



# UNDERSTANDING THE LABOUR MARKET OF HUMAN RESOURCES FOR HEALTH IN ZAMBIA

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## **Abstract**

Universal health coverage depends on having the necessary human resources to deliver health care services. Zambia is among the African countries currently experiencing a crisis in the area of human resources for health (HRH). The major causes of the crisis include inadequate and inequitable distribution of health workers; high vacancy rates; insufficient education capacity to supply the desired levels of health workers needed by the market, inadequate wages and working conditions to attract and retain people into health work, particularly in rural underserved areas. This shortage affects most of the available health worker categories. The shortage and maldistribution of health workers stems from various labour market and governance factors, including an exodus of trained professionals to other countries in Africa and elsewhere. This document provides an overview of the HRH labour market in Zambia, highlighting the importance of a comprehensive approach to understanding the driving forces that affect the supply and demand for health workers, in order to provide a basis for developing effective HRH policies that can contribute to progress towards universal health coverage.

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## **1. Introduction**

Universal health coverage is defined as ensuring that all people can use the promotive, preventive, curative, rehabilitative and palliative health services they need, of sufficient quality to be effective, while also ensuring that the use of these services does not expose the user to financial hardship (WHO, 2010). Three major goals of universal health coverage have been clearly outlined: (1) equity in access to health services – those who need the services should get them, not only those who can pay for them, (2) that the quality of health services is good enough to improve the health of those receiving services, and (3) financial-risk protection – ensuring that the cost of using care does not put people at risk of financial hardship. An integral part of universal health coverage, however, remains the human resources for health that deliver health care services, without whom its success cannot be guaranteed (Sousa et.al., 2013). Human resources for health (HRH) include public and private sector doctors, nurses, midwives, pharmacists, technicians and other paraprofessional personnel, as well as untrained and informal-sector health workers, such as practitioners of traditional medicine, community health workers, and volunteers (WHO, 2006).

Zambia, like many countries in sub-Saharan Africa, has a shortage of human resources for health. This shortage affects most of the available health worker categories. The consequences of this shortage are aggravated through the inequitable distribution of health care workers in urban and rural areas.

Besides the workforce shortage and distribution problems, the health labour market in Zambia also has problems of inefficiency. Efficiently using the existing health care workforce by increasing the productivity and performance of the health workers should therefore be an important dimension of ensuring improved health outcomes (Scheffler, Bruckner & Spetz, 2012).

This case study on Zambia aims to highlight the importance of adopting a comprehensive approach to understanding the driving forces that affect the supply and demand of health workers in order to provide a basis for developing effective human resources for health policies that can facilitate the success of universal health coverage.

## 2. Context of the country

The population count from the preliminary results of the 2010 Census of Population and Housing for Zambia was 13 046 508 as of October 2010. Of these, 49% were male and 51% were female. Zambia's population grew at an average annual rate of 2.8% during 2000–2010 and 2.4% during 1990–2000.

Zambia is a lower-middle-income country in southern Africa with a gross domestic product (GDP) in current US dollars of US\$ 19.2 billion (2011). With a population of 13.0 million in 2010, it has a GDP per capita (corrected for purchasing power parity) of US\$ 1425 (World Bank, 2012). Expenditure on health as a percentage of GDP is 5.89% (WHO, 2012). Table 1 shows recent trends in Zambia's key economic and social indicators.

Table 1. Trends in key economic and social indicators, Zambia, 2000–2011

|                                    | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010  | 2011 |
|------------------------------------|------|------|------|------|------|------|------|------|------|------|-------|------|
| GDP <sup>1</sup>                   | 3.2  | 3.6  | 3.6  | 4.3  | 5.4  | 7.3  | 10.7 | 11.5 | 14.7 | 12.2 | 16.19 | 19.2 |
| Real GDP growth rate (%)           | 3.6  | 4.9  | 3.3  | 5.1  | 5.4  | 5.2  | 5.8  | 6.2  | 6.2  | 5.7  | 7.6   | 5.9  |
| Inflation rate (%) <sup>2</sup>    | 30.1 | 18.7 | 26.7 | 17.2 | 17.5 | 15.9 | 8.2  | 8.9  | 16.6 | 9.9  | 11.7  | 13.5 |
| Poverty incidence (%) <sup>3</sup> |      |      |      |      | 68   |      | 62.8 |      |      |      | 60.5  |      |

Note: <sup>1</sup> in billions of current US dollars. <sup>2</sup> Annual. <sup>3</sup> Percentage of population.

Source: World Bank (2012).

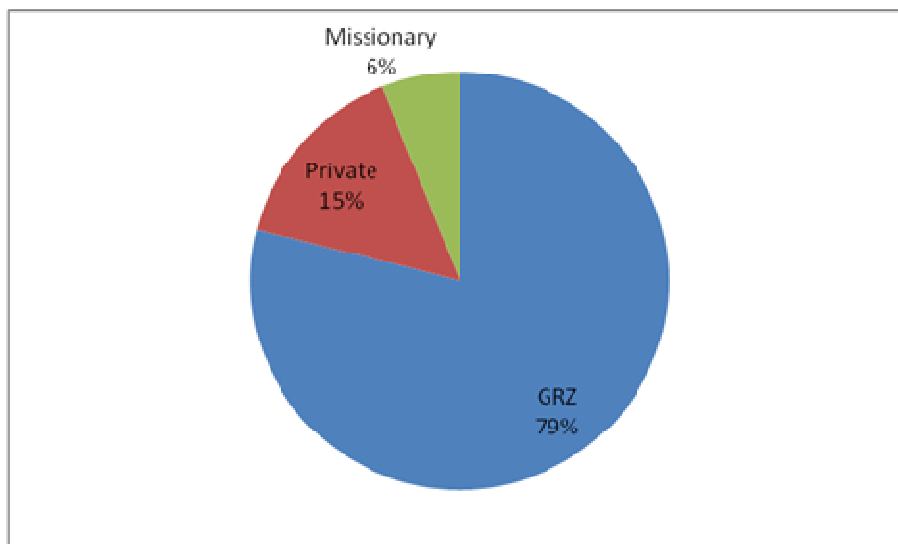
Zambia remains one of the poorest countries in the world, with about 60% of its population living below the national poverty line and 42% living in extreme poverty (Central Statistical Office, 2011). The mortality rate of people younger than five years old is 46 per 1000 live births (WHO, 2012).

The country is facing an epidemiological transition toward a dual disease burden. Although communicable diseases such as HIV, tuberculosis and malaria have had major effects on the health of the population, an increasing prevalence of noncommunicable diseases has been reported, predominantly caused by changes in demographic, behavioural and social trends as well as large-scale population shifts from rural to urban areas. The country's huge disease burden is partly attributable to poverty, inequity, inadequate food, poor environmental health and sanitation and limited promotion of healthy lifestyles and prevention techniques.

## 2.1 Health system

In the formal health sector, the government is the main provider of health care services and has 1490 health facilities countrywide, representing 79% of the total health sector. There are about 272 private health facilities (15%) and 121 missionary health facilities (6%) (Fig. 1) (Ministry of Health, 2011). The public health market, which is the focus of this study, is the main health market actor in Zambia.

Fig. 1. Share of health sector facilities in Zambia, 2011



Source: Ministry of Health (2010).

In the formal health sector, the lowest-level facility is a health post, intended to cater for populations of 500 households (3500 people) in rural areas and 1000 households (7000 people) in urban areas or to be within a five-kilometre radius for sparsely populated areas. The next level is the health centre. Urban health centres are intended to serve a catchment population of 30 000 to 50 000 people. Rural health centres are intended to serve a catchment area of a 29-kilometre radius or a population target of about 10 000 people.

## 2.2 Institutional context

The government has demonstrated strong commitment to addressing the country's human resources for health challenges. This is reflected in Zambia's Poverty Reduction Strategy Paper 2001–2004 (Ministry of Finance and National Planning, 2002), Fifth National Development Plan 2006–2010 (Ministry of Finance and National Planning, 2006), Sixth National Development Plan 2011–2015 (Ministry of Finance and National Planning, 2011a), the revised Sixth National Development Plan, 2013–2016 (Ministry of Finance and National Planning, 2011b), the 2006–2010 National Health Strategic Plan (Ministry of Health, 2005a) and more specifically, in the 2006–2010 Human Resources for Health Strategic Plan (Ministry of Health, 2005a), the Strategic Plan for Human Resources for Health 2011–2015 (Ministry of Health, 2011) and the National Training Operational Plan 2013–2016

(Ministry of Health, 2012b). These policy documents and plans establish national health priorities and formulate health workforce policies based on the evaluated needs of the national population. However, as Scheffler et al. (2008) posit, “needs-based approaches” are not sufficient to formulate effective policies since they ignore the dynamics of the labour market for health workers. Effective policies for dealing with the challenge of human resources for health in Zambia must therefore rest on a good analysis of the health labour market to understand factors influencing both the demand and supply of health care workers (Sousa et al., 2013).

### **3. Framework for the health labour market**

This section summarizes Scheffler, Bruckner & Spetz (2012) to understand the dynamics of the health labour market.

Assessing the health labour market requires studying both the demand and the supply sides and how to match them to determine whether there are or will be shortages (or surpluses) of health workers.

The supply of health workers includes the number of qualified health workers (physicians, nurses and other care providers) willing to work at a given wage rate in the health care sector. Thus, training is a key determinant of this part of the labour market. The number of trained health workers depends on training institutions, the number of years of training, the education level, the cost of training, the individual interest in working in that field, the expected probability of getting a job after training, etc. It is linked to the market for training health workers.

The demand for health workers, which is linked to the demand for health care, is measured by the hiring of human resources for health by public and private institutions. Each of these institutions compete, with different wage rates, budgets, provider payment practices, labour regulations and rules that determine hiring and wage decisions.

In general, the higher the wage, the larger the number of available health workers willing to work for the health sector. Additional considerations, including better working conditions, safety and career opportunities, will also determine the decision to work in that sector, to work in another sector or to migrate.

The interaction between the supply and demand for health workers determines the wages and other compensation, the number of health workers employed, the number of hours they work, the geographical location and their employment settings.

## **4. Data**

Following Scheffler, Bruckner & Spetz (2012), time-series data for Zambia for 2007–2011 were compiled to investigate the factors that determine the supply and demand of health workers. This involved collecting and analysing data on the number of health workers and the hours they work by sector, health occupation, skills mix, sex, age and location, graduates of training programmes and outward migration. Further, the hiring of health workers by government and vacancy rates were measured. Data on wages and other non-wage compensation paid to health workers as well as on comparative wages paid to teachers and lawyers in the public market were also compiled and analysed. The main sources of data were official statistics from the Ministry of Health, Ministry of Finance, the Health Professionals Council of Zambia, the General Nursing Council of Zambia, the Zambia Union of Nurses Organisations and training institutions.

## **5. Analysis of the health labour market**

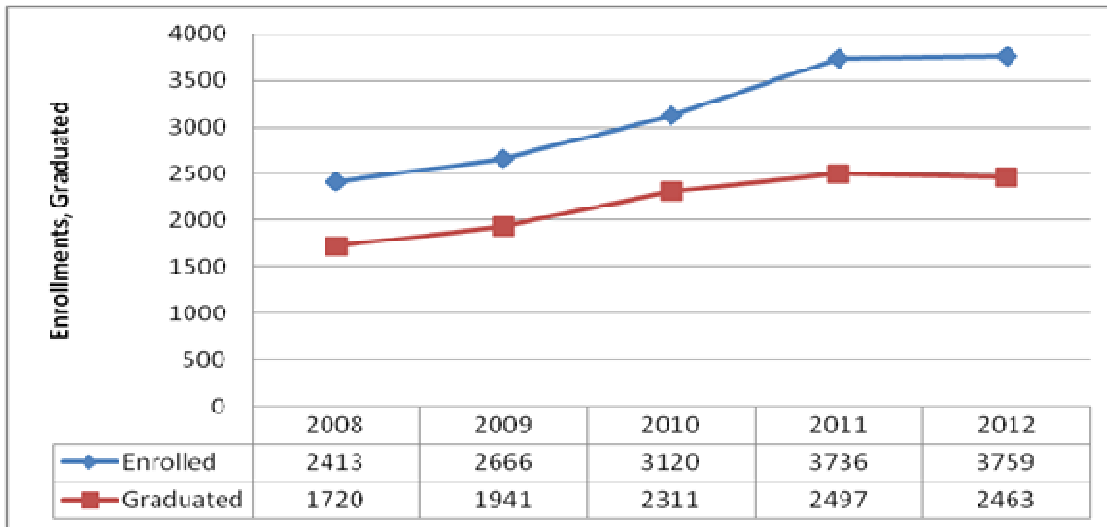
### **5.1 Production**

During the past five years, the Ministry of Health has implemented several initiatives that have led to a steady increase in the number of graduates per year from health-related training programmes. Overall, about 39 health training institutions in Zambia offer various programmes. In an effort to quantify the infrastructure needs of Zambia's training institutions, the Ministry of Health comprehensively assessed the 39 public, mission and private training institutions in Zambia in June 2008. Based on the findings, the 2008 National Training Operational Plan was developed. The Plan defined the infrastructure, faculty and equipment needs of each training institution. The National Training Operational Plan estimated that the annual enrolment of health-related students could be increased from 1900 to 3700 by 2012. Nevertheless, this could only be achieved through substantial funding support from government. However, because of limited funding, the 2008 National Training Operational Plan has not been fully implemented, and training institutions continue to face considerable infrastructure constraints impeding the ability to substantially increase intake.

Overall, several training institutions have started new programmes and increased the numbers of students enrolled in and graduating from health care training institutions nationwide (Fig. 2). Since the average training programme lasts 2–3 years, the number of graduates lags from the time of enrolment. The number of annual graduates increased from 1101 in 2005 to 2311 in 2010, representing an increase of 110% (Ministry of Health, 2011). These figures include graduates from public, mission and private training institutions.



Fig. 2. Medical students enrolled and graduated in Zambia, 2008–2012



Source: Ministry of Health (2012b).

However, the high attrition rates (averaging 30% annually) between those enrolled and graduating remain a major impediment to ensuring a sufficient flow of health workers into the health labour market and to ensuring adequate competence levels. The physical capacity of training institutions, while improving, remains inadequate. A major problem is student accommodation, which remains inadequate in most training institutions (Herbst et al., 2011). Most schools have overcrowded, unsafe and unhealthy living conditions. Hostels are run down and need basic repairs. In many schools, the number of students enrolled and housed far exceeds the capacity of student hostel blocks. Besides, while classrooms, libraries, kitchens, dining halls, and other infrastructure differ in quality across schools, these facilities remain inadequate, leading to higher attrition rates.

In addition, the increase in enrolments and programmes has far outpaced the number of teaching staff. The average lecturer-to-student ratio is 1:35, and the clinical instructor-to-student is 1:105, versus the recommended 1:20 and 1:10, respectively (Ministry of Health, 2011). The challenge of teaching staff is, therefore, another dimension to the human resource for health crisis in Zambia. The shortages in the teaching staff are attributed to several factors that include few numbers qualifying from the existing workforce, brain drain from migration and increased enrolment in existing training institutions.

Key policy initiatives by the Ministry that have precipitated the increase in the number of graduates include the deliberate policy to encourage private-sector participation in preservice training; reopening closed public training institutions; increasing the number of scholarships for in-service training programmes; supplementing fees for preservice training in public service training institutions; providing financial retention incentives for teaching staff; reviewing and updating the National Training Operational Plan of 2008 to increase classroom and bed space for students; establishing the Ndola School of Medicine for training physicians and dental surgeons; increasing the number of trained nursing and midwifery tutors; and increasing basic science lecturers and clinical sciences lecturers through the Nursing Education Partnership Initiative and the Medical Education Partnership Initiative.

Additional initiatives to increase the production of new health workers have included upgrading the level of training (new degree programmes launched or projected, such as a BSc in Nursing), facilitating direct access to diploma-level specialist training (such as clinical officer, psychiatry midwifery and mental health nursing), creating new cadres to formalize task delegation from higher-level cadres (such as dispensers, counsellors and licentiates) and informal task shifting. In early 2001, Zambia's law was amended to authorize nurses to prescribe and to insert drips (Ferrinho et al., 2011). Among the main incentives encouraging entrance to health training schools is that the health sector guarantees better paying employment in the face of high unemployment rates in the country. The Ministry of Health has a deliberate policy to recruit all graduates from schools every year.

In 2010, the Ministry of Health developed a National Community Health Workers Strategy. The strategy defines training of community health assistants for a period of one year. The strategy will be rolled out in four phases, which started in June 2011, with the intake of a pilot class of 311 community health assistants and a planned expansion of up to 5214 in phase 4. The pilot class will inform decision-making for the national scale-up. The newly established Ndola Community Health Assistant Training School is hosting the first pilot training programme on the grounds of Ndola Central Hospital. Admittedly, enrolled nurses are the most prevalent type of health worker in Zambia. However, the impact of shortages and imbalances, reflected in high vacancy rates of personnel in Zambia, associated with imbalances between provinces, levels of care and in the mix of cadres, has necessitated training community health assistants to complement the nursing cadre.

## **5.2 Number of health workers**

This study focuses on the public market, the government being the main actor on the formal health market, providing 79% of the health care services. In December 2011, Zambia had 18 397 (Table 2) active health care workers employed in the public market, or 1.24 public service health workers per 1000 population. From 2007 to 2011, the number of health care workers in the public market increased from 12 780 to 18 397. This improvement in the number of health professionals is largely attributed to increased training output and recruitment of foreign nationals.

To mitigate the shortage of health care workers, foreign nationals and volunteer community health workers support health facilities. Since the current annual production of physicians is too low to meet the country's need, the Ministry of Health has appointed expatriate physicians throughout the country to alleviate the shortage. About 30% of the physicians serving in Zambian health facilities are foreign nationals (Ministry of Health, 2011). Untrained volunteer health workers also play an important role in providing community-level health services.

In the past, untrained volunteer health workers were being provided with short-term (two weeks to three months) training by government and international cooperating partners and employed throughout the country. In an effort to formalize this health cadre and provide government oversight and standardization, the Ministry of Health has now developed and began implementing the Community Health Assistant Strategy. The strategy will be rolled out in phases, the first of which has been a pilot phase, effective June 2011. The pilot will generate evidence and learning to inform a national scale-up.

### 5.3 Health workers by category

All types of health care workers increased in numbers during 2007–2011, except radiation technologists and X-ray cadres, which decreased slightly (see Table 1 in the Annex). The increase in supply was more pronounced for medical licentiates (65%), pharmacy personnel (48%) and laboratory technologists (45%) (Table 2 and Fig. 3).

Incidentally, the density of health workers (per 1000 population) was 1.24 in 2011. The density of physicians in 2011 was 0.08 per 1000 population, and the density of nurses and midwives was 0.81 per 1000 population (Ministry of Health, 2011).

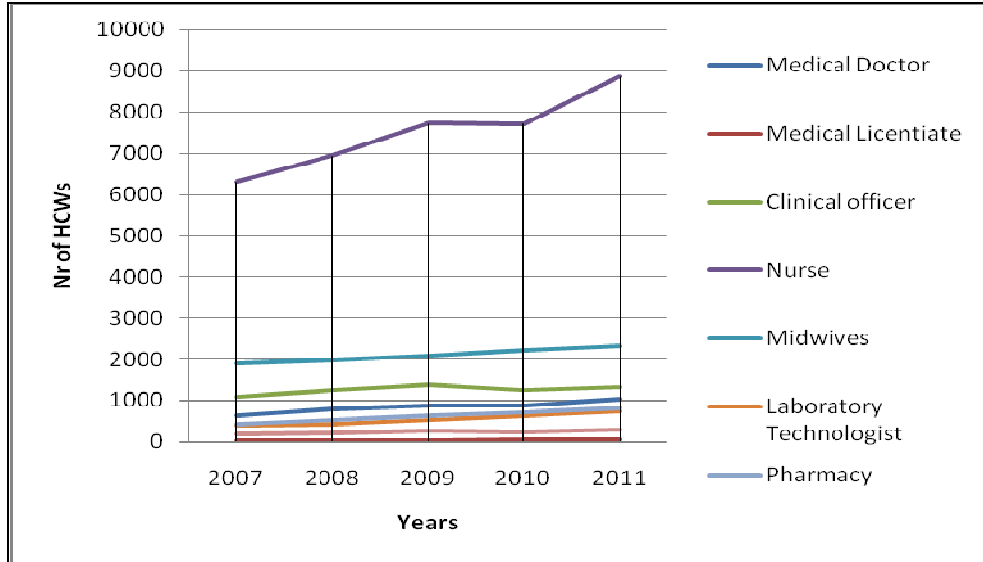
Table 2. Public market supply of health care workers for selected occupations, 2007–2011

| Cadre                    | 2007   | 2008   | 2009   | 2010   | 2011   | Net change,<br>2007–2011<br>(%) |
|--------------------------|--------|--------|--------|--------|--------|---------------------------------|
| Physicians               | 639    | 783    | 864    | 882    | 1 024  | 38                              |
| Medical licentiates      | 23     | 23     | 33     | 65     | 67     | 66                              |
| Clinical officers        | 1 092  | 1 248  | 1 384  | 1 238  | 1 328  | 18                              |
| Nurses                   | 6 308  | 6 937  | 7 726  | 7 711  | 8 859  | 29                              |
| Midwives                 | 1 910  | 1 997  | 2 089  | 2 218  | 2 334  | 18                              |
| Laboratory technologists | 402    | 440    | 541    | 625    | 743    | 46                              |
| Pharmacy                 | 421    | 521    | 626    | 704    | 818    | 49                              |
| Dentistry                | 201    | 215    | 256    | 255    | 288    | 30                              |
| Others                   | 1 784  | 1 953  | 2 293  | 2 615  | 2 936  | 39                              |
| Total                    | 12 780 | 14 117 | 15 812 | 16 313 | 18 397 | 31                              |

Others include: anaesthesiologists, clinical instructors, clinical officers, entomologists, environmental technologists, epidemiologists, health centre in-charge, hospital administrators, lecturers, medical physicists, nutritionist technologists, obstetricians, occupational health technologists, orthopaedic technologists, others, parasitologists, pathologists, physiotherapists, physiotherapy technologists, psychiatrists, psychologists, public health officers, radiation technologists, radiography technologists, tutors, ultrasonographers and X-ray technicians.

Source: Ministry of Health (2012a).

Fig. 3. Numbers of health care workers in Zambia, 2007–2011

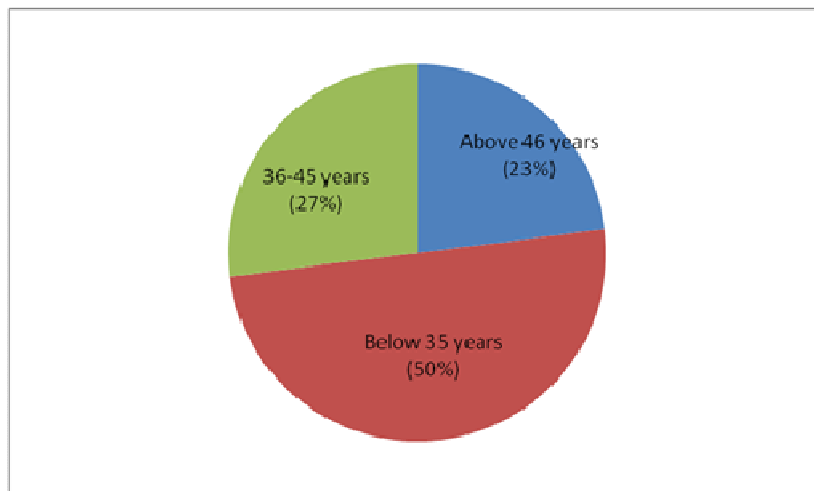


Source: Ministry of Health (2012).

#### 5.4 Health workforce by age

In December 2011, the age profile of health care workers in Zambia indicated that about 50% were younger than 35 years, 27% were 36–45 years old and 23% older than 46 years (Fig. 4). The average health care worker in Zambia is younger than 35 years and has graduated from medical school in the past 10 years. Most midwives, however, were more than 46 years old (Table 3). More specifically, more than half the midwives currently employed in the public market in Zambia are older than 46 years. This means that about half the midwives could retire in the next decade and introduce another dimension to the shortage of health care workers in Zambia. Deliberate policy intervention to encourage the enrolment of young students in midwifery schools and ensure absorption in the labour market (such as incentives and funding vacancies) will need to be designed and implemented.

Fig. 4. Age profile of health care workers in Zambia, 2011



Source: Ministry of Health (2012a).

Table 3. Age structure of health care workers in the public market in Zambia, 2011

|                          | ≤35 years | 36–45 years | ≥46 years | Total |
|--------------------------|-----------|-------------|-----------|-------|
| Physicians               | 436       | 362         | 226       | 1 024 |
| Medical licentiates      | 13        | 42          | 12        | 67    |
| Clinical officers        | 714       | 338         | 276       | 1 328 |
| Nurses                   | 4 870     | 2 422       | 1 567     | 8 859 |
| Midwives                 | 352       | 677         | 1 305     | 2 334 |
| Laboratory technologists | 405       | 223         | 115       | 743   |
| Pharmacy                 | 695       | 94          | 29        | 818   |
| Dentistry                | 128       | 110         | 50        | 288   |

Source: Ministry of Health (2011).

Generally, however, the age structure of health care workers in the public market has remained balanced. From 2007 to 2011, the age profile of health care workers was evenly spread across the age cohorts (Table 4). An interesting exception is the threefold increase of health workers younger than 35 years during 2007–2011, whereas the other age groups remained approximately constant. Zambia does not, therefore, seem to face a great challenge of an ageing public health care workforce.

Table 4. Number of health workers in Zambia by age category, 2007–2011

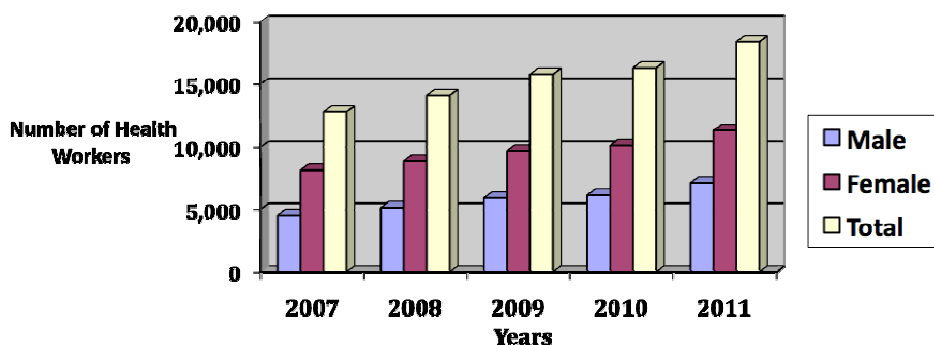
| Age (years) | Dec 2007 | Dec 2008 | Dec 2009 | Dec 2010 | Dec 2011 |
|-------------|----------|----------|----------|----------|----------|
| ≤35         | 3 606    | 4 368    | 6 155    | 7 409    | 9 175    |
| 36–45       | 4 795    | 5 020    | 5 071    | 4 852    | 5 023    |
| ≥46         | 4 379    | 4 729    | 4 586    | 4 152    | 4 199    |
| Total       | 12 780   | 14 117   | 15 812   | 16 313   | 18 397   |

Source: Ministry of Health (2012a).

## 5.5 Health workforce by sex

The distribution of health care workers by sex in the public market in Zambia indicates that women are in the majority. This trend was seen for all the five years under consideration, 2007–2011 (Fig. 5).

Fig. 5. Health care workers in the public market in Zambia by sex, 2007–2011



Source: Ministry of Health (2011).

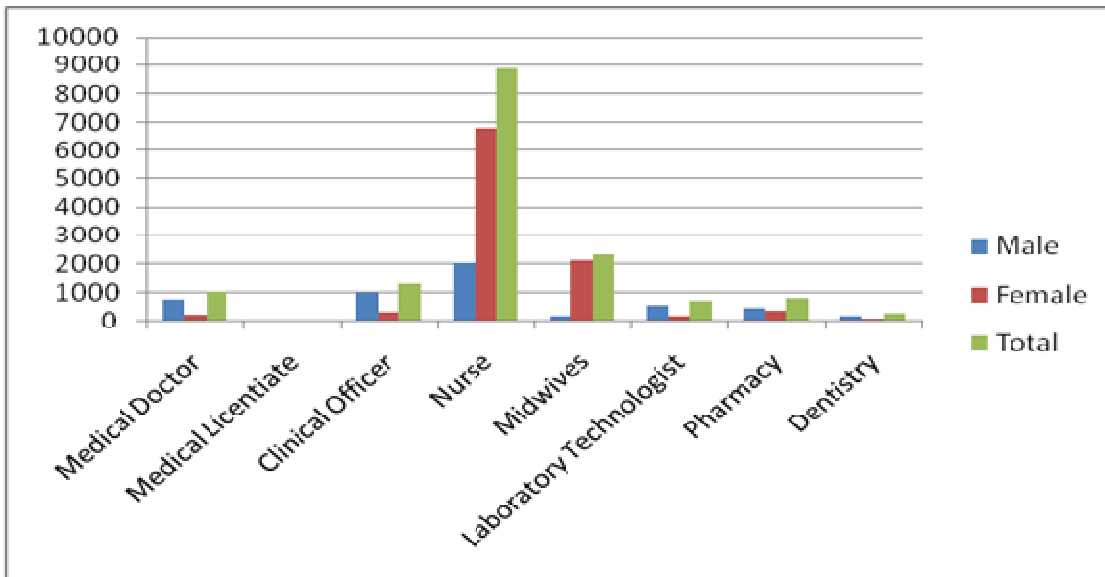
In December 2011, for instance, 11 313 of the 18 397 health care workers were women (61%) versus 7075 men (39%). The female predominance is driven by the nurse and midwife categories, which are traditionally women-oriented occupations in Zambia. More than 77% of all nurses in the public market in Zambia and 92% of all midwives are female (Table 5 and Fig. 6). The feminization of health workers, therefore, remains a major challenge in Zambia. This requires targeted policy measures to ensure a more female worker–friendly environment (Sousa et al., 2013).

Table 5. Distribution of key categories of health worker in the public market by sex, 2011

|                          | Men      |    | Women    |    | Total |
|--------------------------|----------|----|----------|----|-------|
|                          | <i>n</i> | %  | <i>n</i> | %  |       |
| Physicians               | 770      | 75 | 254      | 25 | 1 024 |
| Medical licentiates      | 53       | 80 | 14       | 20 | 67    |
| Clinical officers        | 1 003    | 75 | 325      | 25 | 1 328 |
| Nurses                   | 2 045    | 23 | 6 814    | 77 | 8 859 |
| Midwives                 | 193      | 8  | 2 141    | 92 | 2 334 |
| Laboratory technologists | 531      | 71 | 212      | 29 | 743   |
| Pharmacy                 | 446      | 54 | 372      | 46 | 818   |
| Dentistry                | 174      | 60 | 114      | 40 | 288   |

Source: Ministry of Health (2012a).

Fig. 6. Distribution of key health occupations in Zambia by sex



Source: Ministry of Health (2011).

For other categories of health care workers, however, men are in the majority. For instance, in December 2011, 254 women were physicians and 770 men; 53 men versus 14 women as medical licentiate; 531 men versus 212 women as laboratory technologists; 446 men versus 371 women as pharmacists; and 174 men versus 114 women as dentistry personnel (Table 5).

## 5.6 Geographical distribution of the health workforce

In terms of the location of health care workers, although there has been an improvement during the past five years, Zambia continues to suffer from an inequitable distribution of health workers, at the disadvantage of rural provinces. As illustrated in Table 6, many of the provinces that suffered from the greatest shortage of health care workers in 2005 benefited from the largest increase in health care workers per capita during 2005–2010, notably Southern, Northern, Luapula and Western. Similarly, Lusaka Province saw a reduction in its density of health care workers in an effort to benefit rural provinces.

Table 6. Distribution of health care workers by urban or rural location, 2005–2010

| Province      | Category     | 2005   | Health care workers per 1000 population | 2010   | Health care workers per 1000 population | Change per 1000 population, 2005–2010 |
|---------------|--------------|--------|---|--------|---|---------------------------------------|
| Northern      | mainly rural | 559    | 0.39                                    | 1 191  | 0.68                                    | +0.29                                 |
| Luapula       | mainly rural | 545    | 0.60                                    | 807    | 0.84                                    | +0.24                                 |
| Eastern       | mainly rural | 1 119  | 0.73                                    | 1 385  | 0.81                                    | +0.08                                 |
| Western       | mainly rural | 720    | 0.83                                    | 984    | 1.12                                    | +0.29                                 |
| Central       | mainly urban | 1 126  | 0.95                                    | 1 442  | 1.14                                    | +0.19                                 |
| Southern      | mainly mixed | 1 625  | 1.15                                    | 2 477  | 1.54                                    | +0.39                                 |
| North-Western | rural        | 870    | 1.27                                    | 1 033  | 1.46                                    | +0.19                                 |
| Copperbelt    | urban        | 2 899  | 1.59                                    | 3 260  | 1.66                                    | +0.07                                 |
| Lusaka        | urban        | 2 665  | 1.69                                    | 3 648  | 1.66                                    | -0.03                                 |
| Total         |              | 12 128 | 1.06                                    | 16 227 | 1.24                                    | +0.18                                 |

Source: Ministry of Health (2011).

This dynamic was due to the introduction of compensation schemes for health care workers serving in the rural areas. In 2003, the government initiated the Zambian Health Workers Retention Scheme (ZHWRS) to attract medical officers to work in the rural and remote areas of the country. In 2007, the ZHWRS was expanded to include other health workers.<sup>1</sup> The award payments of the ZHWRS range from 30% to 75% of the health care worker's basic salary per year, based on the level of remoteness of the health facility in which the health care worker has been placed. In addition, health care workers on the ZHWRS who successfully complete the three-year contract are awarded a bonus payment of nine times their monthly allowance. In the recent past, the United Nations Population

<sup>1</sup> Medical consultant; medical licentiate; clinical officer; tutor/lecturer; nurse; midwife; and environmental health technologist.

Fund has introduced a bonding system for nursing students in North-Western Province, who receive a bursary for paying tuition fees and after graduation are expected to work within the province for a minimum period of two years.

However, although the Government of Zambia has incorporated incentives within its salary schedule to attract health care workers to rural areas, these allowances have not been sufficient to attract a suitable number of health workers to the rural areas. As such, there still exists a great discrepancy between the health care workers in urban and rural areas. The density of health care workers by population in Lusaka (urban), for instance, is 1.66, which is more than twice that of Northern Province (predominantly rural), with 0.68. Why might this happen? Wages is not the only factor that influences internal health care worker migration. There is friction in the health labour market. Living conditions, safety and the quality of life in each area matter. Thus, health workers have typically preferred to live and work in urban areas that offer better job opportunities and infrastructure. The intrinsic preferences of the workers for given areas also matter, as does proximity to family and friends. However, the pressure on wages does exist, since some workers have chosen to migrate to rural areas in response to the compensation schemes.

## **5.7 Informal economy**

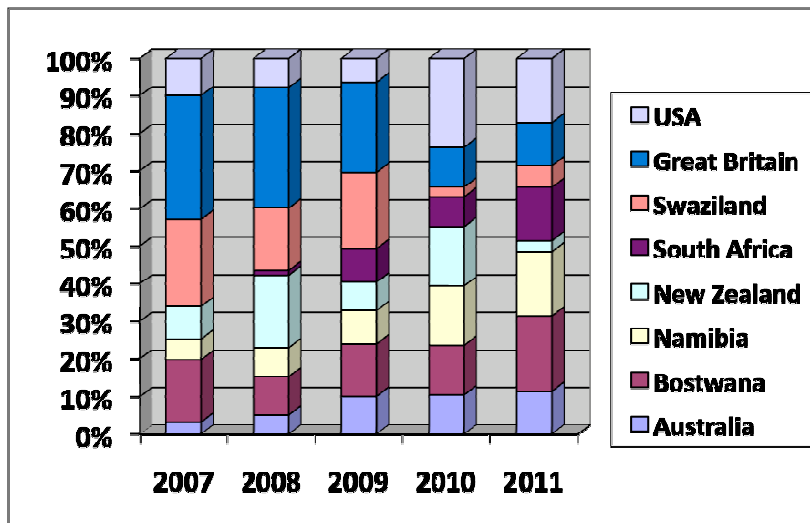
Note that the informal health sector also exists and is large but unregulated. It consists of numerous trained and untrained traditional birth attendants and traditional healers and a wide range of community health workers. Some people in rural and remote areas consult informal health service providers. Even some urban people with formal education also consult them for specific health concerns.

## **5.8 Migration**

Nurses and midwives constitute the largest group of health care workers in Zambia. However, the attrition and movement of such workers, particularly through migration, has continued to affect the supply of nurses and midwives to the domestic health labour market. Figure 7 illustrates the number of registered nurses in Zambia requesting verification from the General Nursing Council for the top eight destination countries (Australia, Botswana, Namibia, New Zealand, South Africa, Swaziland, the United Kingdom and the United States of America) for 2007–2011.



Fig. 7. Number of registered nurses requesting verification from the General Nursing Council of Zambia for the top eight destination countries, 2007–2011



Source: General Nursing Council (2011).

Before 2000, South Africa was the most important single destination. Since 2000, the substantial increase in migration is attributable to access to new destination countries such as Australia, New Zealand, the United Kingdom and the United States, in addition to established destination countries such as Botswana and South Africa. Botswana has long been popular, especially among registered midwives: higher salary, proximity to home, better housing and provision of uniforms are often cited as attracting nurses from Zambia (Hamada et al., 2009).

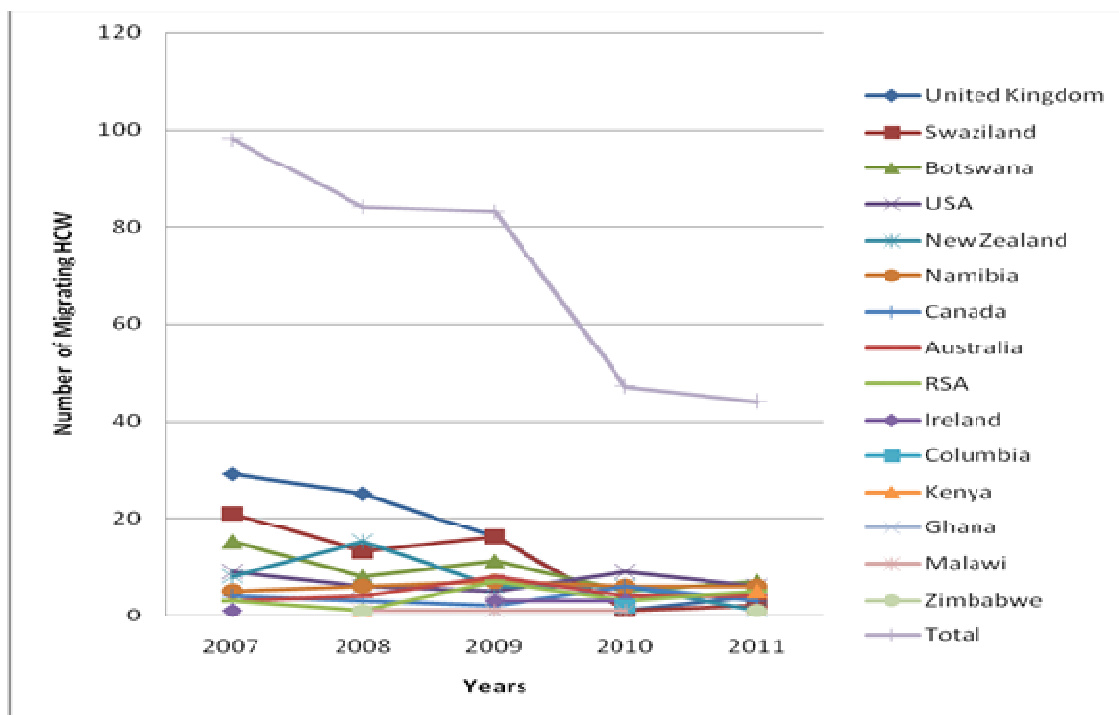
The trend in outward migration of nurses, however, shows an overall declining pattern, from 98 in 2007 to 44 in 2011 (Table 7 and Fig. 8). This is due to a combination of factors that include recent public sector incentives to improve wages and conditions of employment for health care workers in Zambia and introduction of in-service training and opportunities for progression within Zambia's public health labour market.

Table 7. Outward migration of nurses from Zambia and destination countries, 2007–2011

|                          | 2007 | 2008 | 2009 | 2010 | 2011 |
|--------------------------|------|------|------|------|------|
| United Kingdom           | 29   | 25   | 16   | 1    | 4    |
| Swaziland                | 21   | 13   | 16   | 1    | 2    |
| Botswana                 | 15   | 8    | 11   | 5    | 7    |
| United States of America | 9    | 6    | 5    | 9    | 6    |
| New Zealand              | 8    | 15   | 6    | 6    | 1    |
| Namibia                  | 5    | 6    | 7    | 6    | 6    |
| Canada                   | 4    | 3    | 2    | 6    | 3    |
| Australia                | 3    | 4    | 8    | 4    | 4    |
| South Africa             | 3    | 1    | 7    | 3    | 5    |
| Ireland                  | 1    | 0    | 3    | 3    | 0    |
| Columbia                 | 0    | 0    | 0    | 2    | 0    |
| Kenya                    | 0    | 1    | 0    | 0    | 5    |
| Ghana                    | 0    | 0    | 1    | 0    | 0    |
| Malawi                   | 0    | 1    | 1    | 1    | 0    |
| Zimbabwe                 | 0    | 1    |      | 0    | 1    |
| Total                    | 98   | 84   | 83   | 47   | 44   |

Source: General Nursing Council (2011).

Fig. 8. Outward migration of nurses from Zambia and destination countries, 2007–2011



Source: General Nursing Council (2011).

## 5.9 Wages

Table 8 shows the wages paid to physicians and nurses in the public market in Zambia. A physician earns on average less than US\$ 24 000 per year. A nurse earns, on average, US\$ 12 000 per year. When the wages (excluding monetary allowances) of health workers are benchmarked against the average gross national income per capita of US\$ 1350 (World Bank, 2012)) in Zambia, physicians in Zambia earned about 18 times the gross national income per capita in 2011 and nurses about 9 times. Nevertheless, this does not compare very well with the wages obtained in the health labour market in other countries.

Table 8. Mean monthly wages for physicians and nurses (US dollars), 2007–2011

| Health care worker category | 2007 | 2008 | 2009 | 2010 | 2011 |
|-----------------------------|------|------|------|------|------|
| Physicians                  | 1698 | 1714 | 1490 | 1795 | 1931 |
| Nurses                      | 886  | 895  | 778  | 940  | 1008 |

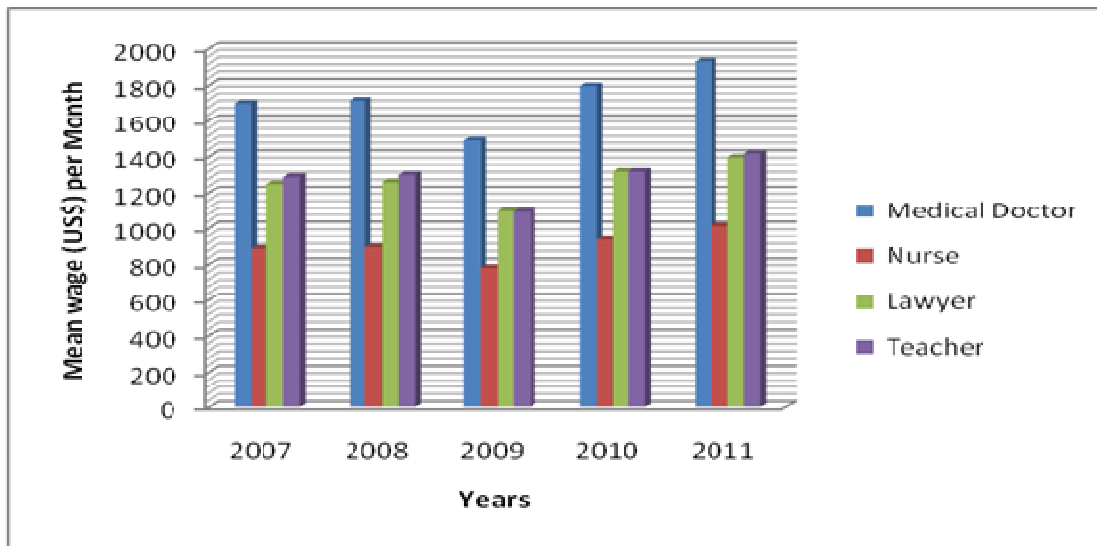
Note: the wages are in nominal terms and have not been deflated for changes in prices. The dip between 2008 and 2009 was caused by the erosion of the purchasing power of the domestic currency in relation to the US dollar, which this report uses to enable international comparisons.

Source: Ministry of Health (2012a).

However, in addition to the basic monthly wage, degree holders (physicians and other health care professionals) are eligible for a recruitment and retention allowance of 25% of the basic monthly wage, and those serving in rural areas are eligible for a 20% rural hardship allowance and 25% remote hardship allowance. In addition, those serving in rural and remote areas are eligible for top-up allowances under the ZHWRS of 30–75% of their basic monthly wage. Other non-wage compensation include a housing allowance, job security and a pension (since all public service workers are employed on a permanent and pensionable basis).

In terms of wages paid to other professions in the public market, the study finds that the basic wages paid to non-health sector work categories with equivalent qualifications do not differ substantially from those paid to health care workers, even though the wages of physicians are slightly higher than those for other categories with similar qualifications, such as lawyers employed in the public market. However, the wages paid to nurses are lower than those for teachers with equivalent qualifications (Fig. 9 and Table 2 in the Annex). The differences in remuneration arise from additional incentives that largely benefit health care workers.

Fig. 9. Comparative mean monthly wage (US dollars) of public sector workers, 2007–2011



Source: Ministry of Health (2012a).

Wages are a key component of labour markets. Governments need to pay higher wages to keep physicians and nurses in the health sector and stop them from migrating. In the early 1990s to 2004, Zambia experienced an exodus of physicians. As a consequence, since 2000 and onwards, the government has increased the wages of physicians to prevent them from leaving the country. Between 2007 and 2011, wages increased by 16% and are higher than other professions with similar education such as lawyers. However, despite these increases, the average annual wage of physicians is only US\$ 21 780. This suggests that many qualified physicians may not be willing to work in Zambia with the current working conditions and wages. Thus, unless wages are made more competitive and responsive to international health labour market dynamics, the shortage resulting from economic reasons is unlikely to be resolved.

## 5.10 Health workers shortages and surpluses

The most common measure for identifying whether there are economic shortages or surplus of health workers in a health labour market is the vacancy rate, which is defined as the ratio of the number of unfilled vacancies to the number of funded health care posts. This allows the gap between the demand and the supply of health workers to be identified.

- **Vacancies**

Although the annual number of graduates is envisaged to continue to increase, a large gap still exists between the filled positions and the available number of health workers. The estimated vacancy rate is 62% for physicians and 53% for nurses and midwives. Ferrinho et al. (2011) report that the percentage of vacant posts in 2011 for level 3 facilities (central hospitals at the national level) varied from 5% in Lusaka to 38% in Copperbelt Province; for level 2 facilities (provincial-level hospitals), from 30% for Western to 70% for Copperbelt Province; for level 1 facilities (district-level hospitals), from 54% for the Southern to 80% for the western provinces.

For rural health centres, vacancies varied from 15% to 63% (for Lusaka and Luapula respectively); for urban health centres, the observed vacancy rates varied from 13% for Lusaka to 96% for the western provinces. Thus, despite the increased number of graduates (110% between 2005 and 2010) and an almost 100% absorption of graduates from training institutions into the public health market, vacancy rates remain high, especially for rural areas.

- **Needs-based shortage**

To estimate the deficiency of the health system to cover the needs of the population, the needs based shortage is estimated to identify the gap between the available health workforce and the health workforce required to meet the needs of the population. Despite the increase in the number of health care professionals and the support of expatriate and volunteer health workers, a gap still exists between the number of available health care workers and the needs of the national health system (Table 9). As of December 2011, Zambia had a national shortage of 21 191 health care workers. Thus, the public health care labour market only had half the health care workforce it needed. As of December 2011, for instance, all major health care worker categories reported shortages, except the pharmacy cadre, which had a surplus of 393 (Ministry of Health, 2011).

Table 9. Estimates of shortages for selected public health worker occupations, 2011

| Health worker category   | Number available | Number needed | Estimated shortage | Estimated shortage (%) |
|--------------------------|------------------|---------------|--------------------|------------------------|
| Physicians               | 1,024            | 2,381         | 1,357              | 56                     |
| Medical licentiates      | 67               | –             | –                  | –                      |
| Clinical officers        | 1,328            | 4,000         | 2,672              | 66                     |
| Nurses                   | 8,859            | 16,732        | 7,873              | 47                     |
| Midwives                 | 2,334            | 5,600         | 3,266              | 58                     |
| Laboratory technologists | 743              | –             | –                  | –                      |
| Dentistry                | 288              | 633           | 345                | 54                     |

Source: Ministry of Health (2012a).

In a country with a population exceeding 13 million, Zambia has only about 1000 physicians, about 44% of its target of 2381, and less than one third the doctor–patient ratio recommended by WHO (Table 9). The country had only 8859 nurses, far below the target of 16 732. The shortage poses a particular challenge to realizing improving national health outcomes and attaining universal health coverage.

The economic and needs-based shortages pose a particular challenge to achieving universal health coverage. Policies to overcome these shortages therefore need to rest on in-depth analysis of the dynamics of the health labour market. This multidimensional approach is missing in the current formulation of policies.

## 6. Conclusion

In conclusion, Zambia has both shortages and poor distribution of health workers largely because the approach to human resources for health planning and programming is not informed by good analysis of the health labour market. At best, the approach is frequently based on the number of health workers that are required to meet the needs of the population and focuses on training more workers. However, this needs-based approach is not enough to formulate policies, since it ignores the dynamics of the health labour market. Resolving the challenge of shortages and poor distribution of health workers and thus achieving universal coverage therefore depends largely on how Zambia succeeds in analysing the health labour market in depth and understanding the driving forces that affect the supply and demand of the health workforce, both in Zambia and at the global level.

The key policy implication is that understanding the interactions between the factors that determine the demand and supply of the health workforce – the dynamics of the health labour market – is critical to developing effective policies to address health workforce shortages and maldistribution in Zambia. Unless this is done, universal health coverage is unlikely to be attained. The increase in health cadre training output and recruitment during 2007–2011 along with the various policy initiatives for expanding human resources for health and deliberate efforts to raise compensation levels for the health workforce clearly show that Zambia’s health system has made progress in responding to the past challenges in human resources for health. However, the continued existence of health workforce shortages, reflected in high vacancy rates and maldistribution across specific

professions and geographical regions, indicates the existence of an economic problem, and resolving this requires comprehensive analysis of the health labour market in Zambia.

## **7. Lessons learned**

The country has less than half the nurses and only 43% of the physicians required. The shortage and maldistribution of health workers stems from various labour market and governance factors, including an exodus of trained professionals to other countries in Africa and elsewhere, an equally complicated internal brain drain and poorly funded and limited medical-training infrastructure. Other studies (Herbst et al., 2011) have identified the limited capacity of health training institutions as the main cause of the low supply of health workers. Thus, the shortages arise from insufficient education capacity to supply the desired levels of health workers needed by the market, inadequate wages and working conditions to attract and retain people into health work, particularly in underserved areas. Further, low funding in health facilities results in insufficient demand and other market imbalances. Future strategies to increase the availability of health workers therefore need to align with these imperatives.

## **8. Recommendations**

Based on the findings and analysis, the following are specifically recommended.

### **1. Increase the productivity and performance of the current health workforce**

Use the current health workforce more efficiently by increasing the productivity and performance of the health workforce (Scheffler, Bruckner & Spetz, 2012).

### **2. Increase the number of health workers employed**

Despite the expansion in the private sector, the public sector needs to increase its share of the budget to meet the human resource needs of the health sector. Over time, more effective health workforce information systems need to be introduced to enable the sector to set expansion targets to meet the health workforce needs of a growing national population.

### **3. Distribute human resources for health equitably across the country**

Considerable imbalances in the distribution of health service providers exist between urban and rural areas to the disadvantage of rural and remote districts and provinces. Concerted efforts need to be made to improve the working conditions and incentives for health workers in the rural and remote areas of the country to attract and retain more health care workers to rural health facilities.

### **4. Improve the wages and working conditions for health care workers**

The public market needs to improve remuneration packages and working conditions to promote the importance of health workers and the services they deliver and to stem migration to foreign labour markets.

### **5. Increase training output**

Despite a substantial increase in the number of graduates in recent years, a large gap still exists between what is required and what is available. This is specifically notable for nurses and midwives, physicians, medical licentiates, clinical officers and laboratory staff.

Increased training output therefore needs to be sustained. Further, the training capacity of the health sector should be updated annually to reflect the skills required for effectively and efficiently delivering services. Training programmes should continually be adjusted to meet future health challenges and to ensure high-quality services. Task-shifting strategies can be promoted to use health workers with less training to carry out a variety of health care tasks after appropriate training (Fulton et al., 2011). The need to increase training output and ensure retention within the national health labour market will be cardinal.

### **6. Improve access to training for students from rural and remote areas**

Evidence indicates that students from rural and remote areas are more likely to remain in rural and remote regions. However, most of the training institutions offering programmes for health practitioners are located along the rail lines or in urban areas, which has hampered potential students from rural areas from applying to the health programmes. Programmes that promote rural and remote students, such as positive discrimination practices and quota systems, should be explored and implemented. In addition, the community health assistant training programme should be sustained, since it recruits students from rural and remote communities to serve within their community.

### **7. Increase the budget allocated to health**

Adequate fiscal space is an important parameter required to overcome the crisis in human resources for health. All the factors discussed above that influence labour market dynamics require adequate fiscal space. The allocation to the health sector must therefore be increased to overcome financial constraints limiting the capacity of the sector to expand training infrastructure, pay competitive wages, improve working conditions and implement other measures.

## **9. Data limitations**

The study had limitations, however. First, it largely focused on health care workers with direct contact with the patient even though the concept of human resources for health is broader and includes management and administrative support staff. Second, the lack of availability of data on some variables, specifically those relating to private-sector wages and employment levels, limited the extent of comparative analysis. The scope of the study was therefore restricted to the public health sector in assessing health care worker demand and supply dynamics for 2007–2011. Even with these limitations, however, the study provides useful insights into Zambia's health labour market and identifies challenges to attaining universal health coverage.



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## Annex

Table 1. Number of health care workers by occupation, 2007–2011

| Health care worker category          | Dec 2007      | Dec 2008      | Dec 2009      | Dec 2010      | Dec 2011      |
|--------------------------------------|---------------|---------------|---------------|---------------|---------------|
| Anaesthesiologists                   | 1             | 1             | 1             | 1             | 1             |
| Clinical Care Officers               | 1             |               | 15            | 52            | 52            |
| Clinical Instructors                 | 45            | 48            | 54            | 68            | 70            |
| Clinical Officers                    | 1 092         | 1 248         | 1 384         | 1 238         | 1 328         |
| Dentistry                            | 201           | 215           | 256           | 255           | 288           |
| Entomologists                        |               |               | 1             | 1             | 1             |
| Environmental Technologists          | 845           | 945           | 1 113         | 1 168         | 1 302         |
| Epidemiologists                      | 1             | 1             | 1             |               |               |
| Health Centre In-Charge              |               |               | 47            | 245           | 248           |
| Hospital Administrators              | 7             | 11            | 5             | 2             | 3             |
| Laboratory Technologists             | 402           | 440           | 541           | 625           | 743           |
| Lecturers                            | 40            | 41            | 44            | 54            | 55            |
| Physicians                           | 639           | 783           | 864           | 882           | 1 024         |
| Medical licentiates                  | 23            | 23            | 33            | 65            | 67            |
| Medical physicists                   |               | 2             | 2             | 3             | 3             |
| Midwives                             | 1 910         | 1 997         | 2 089         | 2 218         | 2 334         |
| Nurses                               | 6 308         | 6 937         | 7 726         | 7 711         | 8 859         |
| Nutritional technologists            | 51            | 61            | 104           | 128           | 151           |
| Obstetricians                        |               | 1             | 1             |               |               |
| Occupational health<br>technologists | 1             | 1             | 1             | 2             | 2             |
| Orthopaedic technologists            | 4             | 4             | 4             | 4             | 5             |
| Others                               | 387           | 391           | 361           | 211           | 247           |
| Parasitologists                      | 1             | 1             | 2             | 1             | 2             |
| Pathologists                         |               |               |               | 1             | 1             |
| Pharmacy                             | 421           | 521           | 626           | 704           | 818           |
| Physiotherapy technologists          | 155           | 168           | 199           | 238           | 300           |
| Psychiatrists                        |               |               | 1             |               |               |
| Psychologists                        |               |               | 1             | 3             | 3             |
| Public health officers               |               |               | 13            | 46            | 47            |
| Physiotherapists                     | 7             | 8             | 7             | 3             | 3             |
| Radiation technologists              | 11            | 13            | 13            | 10            | 10            |
| Radiography technologists            | 149           | 174           | 209           | 228           | 283           |
| Tutors                               | 75            | 79            | 91            | 144           | 145           |
| Ultrasonographers                    |               |               | 1             | 1             | 1             |
| X-ray technicians                    | 3             | 3             | 2             | 1             | 1             |
| <b>Total</b>                         | <b>12 780</b> | <b>14 117</b> | <b>15 812</b> | <b>16 313</b> | <b>18 397</b> |

Source: Ministry of Health (2011).

Table 2. Comparative mean monthly wages (US dollars) of public sector workers, 2007–2011

| <b>Profession</b> | <b>2007</b> | <b>2008</b> | <b>2009</b> | <b>2010</b> | <b>2011</b> |
|-------------------|-------------|-------------|-------------|-------------|-------------|
| Physicians        | 1698        | 1713        | 1490        | 1795        | 1931        |
| Nurses            | 886         | 895         | 778         | 937         | 1008        |
| Lawyers           | 1248        | 1260        | 1096        | 1317        | 1394        |
| Teachers          | 1288        | 1300        | 1093        | 1317        | 1417        |

*Source:* Ministry of Health (2012).