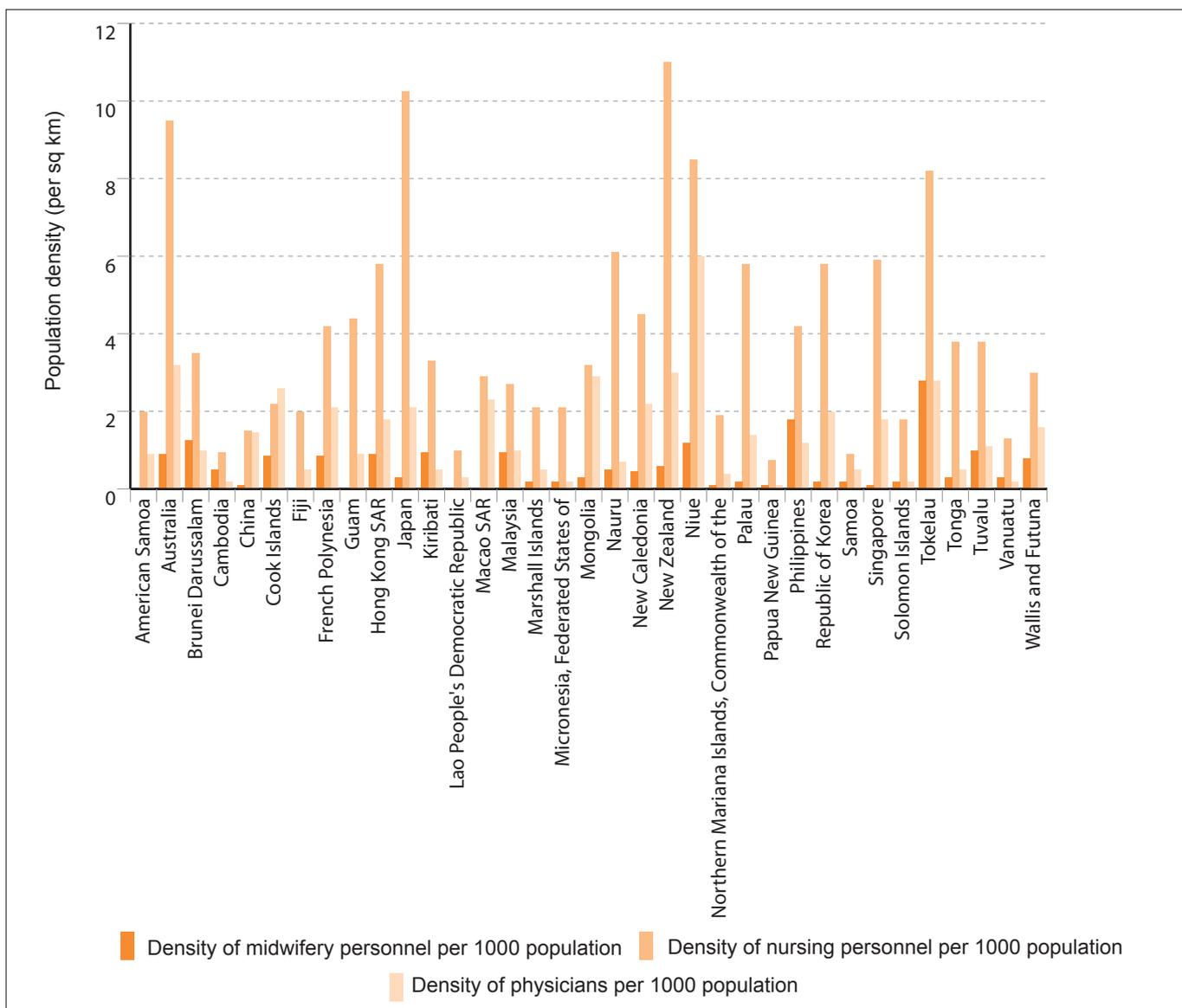
reflect (1) the different levels of supply available from the educational system for different professions and occupations; (2) any policy decisions made about the relative investment in different roles and occupations; and (3) the demand for specific skills determined by service configuration and health-care demand. Skill mix may also be effected by ‘task shifting’ if health systems aim to improve overall HRH effectiveness by re-allocating elements of current roles to other types of workers, or introducing a new role into the health system (WHO, 2008).

The skill mix can, therefore, shift over time because of a change in the relative supply of different professions or occupations, or because a current occupation or profession is redefined due to task shifting. This will

have labour market implications. One current example in the Region is Cuba’s provision of medical training to nationals from several countries in the Western Pacific (Asante et al., 2012). If these newly trained physicians are all employed back in their home countries, such as Fiji, Solomon Islands and Vanuatu, there will be a rapid and significant increase in the ratio of physicians to population in these countries, but also a marked increase in the ratio of doctors to nurses. This has implications, not only for paybill costs, but also for the roles and deployment of nurses and other occupations already in the health labour market in these countries.

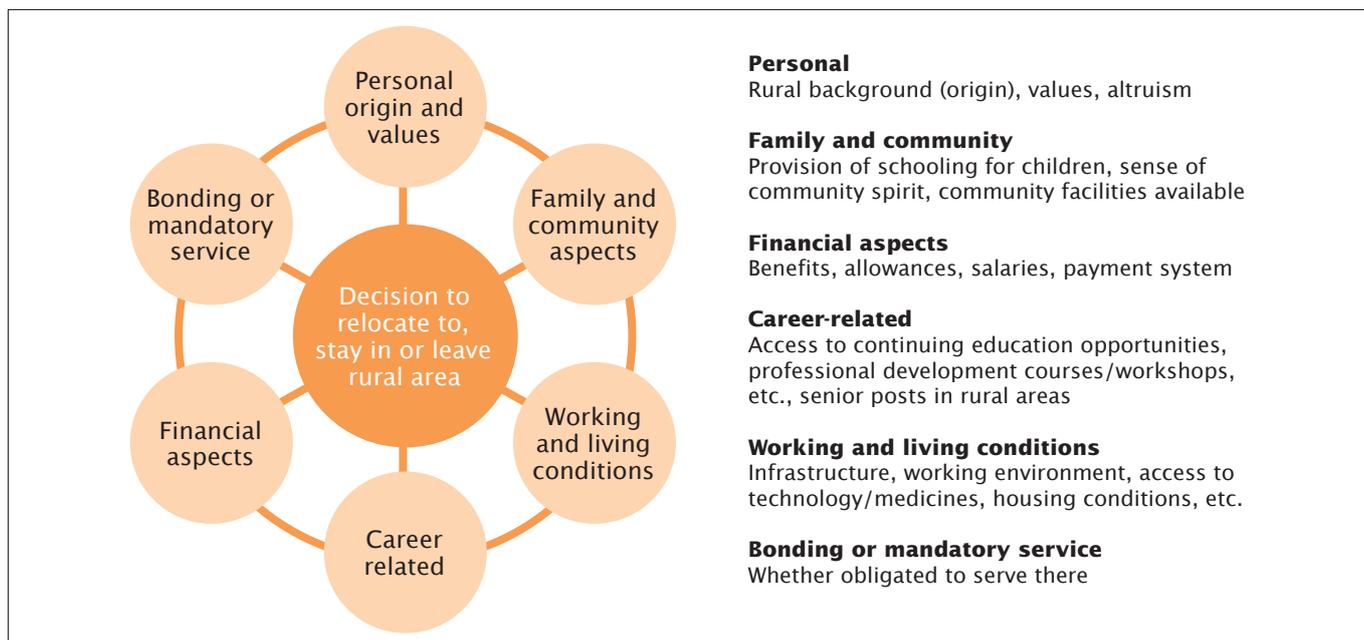
When there are changes in the supply of one occupation or profession in the labour market, part of the HRH policy and planning challenge is, not only to

**Figure 6.** Nursing personnel, midwifery personnel and physicians per 1000 population



Source: WHO Regional Office for the Western Pacific (2013).

**Figure 7.** Factors related to decisions to relocate, stay or leave rural and remote areas



Source: WHO (2010a).

ensure that this does not result in a short-term surplus, (if supply has increased) or shortage (if supply has decreased), but also to consider the knock-on effect on other professions or occupations.

## 2.5 HRH distribution

The data presented in the previous section give some indication of national-level variations in the current stock and mix of health workers in the Region, but they do not show how they are distributed geographically or sectorally within countries. This is an important dimension of health-care labour markets and is also a critical determinant of effective health-service delivery.

## 2.6 Geographical distribution

Irrespective of the overall availability of health workers, in most countries these workers are unequally distributed in relation to the demand for health services. This is sometimes referred to as geographical maldistribution of the workforce. Shortages of health workers are usually most evident in rural and remote locations. For example, Kanchanachitra and colleagues (2011), in their assessment of HRH issues in southeast Asia, illustrated HRH geographical maldistribution of doctors and nurses in Cambodia, the Philippines, the Lao People's Democratic Republic, Thailand, and Viet Nam; in all cases rural and remote areas were relatively under-staffed in comparison to urban areas.

The factors that contribute to this maldistribution are complex and interrelated, and include employment, professional, personal and economic factors (Dussault, Franceschini, 2006). The range of factors influencing workers' decisions about location and practice in a rural area are highlighted in Figure 7, and are taken from WHO's *Increasing access to health workers in remote and rural areas through improved retention: global policy recommendations* (WHO, 2010a).

## 2.7 Distribution by sector

In many countries, the majority of health workers are employed in the public sector. However, there are usually other sources of employment for workers with health-sector skills and qualifications, including the educational sector, NGOs, the military, and the private health sector.

Where these other employers are a source of employment for health workers, and are contributing to meeting population health needs, it is important to include them in health-care labour market analysis and HRH planning. These employers may be competing with the public sector for available health-care personnel, and are both possible destinations for and sources of public sector staff. In some health labour markets there is also what is known as dual practice, where public sector workers, often doctors, also work in the private sector (García-Prado, González, 2007). Giving these key health professionals a second

source of income may be a way of retaining them, but it is important to capture these data accurately in overall labour market analysis and HRH planning so as to avoid “double counting” individual health professionals.

It is also important to take into account any private sector role in the provision of education when conducting labour market analysis on supply inflows. In some countries in the Region (e.g. the Philippines), a significant and growing proportion of the total capacity to train new health workers is located in the private sector. This can increase the supply of newly trained health workers, but may be aimed at training health workers for international labour markets rather than domestic markets, and is sometimes less open to national policy direction and quality control than educational institutions located within the public sector.

## 2.8 HRH mobility and migration

As noted in the introduction to this report, all labour markets are dynamic. New workers join the workforce from training, and from other organizations, sectors and countries. At the same time, current workers leave the workforce, moving to other organizations, sectors or countries; they also retire, or leave because of ill health or death. As discussed earlier, this is normally referred to in HRH planning as ‘stock and flows’. At any one time, there will be inflows of new workers joining the current workforce stock, and outflows of workers leaving the stock. If HRH planning is to be effective, it must be able to assess these flows.

For many countries, the typical mobility pattern of health workers is from rural to urban areas in search of better career prospects, from public to private health sector in search of improved income (if an economically viable private sector exists), from health sector to non-health sectors in search of more attractive career opportunities, and, in some cases, from one country to another country (see Kanchanachitra et al., 2011; Yamamoto et al., 2012).

The issue of international flows, occurring in some cases as a response to international recruitment, and in others as part of broader migratory flows, has received significant policy focus in recent years. These cross-border flows from countries in the Western Pacific Region include flows within the Region, such as from small Pacific states to Australia and New Zealand, and flows elsewhere, such as doctors from Malaysia moving

to the United States of America or the Gulf States. The outflow of skilled workers from the relatively small stocks in some countries has been cited as a significant contributing factor to health worker shortages in a number of Pacific countries (WHO Regional Office for the Western Pacific, 2011). Concern about outflow from developing countries was a factor in the adoption of the 2010 WHO code on the international recruitment of health workers (WHO, 2010b).

However, there are other intra-regional flows that need to be acknowledged and assessed in national and regional labour market analysis. One recent study reported that expatriate doctors in Fiji include, not only those from other Pacific island countries, but also those from Hungary, Myanmar, Nigeria and Pakistan, while doctors and nurses in Palau were recruited from an even more diverse range of countries (Yamamoto et al., 2012). Another example is that of New Zealand. It is not only a major destination for international flows of health workers from countries such as India and the United Kingdom, but also a major source country, with many of its health workers moving to Australia (WHO Regional Office for the Western Pacific, 2011).

Finally, as noted earlier, some countries in the Region, most notably the Philippines, actively pursue a policy of encouraging private sector educational establishments to train staff (mainly nurses) to supply international demand. The flow of these nurses within the Western Pacific Region is to destinations such as Australia and Singapore, but they also migrate to other regions.

## 2.9 HRH performance and productivity

The effective delivery of health services depends, not only on the number of health workers, but also on how they are produced, their level of skills, how effectively they are utilized, and how well they are enabled to deliver services. WHO (2006) has summarized the four dimensions of workforce performance as:

- availability – including both distribution and attendance of existing workers;
- competence – the combination of technical knowledge, skills and behaviour;
- responsiveness – referring to the degree to which people’s needs are met, regardless of their status or the nature of their complaint; and
- productivity – producing the maximum effective health services and outcomes given the available stock of health workers, which includes reducing the waste of staff time or skills.

Labour market analysis can contribute to developing a better understanding of HRH productivity, for example, by measuring staffing costs or activity levels. Key elements in increasing health-worker performance include improving the effectiveness of management, supervisory systems, capacity and performance management processes linked to

training and development; the provision of enabling working conditions and work environments; fair and timely payment of wages; appropriate equipment and infrastructure; and safe and secure workplaces. The evidence also shows that building a motivated and productive health sector workforce contributes to improved recruitment and retention (WHO, 2006).

### 3. A framework for understanding health-care labour markets

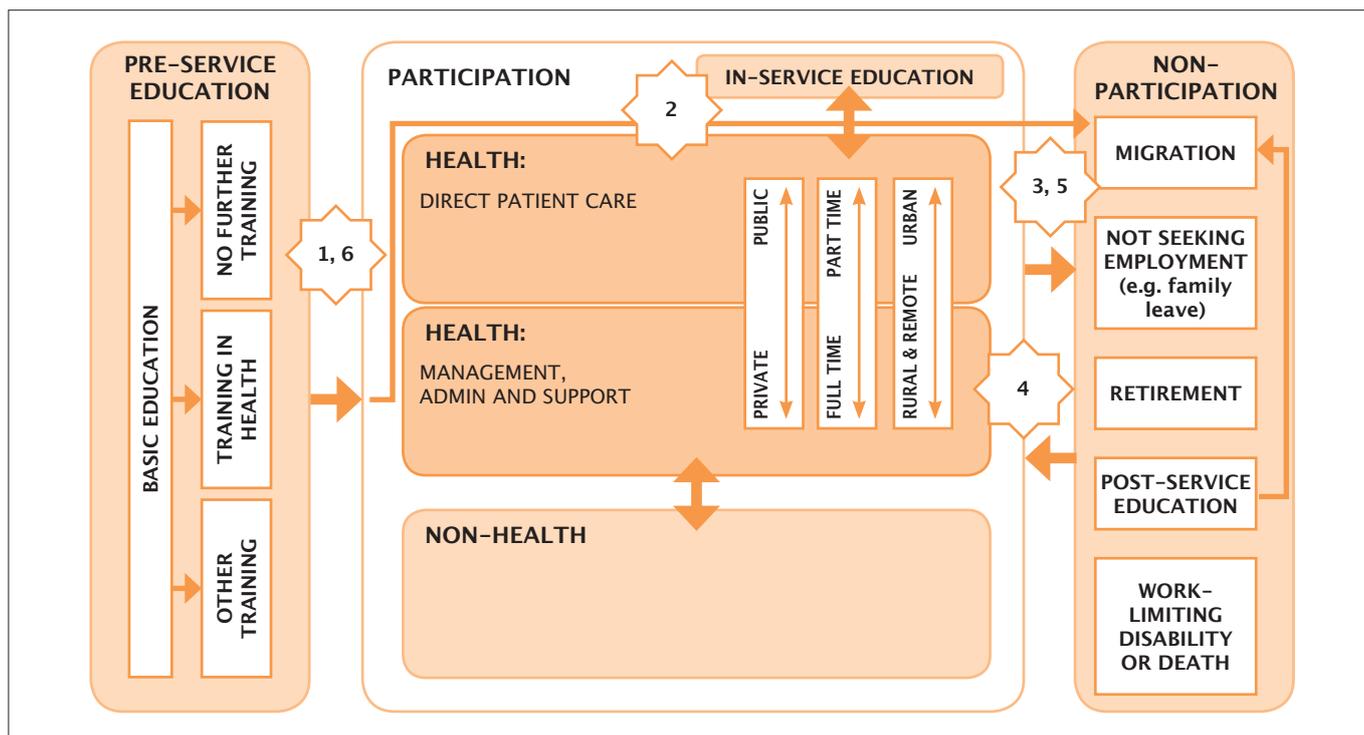
The previous sections set out key HRH aspects where labour market analysis can contribute to developing effective policies and planning, and introduced the concepts of supply and demand, competing demand, and labour market stocks and flows. In this section, an overall framework for health-care labour market analysis is introduced, and illustrative examples of the use of the labour market analysis are provided within the context of this framework.

The framework provides a reference point for policy-makers and planners. It presents a conceptual map of the different flows around the labour market, highlighting the connecting flows with arrows, and

shows the various links and connections that may be open to policy intervention and control. It is shown in Figure 8 which has been developed from previous work by Buchan, Seccombe and Smith (1998), Dal Poz and colleagues (2009), and Vujicic and Zurn (2006).

In Figure 8, the main focal point for HRH planning and policy is the stock of workers participating in the health boxes, either in direct patient care or in management, administration and other support roles. The framework illustrates the flows into and out of the two health workforce boxes, showing where new workers may flow from – from pre-service education, non-health sector jobs, and from ‘not participating’ in

Figure 8. Health labour market dynamics



Source: Adapted and developed from Buchan, Seccombe, Smith (1998), Vujicic, Zum (2006), and Dal Poz et al. (2009).

employment in the country. They may also migrate from other countries, or re-enter the labour market after having been on leave, for example. Outflows from the health sector can include going on to post-basic education or non-health jobs, migrating to other countries, or retiring or leaving because of ill health, etc.

To develop as comprehensive a picture of labour market dynamics as feasible, the aim should be to provide an accurate estimate of the size of the stock, and of the magnitude and trends of the different flows. This will often require looking beyond the health sector for relevant data and information—from other government departments (e.g. immigration, education) as well as from other sources such as professional registers and censuses. More details are given in Annex 1.

Analysis and research can be used at different points in the labour market framework to help identify and delineate the actual size of labour market flows, assess distribution issues, and determine where competitive demand may be a factor.

### 3.1 Case studies

The numbers 1 to 6 on the framework refer to illustrative case studies, drawn from published studies conducted in the Region and beyond, which highlight the scope to focus on specific types of labour market flows, whilst keeping the broader labour market in perspective. These case studies are:

- (1) China: Assessing quantity and distribution of HRH
- (2) Fiji: Identifying flows to other sectors (including out-migration)
- (3) New Zealand: Developing an overview of international HRH migration flows
- (4) Papua New Guinea: National HRH supply and demand.
- (5) Republic of Korea: Identifying the flow of trained health professionals within the labour market
- (6) Thailand: Assessing attrition from the health labour market

Each is discussed in more detail below.

#### **(1) China: Assessing quantity and distribution of HRH**

Data on the nature and size of the flows within the labour market are not always available, but

a systematic analysis of the stocks can enable reasonable inferences about the flows to be developed.

A study on the health-care workforce in China compared new supply inflow data (i.e. training enrolments and outputs) and data on the size of the health workforce. Multiple data sources were used, including data on the number and distribution of doctors and nurses obtained from the Ministry of Health, national census data, and data held by the Ministry of Education on the number of student admissions. The analysis highlighted a number of HRH planning and policy issues, including inequities in access to skilled health workers between rural and urban areas, low-worker density correlating with higher infant mortality. The analysis also showed a large disparity between the number of people qualifying as health professionals and the number in professional practice. The report hypothesized that this indicated that expansion in training had led to an over-supply, which was being absorbed into other occupations. The implications for policy development include a need to re-examine the way that educational resources are allocated, and to improve coordination between the ministries of health and education.

*Source:* Anand et al. (2008).

#### **(2) Fiji: Identifying flows to other sectors (including out-migration)**

Analysing labour market flows can provide valuable information to inform policy development on improved retention.

An analysis carried out in Fiji aimed to gain greater insight into the flow of medical specialists from the public sector to overseas labour markets. The study used data from enrolment and graduation records of the Fiji School of Medicine, from local specialist coordinators and from publicly available registration information in Australia and New Zealand. Semi-structured personal interviews were also conducted with 36 of the Fijian doctors to gather qualitative data. The study found that 48.5% of the Fijian nationals trained at the Fiji School of Medicine were working in the Fijian public sector, 6% were temporarily training overseas, 30.3% had migrated overseas and the rest had remained in Fiji but were not in public sector employment. The interviews with Fijian physicians who had left Fiji revealed a range of reasons for overseas migration, with concerns about political instability and family welfare predominating. For those moving to the Fijian private sector, difficult working

conditions and frustration about career progression in the public sector were also highlighted.

*Source:* Oman, Moulds, Usher (2009).

### **(3) New Zealand: Developing an overview of international HRH migration flows**

The OECD conducted a study of the health professional migration inflows and outflows from New Zealand. The study used a range of data including census, employment, migration and registration data, as well as workforce statistics and health-service information, to assess stocks and international inflows and outflows of physicians and nurses. The key findings were that, out of New Zealand's stock of doctors and nurses, 36% and 24%, respectively, were foreign-trained. The study also found that a significant number of New Zealand-born health professionals were living overseas. The report identified a number of contributing factors to the relatively high international inflow and outflow of health professionals, including the relative ease with which doctors' and nurses' qualifications are recognized in New Zealand, as well as the availability of temporary migration status to address workforce shortages in rural areas. New Zealand was also training proportionally fewer domestic medical graduates than the OECD country average. The report identified a broad portfolio of policies that could be considered in order to reduce the country's potential vulnerability to international competition for health professionals. These included improving salaries and working conditions, further developing different skill-mix approaches, developing policies to encourage return migration, and strengthening links between education and health workforce policy and planning.

*Source:* Zurn, Dumont (2008).

### **(4) Papua New Guinea: A comprehensive national HRH supply and demand assessment, and costed scenarios**

In 2011, national stakeholders and development partners in Papua New Guinea were becoming increasingly aware that the health sector faced an emerging HRH crisis related to staff and skills shortages, inadequate training, and poor HRH data. A comprehensive analytical study of the national health-care labour market was commissioned. The study reported for the first time in a decade on the current stock, age and gender of the health workforce, and on the capacity of health training institutions. It included an analysis of HRH data from a range of

official sources, and a survey of training institutions. The study then developed assessments of supply and demand, used these to present five different costed scenarios for health staff over the next two decades, and identified supply and demand gaps related to these different scenarios. The report concluded that the Papua New Guinea Government's response needed to deal with (1) an "immediate supply side crisis" of under-supply of staff (shortages); (2) address qualitative inadequacies in current staff training; and (3) introduce incentives to attract staff to rural areas. The study report concluded "drastic short- and long- term steps must be taken to remove health human resources as a major long-term constraint on the health sector's capacity to deliver better health services" (World Bank, 2011:xvi).

*Source:* World Bank (2011).

### **(5) Republic of Korea: Identifying the flows of trained health professionals within the labour market**

Analysing the flows in the labour market can provide valuable information about turnover, as well as some of the factors that can contribute to it.

An example of this is a 'survival analysis' of nurse graduate employment conducted in the Republic of Korea. Data from a general survey, the Graduates Occupational Mobility Survey, were used to map the actual turnover patterns and the duration of nurse graduates' first jobs after graduating. This information was used to develop a survival curve, which estimates the probabilities of graduate nurses staying in their first job for one, two and three years. Factors analysed as part of this process included those related to individual and family characteristics, nursing education, hospital characteristics and overall job satisfaction. The study estimated that the probability of nurse graduates staying in their first job for one year was 0.823, for a second year was 0.666, and for the third year was 0.537.

The study authors found that both hospital characteristics and job satisfaction had a significant impact on turnover. They concluded that improving job satisfaction through measures such as promoting better interpersonal relationships, as well as improving work content and the physical work environment, could reduce high turnover rates.

*Source:* Cho et al. (2012).

## **(6) Thailand: Assessing attrition from the health labour market**

Analysis of broad trends in the national labour market can support HRH policy-making at the national level.

Using information derived from census data, one such macro-level analysis examined changes in the number of health workers over time in Thailand. Dal Poz and colleagues (2009) used census data from 1990 and 2000 as two points in time, to identify the changes in the stock (number) of male and female health workers in Thailand. The data were categorized by gender and age. The analysis highlighted significant gender differences in the outflow (attrition) from the stock, the level of attrition being much greater for males across all age groups. While it was not possible to interpret from this dataset the reasons behind the losses, it did pose questions for HRH policy-makers and planners about the way the labour market was operating, which would inform efforts to reduce the outflows.

*Source:* Dal Poz et al. (2009).

### **3.2 Policy and planning benefits of using the labour market framework**

The above six case studies give some sense of the scope to apply labour market analysis within the overall framework in order to help shape and inform HRH planning and policy. They also highlight that the scope for policy intervention will not always be solely within the health sector. Whilst some flows can be managed or adjusted by policy intervention in the health sector, others will be open to policy intervention from other government departments, such as education or immigration, and from other stakeholders. Using the framework can also highlight that policy efforts at one part of the framework may require policy support in other areas, or may have impact and knock-on effects elsewhere.

For example, a policy intervention to increase the numbers of nurses in pre-service training in health (Figure 8, left-hand middle box) with the objective of increasing the number of nurses employed in the public sector may not be effective if the supply (flow) of suitably qualified candidates from basic education is insufficient. The case study from the Republic of Korea shows the benefit of assessing the likely attrition patterns from first employment, so as to develop a better understanding of how sustainable the

inflow from education is, and what level of training intake is required to meet anticipated demand.

HRH policy-makers and planners will need to develop a full overview of the framework, which covers the magnitude of flows from pre-service training, the levels of participation in various sectors, and the level of flows to and from the various types of non-participation. If a complete picture is not developed, there are two major risks. Firstly, that HRH planning will not take full account of the actual and net effect of the different inflows and outflows and will, therefore, be based on inaccurate estimates and assumptions. Secondly, that without a clear understanding of the profile of the current stock in the health sector, the magnitude of flows, reasons for flows, and sources and destinations of flows, HRH policies will not be informed by evidence, will not be aligned with labour market dynamics and will, therefore, be less likely to be relevant or effective.

The main recent HRH focus in many countries has been to try to address shortages by scaling up the workforce. The most commonly considered area for possible policy adjustment is often the 'training in health' box (Figure 8, left-hand middle box), with a decision to either train more or fewer new workers: in other words, to adjust the inflow from training and education. However, policy-makers will need to be clear that this intervention, if based only on a reliance on increased flow from education, will have a time lag, and cost implications—it can take four years for a new nurse to be trained and enter the labour market; it may take 10 years or more for a medical specialist to be trained. The scope to use costed scenarios, as illustrated in the Papua New Guinea example, should be assessed when a change in the size of the inflow from the education sector is the focus, so as to develop a better understanding of realistic policy options.

Another policy option adopted by some countries has been to recruit workers with appropriate skills from other organizations, sectors or countries. This can be a more rapid policy solution, but will require an understanding of workforce availability in these sectors and the costs involved, as well as the identification of the cost-effectiveness and competitiveness of recruitment policies and sources. Other interventions can include attempting to reduce outflow, for example, by developing more effective HRH retention policies, such as was suggested in the New Zealand study, or by adjusting retirement policies. There may also be the possibility of focusing on

improving the productivity of the current workforce stock by changing the skill mix, and by developing new working methods and patterns.

The benefit of being able to undertake labour market analysis is that policy-makers can develop a clearer understanding of their realistic HRH policy options, and of the costs and implications of implementing these options. The relative effect of the different flows

and trends in inflow and outflow can be assessed. Policy-makers can identify where they have scope to adjust or change policies to achieve a better balance of supply of and demand for health personnel, a better aligned linkage between education and employment, a more effective “bundle” of recruitment and retention strategies, and a more productive workforce. Labour market analysis should be an integral part of any approach to HRH policy and planning.

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# Annexes

## Annex 1. Sources and resources

### Developing a more detailed understanding of labour market concepts

This report has set out the main issues that policy-makers should consider in developing a better understanding of the dynamics of health-care labour markets. For a more detailed review of the economic and labour market theories that underpin labour market analysis in the health sector, a useful source is the WHO Observer, Issue 11 (Scheffler, Bruckner, Spetz, 2012). This provides examples of the application of economic theory to different aspects of health-care labour markets. Another helpful source that sets out the underlying concepts and emphasizes the need to consider the dynamics of health-care labour markets in developing appropriate policies is Vujicic and Zurn (2006).

### Labour market data

This report has highlighted that a range of data sources should be considered in developing a well informed policy approach. It has also emphasized that different aspects of labour market dynamics, and different labour market policy questions may require different types of data, information and analysis. The first step in any labour market analysis should be to review available data to identify what can be made available, and therefore can be analysed and ‘understood’ about labour market dynamics, and also to be clear about any critical information gaps. New data collection, and primary research, may be required to fill the gaps, but should only be undertaken as a last resort, given the resource implications in developing new datasets or undertaking one-off studies.

An audit of available data, and data sources, should cover not just the health sector or the ministry of health. It is likely that other sectors and government departments (e.g finance, education, immigration) will hold information relevant to national-level labour market analysis. The aim should be to identify the minimum national dataset required to support all key aspects of health workforce planning and HRH policy, including labour market analysis, and work collectively to achieve this. Narrowly focused analysis or one on a single issue may be required to inform policy-makers about a specific pressing labour market challenge, but the long-term aim

should be to have systematic regular analyses, not isolated one-off approaches covering different HRH issues.

For more discussion on the need to develop various HRH indicators, including those that will support stock and flow analysis, which indicators are most useful for which purposes, and how they should be analysed and interpreted, see the WHO/World Bank/USAID *Handbook on monitoring and evaluation of human resources for health* (Dal Poz et al., 2009). See also Diallo and colleagues (Diallo et al., 2003) for more discussion and analysis of which data sources can be checked for different types of HRH and labour market analysis.

Examples of the types of labour market data that should be considered include:

- population and related statistics (e.g. census data)
- economic activity
- employment
- employment effects of technical change
- unemployment
- vacancies
- educational supply: school leavers, further education, graduates
- qualified workforce
- training
- travel to work
- local labour market studies
- labour mobility
- absence
- working hours/time
- labour turnover
- labour shortages
- earnings
- labour costs and productivity.

*Source:* adapted from Meager et al. (1990).

Data availability will vary in different countries and systems, but a starting point should be to conduct a broad-based audit of sources, recognizing that some relevant data will be held by other institutions and government departments, as well as by other sources such as in professional registration data, tracer studies of graduates from the education sector, etc.

## Tools and techniques for labour market analysis

There are several online sources to access relevant HRH planning and policy support tools. WHO provides access to a range of such tools at the online HRH resource centre (<http://www.who.int/hrh/resources/en/>) and a broader range of reports, publications and tools can be searched at the HRH Global Resource Center (<http://www.hrhresourcecenter.org/>). A third source for reports and tools focusing on nursing workforce and labour market issues is the International Centre for Human Resources in Nursing (<http://www.icn.ch/pillarsprograms/international-centre-for-human-resources-in-nursing-ichrn/>).

### Flow measures

#### *Turnover rate*

The most commonly used measure of staff flow is turnover, which looks at the outflow as a proportion of the stock of the workforce, usually on an annual basis. Sometimes referred to as the crude turnover rate or separation rate, it is calculated by:

$$\frac{\text{total number of leavers during the time period}}{\text{average number of workers in time period}} \times 100/1.$$

#### *Stability rate*

This is a measure of retention—it calculates the proportion of a workforce that remains in the organization for a specified period of time. Once measured over several time periods, it can give a record of variations in relative retention rates of different cohorts or parts of the organization. It is calculated by:

$$\frac{\text{number of workers at the start of the time period who remain at the end of the period}}{\text{number of workers at the start of the period}} \times 100/1.$$

Other, more complex measures include the survival rate/survival function, and median survival. For more details of the definition and use of flow measures, see Dal Poz et al. (2009); Buchan (2010); and Russell, Humphreys, Wakerman (2012).

### Distribution/concentration measures

The health workforce to population ratio or similar ratio measures (e.g. doctors to inpatients, nurses to occupied beds) are the most commonly used

type of indicator of availability, distribution or supply. When compared across regions (e.g. urban-rural), organizations, sectors (e.g. public-private) or countries, it can give an indication of variations in levels of availability, and differences in staff mix.

In addition, there are economic analytical techniques that can be applied to determine the extent to which there is an inequitable distribution of a specified type of health worker in comparison to population distribution. These analytical approaches may not be used regularly in the health system but, over time, they can be used to track progress towards specified targets of improved distribution of health workers. These include the Lorenz curve ([http://en.wikipedia.org/wiki/Lorenz\\_curve](http://en.wikipedia.org/wiki/Lorenz_curve)) and the concentration index.

The Gini coefficient ([http://en.wikipedia.org/wiki/Gini\\_coefficient](http://en.wikipedia.org/wiki/Gini_coefficient)) is one indicator that can be used to assess the extent to which the distribution of a type of health worker is equitable across regions, using, for example, a rural-urban scale based on population density. It is a technique also used to assess other types of inequitable distribution. Kanchanachitra and colleagues used Lorenz curves to illustrate geographical distribution of doctors and nurses in Cambodia, the Lao People's Democratic Republic, the Philippines, Thailand and Viet Nam, and also applied Gini coefficient analysis to doctors and nurse densities in the Philippines, Thailand and Viet Nam (Kanchanachitra et al., 2011). The World Bank report on labour markets and geographical imbalances in Africa (Lemiere et al., 2011) is a helpful source of more detailed information on applying these techniques in labour market analysis.

### Labour market behaviour; health workforce motivations and preferences

Labour market dynamics reflect the aggregate effect of the behaviour of individual workers—individuals make voluntary decisions, e.g. to move between jobs, leave the country, move from full-time to part-time work, etc. They are also subject to “involuntary” changes, e.g. statutory retirement, ill health or death. At the aggregate level, these patterns of change and mobility can be major challenges for policy-makers, particularly if there is an unanticipated shift in the magnitude or direction of a flow—if, for example, there is a sudden increase in outflow of nurses because there are attractive career prospects in another country, or because the number of new graduates entering the labour market has grown so that it exceeds available vacancies. Early warning of the changes, as well as an

understanding of the drivers for change, will assist policy-makers in addressing their impact.

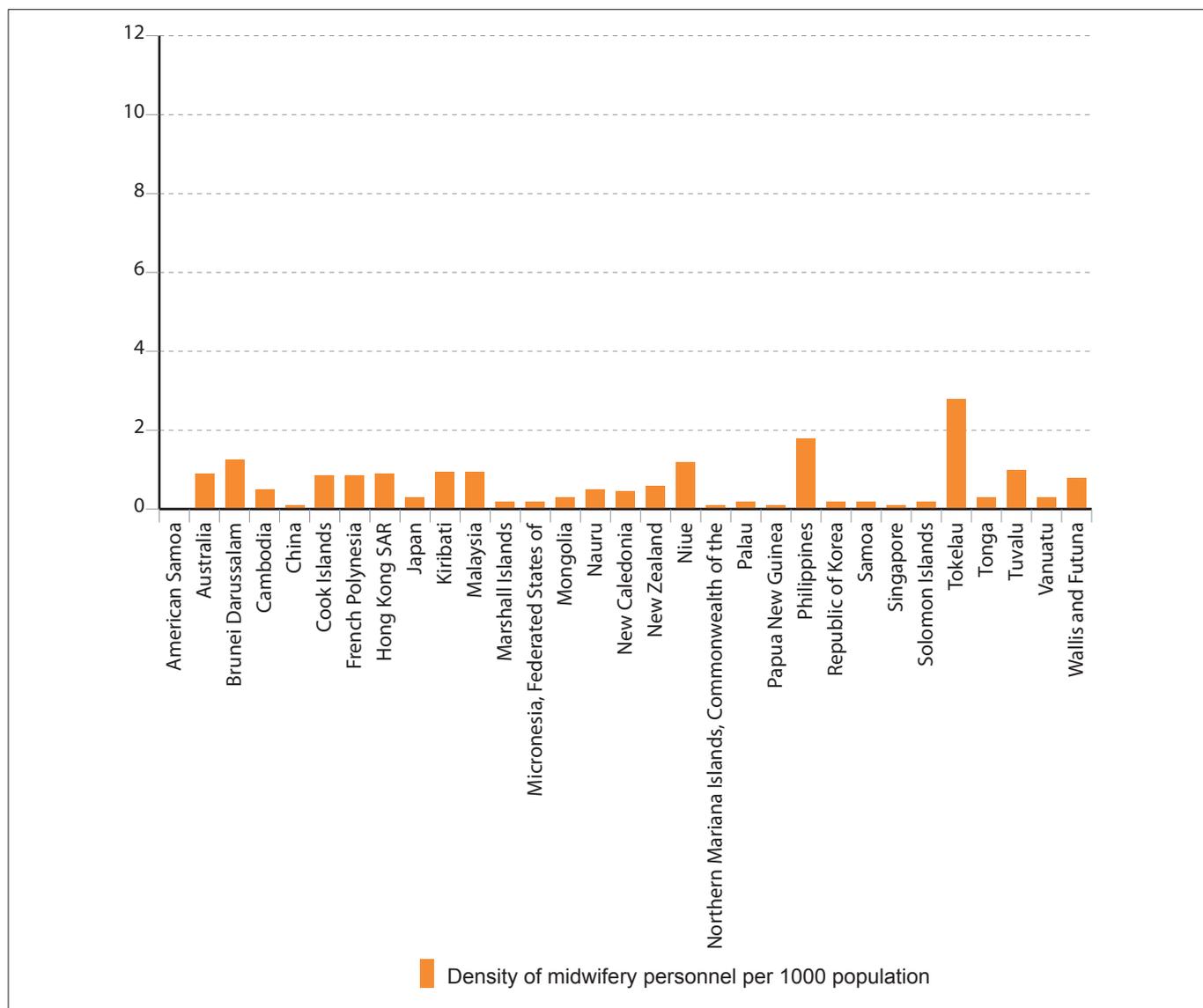
Policy-makers also need to be confident that their policies on employment, retention and motivation will align with health workers' needs and preferences, insofar as they are feasible given resource constraints. There is, therefore, a place for the use of staff surveys and focus groups to ascertain health workers' profiles, priorities and preferences. Information generated from this type of research can test the appropriateness and "fit" of current policies, as well as provide some guidance on the priorities for the development of any new policies.

The *CapacityPlus* website (<http://www.capacityplus.org/>) and the International Centre for Human Resources in Nursing (ICHRN) website (above) give access to a range of research studies based on surveying health workers about their work, work ambitions and work places, in countries in the Region and elsewhere. One recent example is a survey of health workers in Papua New Guinea (Razee et al., 2012). Another tool that has been developed to help delineate policy options when examining health workers' preferences in relation to motivations and retention is the 'discrete choice experiment'. See Mangham, Hanson, McPake (2009) for a review. For an example of the application of a discrete choice experiment in HRH in the Lao People's Democratic Republic, see Jaskiewicz et al. (2012).

## Annex 2. Countries and areas of the Western Pacific Region

American Samoa	New Caledonia
Australia	New Zealand
Brunei Darussalam	Niue
Cambodia	Northern Mariana Islands, Commonwealth of the
China	Palau
Cook Islands	Papua New Guinea
Fiji	Philippines
French Polynesia	Pitcairn Islands
Guam	Republic of Korea
Hong Kong SAR	Samoa
Japan	Singapore
Kiribati	Solomon Islands
Lao People's Democratic Republic	Tokelau
Macao SAR	Tonga
Malaysia	Tuvalu
Marshall Islands	Vanuatu
Micronesia, Federated States of	Viet Nam
Mongolia	Wallis and Futuna
Nauru	

### Annex 3. Additional figures: Health workforce density, Western Pacific Region



Annex 3 (cont.)

