2012
FIP Global Pharmacy
Workforce Report

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Colophon

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This report together with the questionnaire and data from the 2012 FIP Global Pharmacy Workforce Survey are available for electronic download from www.fip.org/humanresources

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Foreword

On the occasion of the International Pharmaceutical Federation’s 100th anniversary, a number of crucial initiatives are taking place towards advancing pharmacy practice, science and education, including holding a Ministers Summit on the Added Value of the Responsible Use of Medicines. In recognition of our past 100 years of achievement, this 2012 Global Pharmacy Workforce Report serves as an important reminder of the efforts that national professional and scientific associations, governments and academic institutions have made—and continue to make—to prepare a competent pharmacy workforce that adds value to health care systems through ensuring the responsible use of medicines.

Findings from this report clearly show that professional associations are important stakeholders in advancing the pharmacy workforce. Collaboration between Ministries of Health, Ministries of Education, educational institutions and professional associations pave the way to better plan and coordinate a pharmacy workforce that can respond to the current and future needs of the local population. Political will and investment are crucial aspects to secure pharmacy human resource capacity building. If the pharmacy workforce is to add value through responsible medicines use, the workforce must be present in sufficient numbers and with the competencies required to fulfil the needs of the local population.

We hope that this report will serve as a valuable evidence based instrument to stimulate further research, discussion and policy action.

This report was only possible with the support of over 120 contributors across 90 countries and territories from pharmacy professional and regulatory bodies, schools of pharmacy, research centres, agencies, and pharmaceutical service providers who generously gave their time to obtain data and share their experiences. Thank you also to members of the Report Working Group, FIP volunteers and World Health Organization staff for their leadership, close collaboration and extensive input to make this report a reality. On behalf of FIP I would like to express our sincere appreciation of the efforts made by all contributors.

Michel Buchmann, PhD
President
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Access to quality medicines and competent, capable health care professionals are fundamental aspects of any health care system. Pharmaceutical human resources should ensure the uninterrupted supply of quality medicines to the population, their management, and responsible use, as vital components in improving the health of nations.

Multi-stakeholder collaboration incorporating best available evidence is required to inform needs-based pharmaceutical human resources planning. When relevant, well-informed stakeholders partner to address workforce issues, there are greater possibilities for coordinated workforce planning and implementation.

Pharmacy workforce per capita varies considerably between countries and regions, and generally correlates with country-level economic development indicators. Countries and territories with lower economic indicators, such as those in Africa, tend to have relatively fewer pharmacists and pharmacy support workers. This has implications for observed inequalities in access to medicines and medicines expertise. In addition, some countries and territories have many times more pharmacists than pharmacists, which may imply a renewed need for supervision of medicines and medicines use.

Strategic frameworks and policies related to the pharmacy workforce are being successfully developed and implemented at the country level through multi-stakeholder processes involving ministries of health, health professional associations, regulators, and educators. The need for active leadership and managerial involvement in the development of such frameworks is essential. Careful planning is required to ensure that the pharmacy pharmacy workforce identified from the literature include the following key elements:

- Access to quality medicines and competent, capable health care professionals.
- A needs-based education strategy that allows local systems to best assess the needs of their community and then develop (or adapt) the supporting educational system to produce a workforce relevant to these needs.
- National health care demands are diverse and complex, often varying widely within and between regions. Although broad and general frameworks may be beneficial at the macro level, a "one-size fits all" system does not offer the authenticity needed for full engagement and sustainability at the local level.
- Pharmaceutical Human Resources continue to be a priority issue for FIP Education initiatives (FIPED). To engage collaboratively with all stakeholders, we need to work together towards developing a profession that can meet present and future societal and pharmaceutical health needs around the world.

PT 2

INTRODUCTION

The world’s health workforce is facing significant challenges:

- Increased demand for health services and increasing expectations for service delivery have a significant effect on shaping workforce dynamics.
- Contemporary issues surrounding the global pharmacy workforce identified from the literature include the importance of working conditions and job satisfaction on retention, workforce development and revalidation, wide-ranging supply and demand factors affecting the workforce, and migration.
- To support growth in the establishment of pharmacy practice and its aspiration for increased patient-focused care, workforce needs and other trends will need to be factored into pharmaceutical service development plans.

2.1 The global policy context

The world’s health workforce is facing significant challenges. With an estimated shortage of more than four million health workers worldwide, the global health workforce is (or at least is perceived to be) one of the greatest health system constraints in most countries seeking to meet their 2015 Millennium Development Goals (MDGs). Increased demand for health services and increasing expectations for service delivery have had a significant effect in shaping labour market dynamics. As a result, health workforce issues have generated huge interest and international action to bring about change. The publication of the World Health Report in 2006 [1] highlighted health workforce issues and stimulated widespread investigation and international action to bring about change. This report was a major driving force for expansion of the international health workforce in order to meet the health-related Millennium Development Goals. There have since been a number of calls to action. The 2008 World Health Report [2] states that the health workforce shortages and inefficiencies are also seriously undermining effective implementation of primary health care. The 2010 World Health Report [3] identifies that the health workforce shortages and inefficiencies are fundamental to developing robust health systems and for meeting their 2015 Millennium Development Goals (MDGs). The 2010 World Health Report [4] calls for different mechanisms for financing national health care systems in order to meet the MDGs. The policy recommends that the world’s health workforce improve productivity, accessibility, and efficiency, and that health systems strengthen coordination and accountability to ensure that health workforce issues are addressed.

The WHO report on social determinants of health [7] identifies that a competent, supported health workforce is fundamental to developing robust health systems and for reaching health and development goals. It calls for whole system action on social determinants of health that must involve the government, civil society, and local communities, business, global fora, and international agencies. It states that to be effective policies and programmes must embrace all sectors of society not just the health sector, and that providing more health workers alone will not reduce health inequalities.

The High-level Taskforce on Innovative International Financing for Health Systems [8] calls for different mechanisms for financing national health care systems in order to meet the MDGs. The taskforce recommends that the world’s health workforce improve productivity, accessibility, and efficiency, and that health systems strengthen coordination and accountability to ensure that health workforce issues are addressed.

In many countries, pharmacists are the most accessible of all health care workers and as such play a key role in the delivery of health care services, particularly the safe distribution of medicines at all levels. In an era of rapidly accelerating change in health care delivery, the roles of pharmacists are constantly being redefined, as roles, competency, and training requirements change. Thus, understanding the current workforce and the factors that influence it are key components to human resource planning in pharmacy. As the recent report from the Office of the Chief Pharmacist to the US Surgeon General states, a health system improvement that is well supported by the evidence base is to maximize the expertise and scope of pharmacists and minimize expansion barriers for an already existing and successful health care delivery model [9].
PART 1

KEY MESSAGES

- Access to quality medicines and competent, capable health care professionals are fundamental aspects of any health care system. Pharmaceutical human resources should ensure the uninterrupted supply of quality medicines to the population, their management, and responsible use, as vital components in improving the health of nations.
- Multi-stakeholder collaboration incorporating best available evidence is required to inform needs-based pharmaceutical human resources planning. When relevant, well-informed stakeholders partner to address workforce issues, there are greater possibilities for coordinated workforce planning and implementation.
- Pharmacy workforce per capita varies considerably between countries and regions and generally correlates with country-level economic development indicators. Countries and territories with lower economic indicators, such as those in Africa, tend to have relatively fewer pharmacists and pharmacy support workers. This has implications for observed inequalities in access to medicines and medicines expertise. In addition, some countries and territories have many times more pharmacies than pharmacists, which may imply a renewed need for supervision of medicines and medicines use.
- Strategic frameworks and policies related to the pharmacy workforce are being successfully developed and implemented at the country level through multi-stakeholder processes involving ministries of health, health professional associations, regulators, and educators to drive and achieve both competence and practitioner excellence for care quality.
- Improving workforce performance productivity, capability, and the ability to adapt to new roles is an ongoing challenge in the increasingly dynamic environment of rising health care costs, increased demand for health services, and increased burden of chronic diseases. Fueled in part by an increased focus on patient care and inter-professional collaboration, these elements provide the opportunity for pharmacists to use their professional skills to provide safe, high-quality, and cost-effective pharmaceutical services for the benefit of populations. Leadership is a key aspect in empowering pharmacy professionals to maximize these opportunities and to innovate and shape their practice.
- Investment in transforming and scaling up professional education is crucial, as education provides the foundation for building a capable health care workforce. The capacity to provide pharmaceutical services in each country is dependent upon having an assured, competent workforce and an integrated academic workforce to train sufficient numbers of new pharmacists and other support staff at both foundational and advanced levels. Ongoing effort is needed to ensure capacity building of skilled medicines expertise meets the pharmaceutical health needs of populations.
- A needs-based education strategy allows local systems to best assess the needs of its community and then develop (or adapt) the supporting educational system to produce a workforce relevant to these needs. National health care demands are diverse and complex, often varying widely within and between regions. Although broad and general frameworks may be beneficial at the macro level, a “one-size fits-all” system does not offer the authenticity needed for full engagement and sustainability at the local level.
- Pharmaceutical Human Resources continue to be a priority issue for FIP Education initiatives (FIPEd) to engage collaboratively with all stakeholders; we need to work together towards developing a profession that can meet present and future societal and pharmaceutical health needs around the world.

PART 2

INTRODUCTION

The world’s health workforce is facing significant challenges. With an estimated shortage of more than four million health workers worldwide, the global health workforce crisis is possibly the greatest health system constraint on countries seeking to meet their Millennium Development Goals (MDGs). Increased demand for health services and increasing expectations for service delivery have had a significant effect in shaping labour market dynamics. As a result, health workforce issues have generated huge interest and international action to bring about change. The publication of the World Health Report in 2006 [1] highlighted health workforce issues and stimulated widespread investigation and international action to bring about change. This report was a major driving force for expansion of the international health workforce in order to meet the health-related Millennium Development Goals. There have since been a number of calls to action. The 2006 World Health Report [2] states that the health workforce shortages and inequities are also seriously hampering effective implementation of primary health care. The 2012 World Health Report [3] identifies that health workforce shortages are hindering the expansion of health service coverage and calls for more efficient and equitable use of financial resources. The 2013 WHO resolution on health workforce strengthening recognises the centrality of human resources for health to the effective operation of health systems [4].

2.1 The global policy context

The world’s health workforce is facing significant challenges. With an estimated shortage of more than four million health workers worldwide, the global health workforce crisis is possibly the greatest health system constraint on countries seeking to meet their Millennium Development Goals (MDGs). Increased demand for health services and increasing expectations for service delivery have had a significant effect in shaping labour market dynamics. As a result, health workforce issues have generated huge interest and international action to bring about change. This report was a major driving force for expansion of the international health workforce in order to meet the health-related Millennium Development Goals. There have since been a number of calls to action. The 2006 World Health Report [2] states that the health workforce shortages and inequities are also seriously hampering effective implementation of primary health care. The 2012 World Health Report [3] identifies that health workforce shortages are hindering the expansion of health service coverage and calls for more efficient and equitable use of financial resources. The 2013 WHO resolution on health workforce strengthening recognises the centrality of human resources for health to the effective operation of health systems [4].

The Kampala Declaration and Agenda for Global Action in 2008 [5] acknowledges that the highest attainable standard of health is a fundamental human right, and highlights the need for immediate action to resolve the accelerating global health workforce crisis. It calls for concerted governmental, civil society, private sector, and professional organisation action to ensure that health workforce issues are addressed. The G8 Communiqué of July 2008 [6] states that members will work towards increasing health workforce coverage towards the WHO threshold of 2.3 health workers per 1000 people. It also supports efforts by partner countries and relevant stakeholders in developing robust health workforce plans and establishing specific, country-led milestones.

The WHO report on social determinants of health [6] recognises that a competent, supported health workforce is fundamental to developing robust health systems and for reaching health and development goals. It calls for whole system action on social determinants of health that must involve the government, civil society and local communities, business, global fora, and international agencies. It states that to be effective policies and programmes must embrace all sectors of society not just the health sector, and that providing more health workers alone will not reduce health inequalities.

The high-level Taskforce on Innovative International Financing for Health Systems [8] calls for different mechanisms for financing national health care systems in order to meet the MDGs. The Venice statement on maximizing positive synergies between health systems and global health initiatives [9] makes a number of recommendations and calls for the health system strengthening agenda to be infused with a sense of ambition, scale, speed, and increased resources and to promote country capacity for strong national planning processes and better alignment of resources with national planning processes.

In many countries, pharmacists are the most accessible of all health care workers and as such play a key role in the delivery of health care services, particularly the safe distribution of medicines at all levels. In an era of rapidly accelerating change in health care delivery, the roles of pharmacists are constantly being redefined, as roles, competency, and training requirements change. Thus, understanding the current workforce and the factors that influence it are key components to human resource planning in pharmacy. As the recent report from the Office of The Chief Pharmacist to the US Surgeon General states, a health system improvement that is well supported by the evidence base is to maximise the expertise and scope of pharmacists and minimize expansion barriers for an already existing and successful health care delivery model [10].

Authors
Claire Anderson, Professor of Social Pharmacy and Tapash Roy, Research Associate, Division of Social Research in Medicines and Health, School of Pharmacy, University of Nottingham, UK.

Summary
- Increased demand for health services and increasing expectations for service delivery have a significant effect in shaping workforce dynamics.
- Contemporary issues surrounding the global pharmacy workforce identified from the literature include the importance of working conditions and job satisfaction on retention, workforce development and revalidation, wide-ranging supply and demand factors affecting the workforce and migration.
- To support growth in the establishment of pharmacy practice and its aspiration for increased patient-focused care, workforce needs and other trends will need to be factored into pharmaceutical service development plans.
Recent focus on the pharmacy workforce in Australia, Canada, Great Britain, and the USA [4-12], the 2006 and 2009 FIP Global Pharmacy Workforce reports [13,14], and a systematic review of the literature [22] add to our understanding of the complex issues that countries face. It is not just a simple case of supply and demand. There is also a need for countries to model their workforce needs based on predicted future provision of services and care, roles and responsibilities of the pharmacy support workforce, increased use of technology, the advancement of biotechnology and personalised medicine, demographic changes, and future patterns of working all while ensuring there is a sustainable academic workforce to maintain the supply of suitably trained pharmacists.

2.2 Systematic review of the literature on the pharmacy workforce

A systematic review of the literature from January 2006 to March 2012 was undertaken that focused upon the issues facing the expansion of the global pharmacy workforce. Contemporary issues surrounding the global pharmacy workforce and, more specifically, the published methods used to expand the workforce were systematically identified and reviewed. One hundred and nine studies were included in the review, to be published separately. Findings from the review (in press) are summarised below.

Working conditions and job satisfaction

The level of job satisfaction among pharmacy personnel is an important indicator of staff turnover and retention. The primary determinants of job satisfaction were intrinsic aspects of the job: that is, factors that make people satisfied with the work that they do or the way in which they are used. A number of studies found female pharmacists hold high levels of job satisfaction compared with their male counterparts. Job position was consistently found to be a significant factor affecting levels of job satisfaction.

Pharmacy workforce migration

There is greater migration from less developed countries to more developed countries. The pharmacist workforce from African and Asian countries was disproportionately affected by migration. A significant number of pharmacists from developing countries migrate to the developed world, however, the extent of such migration was not properly captured. Postulated reasons for migration include better remuneration, joining or supporting family, political and social instability, poor living conditions, poor working conditions, and management, unsafe environment, further training and qualifications, and job opportunities and satisfaction.

2.3 Conclusion

This systematic review updates and builds a better understanding of the current challenges affecting the global pharmacy workforce in ensuring equitable access and responsible use of safe, effective and quality medicines. This review complements findings from the 2012 Global Pharmacy Workforce Survey on workforce composition and expands on findings from the 2006 and 2009 workforce reports and support for CPD, motivation and interest in CPD, attitudes towards compulsory CPD, system constraints, and technical problems were identified as key barriers to CPD. Pharmacy professionals on the whole agreed with the principle of engaging with CPD, but there was little evidence to suggest widespread wholehearted acceptance and uptake of CPD, essential for revalidation. Direct experience of effective CPD in the absence of perceived barriers could impact personal and professional development and patient benefit, thus strengthening personal beliefs in the value of CPD.

Supply and demand issues: Current status and future directions

Increased demand and limited supply of pharmacists constrains the ability of the workforce to expand. Many different supply and demand factors that influence the pharmacy profession were identified, the majority of which were common to most countries. The most common factors increasing demand for pharmacists were increased feminisation, increased clinical governance measures through continually reviewing and improving the quality of patient care, increased numbers of prescriptions, and increased complexity of medication therapy. The most common factors mitigating demand for pharmacists included increased use of technology, expansion in the numbers and roles of pharmacy technicians, and increased numbers of pharmacy graduates.

References

6. EID Communicue on Africa and Development 8 July 2006
Recent focus on the pharmacy workforce in Australia, Canada, Great Britain, and the USA [20, 21] the 2006 and 2009 FP Global Pharmacy Workforce reports [3, 20], and a systematic review of the literature [22] add to our understanding of the complex issues that countries face. It is not just a simple case of supply and demand. There is also need for countries to model their workforce needs based on predicted future provision of services and care, roles and responsibilities of the pharmacy support workforce, increased use of technology, the advancement of biotechnology and personalised medicine, demographic changes, and future patterns of working all while ensuring there is a sustainable academic workforce to maintain the supply of suitably trained pharmacists.

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References

6. ED Communicate on Africa and Development 8 July 2008
PART 3

GLOBAL PHARMACY WORKFORCE DESCRIPTION

Authors

Ian Bates, Director Pharmacy Education Taskforce, and Andrea Bruno, FIP Ed Project Coordinator and Researcher

Summary

- The 2012 FIP Global Pharmacy Workforce Survey is a tool that is used to collect data on the pharmacy workforce at the country level, with the objective of analysing and monitoring the status of the pharmacy workforce and pharmacy education.

- The survey was conducted using English, French and Spanish on-line submission forms; workforce data was received for 90 countries and territories representing 25 million pharmacists and nearly one and half million technicians and support cadres available for download from www.fip.org/humanresources.

- Pharmacy workforce density varies considerably between countries and WHO regions and generally correlates with population numbers and country level economic development indicators. Those countries and territories with lower economic status tend to have relatively fewer pharmacists and pharmacy technicians.

- African countries tended to have lower densities of pharmacists, pharmacy technicians and support cadres, and also pharmacies. This shortage has implications for inequalities in access to medicines and medicines expertise. Ongoing efforts are needed to ensure capacity building of skilled medicines expertise to meet the pharmaceutical health needs of populations. In addition, some countries and territories have many times more pharmacies than pharmacists, which may imply a renewed need for supervision of medicines and medicines use in these geographies.

- The proportion of the female workforce is a majority globally, with some regions having an average female workforce of over 50%.

3.1 Introduction and methods

The 2012 FIP Global Pharmacy Workforce Survey was conducted between September 2011 and June 2012, the objective of the survey being to analyse, monitor and report on the status of the pharmacy workforce and pharmacy education.

FIP Member Organisations, and respondents to the 2009 FIP Global Pharmacy Workforce Survey together with other contacts for professional bodies, regulatory bodies and universities were approached to provide country-level data.

The survey was developed in collaboration with the FIP Collaborating Centre, University College London, School of Pharmacy and the FIP Education Initiatives (FIPEd) Working Group on Pharmaceutical Sector Human Resources. The survey sought data relating to pharmacy education, workforce and relevant regulations for both pharmacists and pharmacy technicians and was available in English, French and Spanish. The dataset was cleaned and checked with respondents before being prepared for analysis. The survey tool, data table, and the final report are available for download from www.fip.org/humanresources.

A total of 90 countries and territories responded to the survey, an increase on 56 respondent countries from the 2009 report. Of these 90 countries and territories, 30 were from the Pacific Island nations, due to low relative frequencies these countries were aggregated into a single Pacific Island Countries (PIC) case entity for analysis in the 2012 report. The subsequent aggregated count for the 2012 report is 80 cases. The total case load represents around three-quarters of the current world population and around half of all UN member states.

The data collection was conducted using multiple languages and this has assisted with country level engagement for the 2012 report compared with previous reports. The analysis presented here should be interpreted within the confinements of generalisation and based on best available validated data presented here should be interpreted within the confines of generalisation and based on best available validated data collated by the FIPEd team. A listing of contributing countries and territories is supplied in Annex 1.

Table 3.1 shows the respondent countries and territories categorised by WHO region, compared with the formal listing of all WHO member states, showing good proportionality between the FIP countries and territory level responses and the global WHO member states.

3.2 Global overview: The pharmacy workforce and global comparisons

The case load (n=90 countries and territories) comprises descriptive data covering around 2.5 million pharmacists and 1.4 million pharmacy technicians (or equivalent). There are strong correlations with total pharmacists and technicians and country population (Figure 3.1, R² = 0.36, p<0.001 and R² = 0.45, p<0.001 respectively). In both cases, African countries tend to have data that shows a greater tendency for fewer pharmacists and support cadres per country population, a human resource for health situation also replicated in other health care professions (see also Figure 3.2).

A more standardised measure is to use the population density of pharmacists (presented as per 10,000 population), which varies considerably between countries and territories ranging from 0.02 (Somalia) to 25.07 (Malta), with the mean of the 82 countries and territories (sample mean) being 6.02 pharmacists/10,000 population. Figure 3.2 presents the global density of pharmacists per country or territory per 10,000 population; African nations by comparison, have significantly fewer pharmacists per capita.
PART 3

GLOBAL PHARMACY WORKFORCE DESCRIPTION

Authors
Ian Bates, Director Pharmacy Education Taskforce, and Andrea Bruno, FIP’s Project Coordinator and Researcher

Summary
- The 2012 FIP Global Pharmacy Workforce Survey is a tool that is used to collect data on the pharmacy workforce at the country level, with the objective of analysing and monitoring the status of the pharmacy workforce and pharmacy education.
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- Pharmacy workforce density varies considerably between countries and WHO regions and generally correlates with population numbers and country level economic development indicators. Those countries and territories with lower economic status tend to have relatively fewer pharmacists and pharmacy technicians.
- African countries tended to have lower densities of pharmacists, pharmacy technicians and support cadres, and also pharmacies. This shortage has implications for inequalities in access to medicines and medicines expertise. Ongoing efforts are needed to ensure capacity building of skilled medicines expertise to meet the pharmacetical health needs of populations. In addition, some countries and territories have many times more pharmacists than pharmacists, which may imply a renewed need for supervision of medicines and medicines use in these geographies.
- The proportion of the female workforce is a majority globally, with some regions having an average female workforce of more than 65%.
- Most pharmacists are employed in community retail pharmacies, followed by hospital, industry, research and universities. The survey was conducted in collaboration with the FIP Collaborating Centre, University College London, School of Pharmacy and the FIP Education Initiatives (FIP/ED) Working Group on Pharmaceutical Sector Human Resources. The survey sought data relating to pharmacy education, workforce and relevant regulations for both pharmacists and pharmacy technicians and was available in English, French and Spanish.

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The 2012 FIP Global Pharmacy Workforce Survey was conducted between September 2011 and June 2012; the objective of the survey being to analyse, monitor and report on the status of the pharmacy workforce and pharmacy education. The survey was prepared for analysis. The survey tool, data table, and the final report are available for download from www.fip.org/humanresources.

A total of 90 countries and territories responded to the survey, an increase on 56 respondent countries from the 2009 report. Of these 90 countries and territories, 19 were from the Pacific Island nations, due to low relative frequencies these countries were aggregated into a single Pacific Island Countries (PIC) case entity for analysis in the 2012 report. The subsequent aggregated count for the 2012 report is 80 cases. The total case load represents around three-quarters of the current world population and around half of all UN member states.

The case load was conducted using multiple languages and this has assisted with country level engagement for the 2012 report compared with previous reports. The analysis presented here should be interpreted within the confines of generalisation and based on best available validated data.

Table 3.1. Respondent frequencies by WHO region

<table>
<thead>
<tr>
<th>Region</th>
<th>FIP 2012 Rep.</th>
<th>%</th>
<th>50 WHO member states</th>
<th>%</th>
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<tr>
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<td>11.3</td>
<td>19.8</td>
<td>18.4</td>
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<td>Americas</td>
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<td>Eastern Med/Asia</td>
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<td>10.3</td>
<td>25.5</td>
<td>26.3</td>
</tr>
<tr>
<td>Western Pacific</td>
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<td>15.6</td>
<td>37.5</td>
<td>39.3</td>
</tr>
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<tr>
<td>Europe</td>
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<td>25.5</td>
<td>17.8</td>
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<tr>
<td>Total</td>
<td>90</td>
<td>100</td>
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The data collection was conducted using multiple languages and this has assisted with country level engagement for the 2012 report compared with previous reports. The analysis presented here should be interpreted within the confines of generalisation and based on best available validated data.

A more standardised measure is to use the population density of pharmacists (presented as per 10,000 population), which varies considerably between countries and territories ranging from 0.12 (Somalia) to 25.27 (Malta), with the mean of the 81 countries and territories (sample mean) being 6.02 pharmacists/10,000 population. Figure 3.2 presents the global density of pharmacists per country or territory per 10,000 population. African nations by comparison, have significantly fewer pharmacists per capita.

Figure 3.2. Pharmacists/support cadres and country/territory population (logarithmic scales)
In most countries and territories, there is a greater density of pharmacists than pharmacies. However, some have many times more pharmacies than pharmacists (Afghanistan, Bangladesh, Bhutan, Burundi, India, Nepal, Pakistan, Somalia, Vietnam and Zambia; see also Figure 3.4), flagging the issue of appropriate supervision of pharmaceutical services. Figure 3.3 shows the density of both pharmacists and pharmacies by WHO region for comparison. Regions with fewer pharmacists tend to have more pharmacies per capita – showing a smaller gap between pharmacists and pharmacies per capita.

Figure 3.2. Density of pharmacists per 10,000 population (only countries and territories that have a non-zero value)

Figure 3.3. Mean WHO regional values of pharmacists and pharmacies per capita

Pharmacists per 10,000 population

Mean value

Sample mean 6.02

Sample mean (pharmacists)

Sample mean (pharmacies)
In most countries and territories, there is a greater density of pharmacists than pharmacies. However, some have many times more pharmacies than pharmacists (Afghanistan, Bangladesh, Bhutan, Burundi, India, Nepal, Pakistan, Somalia, Vietnam and Zambia; see also Figure 3.4), flagging the issue of appropriate supervision of pharmaceutical services. Figure 3.3 shows the density of both pharmacists and pharmacies by WHO region for comparison. Regions with fewer pharmacists tend to have more pharmacies per capita — showing a smaller gap between pharmacists and pharmacies per capita.

Figure 3.2. Density of pharmacists per 10,000 population (only countries and territories that indicate a non-zero value)

Figure 3.3. Mean WHO regional values of pharmacists and pharmacies per capita
There is a correlation between the density of pharmacies (facilities that dispense medicines) and pharmacists (Figure 3.4). Countries with higher densities of pharmacists also tend to have higher densities of pharmacies ($R^2 = 0.38, p < 0.001$). African countries lack both pharmacies and pharmacists, which has implications for access to medicines given the inadequate availability (and likely inequitable distribution) of access points and skilled workforce.

Figure 3.4. Pharmacists and pharmacies per 10,000 population (n=76 countries and territories)

There are also relationships between the economic status of a country as measured by Gross National Income (GNI) per capita, health expenditure per capita, and pharmacist densities (Figure 3.5). There is an implication that spending on health and pharmacist availability are functions of economic development. Pharmacist density regresses independently with GNI.

[GNI and Health expenditure data source: World Bank 2011. GNI and health expenditure adjusted for purchasing power parity (PPP) in US$]

Figure 3.5. Pharmacists and health expenditure (n=82 countries and territories) per 10,000 population
There is a correlation between the density of pharmacies (facilities that dispense medicines) and pharmacists (Figure 3.4). Countries with higher densities of pharmacists also tend to have higher densities of pharmacies ($R^2 = 0.36, p < 0.001$). African countries lack both pharmacies and pharmacists, which has implications for access to medicines given the inadequate availability (and likely inequitable distribution) of access points and skilled workforce.

![Figure 3.4. Pharmacists and pharmacies per 10,000 population](n=76 countries and territories)

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![Figure 3.5. Pharmacists and health expenditure](n=82 countries and territories) per 10,000 population

[GNI and Health expenditure data source: World Bank 2011. GNI and health expenditure adjusted for purchasing power parity (PPP) in US$]
The relationship of workforce with economic indicators is also shown by mapping pharmacists per capita with World Bank classification. There is a linear association with standardised pharmacist numbers and World Bank classification (Figure 3.6). There are demographic similarities with the lower-middle and upper-middle categories, but large differences between low income and high income. The gap between pharmacists and pharmacies also increases with economic income, perhaps as a result of greater role opportunities for pharmacists in high-income nations. The density of pharmacies is greater than that of pharmacists in low-income countries and territories, suggesting medicines access and supply challenges in these economic environments.

Figure 3.6. Pharmacists and pharmacies by World Bank income level categories (n=80 countries and territories)

Total licensed pharmacist frequencies may not be representative of the active workforce. Survey data captured frequencies of active establishment and compared this with total registrants (expressed as a ratio of ‘active:registered’). The ratio of actively practicing pharmacists to registered is described in Figure 3.7. The proportion of pharmacists that are actively practicing ranges from 8% to 100% (n=69 countries and territories). There are significant mean differences between WHO regions in this ratio, with Southeast Asia and Western Pacific having the lowest means, and the Americas and Europe having the highest (Table 3.2). It is important to consider discrepancies between the practicing and registered workforce to obtain greater accuracy in workforce planning.

Figure 3.7. Ratio of active to total pharmacist workforce by country (n=69 countries and territories)

Table 3.2. Active: Registered workforce ratios by WHO region

<table>
<thead>
<tr>
<th>WHO Region (sample n)</th>
<th>Mean ratio</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
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</thead>
<tbody>
<tr>
<td>Africa (16)</td>
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<td>Americas (6)</td>
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</tr>
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<td>Western Pacific (11)</td>
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<tr>
<td>SE Asia (4)</td>
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<tr>
<td>Europe (39)</td>
<td>84</td>
<td>.16</td>
<td>38</td>
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(ANOVA, F=3.4, p=0.034)
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![Pharmacists and pharmacies by World Bank income level categories (n=80 countries and territories)](image)

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![Ratio of active to total pharmacist workforce by country (n=69 countries and territories)](image)

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<th>SD</th>
<th>Minimum</th>
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<td>Europe (29)</td>
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<td>.16</td>
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<td>1.00</td>
</tr>
</tbody>
</table>

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Global workforce gender distribution

The proportion of workforce gender mix shows increased ratios of females in the profession; this is now an average of 54.9% (range 4.8% to 92.4%). However, the country level distribution shows a varied picture (Figure 3.8). There is also variance between WHO regions (Figure 3.9).

This change in proportion in favour of women suggests that pharmacy, as a professional qualification and career, remains attractive for women. Evolving roles towards more patient-facing roles could be one factor, in addition to greater flexibility of career structures and breaks.
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Workforce distribution by sector

The 2012 global sample reveals that, on average, 53% of pharmacists were found to work in community pharmacy environments, 18% in hospitals, 10% in industry, 5% in research and academia and 5% in regulation. The African region has less than 5% of its workforce employed in the pharmaceutical industry, in contrast to the Southeast Asian region where the pharmaceutical industry employs up to 30% of the pharmacist workforce (Figure 3.10). The European region has the highest proportion of the pharmacy workforce working in community settings.

PART 4

PHARMACY EDUCATION

Authors

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7 Rhodes University, South Africa
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9 Accreditation Council for Pharmacy Education (ACPE), USA

Summary

- As part of a tripartite agreement, the International Pharmaceutical Federation (FIP), World Health Organization (WHO), and United Nations Educational, Scientific and Cultural Organization (UNESCO) endorsed the establishment of the Global Pharmacy Education Taskforce (PET). The Taskforce was officially launched at the 1st Global Health Workforce Alliance meeting of the WHO in Kampala in 2008.

- The Pharmacy Education Taskforce has successfully implemented its 2008-2010 Action Plan, providing evidence-based support to facilitate needs-based pharmacy education development. A work plan for 2012-2013 was developed to continue and expand the work, as well as a strategic vision for 2014 and beyond.

- FIP Education Initiatives (FIPEd) was established by FIP in 2011, bringing together and building on all of FIP’s education focused activities, with the aim of stimulating transformational change in pharmacy education and facilitating the development of the profession, towards meeting present and future societal and pharmacy workforce needs around the world (www.fip.org/education).

- The capacity to provide pharmacy services in each country is dependent upon having an assured, competent, and capable workforce and a similarly integrated academic workforce to train and support sufficient numbers of new pharmacists and other members of the support workforce at both basic and advanced levels.

- There remains variance in the scope and range of pharmacy education quality assurance systems. An adaptable quality assurance framework has been developed and adopted by FIP. Advocacy continues to encourage systems to improve quality assurance and accreditation of pre-service education.

- Ensuring mechanisms for assured practitioner competence (and ultimately performance) and expert practice is now a key goal for pharmacy education policy. Systems and Continuing Professional Development (CPD) support should be oriented to enable competency-based lifelong development for all practitioners.

- Increased focus needs to be placed on building a competent pharmacy support workforce, on developing leadership across pharmacy education and on ensuring that there is a greater sharing, reporting and publishing of education innovations and research.

4.1 Advancing pharmacy education globally

FIP Education Initiatives (FIPEd) is the umbrella directorate bringing together all of FIP’s education focused actions, strengthening projects and partnerships with WHO and UNESCO.

FIPEd comprises the Academic Institutional Membership (AIM), the Academic Pharmacy Section (AcPS) and the Pharmacy Education Taskforce (PET). FIPEd advocates for the use of needs-based education and training strategies (Figure 4.1) where pharmacy education provision is socially accountable, practice and science are evidence-based and practitioners have the required competencies to provide needs-based services to their communities.

FIPEd provides a global platform for exchange, providing mentorship and learning opportunities for academics and students, as well as the development of leadership and management, and pedagogic skills. FIPEd builds on, advocates for, and disseminates evidence-based guidance, consensus-based standards, tools, and resources for educational development and quality assurance. It also develops and facilitates education-related policy that supports advancement of the profession. FIPEd also advocates for and works with stakeholders at global, regional, and local levels.

Building on the success of the 2008-2010 Action Plan (1) the current domains (www.fip.org/education, taskforce) of activity will continue to develop and grow in a sustainable way.
The 2012 global sample reveals that, on average, 55% of pharmacists were found to work in community pharmacy environments, 18% in hospitals, 10% in industry, 5% in research and academia and 5% in regulation. The African region has less than 5% of its workforce employed in the pharmaceutical industry, in contrast to the Southeast Asian region where the pharmaceutical workforce working in community settings.

![Pharmacist distribution (%) by employment area (+/- SD)](image)

**Figure 3.10.**

<table>
<thead>
<tr>
<th>Sector</th>
<th>Hospital %</th>
<th>Industry %</th>
<th>Regulatory %</th>
<th>Other %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
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<tr>
<td>Africa</td>
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</tr>
<tr>
<td>SE Asia</td>
<td>20</td>
<td>40</td>
<td>10</td>
<td>30</td>
</tr>
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**Workforce distribution by sector**

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The capacity to provide pharmacy services in each country is dependent upon having an assured, competent, and capable workforce and a similarly integrated academic workforce to train and support sufficient numbers of new pharmacists and other members of the support workforce at both basic and advanced levels.

- There remains variance in the scope and range of pharmacy education quality assurance systems. An adaptable quality assurance framework has been developed and adopted by FIP. Advocacy continues to encourage systems to improve quality assurance and accreditation of pre-service education.
- Ensuring mechanisms for assured practitioner competence (and ultimately performance) and expert practice is now a key goal for pharmacy education policy. Systems and Continuing Professional Development (CPD) support should be oriented to enable competency-based lifelong development for all practitioners.
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**PART 4**

**PHARMACY EDUCATION**
The global workforce needs to be competent, capable, adaptable, and oriented to a medicines-centered, patient-focused approach, with development and professional practice, centred on the tenets of needs-based education [5].

For health care professionals, the capability to improve therapeutic outcomes, patients’ quality of life, scientific advancement, and public health imperatives is dependent on a foundation of sound education and training [3]. Likewise, a capable practitioner workforce is an essential pre-requisite for all health care professions, and pharmacy is no exception. Evolving roles towards more patient-focused service provision have been a steady trend in the last two decades. Modern, contemporary forms of initial education and training are vital for professions to be able to meet the increasingly complex health care demands of populations [7]. Additionally, there is a need to understand national priorities and the resource requirements and constraints that are present in all national economies, and to be able to describe the context and need for pharmacy education within these economies. Globality, this requires a coordinated and multi-system approach to the continued development of intelligent planning, supply, and initial and advanced training and education to prepare the pharmacy workforce for such roles.

When using the term pharmacy education, it is to be understood that this refers to the educational design and capacity to develop the workforce for a diversity of settings (e.g. community, hospital, research and development, academic) across varying levels of service provision and competence (e.g. pharmacy support staff, workforce, pharmacists and pharmaceutical scientists, and scope of education e.g. undergraduate, postgraduate, life-long learning).

This multi-dimensional conceptualization embodies a systematic approach to education development that enables and supports a capable and flexible workforce to provide access to medicines expertise and to effectively improve the health of nations.

Pharmacy education worldwide continues to have many issues that challenge the quality of teaching, and learning at a time when there are limited resources to meet these challenges. The data in this report provides evidence that there is a global scarcity of qualified pharmacists to provide patient care at a time when there are more opportunities for pharmacists to expand their roles and responsibilities [8]. From this perspective, pharmacy is no different from other health care professions. PPEd and the associated Pharmacy Education Taskforce (PET) advocates for professional needs-based education, working in partnership with the UNESCO and WHO [6,7].

PET currently oversees the implementation of the Work Plan 2012–2012, which continues the work initially developed by the 2008–2010 Action Plan [1,9]. The Work Plan is oriented towards identifying, locally-determined needs and using this information to facilitate comprehensive education development and achievement of the competencies required to provide the local services (Figure 4.1). The domains for action prioritised in the work plans relate to developing a pharmacy education vision and framework, preparing the pharmacy workforce, and integrating quality assurance and education leadership for these efforts. From these domains, five project teams have been created to support the areas of (i) vision and competency, (ii) academic and institutional capacity, (iii) quality assurance, (iv) pharmacy support workforce, and (v) educational leadership. The leadership for these project teams comes from PET, which serves as the coordination, analysis, and dissemination hub. It includes both a core of key stakeholders and a dynamic shell of voluntary regional collaborators.

4.2 Pharmacy education capacity and training institution distribution

The supply side of the workforce capacity pipeline is clearly important, and valid data about institutional capacity for providing initial education and training are critical in order to provide workforce intelligence for the profession. This section aims to provide comparative data on the supply side capacity challenges in order to provide indicators for planning at global and regional levels. The data presented here are concerned with capacity, competence and quality are dealt with in subsequent sections. It is clear that nations will need sufficient numbers of students in initial education programmes to provide for a future capable workforce. In addition, the academic establishment data also need to be determined. Without an adequate academic workforce, there cannot be a competent and capable health care workforce.

Education-related data from this survey are derived from a total of 96 country/territory-level responses across a number of variables. Three countries in our sample reported that they had no university-based schools of pharmacy and 14 (19%) reported only a single national pharmacy school. Conversely USA reported 127 accredited schools and India reported 190. The sample reported a total of 287 schools of pharmacy from 92 countries and territories, which of which 158 were reported as accredited. The reported academic workforce (as a proportion of the total pharmacy workforce) ranges from 0.1% (Libia) to 35.7% (Cameroon) with a sample mean of 5.2% of the workforce.

The respondents reported a total of 18,239 (n=54 countries and territories) pharmacy graduates per year, with a sample mean of 71.4 graduates per year per school. Figure 4.2 shows the country and territory level production of newly qualified graduate pharmacists per year (for available data).
The global workforce needs to be competent, capable, adaptable, and oriented to a medicine-centered, patient-focused approach, with development and professional practice, centered on the tenets of needs-based education [5, 6].

For health care professionals, the capability to improve therapeutic outcomes, patients’ quality of life, scientific advancement, and public health imperatives is dependent on a foundation of sound education and training [3]. Likewise, a capable practitioner workforce is an essential pre-requisite for all health care professions, and pharmacy is no exception. Evolving roles towards more patient-focused service provision have been a steady trend in the last two decades. Modern, contemporary forms of initial education and training are vital for professions to be able to meet the increasingly complex, health care demands of populations [6, 7]. Additionally, there is a need to understand national priorities and the resource requirements and constraints that are present in all national economies, and to be able to describe the context and need for pharmacy education within these economies. Globally, this requires a coordinated and multi-system approach to the continued development of intelligent planning, supply, and initial and advanced training and education to prepare the pharmacy workforce for such roles.

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Education-related data from this survey are derived from a total of 49 country/territory level responses across a number of variables. Three countries in our sample reported they had no university-based schools of pharmacy and 34 (69%) reported only a single national pharmacy school. Conversely, USA reported 127 accredited schools and India reported 1400. The sample reported a total of 297 schools of pharmacy from 82 countries and territories, of which 1385 were reported as accredited. The reported academic workforce as a proportion of the total pharmacy workforce ranges from 0.1% (Uganda) to 35.7% (Cameroon) with a sample mean of 5.2% of the workforce.

There is a strong correlation with numbers of institutions providing initial pharmacy education and the country and territory level population. Institutional and national infrastructures for pharmacy education and training tend to be aligned with population size, although many African nations are situated below the regression line (Figure 4.4). The Figure 4.5 illustrates the total number of pharmacy schools and total number of pharmacy technician training schools (n= 46 countries and territories).
A key challenge in addressing the global health workforce shortage is that countries in Africa tend to have fewer trained pharmacy personnel and fewer training institutions within the country’s infrastructure. Physical resource and supply capacity therefore remain an important issue for FIP.

### 4.3 Quality assurance

While virtually all countries have established systems for oversight and quality assurance (QA) of education in general, fewer countries have QA systems specific to pharmacy education that are well-developed. In some countries, such systems are emerging, in others, they are non-existent; at best, rely on internal (institutional) QA processes.

Data from the Global Pharmacy Workforce Survey suggest that only one respondent country (Uruguay) did not have any pharmacy schools accredited and only one respondent country (Burundi) did not have any pharmacy technician training schools accredited. Eight (out of 48) countries have variance between the total number and the number of accredited pharmacy schools and five (out of 26) countries have variance between total number and the number of accredited pharmacy technician training schools. Forty-two countries have their full national compliment under a national accreditation system for pharmacy schools and 23 countries for pharmacy technician training schools.

Further study of national accreditation systems is needed to gain greater insights into how such systems impact the quality of pharmacy education, such research has been proposed by PET. Ideally, countries should have their own national QA system and standards for pharmacy education that reflect contemporary and emerging pharmacy practice and education meet the specific needs of the country.

To support national efforts to improve systems and standards for QA of pharmacy education, FIP developed and adopted the Global Framework for Quality Assurance of Pharmacy Education [1]. The framework (available at www.fip.org/education_taskforce) provides the context for QA of pharmacy education, presents a framework for a national QA system, and offers quality criteria for pharmacy education. The Framework is intended to serve as a foundation that can be adapted and built upon to suit national needs, systems, and conditions; it focuses on the elements that need to be included and how these elements are applied in principle, rather than being specific or prescriptive. The Framework does not advocate for any one overall model of QA system, but comments on different approaches that exist and outlines trends that are emerging globally [12].

In 2009-10, the Framework underwent further validation involving expert reviewers (representing pharmacy practice, academia, regulation and quality assurance of pharmacy education) from 24 participating countries. The survey instrument used examined the validity and national applicability of each component of the Framework. All sections of the Framework including the philosophy and purpose of quality assurance; structure, policies, and procedures for a national quality assurance system, and quality criteria for the outcomes, structure and processes of a pharmacy school and its professional degree program achieved high percentage validity scores of 60 of the 62 elements rating greater than 90%. Data and comments from the validation exercise are being used to inform the revision of the Framework, and release of the updated version is anticipated in 2013.

The quality assurance domain of PET is collaborating with WHO to develop an instrument that institutions can use for self-assessment and quality improvement of their academic program in pharmacy. The instrument, which uses the quality criteria of the Framework, has been piloted in Nigeria and the findings and conclusions from that exercise will inform its revision. It is planned that the updated instrument will be further tested and validated in several additional countries prior to final adoption. Also under consideration is adaptation of the instrument for use with other health professional education.

### 4.4 Practitioner development approaches in professional education

Over the last ten years, competency frameworks in health care have become increasingly popular due to the need for transparency in the training, development, and accreditation of health care professionals [12]. Continuing Professional Development (CPD) is advocated as a means of ensuring the competence of health care professionals and is now mandatory for many of the health care professions. In order for CPD to be meaningful, health care professionals need to know the areas of competence for their role so they can accurately identify their learning needs. In essence, they need to know what it is they need to be able to do [13-15]. Competency frameworks can provide this, and are based on real life roles and experience; empirical or applied learning is essential for the development of competence.

Perhaps a shift should be made towards Continuing Professional Education (CPE), a more fit-for-purpose and competent practitioner according to the specificity of the country or sector needs. There is a need to globally define a career pathway, since there is no seamless evolution of the practitioner.
A key challenge in addressing the global health workforce shortage is that countries in Africa tend to have fewer trained pharmacy personnel and fewer training institutions within the country infrastructure. Physical resource and supply capacity therefore remain an important issue for FIPED.

4.3 Quality assurance

While virtually all countries have established systems for oversight and quality assurance (QA) of education in general, fewer countries have QA systems specific to pharmacy education that are well developed. In some countries, such systems are emerging; in others, they are non-existent or, at best, rely on internal (institutional) QA processes.

Data from the Global Pharmacy Workforce Survey suggest that only one respondent country (Uruguay) did not have any pharmacy schools accredited and only one respondent country (Burundi) did not have any pharmacy technician training schools accredited. Eight (out of 48) countries have variance between the total number and the number of accredited pharmacy schools and five (out of 48) countries have variance between total number and the number of accredited pharmacy technician training schools.

Further study of national accreditation systems is needed to gain greater insights into how such systems impact the quality of pharmacy education, such research has been proposed by PET ideally, countries should have their own national QA system and standards for pharmacy education that reflect contemporary and emerging pharmacy practice and education and meet the specific needs of the country.

To support national efforts to improve systems and standards for QA of pharmacy education, FIP developed and adopted the Global Framework for Quality Assurance of Pharmacy Education [10]. The framework (available at www.frameworkeducation.org) provides the context for QA of pharmacy education, presents a framework for a national QA system, and offers quality criteria for pharmacy education. The Framework is intended to serve as a foundation that can be adapted and built upon to suit national needs, systems, and conditions; it focuses on the elements that need to be included and how these elements are applied in principle, rather than being specific or prescriptive. The Framework does not advocate for any one overall model or QA system, but comments on different approaches that exist and outlines trends that are emerging globally [11].

In 2009-10, the Framework underwent further validation involving expert reviewers (representing pharmacy practice, academia, regulation and quality assurance of pharmacy education) from 24 participating countries. The survey instrument used examined the validity and national applicability of each component of the Framework. All sections of the Framework including the philosophy and purpose of quality assurance, structure, policies, and procedures for a national quality assurance system, and quality criteria for the outcomes, structure and processes of a pharmacy school and its professional degree program achieved high percentage validity scores 60 of the 62 elements rating greater than 90%. Data and comments from the validation exercise are being used to inform the revision of the Framework, and release of the updated version is anticipated in 2013.

The quality assurance domain of PET is collaborating with WHO to develop an instrument that institutions can use for self-assessment and quality improvement of their academic program in pharmacy. The instrument, which uses the quality criteria of the Framework, has been piloted in Nigeria and the findings and conclusions from that exercise will inform its revision. It is planned that the updated instrument will be further tested and validated in several additional countries prior to final adoption. Also under consideration is adoption of the instrument for use with other health professional education.

4.4 Practitioner development approaches in professional education

Over the last ten years, competency frameworks in health care have become increasingly popular due to the need for transparency in the training, development, and accreditation of health care professionals [12]. Continuing Professional Development (CPD) is advocated as a means of ensuring the competence of health care professionals and is now mandatory for many of the health care professions. In order for CPD to be meaningful, health care professionals need to know the areas of competence for their role so they can accurately identify their learning needs. In essence, they need to know what it is they need to be able to do [13-15]. Competency frameworks can provide this, and are based on real life roles and experience; experiential or applied learning is essential for the development of competence.

Perhaps a shift should be made towards Continuing Professional Education (CPE), a more fit-for-purpose and competent practitioner according to the specificity of the country or sector needs. There is a need to globally define a career pathway, since there is no seamless evolution of the practitioner.
The vision and competency project team has developed an initial construct towards an "educational roadmap" to guide efforts in and mechanisms for pharmacy education [31]. Countries, particularly those marginalised by the human resources for health crisis, can use the evidence gathered to develop their workforce and to track the results of their efforts. The scaling up, quality assurance, and quality improvement of global pharmacy education are prerequisites for addressing workforce shortages and service development.

Since publication of the 2009 Workforce Report, a revision of the literature, discussion panels, respondent validation, and an online validation survey were conducted that supported the development of the first Global Competency Framework (GbCF) for services provided by members of the pharmacy workforce. The Global Competency Framework (GbCF) Version 1 contains a core set of behavioural competencies (www.fip.org/education_taskforce).

The GbCF Version 1 can be a starting point to provide guidance for foundation level practice, not only at an individual level but also for further development into advanced practice. It can also be an aid in providing an overview of how practice at a foundation level can be translated into ‘what’ and ‘how’ students should learn and interact with pharmacists' specific skills during their initial degree, always with country differences in mind (the GbCF does not imply that there should be a 'single' global curriculum that would fit all countries). Table 4 indicates the terminology used by PET regarding the theme of competence.

Table 4. Terminology used by PET [12]

<table>
<thead>
<tr>
<th>Competency</th>
<th>Framework</th>
<th>Full repertoire of competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance</td>
<td>Effectiveness and healthy behaviour</td>
<td></td>
</tr>
<tr>
<td>Performance Indicators</td>
<td>Measurable performance against a specified criterion or standard</td>
<td></td>
</tr>
<tr>
<td>Practice Standards</td>
<td>The systems, governance, and information activity with which pharmacy practice is provided, and its services that ensure as standards against which performance can be assessed</td>
<td></td>
</tr>
</tbody>
</table>

Acting as a mapping tool for the creation of country specific needs for the development of practice and practitioner professional development, the GbCF can be attached to an assessment grid and together with appropriate assessment tools, can aid countries that do not currently have a competency framework but wish to develop one. By creating a portfolio, in synergy with other assessment tools, countries can implement the GbCF into practice, developing education and training infrastructures for their practitioners.

4.5 Pharmacy support workforce

FIP acknowledges that health care facilities cannot operate without medicines [34]. The availability of both medicines and pharmacy services is crucial to ensuring a well-functioning pharmaceutical system [35].

<table>
<thead>
<tr>
<th>Pharmacists</th>
<th>2009 Workforce Report (n=53)</th>
<th>2012 Workforce Report (n=81)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>33 (62%)</td>
<td>77 (95%)</td>
</tr>
<tr>
<td>In development</td>
<td>13 (25%)</td>
<td>13 (16%)</td>
</tr>
<tr>
<td>No</td>
<td>10 (19%)</td>
<td>1 (1%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pharmacy Technicians</th>
<th>2009 Workforce Report (n=42)</th>
<th>2012 Workforce Report (n=76)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>8 (19%)</td>
<td>18 (24%)</td>
</tr>
<tr>
<td>In development</td>
<td>9 (22%)</td>
<td>8 (12%)</td>
</tr>
<tr>
<td>No</td>
<td>24 (59%)</td>
<td>50 (66%)</td>
</tr>
</tbody>
</table>

The systems, procedures, and information used by an individual accumulates, develops, and acquires through their action (i.e., the importance of learning new knowledge and skills). The system is, however, also evident between countries within regions. The greatest reliance on pharmacy support workforce cadres is, however, also evident between countries within regions.

4.6 Developing educational leadership

As pharmacy roles continue to evolve and the number of health providers rises to better meet the health needs of a globalized society, transformative leadership is needed to ensure that educational systems continue to innovate while remaining harmonized with workforce planning. The same globalization that has increased economic, social, technical and political interdependence between nations has also influenced education. International trade, cultural exchange, and the use of web-based communication systems have created opportunities for more robust discussions of collaborative but needs-based educational models for pharmacy services [36]. Taking full advantage of these opportunities will require new insights, skills, and perspectives at every leadership level.

For example, for these discussions to be transformative, there must be a better understanding of how culture affects leadership.

Advancing educational leadership will require the profession to purposefully study the evidence from health care, education, and leadership. Some educational systems have prioritized leadership development as a critical part of the training programs required of pharmacists and pharmacy staff. Accreditation bodies, e.g., the US-based Accreditation Council for Pharmacy Education's Standards and Guidelines [39], increasingly value inclusion of leadership instruction.

Table 5 shows the percentage of regional pharmacists and pharmacy technicians who are interested in leadership training.

Many terms are used to describe those working within the pharmacy support workforce (e.g., pharmacy technician, assistant, technologist, dispenser, assistant pharmacist) with a variety of expected competency patterns. It should be noted that, at the core, a pharmacist is the same globally (i.e., having similar expectations of competence). Practice is likewise similar, as pharmacists are experts of medicines. This is a key moment in global education development and should form the basis for further research and development into advanced practice strategies.

A better understanding of the pharmacy support workforce is required to meet their needs in regard to education, registration and other work related issues. In response to this need, a global pharmacy support workforce review for non-pharmacist roles is being undertaken to present a global picture of the diverse nature of this cadre. Preliminary data indicates that, with many countries requiring these cadres to work unsupervised (especially in rural environments) [26], the global distribution of the pharmacy support workforce is varied. Global Pharmacy Workforce Survey data for 2012 show the greatest reliance on pharmacy support workforce cadres to be in South East Asia (67.5%), with the Americas (28.4%) being least reliant on these cadres (Figure 4.6). Significant variation is, however, also evident between countries within regions.
The vision and competency project team has developed an initial construct towards an "educational roadmap" to guide efforts in and mechanisms for pharmacy education [31]. Countries, particularly those marginalised by the human resources for health crisis, can use the evidence gathered to develop their workforce and to track the results of their efforts. The scaling up, quality assurance, and quality improvement of global pharmacy education are prerequisites for addressing workforce shortages and service development.

Since publication of the 2009 Workforce Report, a revision of the literature, discussion panels, respondent validation, and an online validation survey were conducted that supported the development of the first Global Competency Framework (GbCF) for services provided by members of the pharmacy workforce. The Global Competency Framework (GbCF) Version 1 contains a core set of behavioural competencies (www.fip.org/education_taskforce).

The GbCF Version 1 can be a starting point to provide guidance for foundation level practice, not only at an individual level but also for further development into advanced practice. It can also be an aid in providing an overview of how practice at a foundation level can be translated into "what" and "how" students should learn and interact with pharmaceutical care providers. Since its initial release, the GbCF has shown unequal growth across the continuum of education and practice. The global distribution of the pharmacy support workforce is varied. Global Pharmacy Workforce Survey data for 2012 show the greatest reliance on pharmacy support workforce cadres to be in South East Asia (67.5%), with the Americas (28.4%) being least reliant on these cadres (Figure 4.6). Significant variation is, however, also evident between countries within regions.

Data gathered from the global workforce report survey in 2012 indicate that 29 countries (59%) have a competency framework for pharmacists, 17 countries (21%) are currently developing one, and 37 countries (66%) do not have one in place. For pharmacy technicians, 48 countries (65%) reported having a competency framework. Eight countries (31%) reported they are developing one and all countries (66%) reported that they do not have a competency framework. As stated in Table 4.2, despite an increase in number of respondents, there has been no significant increase in the number of countries that have reported using or developing a national competency framework since 2009.

The GbCF is under development; there is further work to be done and more studies to be conducted to effectively define the core competencies for a foundation level framework across all pharmacy sectors that will improve the competence of the practitioners. Nonetheless, the findings provide evidence that at the core, a practitioner is the same globally (i.e., having similar expectations of competence). Practice is likewise similar as: practitioners are experts of medicines. It is a key moment in global education development and should form the basis for further research and development into advanced practice development strategies.

4.5 Pharmacy support workforce

FIP acknowledges that health care facilities cannot operate without medicines [34]. The availability of both medicines and a pharmacy workforce in adequate numbers with appropriate competencies is crucial to ensuring a well-functioning pharmaceutical system [34].

Table 4.2 Percentage of main regions for pharmacy and technician workforce into matched variant pairs

<table>
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Many terms are used to describe those working within the pharmacy support workforce (e.g. pharmacy technician, assistant, technician, dispenser, assistant pharmacist) with a variety of expected competencies. It should be noted that the regional and national definitions vary. Current International Federation of Pharmaceutical Education (IFPE) definition of pharmacy technician [31] is, however, not used consistently, with many countries requiring these cadres to be work supervised (especially in rural environments) [26].

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With a consistent call from countries for a greater focus on pharmacy support workforce cadres, future involvement in this sector of the pharmacy workforce will require greater attention. Any global focus should seek to address local country needs with the larger aim of ensuring safe use of quality medicines by patients.

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With a consistent call from countries for a greater focus on pharmacy support workforce cadres, future involvement in this sector of the pharmacy workforce will require greater attention. Any global focus should seek to address local country needs with the larger aim of ensuring safe use of quality medicines by patients.
4.7 Publishing pharmacy education research and development

The pharmacy academic and education sector is growing to meet the human resource demands in settings where pharmacy education is developed, but also notably in regions such as sub-Saharan Africa where there is the greatest shortage of pharmacy personnel [14]. Pharmacy education is perhaps the only way to provide a sustainable approach to workforce solutions in ensuring quality medicines supply and pharmaceutical care. Research suggests that even in developed settings, educators will be in increased demand in the coming decade [13].

An essential part of this demand is to ensure that these activities are well reported in the literature including journals such as Pharmacy Education.

Pharmacy Education is an online open-access international journal hosted, published by FIP and endorsed by the WHO, and focus on issues in pharmacy education. With a new editorial team who started at the end of 2011, including representation from the African region, a review was conducted of the content of the journal, soon to be published in Pharmacy Education. This review confirmed that Pharmacy Education educationally represents research and reports primarily from Europe (Figure 4.7). The journal is now engaging to a greater extent with the international audience by encouraging research manuscript submissions and inviting peer reviewers specifically from other regions.

An editorial decision was also made in 2012 to focus particularly on the main areas of publishing including original research, programme and assessment descriptions, and short reports (Figure 4.8). Pharmacy Education will no longer publish opinion pieces, essays, book reviews, or keynote lectures, but will continue to support conferences and symposia through the publication of abstracts. There will be continued efforts to ensure the quality of published works and support especially for new authors and researchers and those from the practice settings where formal education increasingly takes place.

4.8 Summary and future steps

- FIPPE is a global forum where educators, practitioners, policy makers and educational planners come together to share experiences, build consensus and drive global advocacy and policy for the transformation and development of pharmacy education.
- PET aims to advocate, facilitate and design support tools for pharmacy education that are needs-based in their approach [14]. This will include post-registration in addition to preservice education.
- Education strategies need to be flexible for the pre-existing and future needs of the community in order to optimise effectiveness. This further supports the importance of the adoption of a vision and action plan for global pharmacy education that is founded in local, regional, national and international needs for health care.
- Future PET activities include the finalisation in 2013 of the FIP-WHO global survey of Pharmacy Schools, launch of the first resources made available through the UNITWIN Network in Global Pharmacy Education Development (GPED), the publication of an updated version of the FIP Quality Assurance Framework for Pharmacy Education, further validation and development of the GEF, finalisation of the pharmacy support workforce competency survey and the compilation of leadership development resources.

References

Key considerations for educational leadership going forward include an increased recognition of the value of and need for interprofessional leadership training. Just as pharmacists must learn to lead across cultures, we must also learn to affect change across and within multiple health professions. In this respect, the countries where the education of pharmacists and pharmacy staff is only now emerging (e.g., Namibia) have a real opportunity to develop models that may be adaptable for others.

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References

This part presents nine case studies on pharmacy workforce planning, management, and development from Afghanistan, Costa Rica, Ghana, Great Britain, Japan, the Pacific Island Countries, Singapore, South Africa, and Tanzania. Sourced from different regions, each case study describes a unique set of pharmacy workforce challenges and issues. The particular focus on Africa, with three case studies from Ghana, South Africa, and Tanzania, reflect the broad changes taking place in this region that is still most affected by the severe shortage of health care professionals. The case studies provide an overview of strategies employed to address key workforce challenges, associated outcomes and lessons learnt.

5.1 Country Case Study: Afghanistan

Authors

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Summary

- There are seven times more pharmacy establishments than the total number of pharmacists and pharmacy assistants in Afghanistan
- Evidence and multi-stakeholder collaboration are required to inform needs-based pharmaceutical human resources planning
- In 2011, the Ministry of Public Health conducted a comprehensive assessment of pharmaceutical human resources at the national, provincial, facility and individual levels to identify key issues and to provide data to inform planning
- Through multi-stakeholder processes, the Ministry of Public Health has developed a draft Pharmaceutical Human Resources Strategic Framework describing strategic objectives and strategies to address priority issues.

5.1.1 Background

The Islamic Republic of Afghanistan is a landlocked country with an estimated population of more than 30 million, of which almost 80% reside in rural areas and 38% live below the poverty line. Life expectancy is 48 years and while mortality rates have declined significantly over the last 30 years, they remain high with an under-five child mortality rate of 149 per 1,000 live births and a maternal mortality ratio of 449 per 100,000 live births [2].

With approximately 1,163 pharmacists and 822 pharmacy assistants in the country, this workforce is outnumbered seven-fold by the 10,331 private pharmacies, 2,083 public sector pharmacies, 679 pharmaceutical wholesalers, and 17 pharmaceutical manufacturers [2]. These figures are especially concerning given the vital role the pharmacy workforce plays in the health system, providing services ranging from manufacturing and regulating medicines to distributing and dispensing medicines. The number of new pharmacists is limited, as there is only one training institution in Afghanistan (the Faculty of Pharmacy at Kabul University). However the number of schools training pharmacy assistants has increased recently to 21, all but one of these schools are public.

Stakeholders identified eight major areas of services across the public and private pharmaceutical sector in 2010 [described in the Competency Framework for Pharmaceutical Services in Afghanistan] :

1. Policy and planning
2. Laws and regulation
3. Quality assurance systems
4. Production/manufacturing
5. Procurement
6. Supply chain management
7. Dispensing: Outpatient hospital and private pharmacy
8. Hospital inpatient dispensing (hospital)

The Ministry of Public Health (MoPH), together with various partners, is actively building the pharmaceutical system after more than 30 years of conflict to provide safe, affordable, and equitable access to medicines. These efforts include strengthening regulatory and quality assurance mechanisms, implementing strategies and policies to improve rational use of medicines, and supporting the development and reform of pre-service education all of which require stronger pharmaceutical human resources to ensure the sustainability of these efforts.

The General Directorate of Pharmaceutical Affairs (GDDPA) and the General Directorate of Human Resources (GDHR) within the MoPH, together with other institutions, are responsible for all activities related to creating and maintaining a sustainable workforce in the pharmaceutical sector. In 2010, the GDDPA and GDHR formed a core team with the support of the U.S. Agency for International Development’s (USAID’s) Strengthening Pharmaceutical Systems (SPS) Project. This core team steered the development and implementation of a comprehensive pharmaceutical human resources assessment in 2011, analyzed and presented findings from the assessment, and facilitated the development of a comprehensive pharmaceutical human resources strategic framework in 2012 (Figure 5.1.3).
This part presents nine case studies on pharmacy workforce planning, management, and development from Afghanistan, Costa Rica, Ghana, Great Britain, Japan, the Pacific Island Countries, Singapore, South Africa, and Tanzania. Sourced from different regions, each case study describes a unique set of pharmacy workforce challenges and issues. The particular focus on Africa, with three case studies from Ghana, South Africa, and Tanzania, reflect the broad changes taking place in this region that is still most affected by the severe shortage of health care professionals. The case studies provide an overview of strategies employed to address key workforce challenges, associated outcomes and lessons learnt.

5.1 Country Case Study: Afghanistan

Authors

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Summary

- There are seven times more pharmaceutical establishments than the total number of pharmacists and pharmacy assistants in Afghanistan.
- Evidence and multi-stakeholder collaboration are required to inform needs-based pharmaceutical human resources planning.
- In 2012, the Ministry of Public Health conducted a comprehensive assessment of pharmaceutical human resources at the national, provincial, facility and individual levels to identify key issues and to provide data to inform planning.
- Through multi-stakeholder processes, the Ministry of Public Health has developed a draft Pharmaceutical Human Resources Strategic Framework describing strategic objectives and strategies to address priority issues.

5.1.1 Background

The Islamic Republic of Afghanistan is a landlocked country with an estimated population of more than 30 million, of which almost 80% reside in rural areas and 36% live below the poverty line. Life expectancy is 48 years and while mortality rates have declined significantly over the last 30 years, they remain high with an under-five child mortality rate of 149 per 1,000 live births and a maternal mortality ratio of 449 per 100,000 live births.

With approximately 1,163 pharmacists and 822 pharmacy assistants in the country, total workforce is outnumbered seven-fold by the 10,131 private pharmacies, 2,082 public sector pharmacies, 679 pharmaceutical wholesalers, and 17 pharmaceutical manufacturers. These figures are especially concerning given the vital role the pharmacy workforce plays in the health delivery system, providing services ranging from manufacturing and regulating medicines to distributing and dispensing medicines. The number of new pharmacists is limited, as there is only one training institution in Afghanistan (the Faculty of Pharmacy at Kabul University). However, the number of schools training pharmacy assistants has increased recently to 21, all but one of these schools are public.

Stakeholders identified eight major areas of services across the public and private pharmaceutical sector in 2010 (described in the Competency Framework for Pharmaceutical Services in Afghanistan):

1. Policy and planning
2. Laws and regulations
3. Quality assurance systems
4. Production/manufacturing
5. Procurement
6. Supply chain management
7. Dispensing: Outpatient hospital and private pharmacy
8. Hospital inpatient dispensing (hospital)

The Ministry of Public Health (MoPH), together with various partners, is actively rebuilding the pharmaceutical system after more than 30 years of conflict to provide safe, affordable, and equitable access to medicines. These efforts include strengthening regulatory and quality assurance mechanisms, implementing strategies and policies to improve rational use of medicines, and supporting the development and reform of pre-service education-all of which require stronger pharmaceutical human resources to ensure the sustainability of these efforts.

The General Directorate of Pharmaceutical Affairs (GDPA) and the General Directorate of Human Resources (GDHR) within the MoPH, together with other institutions, are responsible for all activities related to creating and maintaining a sustainable workforce in the pharmaceutical sector. In 2010, the GDPA and GDHR formed a core team with the support of the U.S. Agency for International Development (USAID)'s Strengthening Pharmaceutical Systems (SPS) Project. This core team steered the development and implementation of a comprehensive pharmaceutical human resources assessment in 2011, analyzed and presented findings from the assessment, and facilitated the development of a pharmaceutical human resources strategic framework in 2012 (Figure 5.1.3).
The last few decades have seen rapid growth in the number of pharmacists and pharmacy assistants, with the density varying from 2010 to more than three per 10,000 population in different provinces (Figure 5.1.2).

Aside from provincial distribution imbalances, the graduate tracking survey also found a lack of pharmaceutical human resources in rural areas of each province; rural areas in some provinces lacked pharmaceutical staff entirely (Figure 5.1.3).

This section describes the strategies applied through the pharmaceutical human resources assessment and strategic framework processes and key lessons learned and summarises the strategic objectives in the human resources framework.

### Needs-based approach

The needs in Afghanistan are unique, particularly given the conditions, history, and trends in the pharmaceutical sector. The core team first identified what information they would need in order to develop a strategic plan, and from this they identified a set of assessment objectives. They used these assessment objectives to guide processes to adapt existing WHO tools [3] or to develop required tools (e.g., graduate tracking tool, competency assessment tool).

The assessment thus set out to address specific information needs, generating data to inform the development of a strategic plan that addresses priority pharmaceutical human resources issues. Specific assessment objectives and their purposes at each level are summarized in Table 5.1.1.

### Multi-stakeholder engagement

Pharmaceutical human resources is a relatively new focus area, and this assessment and strategic framework development process provided opportunities for key stakeholders to engage in discussions and share information and insights required to see different dimensions of complex and challenging issues.

Before the first stakeholders' forum in 2010, the core team conducted a stakeholder analysis to identify priority stakeholders to engage. Throughout the process, a broad range of stakeholders that influence pharmaceutical human resources planning, management, or development were kept informed and invited to contribute to the development of the strategic framework. Such engagement was also key to gaining the commitment of stakeholders throughout the process, including stakeholders outside of the MoPH and pharmaceutical sector who hold decision-making authority over strategies described in the strategic framework.

### Evidence-based approach

Prior to 2010, there was a lack of information on pharmaceutical human resources and a lack of data that described priority issues. The pharmaceutical human resources assessment provided much needed information to inform human resources planning, management, and development. The assessment was carried out at the national, provincial, facility, and individual levels. The national and provincial level assessments were conducted in the first phase, and consisted of a review of existing policy documents and records. Facility and individual level assessments were conducted in four provinces (Kabul, Hirat, Nangahar, and Balkh) across 205 randomly selected facilities (Table 5.1.2). A total of 265 personnel providing pharmaceutical services filled out an
far exceeded the supply of pharmaceutical human resources in urban areas, as a result of demand and weakened regulatory frameworks on private sector pharmacies in Afghanistan, particularly in and distribution imbalance among health facilities. Although there was limited interaction, information flow, and coordination among human resources for health (HRH) planning. There was also a lack of a licensing renewal mechanism that meant information kept by GPDA on the number of pharmacists was out of date, and the directorate had no way of knowing which of pharmacists were in-country and actively working in the pharmaceutical sector. Although pharmaceutical cadres including nurses, physician assistants, teachers, school students, and lay workers. Although pharmaceutical human resources was also not disaggregated by cadre. Information regarding pharmacist and pharmacy assistant graduates and vacancies did not systematically flow among training institutions, GDPAs, and MoH. The lack of a licensure renewal mechanism meant that information kept by GPDA on the number of pharmacists was out of date, and the directorate had no way of knowing which of pharmacists were in-country and actively working in the pharmaceutical sector. All of these factors made it difficult to maintain an up-to-date and accurate human resources information system to inform human resources for health (HRH) planning. There was also limited interaction, information flow, and coordination among MoPH, training institutions, employers, and development partners on pharmaceutical human resources issues. Although stakeholders recognized the importance of these issues, there was an absence of pharmaceutical human resources strategies and plans designed to address them.

Pharmaceutical human resources shortage and distribution imbalance

The last few decades have seen rapid growth in the number of private sector pharmacies in Afghanistan, particularly in urban areas, as a result of demand and weakened regulatory mechanisms. Over time, the number of private pharmacies has far exceeded the supply of pharmaceutical human resources in the labor market. Increasingly, other health workers and lay workers provide pharmaceutical services in both private and public sectors. Of the 136 private pharmacy personnel participating in the assessment, only 12% were pharmacists and 2% were pharmacy assistants, the majority of whom were other cadres including nurses, physician assistants, teachers, school students, and lay workers. Although pharmaceutical human resources establishments outnumber the pharmaceutical workforce, only 57% of pharmacists who graduated between 2009 and 2020 worked in the pharmaceutical sector, and 20% were unemployed at the time of the graduate tracking survey in February 2022.

The survey also found maldistribution of pharmacists and pharmacy assistants, with the density varying from 2010 to more than three per 10,000 population in different provinces (Figure 5.1.2).

Aside from provincial distribution imbalances, the graduate tracking survey also found a lack of pharmaceutical human resources in rural areas of each province; rural areas in some provinces lacked pharmaceutical staff entirely (Figure 5.1.3).

In a February 2022 workshop, key stakeholders voiced their concern regarding the growth in the proportion of non pharmaceutical cadres and informal workers, stressing that it posed major risks to the public and reduced the number of available positions for pharmacy graduates. The assessment showed that pharmacist assistants had a major role in the provision of pharmaceutical services in health facilities—the proportion of health facilities for which they were responsible for dispensing was comparable to that of pharmacy assistants. The assessment also identified key competency gaps. Of the surveyed individuals:

- 40% did not have any or only had very little knowledge of formularies and essential drug lists,
- 28% did not have or had very limited ability to arrange pharmaceutical products based on storage guidelines, and
- 24% indicated being able to fully evaluate the appropriateness of prescribed medicines.

Low salaries

The average pharmacist and pharmacy assistant earn similar salaries (around $5,800 to $7,200 Afghanis per month or US$135 to 153). With the increasing cost of living in Afghanistan, these salaries make it difficult for pharmaceutical human resources to earn a living.

5.1.3. Strategies used and lessons learned

This section describes the strategies applied through the pharmaceutical human resources assessment and strategic framework. The core team involved stakeholders and key lessons learned and summarizes the strategic objectives in the human resources framework.

Needs-based approach

The needs in Afghanistan are unique, particularly given the conditions, history, and trends in the pharmaceutical sector. The core team first identified what information they would need in order to develop a strategic plan, and from this they identified a set of assessment objectives. They used these assessment objectives to guide processes to adapt existing WHO tools [3] or to develop required tools (e.g., graduate tracking tool, competency assessment tool).

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<table>
<thead>
<tr>
<th>Assessment levels</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>National</td>
<td>To identify total number of pharmaceutical personnel, data sources for information on pharmaceutical human resources, and current policies and strategies for pharmaceutical human resources.</td>
</tr>
<tr>
<td>Provincial</td>
<td>To identify different cadres providing pharmaceutical services and total pharmaceutical human resources and infrastructure at each facility.</td>
</tr>
<tr>
<td>Facility</td>
<td>To identify employee demographics, cadres providing pharmaceutical services, and human resources policies and procedures.</td>
</tr>
<tr>
<td>Individual</td>
<td>To examine the work environment, supervisory support provided and received, support for long-term, and composition of cadre providing pharmaceutical services.</td>
</tr>
</tbody>
</table>

The integration of the assessment and strategic framework development processes into broader MoPH efforts was critical, as was ensuring alignment with existing strategic plans such as the Human Resources Management and Development, strategic objectives and priority interventions described in the MoPH Strategic Plan 2011-2015.

Multi-stakeholder engagement

Pharmaceutical human resources is a relatively new focus area, and this assessment and strategic framework development process provided opportunities for key stakeholders to engage in discussions and share information and insights required to see different dimensions of complex and challenging issues. Before the first stakeholders’ forum in 2020, the core team conducted a stakeholder analysis to identify priority stakeholders to engage. Throughout the process, a broad range of stakeholders that influence pharmaceutical human resources planning, management, or development were kept informed and invited to contribute to the development of the strategic framework. Such engagement was also key to gaining the commitment of stakeholders throughout the process, including stakeholders outside of the MoPH and pharmaceutical sector who hold decision-making authority over strategies described in the strategic framework.

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5.1.4 Outcomes

Stakeholders in Afghanistan successfully developed a competency framework, applied this framework to assess the competency development needs of individuals providing pharmaceutical services across both the public and private sector, identified information needs, defined assessment objectives, adapted and developed assessment tools to meet these objectives, and completed the assessment to provide an evidence base to inform pharmaceutical human resources planning.

The MoPH convened stakeholders in February 2012 to review findings and draft a pharmaceutical human resources strategic framework. This strategic framework outlines strategic objectives for workforce planning, management, and development, along with strategies, opportunities, barriers, and stakeholder roles. Following widespread consultation on the draft strategic framework with 38 national and international stakeholder groups, consensus on the strategic framework was achieved on 2nd July. The framework will be used to inform the MoPH operational planning process to determine how priority pharmaceutical human resources strategic objectives can be implemented going forward.

The pharmaceutical human resources strategic framework seeks to outline a national strategy for the planning, management, and development of pharmaceutical human resources in the public and private sectors in Afghanistan. It will inform the wider Human Resources for Health strategic and operational plans, and will bring stakeholders together around a common framework for action to strengthen pharmaceutical human resources.

The MoPH will be working together with stakeholders and development partners on priority strategic objectives over the next three years. Efforts include developing pharmaceutical human resources projections, strengthening the pharmaceutical human resources information system, scaling up community pharmacy assistant training programmes, reviewing and revising pre-service resources information system, scaling up community pharmacy assistant training programmes, reviewing and revising pre-service assistant training programmes, reviewing and revising pre-service pharmacy assistant training programmes, and improving basic competence framework, applied this framework to assess the competency development needs of individuals providing pharmaceutical services across both the public and private sector, identified information needs, defined assessment objectives, adapted and developed assessment tools to meet these objectives, and completed the assessment to provide an evidence base to inform pharmaceutical human resources planning.

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References


Table 5.1.2. Pharmaceutical human resources assessment. Facilities

<table>
<thead>
<tr>
<th>FACILITY TYPE</th>
<th>NUMBER OF FACILITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturers</td>
<td>4</td>
</tr>
<tr>
<td>Wholesalers</td>
<td>10</td>
</tr>
<tr>
<td>Private hospitals</td>
<td>9</td>
</tr>
<tr>
<td>Private pharmacies</td>
<td>10</td>
</tr>
<tr>
<td>Public hospitals</td>
<td>26</td>
</tr>
<tr>
<td>Governmental pharmacies</td>
<td>6</td>
</tr>
<tr>
<td>Other Governmental, quelling</td>
<td>3</td>
</tr>
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</table>

Table 5.1.3. Pharmaceutical human resources strategic framework objectives

<table>
<thead>
<tr>
<th>Strategic Framework Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmaceutical human resources planning</td>
</tr>
<tr>
<td>- To strengthen the pharmaceutical human resources information system</td>
</tr>
<tr>
<td>- To facilitate related health and economic action on the spiralling of the pharmaceutical human resources and the human resources within the health sector</td>
</tr>
<tr>
<td>- To allocate increased human-sector resources for pharmaceutical and pharmacy assistance services</td>
</tr>
<tr>
<td>- To develop a national strategy for the planning, management, and development of pharmaceutical human resources</td>
</tr>
<tr>
<td>Pharmaceutical human resource management</td>
</tr>
<tr>
<td>- To establish a learning environment and ensure that the necessary human resources are in place to support the institutional development of the pharmaceutical and pharmacy assistance services</td>
</tr>
<tr>
<td>- To ensure that the pharmaceutical and pharmacy assistance services are available in the public and private sectors to improve quality pharmaceutical care</td>
</tr>
<tr>
<td>Pharmaceutical development</td>
</tr>
<tr>
<td>- To establish academic institutions at the provincial level to train pharmaceutical and pharmacy assistance services</td>
</tr>
<tr>
<td>- To strengthen the pharmaceutical human resources in the area of regulatory system</td>
</tr>
<tr>
<td>- To build the capacity of pharmacist and pharmacy assistance services to perform regulatory roles</td>
</tr>
<tr>
<td>- To improve the pre-service curricula of pharmacist and pharmacy assistance services</td>
</tr>
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</table>

Table 5.1.4. Pharmaceutical human resources assessment. Facilities

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The findings helped to inform in-depth discussions during a stakeholder consultation hosted by MoPH in February 2012 to develop a draft pharmaceutical human resources strategic framework. These findings provided data that at times challenged the perceived nature of problems and helped multiple stakeholders arrive at a shared understanding of key issues and their underlying causes. The assessment findings were published as a factsheet, and small group discussions were held to identify key issues and their causes, in order to propose strategic objectives and determine appropriate strategies (Table 5.1.3).
5.14 Outcomes

Stakeholders in Afghanistan successfully developed a competency framework, applied this framework to assess the competency development needs of individuals providing pharmaceutical services across both the public and private sector; identified information needs, defined assessment objectives, adapted and developed assessment tools to meet these objectives, and completed the assessment to provide an evidence base to inform pharmaceutical human resources planning.

The MoPH convened stakeholders in February 2012 to review findings and draft a pharmaceutical human resources strategic framework. This strategic framework outlines strategic objectives for workforce planning, management, and development, along with strategies, opportunities, barriers, and stakeholder roles. Following widespread consultation on the draft strategic framework with 31 national and international stakeholder groups, consensus on the strategic framework was achieved on 2nd July. The framework will be used to inform the MoPH operational planning process to determine how priority pharmaceutical human resources strategic objectives can be implemented going forward.

The pharmaceutical human resources strategic framework seeks to outline a national strategy for the planning, management, and development of pharmaceutical human resources in the public and private sectors in Afghanistan. It will inform the wider Human Resources for Health strategic and operational plans, and will bring stakeholders together around a common framework for action to strengthen pharmaceutical human resources.

The MoPH will be working with stakeholders and development partners on priority strategic objectives over the next three years. Efforts include developing pharmaceutical human resources projections, strengthening the pharmaceutical human resources information system, scaling up community pharmacy assistant training programmes, reviewing and revising pre-service curriculum, forming a Pharmacy Council to license and regulate pharmacists and pharmacy assistants, improving basic pharmaceutical service competencies, and authorizing increases in private and public sector salaries.

Acknowledgments

This report is the result of combined efforts and collaboration with public sector agencies based in Afghanistan, pharmaceutical sector stakeholders, and the Strengthening Pharmaceutical Services Systems Project funded by USAID and implemented by Management Sciences for Health, an international nongovernmental organization. Specifically, the authors would like to acknowledge support from the Ministry of Public Health: the General Directorate of Human Resources, the General Directorate of Pharmaceutical Affairs, Kabul University Pharmacy Faculty, and Ghazanfar Institute of Health Sciences.

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Table 5.1.3. Pharmaceutical human resources strategic framework objectives

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<td>125</td>
</tr>
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</tr>
<tr>
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<td>6</td>
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5.2 Country Case Study: Costa Rica

Authors

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Summary

- The Colegio de Farmaceuticos de Costa Rica (Costa Rica’s Pharmacists Association) has regulated general pharmacist practice since 1942 and, since 1986, the registration of specialists in various areas of pharmacy practice.
- Currently, Costa Rica has no specific policy regarding pharmaceutical human resources planning to address the needs of the nation.
- There are 3,787 active pharmacists registered as of March 2012 (78.5 active pharmacists per 100,000 population).
- The majority of pharmacists practice in two main areas: health care pharmacy (64.6%) and the pharmaceutical industry (31.6%).
- On average, there is one private pharmacy for every 4,454 inhabitants, although geographical distribution is unequal. In public (state) pharmacies there is an average of one pharmacist per every 15,390 inhabitants.

5.2.1 Background

Costa Rica is a country covering an area of 51,100 km² located in Central America with a population of 4.5 million inhabitants. Since 1942, there has been a supportive social security system (Caja Costarricense de Seguro Social), which provides comprehensive health services to all inhabitants in the country without discrimination.

Pharmaceutical human resources in the country

The number of active pharmacists in Costa Rica in March 2012 is 3,787, of which 69% are female and 31% male. Half are under 35 years of age. The number of active pharmacists per 100,000 inhabitants in the country in 2012 is 785. There are no unemployed pharmacists in the country. There are no certified pharmacist assistants, as this training is not provided in Costa Rica.

Distribution and human resources roles of pharmacists

The majority of professionals practice in two main areas, in the health care pharmacy area (64.6%) and the pharmaceutical industry area (31.6%). The health care pharmacy area includes professionals working in community pharmacies and hospital pharmacies, both public and private. Roles in the pharmaceutical industry area include medical representatives, regents of pharmaceutical distributors, regulatory affairs, pharmaceutical industry and clinical research. In addition, 1.24% of pharmacists have roles in teaching and research. Figure 5.2.1 shows the distribution of areas of practice of pharmacists working in the country.

Figure 5.2.1. Distribution of pharmacy practice areas

![Distribution of pharmacy practice areas](source)

Regulation of professional practice

In Costa Rica, professional practice is regulated by the Colegio de Farmaceuticos de Costa Rica, which is delegated by the State to do so. The Colegio works to ensure the proper implementation of national legislation in pharmaceutical establishments, to monitor the professional authority in such facilities, and to respond to societal demands. An essential tool for effective regulation of professional practice is to propose amendments to the laws and regulations related to medicines. However, it is a lengthy process to amend regulations.

Pharmaceutical education

From 1940 to 1998, the state university, University of Costa Rica (UCR), was the only institution that offered a pharmacy degree. In 1998, however, the first pharmacists graduated from a private university, which had a shorter degree than the state university and a different curriculum. Curricula and general activities of private universities are designed according to the legislation established by the National Council of Private Education (CONESUP) within the Ministry of Education, as opposed to the public universities, which are governed by the National Council of Schools (CONARE).

To date, aside from UCR, there are four private universities that offer pharmacy degrees: La Universidad Interamericana de las Américas (UIA), La Universidad Iberoamericana (UNIBE), La Universidad de Ciencias Médicas (UCMED) and Universidad Latina (ULATINA), which opened in 2011 with no graduates to date. Table 5.2.2 presents the number of professionals registered in the Colegio de Farmaceuticos, according to their university of origin, between 2001 and 2011. In this period, 2,092 new professionals were registered. The number of pharmacy professionals doubled in a decade, for the first time in 100 years.

Table 5.2.2. Registrants in the Colegio de Farmaceuticos de Costa Rica, by university of origin and year of registration, from 2001 to 2011

<table>
<thead>
<tr>
<th>Year</th>
<th>University of origin</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>Total</td>
<td>10</td>
</tr>
<tr>
<td>2002</td>
<td>Total</td>
<td>20</td>
</tr>
<tr>
<td>2003</td>
<td>Total</td>
<td>30</td>
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<tr>
<td>2004</td>
<td>Total</td>
<td>40</td>
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<tr>
<td>2005</td>
<td>Total</td>
<td>50</td>
</tr>
<tr>
<td>2006</td>
<td>Total</td>
<td>60</td>
</tr>
<tr>
<td>2007</td>
<td>Total</td>
<td>70</td>
</tr>
<tr>
<td>2008</td>
<td>Total</td>
<td>80</td>
</tr>
<tr>
<td>2009</td>
<td>Total</td>
<td>90</td>
</tr>
<tr>
<td>2010</td>
<td>Total</td>
<td>100</td>
</tr>
<tr>
<td>2011</td>
<td>Total</td>
<td>110</td>
</tr>
</tbody>
</table>

There are also postgraduate programmes for pharmacists offered only at UCR, which has academic expertise in analysis and quality control of medicines and a recently-established master’s degree in pharmaceutical care. There are also postgraduate programmes in administration, finance, marketing, and other areas of interest.

Development of pharmaceutical specialties

Pharmacists also have the opportunity to specialize in areas of practice, such as public health, pharmacology, biochemistry, physiology, pharmacoconomics and health services, and UIA, 4 years; and in the UCR, 5.5 years. With regards to the duration of degree programs, all require 150 hours, as set by CONESUP. Humanies and other non-degree related courses are only taught at UCR.

2.5.2 Key challenges

Variation in pharmacy education provision

The pharmacy curriculum varies between universities due to differences in the content and depth provided for different subjects. Courses in biopharmaceuticals, pharmacokinetics, pharmaceutical care and pharmaceutical marketing are not always found in the curriculum, despite being important areas of practice.

There is also a major disparity regarding the duration of degree programmes. At UNIBE, completing coursework for the pharmacy bachelor’s degree takes 3 years; at UCMED, 4.5 years; at LATINA and UIA, 4 years; and in the UCR, 5.5 years. With regards to community service, students from UCR have to provide 300 hours of community work, whereas the remaining universities only require 150 hours, as set by CONESUP. Humanies and other non-degree related courses are only taught at UCR.
5.2 Country Case Study: Costa Rica

Authors

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Summary

- The Colegio de Farmacéuticos de Costa Rica (Costa Rica’s Pharmacists Association) has regulated general pharmacist human resources planning to address the needs of the nation.
- There are 3,378 active pharmacists registered as of March 2012 (79.5% active pharmacists per 100,000 population).
- The majority of pharmacists practice in two main areas: health care pharmacy (86.68%) and the pharmaceutical industry (31.68%).
- On average, there is one pharmacy for every 4,454 inhabitants, although geographical distribution is unequal.
- There is a need to further develop leadership among pharmacy professionals to become empowered in their profession and capable of facing current and future challenges.

5.2.1 Background

Costa Rica is a country covering an area of 51,100 km² located in Central America with a population of 4.6 million inhabitants. Since 1941, there has been a supportive social security system (Caja Costarricense de Seguro Social), which provides comprehensive health services to all inhabitants in the country without discrimination [2].

Pharmaceutical human resources in the country

The number of active pharmacists in Costa Rica in March 2012 is 3,378, of which 69% are female and 28% male. Half are under 35 years of age. The number of active pharmacists per 100,000 inhabitants in the country in 2012 is 783. There are no unemployed pharmacists in the country. There are no certified pharmacist assistants, as this training is not provided in Costa Rica.

Distribution and human resources roles of pharmacists

The majority of professionals practice in two main areas, in the health care pharmacy area (84.60%) and the pharmaceutical industry area (22.36%). The health care pharmacy area includes professionals working in community pharmacies and hospital pharmacies, both public and private. Roles in the pharmaceutical industry area include medical representatives, regents of pharmaceutical distributors, regulatory affairs, pharmaceutical industry and clinical research. In addition, 2.24% of pharmacists have roles in teaching and research. Figure 5.2.1 describes the distribution of areas of practice of pharmacists working in the country.

Distribution of pharmacy practice areas

Source: Data obtained from the Colegio de Farmacéuticos de Costa Rica, 2012.

Regulation of professional practice

In Costa Rica, professional practice is regulated by the Colegio de Farmacéuticos, which is delegated by the State to do so. The Colegio works to ensure the proper implementation of national legislation in pharmaceutical establishments, to monitor the professional authority in such facilities, and to respond to societal demands. An essential tool for effective regulation of professional practice is to propose amendments to the laws and regulations related to medicines. However, it is a lengthy process to amend regulations.

Pharmaceutical education

From 1940 to 1998, the state university, University of Costa Rica (UCR), was the only institution that offered a pharmacy degree. In 1998, however, the first pharmacists graduated from a private university, which had a shorter degree than the state university and a different curriculum. Curricula and general activities of private universities are designed according to the legislation established by the National Council of Private Higher Education (CONSEUP) within the Ministry of Education, as opposed to the public universities, which are governed by the National Council of Deans (CONARE).

To date, aside from UCR, there are four private universities that offer pharmacy degrees: La Universidad Interamericana de las Américas (UIA), La Universidad Iberoamericana (UNIBE), La Universidad de Ciencias Médicas (UCMED), and Universidad Latina (ULATINA), which opened in 2011 with no graduates to date. Table 5.2.2 presents the number of professionals registered in the Colegio de Farmacéuticos, according to their university of origin, between 2002 and 2012. In this period, 2,019 new professionals were registered. The number of pharmacy professionals doubled in a decade, for the first time in 100 years.

Distribution of pharmacist faculties

Source: Data obtained from the Colegio de Farmacéuticos de Costa Rica, 2012.

Regulatory affairs

Clinical Research

Teaching

Distribution of pharmaceutical facilities

In Costa Rica there are three types of pharmaceutical facilities establishments that require management by pharmacists: 1) public and private pharmacies, 2) pharmaceutical manufacturing laboratories, and 3) pharmaceutical distributors. The country has 337 pharmaceutical distributors and 75 pharmaceutical manufacturing laboratories. Table 5.2.3 shows the distribution of pharmacies and the number of inhabitants per pharmacy, according to the seven provinces that constitute the country. On average, there is one private pharmacy for every 4,454 inhabitants, although geographical distribution is unequal. In public (state) pharmacies there is an average 15,390 inhabitants per pharmacy.

Development of pharmaceutical specialties

Pharmacists also have the opportunity to specialize in areas of practice, such as public health, pharmacology, biochemistry, physiology, pharmacoeconomics and health services administration. The Colegio de Farmacéuticos has regulated the registration of specialists from both academic and vocational training since 1986. Currently the institution has enrolled 263 professionals, most of whom are specialists in management health facilities [66], followed by specialists in the analysis and quality control of medicines [21].

5.2.2 Key challenges

Variation in pharmacy education provision

The pharmacy curriculum varies between universities due to differences in the content and depth of each subject. Courses in biopharmaceuticals, pharmacokinetics, pharmaceutical care and pharmaceutical marketing are not always found in the curriculum, despite being important areas of practice.

There is also a major disparity regarding the duration of degree programmes. At UNIBE, completing coursework for the pharmacy bachelor’s degree takes 3.5 years; at UCMED, 4.5 years; at LATINA and UIA, 4 years, and in the UCR, 5.5 years. With regards to community service, students from UCR have to provide 300 hours of community work, whereas the remaining universities only require 150 hours, as set by CONSEUP. Humans and other non-degree related courses are only taught at UCR.
Accreditation

Only two universities have degrees that are currently accredited by the National System of Higher Education Accreditation (SINAES), established in 1992, in order to promote and certify quality assurance in both public and private higher education institutions [9]. Accreditation is voluntary and is valid for four years, after which the curriculum must undergo the process of evaluation by the accrediting staff to obtain re-accreditation. The accreditation applies to courses or programmes, not to the schools or academic institutions.

Pharmaceutical human resources planning

Costa Rica has no specific policy regarding pharmaceutical human resources planning to address the needs of the nation. Pharmacy education responds to market needs by providing professionals that the country needs at the moment. Due to the need for an education model that best meets professional and societal requirements, international benchmarks have issued guidelines or called for the need to target training to necessary skills and competencies. Bidadda and Bolaños [8] propose, along with the harmonization of course content, a list of generic competencies that must be obtained by students. This work is complemented by the work undertaken by agencies such as Pan American Health Organization (PAHO)/World Health Organization (WHO) in the establishment of specific skill sets in pharmacy. This new approach responds to the global need for change. The challenge for the universities is to provide teachers with the appropriate tools for specific skills training, including the assessment of these skills.

Systematic evaluations of professional performance

There are no systematic evaluations of professional performance in the country and no mandatory recertification or other systems that mandate the professional to keep up-to-date. If a practitioner harms a patient or society, the only action that can be taken is to bring the matter to professional action that can be taken is to bring the matter to professional. If a practitioner harms a patient or society, the only action that can be taken is to bring the matter to professional action that can be taken is to bring the matter to professional action that can be taken is to bring the matter to professional. If a practitioner harms a patient or society, the only action that can be taken is to bring the matter to professional action that can be taken is to bring the matter to professional. If a practitioner harms a patient or society, the only action that can be taken is to bring the matter to professional.

Development of general skills

International organizations such as WHO have pointed out the need of developing skills in pharmacists that help them to implement pharmaceutical services focused on the individual, family, and community. Pharmacy schools are considering these recommendations to improve their curricula.

Implementation of the Renewed Primary Health Care initiative (PHC-R) by pharmacists

A national working committee on PHC-R has recently been established. It will operationalize and take action to turn the widespread view of private pharmacies as mere commercial establishments and turn them into true health care centers. Also, it intends to public pharmacies become health care centers. The aim is to achieve the highest quality of service from the patient’s first contact with the pharmacist [10].

5.2.3. Strategies and outcomes

Continuing education and recertification for pharmacists

Several strategies are used to promote continuous professional education, primarily through the Colegio de Farmaceuticos and universities. The universities offer courses for practicing professionals as well as conferences in specific areas of practice such as in pharmaceutical care and toxicology. It is the responsibility of the university to offer postgraduate studies.

The Colegio de Farmaceuticos has a professional recertification programme, which is voluntary and charges an annual fee to the professional who wants to participate. The programme aims to encourage the participation of pharmacists in professional development activities and, through the commission of recertification and continuing education committees, manages to systematize and evaluate educational activities. In order to adequately address the educational proposals, a survey for education needs is conducted every two years. Through the strategies used and the range of activities aimed at the needs of professionals, there has been an increased participation in the recertification programme, from an initial 10% in 2004 to 30% in 2012.

There has been a wide range of education activities provided by the pharmaceutical industry, professional associations, and private companies. The Social Security System recognizes this recertification programme and offers a higher salary for recertified professionals working in the public sector; however, this recognition has not yet been achieved in the private sector.

5.2.4. Conclusion

It is necessary to further develop pharmacy leadership in Costa Rica, enabling professionals to become empowered in their profession and capable of facing current and future challenges. To advance the profession, it is necessary to promote the importance of recertification to the profession and to increase the number of specialists and the types of recognized specialties in the pharmaceutical field. It is also important to provide more support to pharmacy education, particularly in private universities.

In the area of pharmaceutical care, it is necessary to promote services that a pharmacy must provide or develop, according to the PHC-R criteria, to update domestic policies on pharmacy practice, to create a plan for long-term development of pharmacies as health care centers, to identify the education that professionals require for these new services in professional practice, and to work with academic institutions to educate future professionals in both the technical and humanistic skills required by this new service approach.

In the absence of comprehensive human resource planning, it is necessary that national policies consider the pharmacy workforce, taking into account the current and emerging areas of work and the needs of the society and country.

References

6. SINAES. ¿Qué es la acreditación?. Available from: http://www.sinaes.ac.cr/acreditación/
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There has been a wide range of education activities provided by the pharmaceutical industry, professional associations, and private companies. The Social Security System recognizes this recertification programme and offers a higher salary for recertified professionals working in the public sector; however, this recognition has not yet been achieved in the private sector.

Accreditation

Since only two of the five universities offering the Degree of Pharmacist (UCR and the University of Medical Sciences) are accredited, the Colegio de Farmacéuticos, along with SINAES, are working to establish specific criteria for the accreditation of pharmacy degrees (8).

Development of general skills

International organizations such as WHO have pointed out the need of developing skills in pharmacists that help them to implement pharmaceutical services focused on the individual, family, and community. Pharmacy schools are considering these recommendations to improve their curricula.

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References

7. SINAES. Lista de carreras con acreditación oficial. Available from: http://www.sinaes.ac.cr/carreras_acreditadas/acreditadas por_area.htm

Development of pharmaceutical specialties

Two major achievements are the consolidation of pharmaceutical specialties and the development of an objective system for registering and regulating specialties. These specialties are recognized by the Social Security system, with those registered and working in the public sector receiving a salary incentive.

5.2.4 Conclusion

It is necessary to further develop pharmacy leadership in Costa Rica, enabling professionals to become empowered in their profession and capable of facing current and future challenges.

To advance the profession, it is necessary to promote the importance of recertification to the profession and to increase the number of specialists and the types of recognized specialties in the pharmaceutical field. It is also important to provide more support to pharmacy education, particularly in private universities.

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References

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5.3. Country case study: Ghana

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Summary
- Access to good quality medicines and competent health care providers are fundamental aspects of the health care system. Pharmaceutical human resources are responsible for ensuring the uninterrupted supply of quality medicines to the public, their management, and rational use, all these being vital components of the architecture to access medicines. The human resources for health crisis affects 57 countries worldwide, including Ghana.

- In 2009, an assessment of pharmaceutical human resources was undertaken in Ghana (funded by the WHO and the European Commission), and the findings provided the evidence, which informed human resources strategic framework and strategic pharmaceutical workforce plan. The plan was developed by key stakeholders with the intention of being integrated into the broader national human resources plan for health. Some of the key findings of the assessment were significant pharmaceutical human resources shortages, inequitable distribution, skill mix imbalances, and limited training capacity.

- Even though Ghana training institutions had produced over 2,500 pharmacists since 2009, only a little over 1,500 were actively practicing pharmacists (0.8 per 10,000 population), 90 practicing pharmacy technicians (4.4 per 10,000), and 3,000 medicine counter assistants (1.24 per 10,000). In 2011, public and private sectors employed 33% and 67% of pharmacists, respectively, compared to 26% and 74% in 2009. The pharmaceutical manufacturing industry only employs 4% of the pharmacy workforce; however, this sector is expanding with the establishment of new manufacturing sites and growth of existing companies.

Pharmaceutical human resources in Ghana are required to provide services as diverse as medicines selection, procurement, compounding, dispensing, medicines information and advice, therapeutic drug monitoring, pharmacovigilance, manufacturing, training, and research.

Although Ghana has a register of 1,966 pharmacists, 2,319 technicians and 2,700 medicine counter assistants, only a total of 1,986 are actively practicing pharmacists (0.81 per 10,000 population), 2,079 actively practicing pharmacy technicians (4.44 per 10,000), and 3,090 medicine counter assistants (1.24 per 10,000). In 2011, public and private sectors employed 33% and 67% of pharmacists, respectively, compared to 26% and 74% in 2009. The pharmaceutical manufacturing industry only employs 4% of the pharmacy workforce; however, this sector is expanding with the establishment of new manufacturing sites and growth of existing companies.

5.3.1. Background

The introduction of pharmacy practice in the Gold Coast (now Ghana) in the 1930s was associated with the development of Western-type medical services in the country. The introduction of the Doctor of Pharmacy (Pharm D) degree and other continuous education programmes in the health sector, and the development and implementation of the Doctor of Pharmacy (Pharm D) degree and other continuous professional development (CPD) programmes

5.3.2. Key issues

Challenges affecting pharmacy workforce planning, management, and/or development
1. Distribution imbalance of pharmacetical personnel between rural and urban areas
2. Needs-based pre-service pharmacy education
3. Poorly defined roles of pharmaceutical personnel
4. CPD and career development: Lack of needs-based programmes
5. Recruitment: Significant delays in the recruitment of personnel to the public sector (takes up to one year), which serves as a barrier to increasing public sector workforce levels
6. Incentives for attracting personnel to work in rural areas are not enforced

Projection and supply

Rural areas are the most affected when it comes to pharmaceutical personnel. There is a concentration of pharmacy personnel in urban areas due to lack of amenities and infrastructure such as quality public and private schools that act as a disincentive to working in the rural areas. Pharmaceutical facilities are concentrated in urban regions.

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3. Poorly-defined roles of pharmaceutical personnel
4. CPD and career development: Lack of needs-based programmes

Table 5.3.1. Number of pharmacists per sector employment

<table>
<thead>
<tr>
<th>Sector</th>
<th>No. of Pharmacists (10,000)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public hospitals &amp; Christian health</td>
<td>599</td>
<td>19.5</td>
</tr>
<tr>
<td>Universities</td>
<td>125</td>
<td>4.0</td>
</tr>
<tr>
<td>Pharmacy training organizations</td>
<td>254</td>
<td>8.0</td>
</tr>
<tr>
<td>Private hospitals &amp; clinics</td>
<td>298</td>
<td>9.0</td>
</tr>
<tr>
<td>Pharmaceutical manufacturers</td>
<td>400</td>
<td>13.0</td>
</tr>
<tr>
<td>Academia/teaching</td>
<td>60</td>
<td>2.0</td>
</tr>
<tr>
<td>Medicine/Pharmacy clinics</td>
<td>44</td>
<td>1.0</td>
</tr>
<tr>
<td>Not currently working</td>
<td>24</td>
<td>0.0</td>
</tr>
</tbody>
</table>


Types of pharmacy

<table>
<thead>
<tr>
<th>Type of pharmacy</th>
<th>Number</th>
<th>Percentage</th>
<th>Number of pharmacists</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public hospitals &amp; Christian health</td>
<td>599</td>
<td>19.5</td>
<td>1,000</td>
</tr>
<tr>
<td>Universities</td>
<td>125</td>
<td>4.0</td>
<td>600</td>
</tr>
<tr>
<td>Pharmacy training organizations</td>
<td>254</td>
<td>8.0</td>
<td>1,500</td>
</tr>
<tr>
<td>Private hospitals &amp; clinics</td>
<td>298</td>
<td>9.0</td>
<td>1,000</td>
</tr>
<tr>
<td>Pharmaceutical manufacturers</td>
<td>400</td>
<td>13.0</td>
<td>370</td>
</tr>
<tr>
<td>Academia/teaching</td>
<td>60</td>
<td>2.0</td>
<td>60</td>
</tr>
<tr>
<td>Medicine/Pharmacy clinics</td>
<td>44</td>
<td>1.0</td>
<td>44</td>
</tr>
<tr>
<td>Total</td>
<td>3,090</td>
<td>100.0</td>
<td>3,090</td>
</tr>
</tbody>
</table>

Table 5.3.3. Regional Distribution of Health facilities and Pharmacy Workforce 2011

<table>
<thead>
<tr>
<th>Region</th>
<th>No. of public hospitals, clinics</th>
<th>No. of private hospitals, clinics</th>
<th>No. of pharmacists</th>
<th>No. of public pharmacies</th>
<th>No. of private pharmacies</th>
<th>No. of medicine counter assistants</th>
<th>Density pharmacies per 10,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern</td>
<td>105</td>
<td>9</td>
<td>99</td>
<td>200</td>
<td>400</td>
<td>2,200</td>
<td>0.25</td>
</tr>
<tr>
<td>UpperEast</td>
<td>97</td>
<td>4</td>
<td>91</td>
<td>100</td>
<td>300</td>
<td>3,000</td>
<td>0.3</td>
</tr>
<tr>
<td>UpperWest</td>
<td>19</td>
<td>1</td>
<td>18</td>
<td>20</td>
<td>60</td>
<td>1,800</td>
<td>0.19</td>
</tr>
<tr>
<td>Ahafo</td>
<td>13</td>
<td>0</td>
<td>13</td>
<td>10</td>
<td>30</td>
<td>900</td>
<td>0.21</td>
</tr>
<tr>
<td>Brong</td>
<td>400</td>
<td>420</td>
<td>159</td>
<td>269</td>
<td>1,931</td>
<td>65</td>
<td>0.85</td>
</tr>
<tr>
<td>Western</td>
<td>24</td>
<td>19</td>
<td>23</td>
<td>13</td>
<td>160</td>
<td>560</td>
<td>0.25</td>
</tr>
<tr>
<td>Central</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>80</td>
<td>800</td>
<td>0.23</td>
</tr>
<tr>
<td>Eastern</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>190</td>
<td>0.22</td>
</tr>
<tr>
<td>GreaterAccra</td>
<td>4,584</td>
<td>4,584</td>
<td>4,584</td>
<td>4,584</td>
<td>4,584</td>
<td>4,584</td>
<td>0.22</td>
</tr>
<tr>
<td>GreaterKoforidu</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>300</td>
<td>1.0</td>
</tr>
</tbody>
</table>

Table 5.3.4. Comparison of frequencies for density of pharmacists per 10,000 population and density of pharmacies per 10,000

<table>
<thead>
<tr>
<th>Region</th>
<th>No. of pharmacists</th>
<th>Density pharmacies per 10,000 (log10 for scaling)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern</td>
<td>200</td>
<td>0.25</td>
</tr>
<tr>
<td>UpperEast</td>
<td>200</td>
<td>0.3</td>
</tr>
<tr>
<td>UpperWest</td>
<td>100</td>
<td>0.19</td>
</tr>
<tr>
<td>Ahafo</td>
<td>60</td>
<td>0.21</td>
</tr>
<tr>
<td>Brong</td>
<td>1,931</td>
<td>0.85</td>
</tr>
<tr>
<td>Western</td>
<td>13</td>
<td>0.25</td>
</tr>
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</tr>
</tbody>
</table>

There are currently three universities undertaking the training of pharmacists (Bachelor of Pharmacy degree) with a combined annual intake of 240 students in 2009. One pharmacy technician training school (Higher National Diploma) enrolling 90, and 32 Medicines Counter Assistants (MCA) programmes enrolling 600 students every six months. To date, there are no formalised training requirements for Licensed Chemical Sellers (LCS). However, the Pharmacy Council (PC) organises annual training programmes for LCS and CPD programmes for pharmacists.

The curriculum for pharmacy education has also been revised to a Doctor of Pharmacy (Pharm. D) programme to improve patient-pharmacist interaction, address job satisfaction and career development challenges, and also bridge the wide gap between academia and practice to reflect emerging trends in health care delivery in other countries.

The Specialist Health Training and Plant Research Act (3) which establishes the College of Pharmacists is also being implemented to provide further opportunities for postgraduate and specialist training totally.

Education capacity, skill mix

Figure 5.3.1. Comparative frequencies for density of pharmacists per 10,000 population and density of pharmacies per 10,000

5.3. Country case study: Ghana

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- Access to good quality medicines and competent health care providers are fundamental aspects of the health care system. Pharmaceutical human resources are responsible for ensuring the uninterrupted supply of quality medicines to the population, their management, and rational use, all these being vital components of the architecture to access medicines. The human resources for health crisis affects 57 countries worldwide, including Ghana.

- In 2008, an assessment of pharmaceutical human resources was undertaken in Ghana funded by the WHO and the European Commission, and the findings provided the evidence, which informed the human resources strategy framework and strategic pharmaceutical workforce plan. The plan was developed by key stakeholders with the intention of being integrated into the broader national human resources plan for health. Some of the key findings of the assessment were significant pharmaceutical human resources shortages, inequitable distribution, skill mix imbalances, and limited training capacity.

- Even though Ghana training institutions had produced over 2,500 pharmacists since 2009, only a little over 1,300 were actively practicing in Ghana. Aecdotal evidence from the Pharmacy Council of Ghana identified workforce retention led to inequitable service provision. To ensure that only quality products are made available to the population, functional and well-resourced pharmaceutical supply and regulatory systems are required, with adequate numbers of trained personnel.

- The curriculum for pharmacy education has also been revised with a combined annual intake of 240 students in 2009, one pharmacy technician training school (Higher National Diploma) enrolling 98, and 32 Medicine Counter Assistants (MCA) programmes enrolling 600 students every six months. To date, there are no formalised training requirements for Licensed Chemical Sellers (LCS): However the Pharmacy Council (PC) organises annual training programmes for LCS and CPD programmes for pharmacists.

5.3.1. Background

The introduction of pharmacy practice in the Gold Coast (now Ghana) in the 1930s was associated with the development of Western-type medical services in the country. The introduction of pharmacy practice in the Gold Coast (now Ghana) in the 1930s was associated with the development of Western-type medical services in the country.

5.3.2. Key issues

Challenges affecting pharmacy workforce planning, management, and/or development

1. Distribution imbalance of pharmaceutical personnel between rural and urban areas
2. Needs-based pre-service pharmacy education
3. Poorly-defined roles of pharmaceutical personnel
4. CPD and career development: Lack of needs-based CPD programmes

5. Recruitment: Significant delays in the recruitment of personnel to the public sector (takes up to one year), which serves as a barrier to increasing public sector workforce levels

6. Incentives for attracting personnel to work in rural areas are not enforced

Projection and supply

Rural areas are the most affected when it comes to pharmaceutical personnel. There is a concentration of pharmacy personnel in urban areas due to lack of amenities and infrastructure such as quality public and private schools that act as a disincentive to working in the rural areas. Pharmaceutical staff are concentrated in urban regions with the ratio of pharmacy personnel in each region ranging between 2.4 to 3.7 per 10,000 population for pharmacists (Table 5.3) and 1.25 for pharmacy technicians. This disparity has led to inequitable service provision. To ensure that only quality products are made available to the population, functional and well-resourced pharmaceutical supply and regulatory systems are required, with adequate numbers of trained personnel.

6. Incentives for attracting personnel to work in rural areas are not enforced

Education capacity, skill mix

There are currently three universities undertaking the training of pharmacists (Bachelor of Pharmacy degree) with a combined annual intake of 240 students in 2009, one pharmacy technician training school (Higher National Diploma) enrolling 98, and 32 Medicine Counter Assistants (MCA) programmes enrolling 600 students every six months. To date, there are no formalised training requirements for Licensed Chemical Sellers (LCS). However the Pharmacy Council (PC) organises annual training programmes for LCS and CPD programmes for pharmacists.

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Performance management

The issue of workforce productivity remains a high priority for the Ministry of Health (MoH) as well as its agencies in the service and regulatory units. There appears to be no clear direction as to what constitutes health workforce productivity [1]. However, with the salary enhancement, the issue of signing performance contracts at all levels was revisited. The MoH and its agencies are presently working on the criteria for the performance contract. Health worker productivity and performance covers performance management, motivation, welfare, training, and continuing professional development.

There is currently no comprehensive system for performance management for the MoH. Staff appraisal appears to be the main performance management tool employed by all age categories. However, there is no objectivity in the performance appraisal process. There is no recognition/award or sanctions for good or poor performance. The appraisals are completed annually, and the process focuses mainly on promotions. There is lack of adequate training for staff and managers on the performance management system.

Workforce distribution and retention

The retirement age for all workers in Ghana is sixty years, and this is seen as an area that contributes to the loss of skilled and experienced health professionals in the health system. It appears from available information and data that the overall attrition of professional health workers is on the decline due to the several positive interventions undertaken by government between 2002 and 2007, including the recent upsurge in production interventions. The recent public payroll analysis also confirms a general decline in attrition particularly after 2006. However, a recent MoH analysis indicates that retirement from the sector stands as the most consequential reason for attrition between 2007 and 2008.

Regulation, practice standards, and competency development

The pharmacy workforce is organized into groups whose practices are regulated by the Pharmacy Council, a statutory regulatory body. This is intended to ensure and maintain quality in practice and to safeguard the wellbeing of the public. There is disconnection among workforce needs, health quality in practice and to safeguard the wellbeing of patients. This is intended to ensure and maintain quality in practice and to safeguard the wellbeing of patients. This is determined by the Pharmacy Council, a statutory regulatory body. This is intended to ensure and maintain quality in practice and to safeguard the wellbeing of patients. This is determined by the Pharmacy Council, a statutory regulatory body.

Policy development and implementation

One key ingredient in ensuring equitable human resources distribution is the existence of a system for identifying and tracking the movement of personnel. Over the years, there have been various efforts aimed at setting up and implementing a human resources system. These efforts were mostly fragmented and region-based, lacking standardization and continuity nationwide. In collaboration with West African Health Organization (WAHO) and Capacity Plus, the MoH has initiated the process of implementing an effective human resource information system to guide relevant decision-making. The system, when fully implemented, will have the components for planning for regulation and management of human resources that will go a long way to ensure effective distribution of staff. The system will serve as the human resources information of a subregional body called the Economic Community of West African States.

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Regulation, practice standards, and competency development
The pharmacy workforce is organized into groups whose practices are regulated by the Pharmacy Council, a statutory regulatory body. This is intended to ensure and maintain quality in practice and to safeguard the wellbeing of the public. There is a connection among workforce needs, health sector policies, and strategies adopted by Ministry of Education (MoE) and private training institutions. As a result, training institutions under the MoE appear to be slow in responding to human resources needs under various programmes of work (POW) and the need to scale up the production of health workers. The legal and regulatory framework for educating health workers is equally splintered, and has emerged in an ad hoc manner. Although this is not unusual in terms of international practice, it creates a challenging regulatory environment and is prone to coordination problems. The introduction of the Health

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### 5.3.4. Conclusion

Pharmacy workforce retention was the main challenge identified by the 2009 pharmacy workforce assessment. This challenge emanated from many other factors relating to pre-service education and training programmes, lack of opportunities for career development, and inadequate reward systems for the workforce.

The MoH and its agencies such as the Pharmacy Council, in consultation with the MoE and the Universities, is addressing pre-service pharmacy education challenges with the introduction of the Pharm D programme and the establishment of the College of Pharmacists to expand career development opportunities locally. Need-based post-service education programmes for all categories of the pharmacy workforce has also been implemented by the Pharmacy Council in collaboration with related agencies and donors.

There are efforts to improve the rewards systems and also streamline workforce training and development to meet institutional and personal needs to improve workforce retention and hence the quality of lives of all people living in Ghana.

### References


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### 5.4. Case study: Great Britain

**Authors**

Chris John, Workforce Development Support Lead, Royal Pharmaceutical Society, Great Britain, Christopher.John@rpharms.com; Ian Bates, Head of Educational Development, UCL School of Pharmacy and Expert Advisor to the Royal Pharmaceutical Society

**Summary**

- The analysis of the General Pharmaceutical Council’s 2010 register of pharmacists indicated that there were 58,664 pharmacists in Great Britain, with the majority working in the community sector.
- There has been a period of unprecedented growth in the UK’s health care workforce. Demand is also increasing.
- The UK’s current economic difficulties and restrictions on public spending mean that further growth of the health care workforce is unsustainable. The workforce will need to work more productively in order to meet demand. Making the pharmacy workforce more productive will require a review of skill mix.
- There is increasing evidence that there is not an undersupply of pharmacists in Great Britain.
- Health Education England (HEE) will provide sector-wide leadership and oversight of workforce planning, education, and training in the NHS in England. In Scotland and Wales, this is the responsibility of the devolved administrations.
- It is important that a robust body of evidence is built to support development of the pharmacy workforce in Great Britain.
- The Royal Pharmaceutical Society (RPS), the professional leadership body for pharmacists and pharmacy, aspires to be the national body that members of the profession, the public, and the government go to for advice about all aspects of the pharmacy workforce.

**5.4.1. Background**

The pharmacy workforce in Great Britain continues to change. The General Pharmaceutical Council (GPhC) have regulated pharmacists since September 2001 and that the register had grown by 2% since 2009. Information was also provided about age, gender, ethnicity, and entrants/leavers from the register. Numbers of independent and supplementary prescribers were also described.

Findings from the pharmacy workforce census (1) conducted in 2001 provide information about the socio-demographic profile and employment patterns of pharmacists. Analysis based on data from respondents to the census (from 69.6% of registered GB resident pharmacist(s) indicates that most pharmacists were employed in the community sector (21.0%), with 21.1% working in hospital pharmacy. Significantly, community pharmacy locum posts accounted for 23.1% of all posts.

**5.4.2. Key Issues**

The NHS

Over the decade between September 2000 and September 2010, the National Health Service (NHS) workforce grew by 30% (4), reaching 1.4 million people employed and maintaining its place as the third largest workforce in the world. The UK’s (Great Britain and Northern Ireland) economic difficulties and restrictions on public spending have made this growth unsustainable. The focus now is to increase the productivity of the workforce - in other words, provide the same quality of service with the same number of staff or less. However, demand for health is increasing. The population is living longer and is more reliant on medicines. In England the proportion of the population aged 60 and over has risen from 20.7% in 2000 to 22.4% in 2010, and there is a strong relationship between the proportion of the population aged 60 and over and the number of prescription items dispensed.

This relationship is reflected in the rising number of prescriptions dispensed each year. In 2000 community pharmacies dispensed 94.7 million prescription items (5), an increase of 23% from 2000 and an increase of 58% from 2000. Evidence from the NHS Pharmacy Education and Development Committee’s 2011 National NHS Pharmacy Establishment and Vacancy Survey (6).
5.3.4 Conclusion
Pharmacy workforce retention was the main challenge identified by the 2009 pharmacy workforce assessment. This challenge emanated from many other factors relating to pre-service education challenges and inadequate rewards systems for the workforce. The MoH and its agencies such as the Pharmacy Council, in consultation with the MoE and the Universities, is addressing pre-service pharmacy education challenges with the introduction of the Pharm D programme and the establishment of the College of Pharmacists to expand career development opportunities locally. Need-based post-service education programmes for all categories of the pharmacy workforce has also been implemented by the Pharmacy Council in collaboration with related agencies and donors.

There are efforts to improve the rewards systems and also streamline workforce training and development to meet institutional and personal needs to improve workforce retention and hence the quality of lives of all people living in Ghana.

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Effective workforce planning and development supports pharmacy service quality by ensuring that sufficient numbers of pharmacy staff with the right skills are in the right place, at the right time, at the right price [3]. Key to this is being able to understand the pharmacy workforce. Each year, an analysis of the register of pharmacists is conducted, providing useful demographic data. The most recent published analysis conducted in August 2010 [2] indicated that there were 50,664 pharmacists in Great Britain and that the register had grown by 2% since 2009. Information was also provided about age, gender, ethnicity, and entrants/exit from the register. Numbers of independent and supplementary prescribers were also described.

Findings from the pharmacy workforce census [1] conducted in 2008 provide information about the socio-demographic profile and employment patterns of pharmacists. Analysis based on data from respondents to the census (from 66% of registered GB resident pharmacists) indicates that most pharmacists were employed in the community sector (71%), with 21% working in hospital pharmacy. Significantly, community pharmacy locum posts accounted for 23% of all posts.

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Summary
- The analysis of the General Pharmaceutical Council’s 2010 register of pharmacists indicated that there were 50,664 pharmacists in Great Britain, with the majority working in the community sector.
- There has been a period of unprecedented growth in the UK’s health care workforce. Demand is also increasing.
- The UK’s current economic difficulties and restrictions on public spending mean that further growth of the health care workforce is unsustainable. The workforce will need to work more productively in order to meet demand. Making the pharmacy workforce more productive will require a review of skill mix.
- There is increasing evidence that there is not an undersupply of pharmacists in Great Britain.
- Health Education England (HEE) will provide sector-wide leadership and oversight of workforce planning, education, and training in the NHS in England. In Scotland and Wales, this is the responsibility of the devolved administrations.
- It is important that a robust body of evidence is built to support development of the pharmacy workforce in Great Britain.
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5.4.2 Key issues
The NHS
Over the decade between September 2000 and September 2010, the National Health Service (NHS) workforce grew by 30% [4], reaching 1.4 million people employed and maintaining its place as the third largest workforce in the world. The UK’s (Great Britain and Northern Ireland) economic difficulties and restrictions on public spending have made this growth unsustainable. The focus now is to increase the productivity of the workforce – in other words, provide the same quality of service with the same number of staff or less. However, demand for health is increasing. The population is living longer and is more reliant on medicines. In England the proportion of the population aged 60 and over has risen from 20.7% in 2000 to 22.4% in 2010, and there is a strong relationship between the proportion of the population aged 60 and over and the number of prescription items dispensed.

This relationship is reflected in the rising number of prescriptions dispensed each year. In 2010 community pharmacies dispensed 946.7 million prescription items [5], an increase of 5.3% from 2009 and an increase of 58.8% from 2000. Evidence from the NHS Pharmacy Education and Development Committee’s 2011 National NHS Pharmacy Establishment and Vacancy Survey [6],
which describes levels of NHS-employed pharmacy staff and does not include community pharmacy staff who are contractors to the NHS, indicate that between May 2010 and May 2011 pharmacist staffing establishments in the NHS overall decreased by 0.2% across England and decreased by 0.4% across Wales (Scotland is undertaking a separate survey to report NHS pharmacy establishment and vacancy rates). Ensuring that the pharmacy workforce is able to meet this rising demand is likely to be challenging, especially in the context of the current major reorganisation of the NHS in England.

Figure 5.4.1 shows the number of established, occupied, and vacant pharmacist posts (Full Time Equivalents, FTEs) in England and Wales from 2008-2011.

### Workforce planning and development

The size and complexity of the NHS, the increasing demand for health services, the length of time it takes to train pharmacists and pharmacy staff, and the political environment within which it operates all conspire to make it difficult to deliver effective workforce planning and development of the pharmacy workforce.

Workforce planning and development is not just about ensuring the continued supply of high quality pharmacy staff for the future in order to meet health demand, it is also about developing career pathways so that pharmacy staff remain engaged and actively participating in the workforce. There is a strong link between staff engagement and productivity. Increasingly, the creation of new roles has been the impetus for workforce development. Roles such as prescribing have been developed with the required education delivered by universities supporting learning in the workplace. There are also opportunities for new roles (e.g. public health).

Making the pharmacy workforce more productive will require a review of skill mix. Up-skilling of the pharmacy technician workforce in many hospitals to undertake the role of an accredited checker of final prescriptions has freed up pharmacists’ time to develop more clinically-oriented duties and new roles. Technology such as automation of dispensary and electronic prescribing may also improve the productivity of the pharmacy workforce, though further evidence is required.

### Balancing the supply and demand of pharmacists

The pharmacy workforce model of 2003 [8] stated that, by 2013, there would be a significant shortage of pharmacists. However, the removal of pharmacists from the Home Office’s Shortage Occupation List [9], growth in the number of pharmacy undergraduates, reduced vacancy rates in the NHS, changes in the health system, and the current economic environment provide evidence that there is not an overall undersupply of pharmacists. Increased demand (e.g. higher numbers of prescription items dispensed) is not in itself evidence of shortage as the workforce may be working more productively.

Indeed, the pharmacist workforce may be in danger of moving to oversupply, but there are considerable geographical variations and differences between sectors, up-to-date workforce intelligence is needed to fully understand the current situation. Other workforce risks will need to be identified to plan for the future.

The Centre for Workforce Intelligence (CfWI) provides advice to health and social care planners, clinicians and commissioners in England about workforce planning and development. In 2011, the CfWI identified other risks to the pharmacy workforce, [10] including:

- Non-alignment of pre-registration trainee pharmacist placements with the expansion of undergraduate placements (in the long term this may be mitigated by the proposals for the integrated undergraduate degree and pre-registration year).
- Age profile: In 2010, 16.6% of registered pharmacists are aged 60 or over (11.6% in 2009) which means that a large proportion of the workforce could be lost within a few years.
- Part-time working and high proportion of female pharmacists (in other words, the supply of pharmacists is not being maximised).
- Locum workforce: The high proportion of locums in the workforce may not be a sustainable model.
- The academic workforce: Do we have enough pharmacists teaching at schools of pharmacy?
- Wellbeing of pharmacists: Increased workload and other factors could be having an adverse effect on the wellbeing of pharmacists.
- Retaining pharmacists within meaningful careers.

5.4.3 Strategies

The coalition government has laid down a proposal for planning and developing the health care workforce outlined in Liberating the NHS: Developing the Health care Workforce [11]. Including the creation of Health Education England (HEE). HEE will provide sector-wide leadership and oversight of workforce planning, education, and training in the NHS in England (see Figure 5.4.2). HEE has undertaken its role in shadow form from April 2012 and taken over the current role of Medical Education England (MEE), albeit an expanded one as HEE will have oversight of nursing and allied health professions in addition to pharmacy, medicine, dentistry, and health care scientists. The Modernising Pharmacy Careers (MPC) Programme Board (part of MEE) was established in 2009 to ensure the pharmacy workforce has the knowledge, skills, and capabilities to deliver pharmacy services of the future. MPC’s work focuses on education and training (pre-qualification), developing pharmacy careers (post-qualification), and cross-cutting projects (e.g. workforce models and new ways of working).
which describes levels of NHS employed pharmacy staff and does not include community pharmacy staff who are contractors to the NHS, indicate that between May 2010 and May 2011 pharmacist staffing establishments in the NHS overall decreased by 0.2% across England and decreased by 0.4% across Wales (Scotland is undertaking a separate survey to report NHS pharmacy establishment and vacancy rates).

Ensuring that the pharmacy workforce is able to meet this rising demand is likely to be challenging, especially in the context of the current major reorganisation of the NHS in England. Figure 5.4.1 shows the number of established, occupied, and vacant pharmacist posts (Full Time Equivalents, FTEs) in England and Wales from 2008–2011.

![Figure 5.4.1 Established, occupied, and vacant NHS pharmacist posts in England and Wales, 2008–2011](image)

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Making the pharmacy workforce more productive will require a review of skill mix. Up-skilling of the pharmacy technicians workforce in many hospitals to undertake the role of an accredited checker of final prescriptions has freed up pharmacists’ time to develop more clinically orientated duties and new roles. Technology such as automation of dispensaries and electronic prescribing may also improve the productivity of the pharmacy workforce, though further evidence is required.

### Balancing the supply and demand of pharmacists

The pharmacy workforce model of 2003 [8] stated that, by 2013, there would be a significant shortage of pharmacists. However, the removal of pharmacists from the Home Office’s Shortage Occupation List [9], growth in the number of pharmacy undergraduates, reduced vacancy rates in the NHS, changes in the health system, and the current economic environment provide evidence that there is not an overall undersupply of pharmacists. Increased demand (e.g. higher numbers of prescription items dispensed) is not in itself evidence of shortage as the workforce may be working more productively.

Indeed, the pharmacist workforce may be in danger of moving to oversupply, but there are considerable geographical variations and differences between sectors, up to date workforce intelligence is needed to fully understand the current situation. Other workforce risks will need to be identified to plan for the future.

The Centre for Workforce Intelligence (CFWI) provides advice to health and social care planners, clinicians and commissioners in England about workforce planning and development. In 2011, the CFWI identified other risks to the pharmacy workforce, [10] including:

- Non-alignment of pre-registration trainee pharmacist placements with the expansion of undergraduate placements (in the long term this may be mitigated by the proposals for the integrated undergraduate degree and pre-registration year).
- Age profile: In 2010, 10.6% of registered pharmacists are aged 60 or over (11.6% in 2009) which means that a large proportion of the workforce could be lost within a few years.
- Part-time working and high proportion of female pharmacists (in other words, the supply of pharmacists is not being maximised).
- Locum workforce: The high proportion of locums in the workforce may not be a sustainable model.
- The academic workforce: Do we have enough pharmacists teaching at schools of pharmacy?
- Wellbeing of pharmacists: Increased workload and other factors could be having an adverse effect on the wellbeing of pharmacists.
- Retaining pharmacists within meaningful careers.

The coalition government has laid down a proposal for planning and developing the health care workforce outlined in Liberating the NHS. Developing the Health Care Workforce [11], including the creation of Health Education England (HEE). HEE will provide sector-wide leadership and oversight of workforce planning, education, and training in the NHS in England (see Figure 5.4.2). HEE has undertaken its role in shadow form from April 2012 and taken over the current role of Medical Education England (MEE), albeit an expanded one as HEE will have oversight of nursing and allied health professions in addition to pharmacy, medicine, dentistry, and health care scientists. The Modernising Pharmacy Careers (MPC) Programme Board (part of MEE) was established in 2009 to ensure the pharmacy workforce has the knowledge, skills, and capabilities to deliver pharmacy services of the future.

MPC’s work focuses on education and training (pre-qualification), developing pharmacy careers (post-qualification), and cross-cutting projects (e.g. workforce models and new ways of working).
HEE will be responsible for health care workforce planning and development across England. At the local level, Local Education and Training Boards (LETBs) accountable to HEE will commission education and training as well as be responsible for workforce planning for specific geographical areas. There are three LETBs emerging in London and a further 21 reported across the rest of England. The LETBs will be health care provider led and will share approximately £4.8 billion of the current NHS budget for education and training. The LETBs will be supported by the CfWI, which will provide an overall profile of the health care workforce.

Workforce planning and development in Scotland and Wales is the responsibility of the devolved administrations. The Scottish Government’s health directorate provides central management of the NHS that oversees the work of 14 area NHS Boards. These boards plan and deliver health services for people in their area. The Welsh Assembly Government is responsible for the delivery of the NHS in Wales and seven local health boards are responsible for planning, securing, and delivering all health care services in their areas.

5.4.4. Outcomes

Approaches to workforce planning

Traditional workforce planning in pharmacy (and indeed the other health care professions) has tended to focus on trends in the supply of and demand for pharmacists. However, it is becoming harder to forecast workforce supply and demand, particularly given the long time frames needed to train pharmacists. Perhaps the question of whether pharmacy has been able to accurately plan its workforce is the wrong one, as it can never be an exact science. A better question might be: How useful is workforce planning in delivering outcomes for patients? Steps must therefore be taken to measure outcomes for patients and to increase flexibility to change workforce skills more quickly in response to changes in patterns of disease and treatment. Such a change can be achieved by a stronger competence-based approach in all training, which recognises general and advanced levels of skills and enables pharmacy staff to acquire new skills for new tasks in a shorter period of time.

A strong voice

The planning and development of the overall health care workforce must be integrated, rather than just looking at the needs of each professional group in isolation. For instance, training of overlapping general skills across the professions can be shared. Much can also be learnt from other health care professions in Great Britain, such as medicine. In 2007 the inquiry into Modernising Medical Careers made a number of recommendations “in the interest of the health and wealth of the nation” [12] so that medical education and training could aspire to excellence, including:

- Shared principles on postgraduate medical training,
- Consensus on the role of doctors at various career stages,
- Subjecting health service workforce planning and commissioning to external scrutiny, and
- Developing a mechanism for providing coherent advice by the profession (i.e. strong leadership for the entire profession).

MEE was formed following the inquiry. The RPS has a strong voice, and it led the pharmacy profession’s response to important consultations that affect the quality, recognition, and supply of the pharmacy workforce, including the work of the Modernising Careers Programme Board, proposed government changes to Higher Education, and settlement of migrants and the European Commissioner’s green paper Modelling the Professional Qualifications Directive. Evidence has also been submitted to the Health Select Committee inquiry into education, training, and workforce planning.

Supporting the evidence base

The future of pharmacy is dependent on the profession’s ability to generate a robust body of evidence to inform workforce development. For instance, evidence of an imbalance in the number of pharmacists could inform a number of measures, including altering the number of training commissioning.

Workforce intelligence has provided insight, but needs to be more than just analysis (e.g. a headcount of the number of pharmacy staff). Further evidence that the pharmacy workforce is fit for purpose is also needed. The General Pharmaceutical Council accredits schools of pharmacy degree programmes, but do newly qualified pharmacists meet the needs of patients?

The RPS aspires to be the national body that members of the profession, the public, and the government go to for advice about all aspects of the pharmacy workforce by:

- Engaging with the whole profession to ensure that the RPS is the authoritative voice on workforce development for pharmacy across England, Scotland, and Wales.
- Informing the development and application of workforce policy through facilitation of research and provision of robust pharmacy workforce intelligence.
- Supporting implementation of solutions, which deliver a capable, flexible, and adaptable workforce that is able to improve productivity, performance, and health outcomes.

5.4.5 Conclusion

The RPS has been working closely with MPC and the CfWI to facilitate effective workforce planning and development. It will be important that the RPS (influence HEE, LETBs and the CfWI) developed administrations to make the right decisions about planning the pharmacy workforce. In partnership with the CfWI, the RPS is forming a workforce engagement group of key stakeholders and partners to maintain oversight of the pharmacy workforce by scrutinising workforce plans, facilitating research, promoting opportunities, and mitigating risks for the pharmacy workforce. The RPS also sees tackling important workforce issues (such as professional empowerment) via its English, Scottish, and Welsh Pharmacy Boards.

The pharmacy workforce has come a long way in 20 years - consultant pharmacists, pharmacist prescribers, and up-skilled pharmacy technicians have all emerged. The next 20 years will be challenging, but new opportunities are already on the horizon.

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References

5.5 Country case study: Japan

Authors
Shigeo Yamamura, PhD, Naoko Arakawa, and Rieko Takehira, PhD, Faculty of Pharmaceutical Sciences, Josai International University, Sentaro Oide, BSc and Nobuo Yamamoto, BSc, Japan Pharmaceutical Association, Naoko Arakawa, FIP Collaborating Centre, London.

Summary
- The massive 9.0 magnitude earthquake and nuclear reactor problem in the Fukushima prefecture in March 2011, the Japanese economy remains in a recovery phase. The fiscal budget (April 2012) was enacted at a total of 96.33 trillion yen (USD 1.11 trillion). Of this, expenditure for health care, including medical expenses accounts, was 26.39 trillion yen (USD 320 million).

- Japan is well on the way to becoming a “super-aged” society. The health-care system needs to be reformed in order to address the challenges of a low birth rate and an aging population.

- There are presently two pharmacy education programmes: 1) a six-year programme that aims to educate pharmacists in community pharmacy, and 2) a four-year programme that aims to educate pharmacists in hospital pharmacy. In April 2012, 8,182 pharmacists graduated from the 6-year programme to enter the workforce.

- In revision of the sales system for over-the-counter (OTC) drugs, an examination system regarding registered assistants to sell OTC medications was implemented.

- The development of the community health-care programme is scheduled for 2022. In this proposed government policy, pharmacists are expected to play an important role in enhancing the home health-care programme.

- Pharmacists will be a key professional to seek balance between cost and effectiveness through rational use of medicines.

5.5.1 Background

After the massive 9.0 magnitude earthquake and nuclear reactor problem in the Fukushima prefecture in March 2011, the Japanese economy remains in a recovery phase. The fiscal budget (April 2012) was enacted at a total of 96.33 trillion yen (USD 1.11 trillion). Of this, expenditure for health care, including medical expenses accounts, was 26.39 trillion yen (USD 320 million). After the massive 9.0 magnitude earthquake and nuclear reactor problem in the Fukushima prefecture in March 2011, the Japanese economy remains in a recovery phase. The fiscal budget (April 2012) was enacted at a total of 96.33 trillion yen (USD 1.11 trillion). Of this, expenditure for health care, including medical expenses accounts, was 26.39 trillion yen (USD 320 million).

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- Pharmacists will be a key professional to seek balance between cost and effectiveness through rational use of medicines.

5.5.2 Key workforce issues

Training programme for pharmacy students and pharmacists

In 2006, the Ministry of Education, Culture, Sports, Science & Technology in Japan introduced a new six-year programme to educate pharmacists. There are presently two pharmacy education programmes: 1) a six-year programme that aims to educate pharmacists and 2) a four-year programme that aims to educate pharmacists. In April 2012, 8,182 pharmacist graduates from the six-year programme entered the workforce (Table 5.5.2). In doing so, they passed the Pharmaceutical Common Achievement Test consisting of Computer-Based Testing (CBT) and Objective Structured Clinical Examination (OSCE). In their fourth year. The fifth year comprises pharmacy practice training over 22 weeks. 11 weeks in hospital and 11 weeks in community settings. This specialized clinical training represents the largest difference compared with the previous programmes. However, evaluating improved clinical skills remains a challenge.

Reform of the pharmaceutical supply system

Before 2006, medicines were classified into two groups: prescription and non-prescription medicines. In 2006, to provide easier access to self-medication, OTC medicines were further classified into three categories: potential to risk of medicines (first, second, and third-class OTC). An OTC supply system with a registered salesperson was implemented (Table 5.5.3). An examination system to qualify the registered salespersons is carried out by the governor of each prefecture. The number of registered salespersons is 95,969 as of March 2012 (8).

Table 5.5.1: Number of pharmacists and pharmacies

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Pharmacists</th>
<th>Community Pharmacists</th>
<th>Hospital Pharmacists</th>
<th>Academic-Graduate students</th>
<th>Pharmaceutical Industry</th>
<th>Government</th>
<th>Others</th>
<th>Total Community Pharmacies</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>252,533</td>
<td>191,023</td>
<td>46,596</td>
<td>7,067</td>
<td>45,415</td>
<td>5,022</td>
<td>2,886</td>
<td>252,533</td>
</tr>
<tr>
<td>2008</td>
<td>267,751</td>
<td>191,023</td>
<td>53,304</td>
<td>7,067</td>
<td>37,643</td>
<td>5,022</td>
<td>2,886</td>
<td>267,751</td>
</tr>
</tbody>
</table>

Source: Data from Ministry of Health, Labour and Welfare (1, 4)

The total number of registered pharmacists has increased by 15,218 from 2006 to 2008 (a rise of 6%). The number of pharmacists working in community pharmacy has increased, while those working in hospitals have remained constant. Pharmacists have many responsibilities in health care, research and education. In the health care system, community pharmacists contribute by dispensing, providing OTC drugs, and other activities. Hospital pharmacists work with medical team members to provide in-patient care. According to the School Health and Safety Act (4), all schools (excluding universities) need a designated pharmacist (school pharmacist) to monitor appropriate environmental conditions (classroom illumination, air ventilation, examination of tapwater, etc.).

Other pharmacists work in the pharmaceutical industry to develop new drugs and formulation and provide drug information to health care professionals. Other important roles of pharmacists are to educate pharmacists and lead continuous professional development programmes in pharmacy schools and other related organizations.

Community pharmacies can be classified into two groups. Some pharmacies focus on dispensing and patient counselling. Others deal with drug supply and also cosmetic goods, usually involving a chain drug store group. Pharmacy education has changed from a four-year to a six-year programme in 2006. Therefore, in the intervening two years, fewer pharmacists entered the workforce. Many pharmacies, especially chain drug stores, are now offering job opportunities to enhance or expand their business.

In hospital settings, tenured pharmacists can get preferential remuneration for pharmaceutical services. Furthermore, there is no pharmacy technician cadre in Japan. This situation provides pharmacy students and pharmacists with opportunities for career direction. However, it has been pointed out that this may lead to unequal workforce distribution.

Table 5.5.2: Results of national examination of pharmacists carried out March 2012

<table>
<thead>
<tr>
<th>Type</th>
<th>Candidates</th>
<th>Successful candidates</th>
<th>Pass rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>9,291</td>
<td>8,613</td>
<td>93.31</td>
</tr>
<tr>
<td>Graduates of 6 year programme</td>
<td>8,182</td>
<td>7,613</td>
<td>93.32</td>
</tr>
<tr>
<td>Pass rate (%)</td>
<td>93.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>1,109</td>
<td>907</td>
<td>80.90</td>
</tr>
</tbody>
</table>

An increase in the number of pharmacy schools (from 46 in 2002 to 74 in 2012) could have the effect of decreasing the quality of school entrance. Also, the extended educational period of the pharmacy programme could adversely affect the number of pharmacy students due to total higher tuition fees.

From this, a concern remains about whether all pharmacists graduate from the six-year programmes have appropriate clinical competencies to become effective pharmacists in the future.

Table 5.5.3: Classification of OTC drugs

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescriptions</td>
<td>Drugs that require a prescription from a licensed medical professional.</td>
<td>Medications for chronic illnesses.</td>
</tr>
<tr>
<td>First-class OTC</td>
<td>Drugs that require a prescription from a licensed medical professional.</td>
<td>Medications for chronic illnesses.</td>
</tr>
<tr>
<td>Second-class OTC</td>
<td>Drugs that require a prescription from a licensed medical professional.</td>
<td>Medications for chronic illnesses.</td>
</tr>
<tr>
<td>Third-class OTC</td>
<td>Drugs that require a prescription from a licensed medical professional.</td>
<td>Medications for chronic illnesses.</td>
</tr>
</tbody>
</table>

Information for rational use of medicines should be provided by specialists in accordance with the degree of potential risk. First-class OTC medicines should be supplied only by a pharmacist who provides additional written information. However, a survey on supply compliance for first-class OTC drugs in 2010 indicated that the rate of compliance in pharmacies was only 33.5% (9).

Home health care programme for elderly people in the community

Japan is well on the way to becoming a “super-aged” society resulting from a low birth rate and an aging population.

The number of elderly people over 65 years old is expected to reach a maximum in 2025. Enhancement of the home health-care programme is a key issue. The development of community health care programmes is scheduled in 2003, and the published policies from the government have stated that each prefecture is responsible for planning the community health-care programmes to meet local needs. In the programme, pharmacists and pharmacies are expected to play an important role as part of a multidisciplinary health care team involving doctors, nurses and other health care professionals. The role of pharmacists is to contribute to the rational use of medicines and medicines management, and pharmacists will need to expand and improve their capabilities in order to become actively involved in these community health-care programmes.
5.5. Country case study: Japan

Authors
Shigeki Yamamura, PhD, 1, yamamura.shige@r.na, and Rieko Takehira, PhD, 1, Faculty of Pharmaceutical Sciences, 1, Josai International University, 1 Sentari Oide, BSc and Nobuo Yamamoto, BSc, 2, Japan Pharmaceutical Association, Naoko Arakawa, FIP Collaborating Centre, London.

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In 2006, to provide easier access to self-medication, OTC drugs, an examination system regarding registered assistants to sell OTC medicines was implemented.

An increase in the number of pharmacy schools (from 46 in 2002 to 74 in 2012) could have the effect of decreasing the quality of school entrants. Also, the extended educational period of the pharmacy programme could adversely affect the number of pharmacy students due to total higher tuition fees. From this, a concern remains about whether all pharmacists graduate from the six-year programmes have appropriate clinical competencies to become effective pharmacists in the future.

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<th>Other</th>
<th>Total Community Pharmacies</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>195,233</td>
<td>152,535</td>
<td>48,906</td>
<td>24,107</td>
<td>2,174</td>
<td>2,483</td>
<td>46,144</td>
<td>3,157</td>
</tr>
<tr>
<td>2008</td>
<td>200,882</td>
<td>157,729</td>
<td>51,676</td>
<td>26,450</td>
<td>1,743</td>
<td>2,381</td>
<td>48,042</td>
<td>3,394</td>
</tr>
<tr>
<td>%</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
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<th>Number</th>
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<tbody>
<tr>
<td>Total</td>
<td>8,781</td>
</tr>
<tr>
<td>Candidates</td>
<td>8,781</td>
</tr>
<tr>
<td>Successful candidates</td>
<td>8,643</td>
</tr>
<tr>
<td>Pass rate (%)</td>
<td>88.31</td>
</tr>
<tr>
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</tr>
<tr>
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</tr>
<tr>
<td>Successful candidates</td>
<td>8,496</td>
</tr>
<tr>
<td>Pass rate (%)</td>
<td>95.33</td>
</tr>
<tr>
<td>Others</td>
<td>2,002</td>
</tr>
<tr>
<td>Candidates</td>
<td>2,002</td>
</tr>
<tr>
<td>Successful candidates</td>
<td>459</td>
</tr>
<tr>
<td>Pass rate (%)</td>
<td>38.19</td>
</tr>
</tbody>
</table>

Source: Results of national examination of pharmacists carried out March 2012 [6].

Ref orm of the pharmaceutical supply system

Before 2006, medicines were classified into two groups: prescription and non-prescription medicines. In 2006, to provide easier access to self-medication, OTC medicines were further classified into three categories according to potential risk of medicines (first, second, and third class OTC), and an OTC supply system with a registered salesperson was implemented (Table 5.5.3) [7]. An examination system to qualify the registered salespersons is carried out by the government of each prefecture. The number of registered salespersons is 95,969 as of March 2012 [8].

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</tr>
<tr>
<td>Patients</td>
<td>95,969</td>
</tr>
<tr>
<td>Pass rate (%)</td>
<td>95.33</td>
</tr>
<tr>
<td>Candidates</td>
<td>95,696</td>
</tr>
<tr>
<td>Successful candidates</td>
<td>94,623</td>
</tr>
<tr>
<td>Pass rate (%)</td>
<td>98.54</td>
</tr>
</tbody>
</table>

Home health care programme for elderly people in the community

Japan is well on the way to becoming a “super-aged” society resulting from a low birth rate and an aging population. The number of elderly people over 65 years old is expected to reach a maximum in 2025. Enhancement of the home health care programme is a key issue. The development of community health care programmes is scheduled in 2003, and the published policies from the government have stated that each prefecture is responsible for the planning of community health care programmes to meet local needs. In the programme, pharmacists and pharmacies are expected to play an important role as part of a multidisciplinary health care team involving doctors, nurses and other health care professionals. The role of pharmacists is to contribute to the rational use of medicines and medicines management, and pharmacists will need to expand and improve their capabilities in order to become actively involved in these community health care programmes.

Table 5.5.3. Classification of OTC drugs [7]

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>95,969</td>
</tr>
<tr>
<td>Patients</td>
<td>95,969</td>
</tr>
<tr>
<td>Pass rate (%)</td>
<td>95.33</td>
</tr>
<tr>
<td>Candidates</td>
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<td>Successful candidates</td>
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<td>Pass rate (%)</td>
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<td>Graduates of 6 year programme</td>
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<tr>
<td>Successful candidates</td>
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</tr>
<tr>
<td>Pass rate (%)</td>
<td>95.33</td>
</tr>
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<td>Others</td>
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<td>Candidates</td>
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<tr>
<td>Successful candidates</td>
<td>459</td>
</tr>
<tr>
<td>Pass rate (%)</td>
<td>38.19</td>
</tr>
</tbody>
</table>

Home health care programme for elderly people in the community

Japan is well on the way to becoming a “super-aged” society resulting from a low birth rate and an aging population. The number of elderly people over 65 years old is expected to reach a maximum in 2025. Enhancement of the home health care programme is a key issue. The development of community health care programmes is scheduled in 2003, and the published policies from the government have stated that each prefecture is responsible for the planning of community health care programmes to meet local needs. In the programme, pharmacists and pharmacies are expected to play an important role as part of a multidisciplinary health care team involving doctors, nurses and other health care professionals. The role of pharmacists is to contribute to the rational use of medicines and medicines management, and pharmacists will need to expand and improve their capabilities in order to become actively involved in these community health care programmes.

Information for rational use of medicines should be provided by specialists in accordance with the degree of potential risk. First-class OTC medicines should be supplied only by a pharmacist who provides additional written information. However, a survey on supply compliance for first-class OTC drugs in 2010 indicated that the rate of compliance in pharmacies was only 33.5% [9].
5.3 Strategies used and lessons learnt

Training programme for pharmacy students and pharmacists

To educate pharmacists towards appropriate clinical competencies, a six-year programme for pharmacist education was started in 2006. At the time of introducing the six-year course, we began developing a model/core curriculum for pharmacy students to gain a minimal level of clinical skills. Both hospital pharmacists and community pharmacists now work collaboratively with pharmacy schools.

Reform of the pharmaceutical supply system

Relaxation of regulations is a global trend, and Japan is no exception. The Japanese government introduced registered salespersons who can sell second and third class OTC drugs. It is probably true that pharmacists can provide better safety in self-medication through OTC drugs.

Although first-class OTC drugs are sold only by pharmacists, the number of community pharmacies with no OTC drugs is increasing because they are focused on dispensing prescriptions. The Japanese Pharmaceutical Association, however, advocates that all drugs used for self-medication be supplied to purchasers through pharmacists, with counselling for effective and safe use.

Home health care programme for elderly people in the community

In 2000, a long-term care insurance system was introduced to respond to society’s major concern about aging (5). Pharmacists’ involvement includes providing medicines management for long-term care. This role should expand, and there is a need for more community-based pharmaceutical care.

The number of pharmacists contributing to long-term care is increasing, including providing new roles (eg home parenteral management for long-term care. This role should expand, and there is a need for more community-based pharmaceutical care.

Pharmacists will be expected to play an important role in this community health care programme. However, other health care professionals still do not accept the role of pharmacists in these settings. More effort is needed to improve workforce capabilities to achieve confidence by other health professionals and to produce better patient outcomes.

In conclusion, the total numbers of pharmacists and pharmacies are not currently an issue. However, because of the imbalance of work environments (community pharmacy, hospital pharmacy, or drug store), a shortage of pharmacists in some fields is reported. This may result in some areas having poor access to appropriate pharmaceutical services. This maldistribution of pharmacies and pharmacists needs to be addressed.

Education and development programmes for pharmacy students and pharmacists are in development. The next step is to increase the public and professional awareness about the importance of pharmacists in Japan’s health care system by the profession itself.

5.4. Outcomes

Training programme for pharmacy students and pharmacists

There is no outcomes evidence for the effect of the new six-year programme at this stage. The outcomes will be evaluated by the Japan Accreditation Board for Pharmaceutical Education (12). New challenges are

References


5.3. Strategies used and lessons learnt

Training programme for pharmacy students and pharmacists

To educate pharmacists towards appropriate clinical competencies, a six-year programme for pharmacist education was started in 2006. At the time of introducing the six-year course, we began developing a model/core curriculum for pharmacy students to gain a minimal level of clinical skills. Both hospital pharmacists and community pharmacists now work collaboratively with pharmacy schools.

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Home health care programme for elderly people in the community

In 2000, a long-term care insurance system was introduced to respond to society’s major concern about aging [50]. Pharmacists’ involvement includes providing medicines management for long-term care. This role should expand, and there is a need for more community-based pharmaceutical care. The number of pharmacists contributing to long-term care is increasing, including providing new roles (eg home parenteral nutrition or domiciliary medicines adherence counselling).

However, many pharmacists do not have the necessary clinical skills to evaluate patient conditions. The community workforce is in need of targeted skills and practitioner development infrastructure.

5.4. Outcomes

Training programme for pharmacy students and pharmacists

There is no outcomes evidence for the effect of the new six-year programme at this stage. The outcomes will be evaluated by the Japan Accreditation Board for Pharmaceutical Education [31]. New challenges are a Controlling the appropriate capacity (entry) in pharmacy schools and accrediting/credentialing the clinical competencies of novices; b. Improving the core curriculum for training of pharmacy students in pharmacy schools; and c. Reorganizing clinical practice experiences at pharmacies and hospitals. The Japan Pharmaceutical Association (JPA) has established a new education system (the Japan Pharmaceutical Association Lifelong Learning Support System – JPALS) in order to support CPD from March 2012 [32]. The JPALS is expected to play an important role in this area.

Reform of pharmaceutical supply system

The number of community pharmacies with no OTC drugs is increasing, and the rate of compliance in the supply of first-class OTC drugs is low (35%). Many pharmacists did not have enough experience in dealing with OTC drugs in the past because they focused on dispensing prescriptions. The challenges are:

a. Enhancement of the supply system for OTC medicines and b. Establishing a national training programme and guidelines for the safe supply of OTC medicines.

Home health care programme for elderly people in the community

The number of pharmacies and pharmacists involved in the long-term care system is increasing. Pharmacists will be expected to play an important role in this community health care programme. However, other health care professionals still do not accept the role of pharmacists in these settings.

More effort is needed to improve workforce capabilities to achieve confidence by other health professionals and to produce better patient outcomes.

In conclusion, the total numbers of pharmacists and pharmacies are in development. The next step is to increase the public and professional awareness about the importance of pharmacists in Japan’s health care system by the profession itself.
5.6 Country case study: Pacific Island Countries (PICs)

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Summary
- Twenty-two independent island countries scattered over 30 million square kilometres of the Pacific Ocean, comprising of more than 7500 islands, form the Pacific Islands.
- The region has a population of approximately 2.5 million people, with populations varying from 1170 in Tokelau to more than 600,000 in Papua New Guinea (PNG) [1].

Pharmacy in the Pacific
- Approximately 300 pharmacy personnel are distributed throughout the public sector of PICs, with more than 80% of these being pharmacy assistants or similar mid-level cadres.
- A lack of education capacity to support competency development of the cadres involved in pharmacy-related services is one of the main issues affecting pharmacy workforce development in PICs.
- A new approach has been developed involving a partnership between UNFPA Suva Sub-Regional Office, the University of Canberra, Ministry of Health officials, and health personnel identified as PICs.
- Cultural principles of learning and a pharmacy competency framework for PICs have been developed and used to create novel, experiential competency-based training approaches for specific cadres.

5.6.1 Background
A picture of the Pacific
- Twenty-two independent island countries scattered over 30 million square kilometres of the Pacific Ocean, comprising of more than 7500 islands, form the Pacific Islands. The Pacific Islands encompass a wide variety of ethnic, cultural, and linguistic groupings that can be broadly divided into Melanesia, Micronesia, and Polynesia.

The region has a population of approximately 2.5 million people, with populations varying from 1170 in Tokelau to more than 600,000 in Papua New Guinea (PNG) [1].

5.6.2 Key issues
A lack of education capacity to support competency development of the cadres involved in pharmacy-related services is one of the main issues affecting pharmacy workforce development in PICs. Evidence of the shortfall is provided by the Australian Agency for International Development (AusAID), UNFPA, and the World Health Organization (WHO), which report continued problems in maintaining the supply of essential medicines through to the clinics and aid posts of PICs [8-13]. WHO asserts that “many maternal and child health-related deaths in the region may be prevented with readily available essential medicines provided by suitably trained health personnel” [13].

Pacific pharmacy education
- Training in EMSM has been conducted in the Pacific over the last several years by UNFPA, United Nations Children’s Fund (UNICEF) and WHO [14]. To a large extent, EMSM training in PICs has been fragmented, superficial, and without a long-term plan to sustain the competencies needed for continued availability of essential medicines. Each agency has promoted their EMSM framework and principles, but with limited reference to local competencies or cultural requirements for effective training [1].

- Generalised EMSM training has been used in the past and assumes all target audiences are the same. Within PICs, expected competencies differ for various health personnel depending on their level of activity within the medicines supply system [3, 15]. Any new training strategy should acknowledge this variation and should ensure that the core competencies of medication selection, procurement, distribution, use, and management are addressed.

5.6.3 Pharmacy Services
Within PICs, expected competencies differ for various levels of health personnel depending on their level of activity within the medicines supply system [3, 15]. Any new training strategy should acknowledge this variation and should ensure that the core competencies of medication selection, procurement, distribution, use, and management are addressed.

5.6.4 Health personnel
Health personnel are frequently involved in dealing with the medicines supply system in PICs. The workforce responsible for maintaining the medicines supply system in PICs is made up of nurses, midwives, nurse aids, and other health personnel at the primary health care level (level 1), pharmacy supply and health personnel at the provincial/ regional level (level 2), and pharmacists who are available and stores managers at the national level (level 3) [1].

Figure 5.6.1: An overview of government pharmacy support workforce cadres in PICs

• LEVEL 1: NATIONAL TERTIARY
- Example Cadre: Pharmacy assistants, stores personnel
- Place of work: National level in Medical Stores or Pharmacy Departments

• LEVEL 2: SECONDARY
- Example Cadre: Pharmacy assistants, stores personnel, nurses and other mid-level cadres
- Place of work: Hospital, provincial stores level, area health services
- Training Kmowledge products: Certificate II in Hospital Health Services Pharmacy Support (junior staff); Certificate IV in Hospital Health Services Pharmacy Support (supervisory staff)

• LEVEL 3: NATIONAL TERTIARY
- Example Cadre: Pharmacist plus stores personnel
- Place of work: National level in Medical Stores or Pharmacy Departments

• LEVEL 4: NATIONAL TERTIARY
- Example Cadre: Pharmacy assistants, stores personnel
- Place of work: National level in Medical Stores or Pharmacy Departments

• LEVEL 5: NATIONAL TERTIARY
- Example Cadre: Pharmacy assistants, stores personnel
- Place of work: National level in Medical Stores or Pharmacy Departments

• LEVEL 6: NATIONAL TERTIARY
- Example Cadre: Pharmacy assistants, stores personnel
- Place of work: National level in Medical Stores or Pharmacy Departments

• LEVEL 7: NATIONAL TERTIARY
- Example Cadre: Pharmacy assistants, stores personnel
- Place of work: National level in Medical Stores or Pharmacy Departments

• LEVEL 8: NATIONAL TERTIARY
- Example Cadre: Pharmacy assistants, stores personnel
- Place of work: National level in Medical Stores or Pharmacy Departments

5.6.5 Medicines flow from national level to primary care centre
- Medicines flow from National Level to Provincial Hospitals Store
- Medicines flow from Provincial Hospitals Store to Primary Care Centre

5.6.6 Medicines flow from primary care centre to patient
- Medicines flow from Primary Care Centre to Patient


References
5.6 Country case study: Pacific Island Countries (PICs)

Authors
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Summary

- The focus on experiential education methods to develop work-based competency has shown quick competency development with immediate application to the workplace
- Engaging practitioners, locally active international organisations, and academia is a constructive way to promote local needs and best practice in pharmacy workforce development.

5.6.1 Background

A picture of the Pacific

Twenty-two independent island countries scattered over 30 million square kilometres of the Pacific Ocean, comprising of more than 7500 islands, form the Pacific Islands. The Pacific Islands encompass a wide variety of ethnic, cultural, and linguistic groupings that can be broadly divided into Melanesia, Micronesia and Polynesia.

The region has a population of approximately 9.6 million people distributed among a number of small island states with populations varying from 1270 in Tokelau to more than 6,000,000 in Papua New Guinea (PNG) [1].

Pharmacy in the Pacific

Approximately 300 pharmacy personnel are distributed throughout the public sector of PICs (excluding the PNG estimate of 75), with more than 80% of these filled by pharmacy assistants or similar mid-level cadres [2, 3]. This reliance on mid-level cadres is consistent with global trends and reflects the unavailability of more highly qualified pharmacists [4, 5]. There is less than one pharmacist per 10,000 population on average across PICs [3], a ratio similar to that found in sub-Saharan African countries (6).

Essential medicine supply management (EMSM) is the main function carried out by government pharmacy departments across PICs, with clinical hospital pharmacy developing in selected tertiary hospitals of larger countries where sufficient pharmacists are available (e.g. Tonga and Fiji). Community pharmacy is active in most of the region’s countries, with non-pharmacists cadres playing a significant role in many countries.

Healthcare in PICs is provided in rural environments where approximately 88% of the population reside [7]. The workforce responsible for maintaining the medicines supply system in PICs is made up of nurses, midwives, nurse aids, and other health personnel at the primary care level (Level 1), pharmacy staff and health personnel at the provincial/ regional level (Level 2), and pharmacists where available and stores managers at the national level (Level 3) [8, 9]. (Figure 5.6.2)

5.6.2 Key issues

A lack of education capacity to support competency development of the cadres involved in pharmacy related services is one of the main issues affecting pharmacy workforce development in PICs. Evidence of the shortfall is provided by the Australian Agency for International Development (AusAID), UNFPA, and the World Health Organization (WHO), which report continued problems in maintaining the supply of essential medicines through to the clinics and aid posts of PICs [8, 9]. WHO asserts that “many maternal and child health related deaths in the region may be prevented with readily available essential medicines provided by suitably trained health personnel” [10].

Pacific pharmacy education

Training in EMSM has been conducted in the Pacific over the last several years by UNFPA, United Nations Children’s Fund (UNICEF) and WHO [14]. To a large extent, EMSS training in PICs has been fragmented, superficial, and without a long-term plan to sustain the competencies needed for continued availability of essential medicines. Each agency has promoted their EMSM framework and principles, but with limited reference to local competencies or cultural requirements for effective training [1].

Generalised EMSS training has been used in the past and assumes all target audiences are the same. Within PICs, expected competencies are different for various health personnel depending on their level of activity within the medicines supply system [3, 15]. Any new training strategy should acknowledge this variation and should ensure that the core competencies of medication selection, procurement, distribution, use, and management are addressed.

The Fiji National University (FNU) and the University of Papua New Guinea (UPNG) are the only universities in the region providing diploma and degree level pharmacy education, with most graduates going into the private sector. Formal certificate training is available for mid-level cadres involved in EMSS, apart from semi-structured localised training in the Solomon Islands and Tonga. The FNU and UPNG initially ran pharmacy assistant courses before upgrading to their current programme based on traditional Australian curricula [16]. With more than 80% of pharmacy staff posts filled by non-pharmacists with limited formal training, the need for a focus in this area is clear [1].

Health personnel need to be competent in relevant aspects of EMSS in order to direct their country supply systems effectively. This material is often missing from preservice curricula, while skills in in-service training are often considered as a result. Many health personnel lack the skills required for this essential part of their day-to-day work [1].
As current essential medicines supply provision continues to fall short of WHO and UN targets, a new systematic, needs-based approach for essential medicines supply management (EMSM) education is required as a first step in developing a competent workforce in PICs.

5.6.3. Strategies used and lessons learnt

A new approach has been developed involving a partnership between UNFPA Suva sub-regional office, the University of Canberra (UC), Ministry of Health officials and the health personnel within identified PICs (Federated States of Micronesia, Republic of Kiribati, PNG, Solomon Islands, Kingdom of Tonga, Tuvalu, and Republic of Vanuatu).

The FIP PET “needs-based” approach to pharmacy education [17] and a participatory action research (PAR) methodology have been used to form a systematic framework to provide a regional solution to these educational deficiencies (See Figure in Part 4, Pharmacy education) Such a framework is consistent with local cultural norms and has the effect of meeting the expectations of donor organisations and local Ministries of Health by providing immediate, tangible benefits that can be presented to the global research community.

In the health sector, PAR is based on reflection, data collection, and action that aims to improve health and reduce health inequities through involving health personnel who, in turn, take actions to improve their own circumstances [18]. Any resultant action is then further researched, and an interactive reflective cycle perpetuates data collection, reflection, and action.

This systematic strategy has as its starting point the need to understand local culture and its impact on learning and teaching, the mapping of competency requirements, and an understanding of currently available information and materials. Subsequently, this information has been applied to develop and trial new pedagogical approaches to the training of health personnel involved in EMSM. This strategy seeks to support the existing systems of the country.

It is important to note that education is only part of a sustainable approach to HRH development. The “HRH Action Framework” demonstrates the interrelationship between human resource management systems, leadership, partnership, finance, education, and policy (Figure 5.6.2)[19]. The framework identifies that education should not be considered in isolation, but is one of six interrelated components that need to be addressed for sustained development in HRH to be achieved [19]. Any new approach to EMSM education must integrate into the overarching HRH plan for individual PICs.

5.6.4. Outcomes

A literature search and several focus groups were conducted involving various levels of health care personnel in PICs to determine cultural learning needs and expectations of training approaches. Using this data, we have established two principles that should be considered when preparing training for PICs (publication in progress). These principles take into account cultural considerations and the priorities of health care workers in the region and are used to guide the development of training materials.

There is a scarcity of information available in the published and grey literature concerning the competencies required for medical supply management of various cadres of health care workers in PICs. In-country competency mapping exercises were conducted in PNG, Vanuatu, and the Solomon Islands with online validation activities and focus groups conducted to verify a pharmacy competency framework for Pacific Island Countries (available from main author on request). The validated competency framework is service-based rather than cadre specific, containing 153 competencies organised into four clusters: 1) Organisation and Management Competencies – a systems focus, 2) Professional/Personal Competencies – a practice focus, 3) Pharmaceutical Public Health Competencies – a population focus, and 4) Pharmaceutical Care Competencies – a patient focus.

A service-based approach allows wider application to the diverse pharmacy practice environments of PICs. Health personnel responsible for the delivery of pharmacy services are encouraged to use this tool when considering appropriate training in EMSM and when monitoring staff effectiveness in their local environments.

Existing training materials for health personnel involved in EMSM at the facility level were reviewed by locally practising health personnel. The personnel concluded that currently used materials do not cover the expected competency requirements for these health personnel, while the structure and content of the materials assessed do not consistently meet the local criteria for best practice in training.

In considering cultural aspects of learning and the competency requirements for various cadres of staff, three different competency development approaches have been developed and are being trialled in a creative commons environment:

1. A country specific five-day skills based workshop with workplace follow up for pharmacy entry-level workers.
2. A ten-month on-the-job certificate using a combination of distance and short intensive sessions with workplace follow up for pharmacists and stores managers at a national level.
3. A short intensive workshop with workplace mentoring and follow up for pharmacists and stores managers at a local level (Level 3).

Through engaging in this regional strategy, we have learnt that considering culture and country-specific requirements is important to the countries. The focus on practical, work-based competency has shown quick competency development with immediate application to the workplace. Overall, engaging practitioners, locally active international organisations, and academia is a constructive way to promote the needs and best practice of pharmacy education.

Level 1 competency-based education model

The Level 1 teaching methodology uses an individual, needs-based approach to develop a practical training manual and a country-specific interactive workshop with a focus on medicines supply management competencies. To do this, a “pre-Level 1 training screening tool” is used in conjunction with stakeholder engagement by phone and e-mail to determine the current standard operating procedures and policies that affect medicines supply management in that country.

This data is then used to develop a competency-based, problem oriented, practical training manual and an interactive five-day workshop with the involvement of local health care personnel.

Skills games, role play, group discussion, story telling, and site visits provide opportunities to practice with limited use of computer projection and maximum involvement by local health care personnel. Selected competencies and participants are measured before and after the workshop. Three months after the workshop, health care personnel are visited by a local supervisor to note the translation of developed competencies into the local environment and discuss any workplace-related issues.

Level 2 workshops have been conducted in nine countries with a total of 252 participants. Participant feedback indicates that the practical nature of the workshop with specific reference to workplace activities has enabled competency improvement. This has been confirmed through our assessment of the students. The use of group work enabling communication in local languages and group discussions where participants can hear and share ideas have been documented as highlights consistent with their cultural approach.

Level 2 competency-based education model

In the absence of training programmes in the region for Level 2 health care workers, we are currently trialling a ten-month on-the-job certificate (certified under the Australian Qualifications Framework), using a combination of distance and short in-country intensive sessions in Vanuatu and Fiji with a total of 33 participants. The course is coordinated by the University of Canberra. The development process engaged Ministry of Health staff and local academic institutions, where they exist, to help develop the overall course structure and required training material. Mechanisms are being explored using mobile phone to provide out of country support. Local supervision is provided through the use of senior staff within the pharmacy and medical stores environment, supported by the University of Canberra.

This course aims to develop competent staff who are able to deliver services in the areas of EMSM, enabling those who have completed the course to better support the pharmacy and medical supply management systems within their respective country environments. This course is designed for junior staff or entry-level workers.

Level 3 competency-based education model

In September 2010, a regional, two-week competency development workshop was hosted by UNFPA for pharmacists and medical stores personnel who hold national responsibilities for medicines supply management in 15 PICs. The focus of the workshop was on the development and local application of medicines supply competencies. To facilitate this approach, participants established work plans and a framework for a peer group...
As current essential medicines supply provision continues to fall short of WHO and UN targets, a new systematic, needs-based approach for essential medicines supply management (EMSM) education is required as a first step in developing a competent workforce in PICs.

5.6.3. Strategies used and lessons learnt

A new approach has been developed involving a partnership between UNFPA Suva sub-regional office, the University of Canberra (UC), Ministry of Health officials and the health personnel within identified PICs (Federated States of Micronesia, Republic of Kiribati, PNG, Solomon Islands, Kingdom of Tonga, Tuvalu, and Republic of Vanuatu).

The FIP-PET “needs-based” approach to pharmacy education [17] and a participatory action research (PAR) methodology have been used to form a systematic framework to provide a regional solution to these educational deficiencies (See Figure in Part 4, Pharmacy education). Such a framework is consistent with local cultural norms and has the effect of meeting the expectations of donor organisations and local Ministries of Health by providing immediate, tangible benefits that can be presented to the global research community.

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This systematic strategy has as its starting point the need to understand local culture and its impact on learning and teaching, the mapping of competency requirements, and an understanding of currently available information and materials. Subsequent to this information has been applied to develop and trial new pedagogical approaches to the training of health personnel involved in EMSM.

This strategy seeks to support the existing systems of the country in which they are located. It is important to note that education is only one part of a sustainable approach to HRH development.

The “HRH Action Framework” demonstrates the interrelationship between human resource management systems, leadership, partnership, finance, education, and policy (Figure 5.6.1). [39] The framework identifies that education should not be considered in isolation, but is one of six interrelated components that need to be addressed for sustained development in HRH to be achieved [39]. Any new approach to EMSM education must integrate into the overarching HRH plan for individual PICs.

5.6.4. Outcomes

A literature search and several focus groups were conducted involving various levels of health care personnel in PICs to determine cultural learning needs and expectations of training approaches. Using this data, we have established approaches that should be considered when preparing training for PICs (publication in progress). These principles take into account cultural considerations and the priorities of health care workers in the region and are used to guide the development of training materials.

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The validated competency framework is service-based rather than cadre specific, containing 153 competencies organised into four clusters:

1) Organisation and Management Competencies - a systems focus,
2) Professional/Personal Competencies - a practice focus,
3) Pharmaceutical Public Health Competencies - a population focus, and
4) Pharmaceutical Care Competencies - a patient focus

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Existing training materials for pharmacy personnel involved in EMSM at the facility level were reviewed by locally practising health personnel. The personnel concluded that currently-used materials do not cover the expected competency requirements for these health personnel, while the structure and content of the materials assessed do not consistently meet the local criteria for best practice in training.

In considering cultural aspects of learning and the competency requirements for various cadres of staff, three different competency development approaches have been developed and are being trialled in a creative commons environment:

1) A country specific five-day skills based workshop with workplace follow up for primary health care workers, including nurses, midwives and nurse aids (Level 1);
2) A ten month on-the-job certificate using a combination of distance and short intensive sessions with workplace follow up for health care workers in medicines supply at the provincial level (Level 2); and
3) A short intensive workshop with workplace mentoring and follow up for pharmacists and stores managers at a national level (Level 3).

Level 1 competency-based education model

The Level 1 teaching methodology uses an individual, needs-based approach to develop a practical training manual and a country specific interactive workshop with a focus on medicines supply management competencies. To do this, a “pre-Level 1 training screening tool” is used in conjunction with stakeholder engagement by phone and e-mail to determine the current standard operating procedures and policies that affect medicines supply management in that country. This data is then used to develop a competency-based, problem oriented, practical training manual and an interactive five-day workshop with the involvement of local health care personnel.

Skills games, role play, group discussion, story telling, and site visits provide a problem-solving environment with limited use of computer projection and maximum involvement by local health care personnel. Selected competencies and participant questions are highlighted and the translation of developed competencies into the local environment and discussed at any workplace-related issues.

Level 2 workshops have been conducted in nine countries with a total of 252 participants. Participant feedback indicates that the practical nature of the workshop with specific reference to workplace activities has enabled competency improvement. This has been confirmed through our assessment of the students. The use of group work enabling communication in local languages and group discussions where participants can hear and share ideas have been documented as highlights consistent with their cultural approach.

Level 2 competency-based education model

In the absence of training programmes in the region for Level 2 health care workers, we are currently trialling a ten-month on-the-job certificate (certified under the Australian Qualifications Framework), using a combination of distance and short in-country intensive sessions in Vanuatu and Fiji with a total of 33 participants. The course is coordinated by the University of Canberra and supported by the Ministry of Health staff and local academic institutions, where they exist, to help develop the overall course structure and required training material.Mechanisms are being explored using mobile phone to provide out of country support. Local supervision is provided through the use of senior staff within the pharmacy and medical stores environment, supported by the University of Canberra.

This course aims to develop competent staff who are able to deliver services in the areas of EMSM, enabling those who have completed the course to better support the pharmacy and medical supply management systems within their respective country environments. This course is designed for junior staff or entry-level workers.

Level 3 competency-based education model

In September 2010, a regional, two-week competency development workshop was hosted by UNFPA for pharmacists and medical stores personnel who hold national responsibilities for medicines supply management in 12 PICs. The focus of the workshop was on the development and local application of medicines supply competencies. To facilitate this approach, participants established work plans and a framework for a peer group.
and external mentoring programme. It is envisaged that this mentoring programme will be utilized and assessed to determine if the mentoring approach aids in the implementation of the country specific work plans to develop local medicines supply competencies.

5.6.5. The future

By the end of 2011, validated pedagogical approaches for the development of medicines supply competencies in two of the three cadre levels will be completed and made available to the wider international community in a creative commons environment. We are still to determine whether the competency-based education approaches we have developed can be made sustainable in the local environment. In the future, these pedagogical approaches will be made available to a broader range of academic institutions in the region, including universities, tertiary colleges, and ministries of health. To aid in the uptake of these new approaches, it is envisaged that in-country academic workshops will be conducted detailing the pedagogical approaches and aiding their implementation in various health care curricula. Uptake of the new approaches and their implementation will then be monitored over the following twelve months.

References

21. Lita Chew, Registrar, Singapore Pharmacy Council, phactg@gmail.com; Wyuck Song, President, Singapore Pharmacy Council; Christine Teng, President, Pharmaceutical Society of Singapore; Lim Hui Leng, Member, Pharmaceutical Society of Singapore.

Summary

- Ageing population, increasing burden of chronic diseases, and rising health care costs are significant challenges that must be addressed by the pharmacy profession in Singapore.
- Collaboration of pharmacy profession with other health care members to achieve safety, optimum, seamless care for patients and the public is key.
- Investing in capacity and capability building of pharmacists is crucial. This includes manpower development, education, training, leadership, specialisation for pharmacists, and role redesign of pharmacy support workforce.
- Information, communication, and automation technology is being leveraged to provide safe, quality and cost effective pharmacy services.
- Policies and regulations are being developed or used to drive and achieve safe and quality care.
- A unified philosophy that galvanises the pharmacy profession and focus on patients through professional practice, ethics, and values is being developed and propagated.

5.7. Country Case Study: Singapore

5.7.1. Background

Singapore is an island city-state with a population of 9.8 million people [1]. It has a well-established health care system, public and private, with an excellent reputation for quality medicine. In the World Health Report on health systems, Singapore was ranked number one in Asia and sixth globally [2]. Health care provision comprises a mix of seven public hospitals and six specialty centres, which together accounts for 72% of inpatient beds, with 18 private hospitals accounting for the remaining 28%. Primary health care is easily accessible through an extensive and convenient network of some 2000 private general practitioners and 18 public outpatient polyclinics. Private practitioners provide around 80% of primary health care services whilst government polyclinics provide the remaining 20% [3]. Health care financing is based on a combination of government subsidies (Medisave, Medishield, Medifund), through taxation and individual responsibility

The health care system in Singapore faces major challenges - a growing and ageing population, increasing burden of chronic diseases, and rising health care costs. As such, the shift from episodic care to long-term care, community-based disease prevention, and treatment of chronic diseases is necessary.

Pharmacists in Singapore work in diverse settings, including community pharmacies, hospitals, pharmaceutical industry, academia, and research. As of December 2012, there are 203 pharmacists registered with the Singapore Pharmacy Council. Approximately 95% of the registered pharmacists work in patient care with a majority working in public institutions. The pharmacist to population ratio is approximately 1:2800 [4]. Rising to the challenge, pharmacists are embracing new professional roles, aside from their traditional dispensing role, to ensure the provision of optimal and cost effective pharmaceutical care.

Areas where pharmacists are making a significant difference to the care of patients include chronic disease management through pharmacist-run clinics, antibiotic stewardship, speciality practice (oncology, infectious disease, critical care, and psychiatry), medication review, medication reconciliation, and medication therapy management services.

5.7.2. Key challenges facing the pharmacy workforce

Aging population and increase in burden of chronic diseases

Singapore has one of the lowest fertility rates in the world (the total fertility rate for 2009 is 1.27) and one of the fastest ageing populations. By 2090, one in five Singaporean residents will be aged 65 and above. This situation is similar to other East Asian countries such as Japan and South Korea. With longer life expectancies and an ageing population, chronic diseases will become a growing burden.

The prevalence rates for hypertension, diabetes mellitus, and dyslipidemia (high blood cholesterol) are 23%, 13%, and 12% respectively [3].

Health care professional workforce production

To meet health care demands, it is estimated that the country needs to grow the health care professional workforce (doctors, nurses, dentists and pharmacists) by 50%, or about 20,000 more, by the year 2020. Greater numbers of pharmacists are needed in direct patient care and in community settings to look after the elderly and those with chronic illnesses. Pharmacists will also be required in health programmes focusing on disease prevention, promotion of healthy lifestyles, and health screening.
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References
16. Bailey MC, Khayat E, Prasad V. Fijian School of Medicine Diploma in Pharmacy graduation, ten year analysis where are they now? Fij. Health Dialog. 2006;1(1):1-6
The Department of Pharmacy at the National University of Singapore, the only institution that produces pharmacy graduates, is steadily increasing its training capacity from the current 160 to eventually reach an annual intake of 240 pharmacy students. Besides increasing our local pipeline, foreign-trained pharmacists are supplementing our pool of pharmacists to meet pharmacist manpower demands. A total of 138 pharmacy degrees are recognised by the Singapore Pharmacy Council [3].

**Capability building**

As health care evolves, the pharmacy profession will have opportunities for new and expanded roles and responsibilities. The undergraduate pharmacy curriculum and the pre-registration training programme need to better integrate knowledge and skills training and facilitate smoother transition from university to practice.

Tomorrow’s pharmacy workforce needs to develop with emerging practice trends (Table 5.7.1).

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<tr>
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5.7.3. **Key strategic areas and proposed actions**

The pharmacy profession in Singapore has been steadily progressing and keeping pace with the growth of Singapore's medical and health care sector. Pharmacy leadership in the country has identified the following key strategic areas to direct the pharmacy workforce towards the nation's Health Care 2020 Master Plan (Table 5.7.2): 1. Manpower Management 2. Education and continuing professional development 3. Information, communication and automation technology (ICAT) 4. Policies and regulation 5. Leadership

**Table 5.7.2. The key strategies and proposed actions**

<table>
<thead>
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<tr>
<td>1. Manpower Management</td>
<td>Collaborative approach to ensure the pharmacy workforce meets future health care system and Singapore’s needs</td>
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<td>2. Education and continuing professional development (CPD)</td>
<td>Lead and collaborate with key stakeholders to implement accessibility programmes to upgrade competency to support the implementation of new services, specialty practice, and new practice models.</td>
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<td>3. Information, communication and automation technology (ICAT)</td>
<td>Collaborate with the Ministry to ensure that key pharmacies will adopt the ICAT technology to facilitate delivery of safe and effective use of medicines to patients.</td>
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<td>5. Leadership</td>
<td>Lead and collaborate with professional organisations to develop a unified philosophy of pharmacy practice.</td>
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<td>Patient empowerment</td>
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<td>Electronic health record</td>
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<td>- Promote the development of a unified philosophy of pharmacy practice that is built on collective strengths of academia and organizations to enhance the accessibility of care</td>
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Table 5.7.2. The key strategies and proposed actions

1. Manpower Management
   - Coordinated approach to ensure the pharmacy workforce meets future health care system and Singapore’s needs

2. Education and continuing professional development (CPD)
   - Collaborative approach to ensure high quality education and CPD programmes to support patient-centred, outcome-focused care

3. Information, communication and automation technology (ICAT)
   - Create a profession-wide strategy for development and use of ICAT to facilitate delivery of safe and effective use of medication to patients

4. Policies and Regulation
   - Address policies and practice issues relevant to electronic transfer of prescriptions and automation technology

5. Leadership
   - Lead and collaborate with professional organisations and stakeholders to enhance the accessibility of care
5.7.4. Current key strategic outcomes

Improved career structure for progression and advancement

A review of the pharmacy career structure in the public health care sector was conducted with a new career pathway framework being introduced in 2009 (Figure 5.7.1). Under the new career framework, pharmacists in the public health care sector can develop their career in professional, clinical, or research tracks. Besides enhancing professional development, the new career framework also attracts and retains pharmacists and expands the pool of future pharmacy leaders needed to guide the profession.

Salary revision and benchmarking

Through regular salary review exercises, the salaries of pharmacists in the public health care sector are adjusted. The most recent salary review was completed in April 2012.

Training scholarships

The Ministry of Health has set aside funding to encourage more pharmacists to pursue specialist training. The funding provides 35 scholarships in specialist residency training and supports another 43 in doctorate and master’s degree programmes.

Establishment of pharmacy specialization framework

The establishment of Pharmacy Specialist Accreditation Board (PSAB) in February 2012 is an existing development for pharmacists. PSAB defines the specialties in the practice of pharmacy and certifies those who meet the requisites of both qualifications and experience for registration as specialists in the public sector. The Singapore Pharmacy Council will maintain the Register of Specialists.

Role redesign of pharmacy technicians

Pharmacy technicians form an important component, accounting for up to 73% of our workforce in some institutions. Development of the pharmacy technician workforce, competencies, and new roles will therefore serve as an important strategy to mitigate the effects of pharmacist shortages and support expanded roles for pharmacists in clinical areas.

Review of pre-registration pharmacist training framework

The Singapore Pharmacy Council has recently completed its review of the existing pre-registration pharmacist’s training programme. The review has led to structural and delivery changes to training and review of the undergraduate pharmacy curriculum. The training will be centrally coordinated, with compulsory and elective modules aimed at achieving desired minimum practice competencies. It is important for joint development of education and training to ensure continuity of transition from undergraduate studies to practice.

Training framework for pharmacy support workforce

The first structured pharmacy technician training course was run by the Pharmaceutical Society of Singapore (PSS) more than 17 years ago to meet the evolving pharmacy service needs in hospitals. In 2009, PSS achieved Approved Training Organisation (ATO) status from the Singapore Workforce Development Agency (WDA). WDA accredits pharmacy technicians and assistants training courses and the government subsidizes the course fees as part of the country’s adult learning and skills development strategy.

Collaboration with Agency of Integrated Care

PSS, in collaboration with the Agency of Integrated Care (AIC), embarked on a pilot pharmaceutical care programme in Voluntary Welfare Organizations (VWO) nursing homes in August 2011. The programme includes: a) Medication review and reconciliation for nursing home residents; b) Drawing up policies and procedures with nursing homes to ensure safe medication use practices, and c) Training of and support for nursing staff to ensure better understanding of medications used by residents and safe medication practices. Preliminary data show positive outcomes including safer and improved medication use practices, resolution of drug-related problems, and good nursing staff feedback for the training provided by pharmacists. PSS and AIC will present the pilot programme results and will discuss with the Ministry to explore the mandatory requirement for nursing homes to engage pharmacist services.

Leverage on information technology and automation to advance care and services

Singapore has developed a pharmacy blueprint with a vision to deliver quality care and adding value through pharmacy information technology (IT). The mission is to develop a world-class pharmacy IT system that enables value-added services to achieve quality, integrated patient care across the health care continuum. This is driven by pharmacists working with patients and other health care providers to look into our health care delivery processes. In hospitals, this is being done in inpatient and outpatient areas. Three hospitals have completed their inpatient closed loop medication management systems and by 2014 will implement outpatient automation systems. These will bring pharmacy practice to another level of safety and efficiency, enabling pharmacists to concentrate on improving patient care; reviewing drug-related problems, and reducing preventable adverse drug events. Other automation such as robots for intravenous compounding and cytotoxic preparation will be explored as these mature.

Facilitating and enabling legislation and regulation

Pharmacist specialisation is provided for under the Pharmacist Registration Act 2007. By September 2012, the pharmacist specialist register will include the following disciplines: oncology and pharmacotherapy, geriatrics, cardiology, psychiatry,
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and continue to work together for the common good of the profession and its services is an important lever to move pharmacy and medication records. Medication reconciliation by pharmacists is now more thorough and effective. Together with the Health Sciences Authority computerised medical information system (CMIS), the database for adverse drug reaction reporting will enable safer medication therapies for Singaporeans.

The national electronic health record launched recently has meant that pharmacists can now access patients’ medical and medication records. Medication reconciliation by pharmacists is now more thorough and effective. Together with the Health Sciences Authority computerised medical information system (CMIS), the database for adverse drug reaction reporting will enable safer medication therapies for Singaporeans.

The Ministry of Health National Medication Safety Taskforce set up in 2010 articulated a national medication safety strategy focusing on standardisation of medication practices, promoting medication safety culture amongst health care providers, building awareness of medication safety in patients, and enhancing medication delivery systems.

5.8. Country case study: South Africa

Authors
Hazel Bradley, Senior Lecturer, School of Public Health, University of the Western Cape, South Africa;杜绝@Outlook.

Summary
- South Africa has 12,813 pharmacists, the majority work in community (49%) and hospital (35%) settings, but they are inequitably distributed geographically and between public and private health care sectors. The proportion of pharmacists working in the public health care sector has increased over the past few years, probably due to the introduction of community service for pharmacists, increased salaries, opportunities for career advancement, and improved conditions of service.
- The country has grown its pharmacy support workforce in the public and private sectors to 9,071 pharmacist assistants aided by government funding for employers to support training. For two new cadres, pharmacy technicians and pharmacy technical assistants, with increased scopes of practice is planned to commence in 2015.
- Eight Schools of Pharmacy produce on average 446 graduates annually, with the curriculum and teaching and learning methodologies developing to meet health services requirements. The current challenge to double the number of graduates to meet the projected health service requirements is overwhelming, given the constraints of academia, but is an area of active engagement of the South African Pharmacy Council (SAPC) and Schools of Pharmacy.
- New roles proposed for pharmacists promise to utilise pharmacists’ professional skills to the benefit of the health services, although precisely how they will be integrated into South Africa’s reforming health system is yet to be determined.
- The Pharmacy Human Resources in South Africa 2011, published by the SAPC, provides comprehensive information on the current pharmacy workforce in the country, together with strategies for future development of the profession. It will assist the Minister of Health in developing integrated plans for the country’s health system. Unless otherwise referenced, the data in this case study is derived from this publication.

5.8.1. Background
South African pharmacy workforce
South Africa’s pharmacy workforce is made up of pharmacists and two levels of pharmacy support personnel, basic pharmacist assistants and post-basic pharmacist assistants, registered with the South African Pharmacy Council (SAPC). In 2014, South Africa had just over 12,813 pharmacists and 9,071 pharmacist assistants, which includes those in training, with considerable differences in distribution across the nine provinces, particularly between urban and rural areas.

The greatest numbers of pharmacists work in community (49%) and hospital (35%) settings, with smaller numbers in industry (6%), wholesale (3%), professional administration (3%) and academia (1%). The majority of pharmacists in South Africa are younger than 55 years, and in two provinces more than 60% are below 35 years. Over the past four decades, in line with international trends, the pharmacy workforce in South Africa has feminised from an 83:17 ratio of male to female in 1970s to 40:60 ratio in 2010.

The educational requirements to register as a pharmacist are a four-year Bachelor of Pharmacy degree followed by a one-year internship. South Africa has eight schools of pharmacy at universities around the country producing on average 476 graduates per year. On completing their internships, all pharmacists are required to work in a public sector (government) pharmacy for one year prior to working in the sector of their choice. Pharmacist assistants complete a course of training with an accredited provider and undergo in-service training under the supervision of an approved pharmacist tutor.
5.7.5. Conclusion

Past leaders in pharmacy practice and education envisaged that pharmacy would be a health profession that ensures the integrity of drug therapy. Embracing this legacy, the profession needs to continue to set its sights on the quality use of medicines. This vision is built on the fact that the less-than-optimal use of medicines is a major public health problem and that pharmacy is the right profession to address this concern. The profession’s movement in the 1990s toward patient-centred practice continues to develop with emerging practice trends and patient care needs.

We are also cognizant of our diverse backgrounds in community, hospital, marketing, sales and distribution, manufacturing, regulatory, and academia. A unified philosophy that clearly identifies the patient as the primary beneficiary of the profession and its services is an important lever to move the profession as a body to meet the rising demands on the health care system and changes in the delivery of health care. In our strategies, we seek to focus on the commonality that binds us all through professional practice, ethics, and values and continue to work together for the common good of the public and the profession.

References


5.8. Country case study: South Africa

Authors

Hazel Bradley, Senior Lecturer, School of Public Health, University of the Western Cape, South Africa, hbradley@uwc.ac.za, Lorraine Osman, Head, Public Affairs, Pharmaceutical Society of South Africa, lorraine@pharma.co.za

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The educational requirements to register as a pharmacist are four-year Bachelor of Pharmacy degree followed by a one-year internship. South Africa has eight schools of pharmacy at universities around the country producing on average 4% graduates per year. On completing their internships, all pharmacists are required to work in a public sector (government) pharmacy for one year prior to working in the sector of their choice. Pharmacist assistants complete a course of training with an accredited provider and undergo in-service training under the supervision of an approved pharmacist tutor.
on improving health outcomes [6]. Two interrelated initiatives currently underway are the PHC re-engineering strategy, with a population-oriented service model of PHC, and the National Health Insurance (NHI), which will introduce universal health insurance coverage over a 24-year period [6,7]. These reforms promise to have farreaching effects on the public and private health sectors, but as yet the implications are unknown.

South Africa’s high disease burden, particularly HIV and TB, high inequality, and a reforming health system provide challenges and opportunities for the pharmacy workforce.

5.8.2 Key Issues

Pharmacy workforce planning

The pharmacy workforce is a critical part of any health system, and planning the South African pharmacy workforce is important if high quality pharmaceutical services are to be delivered to the whole population. This includes the production of pharmacists and pharmacy support workers, and the optimal use of existing pharmacy personnel. One of the first steps in planning for the future is having a clear picture of the current production and practice of the pharmacy workforce, but until recently, the data available was limited. The SAPC recognised the need for accurate data and analysis of human resource needs.

In February 2012, the Council published its report, Pharmacy Human Resources in South Africa 2011 [8]. The document will assist the Minister of Health in refining and implementing pharmacy workforce requirements in the HRH Strategy for the Health Sector 2012/13 to 2016/17 published towards the end of 2011 [9].

Pharmacy workforce shortages

All areas of pharmacy practice in the country report shortages community, hospital, industry, and academia, with vacancy rates for pharmacists of up to 76% reported in the public sector, especially in rural and underserved areas. In 2011, the Western Cape Provincial Health Department was unable to place 463 pharmacists in public sector facilities (http://www.sapc.za.org/G_Publications.asp).

Inequitable distribution of the pharmacy workforce

A feature, by no means unique to South Africa, is the inequitable distribution of the pharmacy workforce both geographically and by sector. The contrast between the nine provinces is marked, with the two most urbanised provinces, Gauteng (GP) and Western Cape (WC), having the highest numbers of pharmacists and pharmacies (Figure 5.8.1).

Slow production of pharmacy graduates

South Africa produces on average 476 pharmacy graduates per year. About 86% of these are foreign students, mostly from southern African countries, who will not be permitted to practice in South Africa. Recent estimates indicate that the number of graduates needs to double to meet projected demands. This means that the existing Schools of Pharmacy need to increase their output or new schools need to open. Both options require additional academic staff, physical infrastructure, and increased throughput. This is challenging in the current environment in which attracting and retaining academic staff is difficult due to low salary levels (junior lecturer salaries are sometimes lower than starting salaries in the private and public health sectors) and schools having to compete for resources in higher education.

Few pharmacy support workers

South Africa has fewer registered pharmacy support workers than pharmacists, 9,075 to 32,813, implying that many tasks performed by pharmacists could be done by assistants. However, a recent report indicated that, in some settings, pharmacy support personnel were underutilised, which seems to indicate poor role allocation and skill mix in the provision of pharmaceutical services.

5.8.3 Strategies

Pharmacy Human Resources in South Africa 2011 Report

The Pharmacy Human Resources in South Africa 2011 published by the SAPC is the culmination of extensive work by a joint task team comprising stakeholders from pharmacy practice and education [8]. The publication provides comprehensive information on the current pharmacy workforce situation in the country, including production and practice. The document aims to assist the Ministry of Health in developing an integrated plan for the country’s health system by providing accurate statistics and an informed analysis of the production and utilisation of pharmacy human resources. Further, it provides a comparison with international trends and highlights challenges and future strategies for the pharmacy profession in South Africa. The report was launched on 24 February 2012. The information is accessible online from the SAPC website (http://www.sapc.za.org/G_Publications.asp).

Recruiting and retaining pharmacists in the public health sector

Over the past few years the government has introduced a range of initiatives to recruit and retain health professionals, including pharmacists, into the public health sector, and in particular to rural and underserved areas. One initiative to increase the number of pharmacists in the public sector commenced in 2001 when mandatory one-year community service in the public sector was introduced for all pharmacists forthcoming registration with the SAPC. This service is carried out immediately after the internship year and is organised through the national department of health in collaboration with the provincial health departments, which are responsible for placing pharmacists in public sector facilities. Over the past 10 years, this has brought an average of 4,799 additional pharmacists into the public sector each year, not all of whom remain in the public sector after completion of the mandatory year. A study is currently underway to determine the number of pharmacists who remain in the public sector as well as the reasons why others leave.

Despite the relative inexperience of young pharmacists, there are many reports of the positive contribution they make, particularly in rural settings. In urban settings, it appears that community service pharmacists are used primarily to supplement poorly staffed pharmacies.

Other schemes to attract and retain pharmacists in the public sector have focused on improving conditions of service, such as the introduction of rural and scarce skills allowances (pharmacy was named as a scarce skill by the Ministry of Labour in 2007). The most recent initiative implemented in 2009-10 was the Occupation-specific Dispensation (OSSD), which consolidated the previous two allowances and included a grading component. The data from the past few years show a gradual increase in the proportion of pharmacists working in the public sector from 12% in 2004 to 26% in 2010 (Figure 5.8.2).

Recruiting and retaining pharmacists in the public health sector

A recent initiative commenced by the National Department of Health, applicable to the health workforce in both the private and public sectors, is the Excellence in Health Care Awards, which recognise outstanding achievements in the health care sector. In collaboration with the SAPC, the National Pharmacist and Pharmacist’s Assistant of the Year Awards are presented annually at a ceremony hosted by the Minister of Health. These awards serve as an affirmation of excellence in pharmacy practice and appreciation of service from the government.

Scaling up pharmacy support workers

Pharmacist assistants

A few years ago, the development of pharmacy support workers was identified as a gap in the South African pharmacy workforce, and a number of strategies have been put in place to grow this part of the pharmacy workforce. In 2010, the SAPC successfully re-launched the pharmacist assistant programme with two levels: pharmacist assistant (basic) and pharmacist assistant (post-basic). The pharmacist assistant qualification is categorised into manufacturing, wholesale, community, and institutional (hospital) pharmacy (n). Most local and provincial health departments, as well as private hospitals and community pharmacies, accessed government skills funding to support these training opportunities. Subsequent to this, some health providers have accessed further funding to train pharmacist assistants, for example in 2011 the Western Cape Provincial Department of Health received funding from the Expanded Public Works Programme to train 120 unemployed young people aged 18-35 years as pharmacist assistants.

Overall, these initiatives have resulted in a steady increase in the numbers of pharmacist assistants in the country (Figure 5.8.3).
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Pharmacy workforce shortages

All areas of pharmacy practice in the country report shortages, community, hospital, industry, and academia, with vacancy rates for pharmacists of up to 76% reported in the public sector in one province. However, the situation has changed with a gradual increase in the proportion of pharmacists working in the public sector from 12% in 2004 to 29% in 2010 (Figure 5.8.2) [10]. Many attribute this shift to improved salaries, formal establishment of posts and opportunities for career advancement, and conditions of service in the public sector, although significant policy and legislative changes in regulations relating to the ownership and licensing of pharmacies, which previously was restricted to pharmacists. Production of the dispensing fee in 2006, have affected other sectors of the pharmacy profession during this period.

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Other schemes to attract and retain pharmacists in the public sector have focused on improving conditions of service, such as the introduction of rural and scarce skills allowances (pharmacy was named as a scarce skill by the Ministry of Labour in 2007). The most recent initiative implemented in 2009-10 was the Occupation specific Dispensation (DSD), which consolidated the previous two allowances and included a regrading component. The data from the past few years show a gradual increase in the proportion of pharmacists working in the public sector from 12% in 2004 to 29% in 2010 (Figure 5.8.2).

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A few years ago, the development of pharmacy support workers was identified as a gap in the South African pharmacy workforce, and a number of strategies have been put in place to grow this part of the pharmacy workforce. The SAPC successfully re-launched the pharmacist assistant programme with two levels: pharmacist assistant (basic) and pharmacist assistant (post basic). The pharmacist assistant qualification is categorised into manufacturing, wholesale, community, and institutional/hospital pharmacy (Wal). Most local and provincial health departments, as well as private hospitals and community pharmacies, accessed government skills funding to support these training opportunities. Subsequent to this, some health providers have accessed further funding to train pharmacist assistants, for example in 2011 the Western Cape Provincial Department of Health received funding from the Expanded Public Works Programme to train 120 unemployed young people aged 28-35 years as pharmacist assistants. Overall, these initiatives have resulted in a steady increase in the numbers of pharmacist assistants in the country (Figure 5.8.3).
New pharmacy technician and pharmacy technical assistant cadres

The pharmaceutical needs of the country increase considerably in the past decade, particularly with the rollout of ARVs, and the need for a more highly qualified pharmacy support cadre that is able to work at primary health care clinics under the indirect supervision of a pharmacist. In response to this, the SAPC decided to phase out the current pharmacy support personnel (pharmacy assistants and supervising pharmacy assistants) and introduce two new mid-level workers, pharmacy technicians and pharmacy technical assistants. These new cadres will be trained full time in higher education and training institutions for one and two years, respectively, and then perform a six-month internship [13]. Precise details of which institutions will provide the training is being negotiated with the Department of Education and Training, the SAPC, and individual universities.

Workforce development

The changing health needs of the country and a health system in flux provide challenges and opportunities for the pharmacy workforce. It is essential to ensure not only production of sufficient numbers but also that the pharmacy workforce have appropriate competencies to contribute optimally as members of the health care team.

Undergraduate education and training

A new pharmacy qualification was recently approved by the South African Qualification Authority to take into account changes in health delivery and pharmacists’ roles. The new curriculum will be introduced in schools of pharmacy in 2013 and will train generalist pharmacists to work in diverse settings. Innovative ways of training pharmacy undergraduates are responding to requirements for pharmacists that are confident in working inter-professionally and at all levels of the health service, from primary and community-based care to highly specialised tertiary hospitals, as well as in industry and academia. New strategies introduced include problem-based and experiential learning methods and opportunities to work in underprivileged communities and at community clinics, as well as hospital settings [12]. Electronic teaching and learning strategies are also in development [13]. The success of these initiatives in producing pharmacy graduates with appropriate attributes and skills for the needs of the country’s health system will need to be evaluated.

New roles for pharmacists

Implementing the district health system in South Africa has resulted in an increased emphasis on primary level services, including the establishment of new posts for district and facility-based pharmacists and pharmacy support workers. Further work on skill mix and staffing norms for primary level services is required to ensure optimal use of the pharmacy workforce to deliver primary level pharmaceutical services.

Community pharmacies in South Africa, in line with those in developed countries, have expanded services from dispensing and DTC prescribing to a range of preventive services, such as blood pressure monitoring, immunisations and family planning counseling. The recent introduction of a fees structure for pharmacists providing these services paves the way for pharmacists to be remunerated for these new roles [14].

Other strategies currently underway to develop the pharmacy workforce and address gaps in health care provision include the proposed introduction of authorised pharmacist prescribers and specialties in industrial pharmacy, clinical pharmacy, and pharmaceutical services in public health [15, 16]. How all these new roles will integrate into the PHC pharmacy profession to contribute to the creation of a reformed health system in South Africa [6, 7].

5.8.4. Outcomes

Pharmacy Human Resources in South Africa 2012 published by the SAPC provides a situational assessment of the current South African pharmacy workforce and outlines challenges and future strategies for pharmacy workforce development in the country.

- The number of pharmacists working in the public sector has improved significantly over past few years improving equity and appears to be due to improvements in remuneration, progress in creating career paths, and improved working conditions.
- A fee structure was recently approved for pharmacists working in community pharmacies to provide a range of preventive health services, paving the way for pharmacists to contribute to primary health care.
- The number of pharmacist assistants has increased steadily at an average of 2000 per annum from 2000 to 2010/11. It is due to the recent introduction of a fee structure for pharmacists working in community pharmacies.
- The number of pharmacists working in the public sector has increased from 11,063 in 2000 to 15,888 in 2010/11. The number of pharmacist assistants has increased from 3,000 in 2000 to 15,550 in 2010/11.

Acknowledgements

Use of data from Pharmacy Human Resources in South Africa 2011, 1A Pharmacy Council, 2012. Input from Round Table Discussion, 16 March 2012, School of Public Health, University of the Western Cape attended by Prof Nadine Butler, Mr Gary Black, Mr Douglas Deby, Ms Denise Fresliaar, Dr Tana Wuliji, and Ms Hazel Bradley.

References

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The need for a more highly qualified pharmacy support cadre that is able to work at primary health care clinics under the indirect supervision of a pharmacist. In response to this, the SAPC decided to phase out the current pharmacy support personnel (pharmacy assistants) and introduce two new mid-level workers, pharmacy technicians and pharmacy technical assistants. New cadres will be trained full time in higher education and training institutions for one and two years, respectively, and then perform a six-month internship. Precise details of which institutions will provide the training is being negotiated with the Department of Education and Training, the SAPC, and individual universities.

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The changing health needs of the country and a health system in flux provide challenges and opportunities for the pharmacy workforce. It is essential to ensure not only production of sufficient numbers but also that the pharmacy workforce have appropriate competences to contribute optimally as members of the health care team.

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New roles for pharmacists

Implementing the district health system in South Africa has resulted in an increased emphasis on primary level services, including the establishment of new posts for district and facility-based pharmacists and pharmacy support workers. Further work on skill mix and staffing norms for primary level services is required to ensure optimal use of the pharmacy workforce to deliver primary level pharmaceutical services. Community pharmacies in South Africa, in line with those in developed countries, have expanded services from dispensing and OTC prescribing to a range of preventive services, such as blood pressure monitoring, immunisations and family planning counseling. The recent introduction of a fees structure for pharmacists providing these services paves the way for pharmacists to be remunerated for these new roles.

Other strategies currently underway to develop the pharmacy workforce and address gaps in health care provision include the proposed introduction of authorised pharmaceutical prescribers and specialties in industrial pharmacy, clinical pharmacy, and pharmaceutical services in public health. All these new roles will integrate into the PHC restructuring strategy and NHI reforms underway is unknown at the moment but they provide opportunities for the pharmacy profession to contribute to the creation of a reformed health system in South Africa.

5.8. Outcomes

- Pharmacy Human Resources in South Africa 2012 published by the SAPC provides a situational assessment of the current South African pharmacy workforce and outlines challenges and future strategies for pharmacy workforce development in the country.
- The number of pharmacists working in the public sector has improved significantly over past few years, improving equity and appears to be due to improvements in remuneration, progress in creating career paths, and improved working conditions.
- A fee structure was recently approved for pharmacists working in community pharmacies to provide a range of preventive health services, paving the way for pharmacists to contribute to primary health care.
- The number of pharmacist assistants has increased steadily to just over 9,000 since a new pharmacist assistant programme was launched in 2000. Training for two new mid-level pharmacy support workers, pharmacy technicians and pharmacy technical assistants, with greater scopes of practice, is expected to commence in 2013 to meet pharmacy workforce needs, particularly for the ARV rollout and a reengineered PHC system.
- Increasing production of pharmacy graduates remains a challenge in the current higher education environment and there is an area that the SAPC and pharmacists in academia are giving urgent attention.

Acknowledgements

References

There is a pressing need for appropriate pharmaceutical workforce. Thus requiring special attention. Critical importance in meeting national and global health goals, Access to quality medicines and competent health care providers that public and private sector dispensaries (ie, lowest level of care). Skills mix imbalance, especially in the area of patient care; and Inadequate growth in pharmaceutical human resources; 2-Mild shortage of all categories of pharmaceutical workforce; 3-Pharmaceutical workforce challenges in Tanzania include: Education in Tanzania. It provides a country situational analysis and current information regarding pharmaceutical training institutions, their numbers, capacities and contribution in making up the profession.

5.9.2. Key Issues

Human resources shortages

The pharmaceutical human resources report of 2009 identified a total of 640 pharmacists (1 per 50,000 population), 479 pharmacy technicians (1 per 80,000), and 376 pharmacy assistants (1 per 100,000). The study also revealed a total of 524 pharmaceutical outlets served by 1,495 pharmaceutical personnel. If pharmaceutical human resources was evenly distributed across all pharmaceutical outlets, only about 29% of outlets would be staffed. This means that pharmaceutical services are provided by unqualified (non-pharmaceutical) personnel in over 70% of the pharmaceutical outlets. This is, therefore, not surprising that 28 of facilities surveyed expressed shortages of over 500 pharmaceutical personnel.

Inadequate growth in pharmaceutical human resources

The 2009 assessment showed limited growth in the numbers of pharmacists and pharmacy technicians between 2007 and 2009, with a low level of new pharmaceutical personnel entering the workforce each year (Table 5.9.2).

Distribution imbalance

The distribution of pharmaceutical personnel is inadequate and has led to a severe shortage in rural areas and inequitable service provision. Pharmaceutical cadres were found to be concentrated in urban areas, with the ratio of personnel per 10,000 population in a region ranging between 0.15-0.37 for pharmacists and 0.01-0.35 for pharmacy technicians. This imbalance poses a major challenge to the nationwide provision of pharmaceutical services, since the proportion of the population living in rural areas is greater than that in urban areas. To ensure that only quality products are made available to the population, functional and well-resourced pharmaceutical supply and regulatory systems are required, with adequate numbers of qualified pharmaceutical personnel. Consequently, despite increasing demand for training, only 21% and 8% of applicants to the pharmacy degree and pharmacy technician diploma programmes were admitted in 2008.

Skills mix imbalance

The assessment also identified a skills mix imbalance with more pharmacists than pharmaceutical technicians and assistants in the country. Pharmacists mainly work in urban areas and at higher levels of the health system and, with such an "upside down triangle," it means that vacancies at lower levels of the health system will remain. Other cadres that do not have pharmaceutical competencies will continue to fill these gaps unless concerted efforts are made to increase the number of technicians and assistants.

5.9.3. Strategies

The findings of the 2009 Assessment of Pharmaceutical Human Resources led to the development of the Pharmaceutical Human Resources Strategic Framework with key stakeholders, which could be integrated into broader human resources for health strategies. The Ministry of Health and Social Welfare (MMSW) has begun several initiatives to address the above challenges, which are summarized in this section.

Pharmaceutical human resources strategic framework

A draft Pharmaceutical Human Resources Strategic Framework 2011–2020 was developed by key stakeholders in April 2011 and aimed at addressing the significant shortage of pharmaceutical human resources. Policy goals were identified to address human resources planning and development (Table 5.9.2).

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Table 5.9.1. Total pharmaceutical human resources 2007 to 2009

Before 2009, there was only one pharmacy school offering a Bachelor of Pharmacy (BPharm) degree, which began in 1974, with an enrolment capacity between 25 and 30 and an output rate of 12 to 15 students per year. By 2009, there were two pharmacy schools offering a BPharm Degree, with a combined intake of about 100 students; two pharmacy technician training schools (diploma), with an intake capacity of about 90 students; and one pharmaceutical assistant training programme enrolling 20 students. All schools faced expansion challenges as they had significant inadequacies in physical infrastructure, academic human resources, and budgets.
Consequently, despite increasing demand for training, only 21% and 8% of applicants to the pharmacy degree and pharmaceutical technician diploma programmes were admitted in 2008 [7].

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This imbalance poses a major challenge to the nationwide provision of pharmaceutical services, since the proportion of the population living in rural areas is greater than that in urban areas. To ensure that only quality products are made available to the population, functional and well-resourced pharmaceutical supply and regulatory systems are required, with adequate numbers of qualified pharmaceutical personnel.

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5.9.2 Key issues

Human resources shortages

The pharmaceutical human resources report of 2009 [7] identified a total of 640 pharmacists (per 100,000 population), 479 pharmacy technicians (per 100,000), and 376 pharmacy assistants (per 10,000). The study also revealed a total of 5241 pharmaceutical outlets served by 1495 pharmaceutical personnel in over 70% of the pharmaceutical outlets. It is, therefore, not surprising that 187 facilities surveyed expressed shortages of over 500 pharmaceutical personnel.

Inadequate growth in pharmaceutical human resources

The 2009 assessment showed limited growth in the numbers of pharmacists and pharmacy technicians between 2007 and 2009, with a low level of new pharmaceutical personnel entering the workforce each year (Table 5.9.1).

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5.9. Country Case Study: Tanzania

Authors

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Summary

Pharmacy education is an important area that contributes to the growth of the pharmaceutical human resources and hence the overall pharmaceutical sector in a country. This case study summarizes recent developments related to pharmacy education in Tanzania. It provides a country situational analysis and current information regarding pharmaceutical training institutions, their numbers, capacities and contribution in making up the profession.

1. Pharmaceutical workforce challenges in Tanzania include:
   - Critical shortage of all categories of pharmaceutical workforce;
   - Inadequate growth in pharmaceutical human resources;
   - Skills mix imbalance, especially in the area of patient care; and
   - Distribution imbalances.

2. The case study also discusses various strategies aimed at increasing the number of pharmaceutical personnel in the country.

3. Background

The human resources for health crisis affects 57 countries worldwide, including Tanzania [2-5]. In Tanzania, it is estimated that public and private sector dispensaries (i.e., lowest level of well-equipped health workforce) [6].

Access to quality medicines and competent health care providers are fundamental aspects of the health care system. Pharmaceutical human resources are responsible for the management, supply, and use of medicines and are vital components of the architecture to address workforce challenges. This case study provides the Tanzanian experience using workforce development approaches that cuts across all levels of the pharmaceutical workforce, from dispensers to pharmacists and specialized pharmaceutical workforce. It is based on the pharmaceutical human resources report of 2009 [7], which was conducted in Tanzania, and applied a WHO-designed methodology.

The main objective of the assessment was to determine the total workforce providing pharmaceutical services in the public, non-governmental organisation (NGO), and private sectors.

Table 5.9.2. Key issues

<table>
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<tr>
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<th>Policy goals</th>
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Mobilizing resources to develop human resources for health

At a higher level, the country was successful in its application for support to the Global Fund to Fight AIDS, Tuberculosis and Malaria Round 6 for Health Systems Strengthening ($4.5 million USD over five years). For a phase one implementation that ends in 2013, funds of $2.9 million USD have been allocated to the country. Out of this, 38% is set to increase production of health workers and 21% to enhance health workforce recruitment and retention. Some pharmacists have been recruited through these funds.

Emergency hiring and hiring retired health workers

Various strategies are in place to improve the recruitment and retention of health workers in Tanzania, including an emergency hiring initiative supported by the Benjamin William Mkapa HIV/AIDS Foundation. However, so far only five pharmacists and four technicians (out of 364 tutors and health workers) have been recruited through this initiative since 2003, to work mostly in rural areas (personal communication).

Two-year renewable contracts are also being offered to retired health workers, including pharmacists, if they are willing to continue providing services in the public sectors. At the same time, local governments are also being encouraged to employ pharmaceutical staff where there are shortages in their Councils.

Scaling up education and training

Scaling up and quality improvement of pharmacy education and training are essential for addressing workforce shortages and in meeting basic health needs in the country. The number of training institutions providing pre-service education for pharmacists and pharmaceutical technicians has doubled over the last five years. The number of schools of pharmacy offering diploma programmes started much earlier (MUHAS) and the University of California San Francisco. The project, which was funded by the Bill and Melinda Gates Foundation, had several objectives. All MUHAS curricula, including the BPharm curriculum, were reviewed, and implementation of the new curricula began in October 2011.

The review process involved identification of competencies considered necessary for pharmacy graduates and analysis of the previous curriculum in order to identify any gaps and redundancies and make appropriate improvements. The process involved not only faculty and students, but also external stakeholders, such as professional regulatory authorities and associations, former pharmacy graduates, their employers, and their co-workers. Views from these stakeholders were obtained through surveys (tracer study) or their participation in curriculum review retreats, and eventually taken into account in the curriculum's revision. The BPharm curriculum was revised, made competency-based, and modularized, so it is easy for one to transfer credits when moving from one institution to another. In addition, the content was also revised, focusing more on patient care, more time was allocated to clinical exposure. The revised curriculum was subjected to approval at the university level and by TCU. It is anticipated that other pharmacy schools in the country will also revise their curricula towards a competency-based model and with greater focus on patient care.

Academic institutions are important centres for conducting needs assessments of pharmaceutical personnel in the country and in designing and making it easy for one to transfer credits when moving from one institution to another. In addition, the content was also revised, focusing more on patient care, more time was allocated to clinical exposure. The revised curriculum was subjected to approval at the university level and by TCU. It is anticipated that other pharmacy schools in the country will also revise their curricula towards a competency-based model and with greater focus on patient care.

Needs-based education and training

Currently, there is a growing demand for clinically-oriented pharmacists who can work in a multidisciplinary health care team. At Muhimbili University of Health and Allied Services (MUHAS), this demand has been addressed through review of the BPharm curriculum, focusing more on patient care. Currently, there are 34,452 ADDO dispensers in the country, and 3,873 ADDO outlets distributed throughout the country and mainly in rural areas (personal communication).

References

5.9.4. Recommendations for pharmaceutical human resources development

The study on the pharmaceutical human resources was an eye opener to policy makers, donors, and other stakeholders, and it has galvanized some actions. However, more effort is needed if stakeholders want to see positive outcomes. Listed below are some of the recommendations made by stakeholders during the development of the strategic plan for pharmaceutical human resources in 2010, which are still relevant:

- Improved pharmacy workforce planning, training, and education are needed in order to prepare an adequate and competent pharmaceutical workforce in the country. Although the number of pharmacy schools in the country has increased, efforts are still needed to attract investors in the establishment of new pharmacy schools.

- Training institutions should find the means to address the challenges of inadequate infrastructure, tutors, and funds to enable them to increase the number of enrolles and output.

- The implementation of these recommendations will definitely bring change in the right direction in pharmaceutical workforce development.

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- The implementation of these recommendations will definitely bring change in the right direction in pharmaceutical workforce development.

Table 5.3. Pharmacy schools, location, year of establishment, and qualification offered

<table>
<thead>
<tr>
<th>Pharmacy school</th>
<th>Type of Institution</th>
<th>Town/City</th>
<th>Year it started</th>
<th>Academic qualification offered (no. of students)</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Dar es Salaam (RUCO)</td>
<td>Public</td>
<td>Dar es salaam</td>
<td>1950</td>
<td>Diploma, and Certificate (20)</td>
</tr>
<tr>
<td>University of Muhimbili</td>
<td>Faith-based Organization</td>
<td>Mwanza</td>
<td>1980</td>
<td>Diploma and Diplomate (50)</td>
</tr>
<tr>
<td>Alliance Theological College of Health Sciences</td>
<td>Faith-based Organization</td>
<td>Morogoro</td>
<td>2011</td>
<td>Diploma and Diplomate (50)</td>
</tr>
<tr>
<td>artial School of Pharmaceutical Sciences</td>
<td>Faith-based Organization</td>
<td>Moshi</td>
<td>2012</td>
<td>Diploma and Diplomate (50)</td>
</tr>
<tr>
<td>Catholic University of Health Sciences</td>
<td>Faith-based Organization</td>
<td>Iringa</td>
<td>2015</td>
<td>Diploma and Diplomate (50)</td>
</tr>
<tr>
<td>Kampala International University</td>
<td>Private</td>
<td>Kampala</td>
<td>2013</td>
<td>Diploma, and Certificate (50)</td>
</tr>
<tr>
<td>Royal Pharmaceutical College</td>
<td>Private</td>
<td>Mwanza</td>
<td>2015</td>
<td>Diploma, and Certificate (50)</td>
</tr>
</tbody>
</table>

*The enrolment capacity is 100 students per cadre but did not get enough students last year due to higher entrance requirements.
Emergency hiring and hiring retired health workers

Various strategies are in place to improve the recruitment and retention of health workers in Tanzania, including an emergency hiring initiative supported by the Benjamin William Mkapa HIV/AIDS Foundation. However, so far only five pharmacists and four technicians (out of 584 tutors and health workers) have been recruited through this initiative since 2010, to work mostly in rural areas (personal communication).

Two-year renewable contracts are also being offered to retired health workers, including pharmacists, if they are willing to continue providing services in the public sectors. At the same time, local governments are also being encouraged to employ pharmaceutical staff where there are shortages in their Councils.

Scaling up education and training

Scaling up and quality improvement of pharmacy education and training are essential for addressing workforce shortages and for meeting basic health needs in the country. The number of training institutions providing pre-service education for pharmacists and pharmaceutical technicians has doubled over the last five years. The number of schools of pharmacy offering a B Pharm degree programme has increased from two to four since 2010, one of which also offers post-graduate programmes. However, these are still inadequate to cater for the needs of the country, and the private sector is being encouraged to open more schools, operating schools are encouraged to address the challenges hindering the increase in enrolees.

The number of schools offering diploma programmes for pharmaceutical technicians has also increased, from two to five (Table 5.9.3). To ensure more pharmacy assistants and pharmaceutical technicians are produced, the Pharmacy Council is currently in the process of introducing a cascading curriculum to provide a path for career growth, particularly for pharmacy assistants. This will be a modular curriculum, in which students planning to work mostly in rural areas (personal communication).

<table>
<thead>
<tr>
<th>Pharmacy school</th>
<th>Type of Institution</th>
<th>Town/City</th>
<th>Year it started</th>
<th>Academic qualification (years of study per course)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dar es Salaam University College of Health Sciences</td>
<td>Public</td>
<td>Dar es Salaam</td>
<td>2007</td>
<td>Diploma (1) and Certificate (20)</td>
</tr>
<tr>
<td>2. Ilala College of Health Sciences</td>
<td>Faith-Based Organisation</td>
<td>Dar es Salaam</td>
<td>2008</td>
<td>Diploma in pharmacy</td>
</tr>
<tr>
<td>3. Bagamoyo College of Health Sciences</td>
<td>Faith-Based Organisation</td>
<td>Bagamoyo</td>
<td>2011</td>
<td>Diploma in pharmaceutical science</td>
</tr>
<tr>
<td>4. Salvation Army School of Pharmaceutical Sciences</td>
<td>Faith-Based Organisation</td>
<td>Morogoro</td>
<td>2012</td>
<td>Diploma in pharmaceutical science</td>
</tr>
<tr>
<td>5. Temeke College of Health Sciences</td>
<td>Faith-Based Organisation</td>
<td>Temeke</td>
<td>2013</td>
<td>Diploma in pharmacy</td>
</tr>
<tr>
<td>6. Kihange International University</td>
<td>Private</td>
<td>Dar es Salaam</td>
<td>2013</td>
<td>Diploma in pharmaceutical science</td>
</tr>
<tr>
<td>7. Royal Pharmaceutical College</td>
<td>Private</td>
<td>Dar es Salaam</td>
<td>2013</td>
<td>Certificate (1)</td>
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*The diploma programmes started much earlier

*The enrolment capacity is 120 students per cadre but did not get enough students last year due to higher entrance requirements

5.4. Recommendations for pharmaceutical human resources development

The study on the pharmaceutical human resources was an eye opener to policy makers, donors, and other stakeholders, and it has galvanized some action. However, more effort is needed if stakeholders want to see positive outcomes. Listed below are some of the recommendations made by stakeholders during the development of the strategic plan for pharmaceutical human resources in 2010, which are still relevant:

- Improved pharmacy workforce planning, training, and education are needed in order to prepare an adequate and competent pharmaceutical workforce in the country. Although the number of pharmacy schools in the country has increased, efforts are still needed to attract investors in the establishment of new pharmacy schools.
- In collaboration with the PC and other stakeholders, pharmacy schools should be at the forefront in designing and instituting well-structured continuing education programmes so as to provide the support needed for pharmacists and pharmacy personnel to cope with medicines development.
- Training institutions should find the means to address the challenges of inadequate infrastructure, tutors, and funds to enable them to increase the number of enrollees and output. The implementation of these recommendations will definitely bring change in the right direction in pharmaceutical workforce development.

References


Mobilizing resources to develop human resources for health

At a higher level, the country was successful in its application for support to the Global Fund to Fight AIDS, Tuberculosis and Malaria Round 4 for Health Systems Strengthening ($54.9 million USD over five years). For a phase one implementation that ends in 2013, funds of $82.9 million USD have been allocated to the country. Out of this, 38% is set to increase production of health workers and 21% to enhance health workforce recruitment and retention. Some pharmacists have been recruited through these funds.
PART 6

STRENGTHENING THE PHARMACY WORKFORCE THROUGH TRANSFORMING AND SCAILING UP EDUCATION

Authors
Erica Wheeler, Technical Officer, Human Resources for Health, World Health Organization (WHO), wheelerer@who.int; Helen Tafa, Technical Officer, Medicines Programme Coordination, wheelerer@who.int; Latah (who@int); Gilles Forte, Coordinator, Medicines Programme Coordination, WHO Department of Essential Medicines and Health Products, latah@who.int; Helen Tata, Technical Officer, Human Resources for Health, Helen Tata, Technical Officer, Human Resources for Health, Helen Tata, Technical Officer, Human Resources for Health, Helen Tata, Technical Officer, Human Resources for Health, Helen Tata, Technical Officer, Human Resources for Health

Summary
- Case studies in countries facing severe health care workforce shortages - Ghana, Ethiopia, Malawi, Nigeria, Sudan and Tanzania - identified clear areas and needs for increased workforce production and potential solutions to increase capacity.
- When relevant stakeholders are informed and brought together to address workforce issues there are greater possibilities for coordinated workforce planning and implementation.
- Adequate investment in education is required, as education provides the foundation for building a competent health care workforce.
- The WHO guidelines on transforming and scaling up health professional education and training include 17 recommendations for strengthening the health care workforce focusing on the areas of governance and implementation; education and training; health workers; and monitoring and evaluation.
- The WHO guidelines are highly relevant to the transformation and scaling up pharmacy education.

6.1. Background

Strengthening the health care workforce

In response to the grave shortage of health workers, especially in 57 countries, the World Health Organization (WHO) has adopted several recent resolutions for health systems strengthening (1). These resolutions have been translated into action in the area of health professional education through the development of policy and technical guidelines designed to improve and transform the quantity, quality and relevance of health worker education and training. The production of the right types of health workers is fundamental to face the health challenges of the 21st century.

Pharmaceutical workforce capacity development

The attainment of national medicines policy objectives requires adequate finances and available, trained pharmaceutical personnel with the necessary skill mix. However, in many sub-Saharan African countries there is a severe shortage of pharmaceutical human resources. This shortage continues in spite of growing workforce demands resulting from substantial donor investments in medicines for the five priority disease areas, HIV/AIDS, tuberculosis and malaria (2). The shortage can be attributed to the neglect of pharmaceutical workforce capacity development by policymakers, donors, and international organizations (3).

Recognizing the importance of pharmaceutical human resources development, and in line with the World Health Organization (WHO) Medicines Strategy, 2006-2011 to enhance human resources capacity to access to essential medicines of adequate quality (4), WHO’s Essential Medicines Department supported a pilot programme in four countries in 2009. The programme sought to quantify the workforce providing pharmaceutical services in both the public and private sectors in Ghana, Nigeria, Sudan, and the United Republic of Tanzania. Financial support was received from the European Union. Also, a set of tools was piloted to assess the availability, development, distribution, attrition and shortages of pharmaceutical human resources (5).

The results of the four country studies revealed that:

- Pharmaceutical human resources development was identified as a challenge and not based on the specific needs of the countries’ pharmaceutical human resources development.
- The pharmaceutical course enrolment levels were low in all four countries. For example, only one out of 20 applicants were enrolled in Nigeria. The enrolment levels are 20% for BPharm and 31% for PhD in Tanzania, while in Ghana the enrolment for BPharm is 13% (130 enrollees per 1000 applicants).
- Pharmaceutical workforce development in all four countries is also hindered by issues with their pharmacy training facilities inadequacy infrastructure, lack of funding, insufficient teaching staff, weak accreditation system, and standard quality of the education are amongst the main issues.

Based on the study results, each country developed a pharmaceutical human resources strategic framework to address these issues. All the stakeholders involved, such that there are opportunities in each educational system that should be used to help overcome barriers and achieve policy goals for human resources development. For example, improving training facilities can be achieved by making optimal use of private sector contributions and funding from other sectors, including the public, governmental and nongovernmental organizations. In Nigeria, funding opportunities for research and infrastructure were identified from the federal government, and the National Universities Commission and the Raw Materials Development Council (6). Funded, collaborative partnerships between local universities and external partners that are solving problems and working together to address gaps are needed to scale up the annual output of pharmaceutical assistants and staff, to improve the quality of pharmacy education, to address the pharmacy curriculum. Educational collaborators, and the Ministry of Health and Social Welfare, to advertise to students and the public the availability of university laboratories that are underused and that can offer evening programmes, the availability of facilities outside training institutions (halls, centres, etc.) and collaboration with nongovernmental organizations and the Ministry of Health and Social Welfare, to advertise to prospective students (6).

The results of the assessment of the pharmaceutical workforce in universities in the four countries were the basis on which to transform and scale up pharmacy education in order to strengthen the workforce.

6.2. Increasing capacity for workforce production

It is important to keep in mind that the purpose of addressing workforce production is to improve population health. This requires fundamental reform, namely modification and use of teaching methods that have proven most effective in adult education to be applied within education and training institutions, modification of curricula to focus on national/community needs, improving the competency of and increasing the number or faculty or using health service providers as adjunct faculty, and of course increasing the numbers of adequately-trained health professionals, while ensuring that they are equitably distributed among all geographical areas and health services, from primary to tertiary levels, to provide high quality care.

Our global challenge today is to educate and manage the largest expansion of health workers in history. This should be done on the basis of the best available evidence in capacity building to ensure models of best practice are replicated and adapted within the country and regional contexts.

Expanding the number of health professionals must be part of a national health plan. This requires political commitment and leadership at the highest levels, as well as strong governance at the institutional level that views communities and organizations as partners in improving health outcomes. The guidelines on transforming and scaling up health professional education and training tackle these complex and interconnected issues in five different areas:

1. Governance and implementation,
2. Education and training institutions,
3. Regulation and accreditation,
4. Financing,
5. Monitoring and evaluation.

There are some countries, which have made significant steps to scale up health professional education and address the quality of health worker training.

Malawi

In Malawi, an evaluation of the UK Department for International Development (DFID) funded programme has shown that the programme was successful in achieving its primary objective of increasing the number of professional health workers in Ministry of Health and the Christian Health Association of Malawi (CHAM) institutions. The evaluation report that across the 11 priority cadres, the total number of professional health workers increased by 57%, from 5,453 in 2004 to 8,369 in 2005. However, only 4 of the 11 cadre met or exceeded their targets, as set out in the original EHPR design document. The conclusion of the evaluation report further stated that “the investments made by the Government have resulted in tangible increases in access to health services and lives saved for the people of Malawi” (7).
PART 6

STRENGTHENING THE PHARMACY WORKFORCE THROUGH TRANSFORMING AND SCAVENGING UP EDUCATION

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- The WHO guidelines are highly relevant to the transformation and scaling up pharmacy education.

6.1. Background
Strengthening the health care workforce
In response to the grave shortage of health workers, especially in 57 countries, the World Health Organization (WHO) has adopted several recent resolutions for health systems strengthening (1). These resolutions have been translated into action in the area of health professional education through the development of policy and technical guidelines designed to improve the quality of health worker training. The production of the right types of health workers is fundamental to face the health challenges of the 21st century.

Pharmaceutical workforce capacity development
The attainment of national medicines policy objectives requires adequate finances and available, trained pharmaceutical personnel with the necessary skill mix. However, in many sub-Saharan African countries there is a severe shortage of pharmaceutical human resources. This shortage continues in spite of growing workforce demands resulting from substantial donor investment in medicines for the three priority disease areas, HIV/AIDS, tuberculosis and malaria (2). The shortage can be attributed to the neglect of pharmaceutical workforce capacity development by policymakers, donors, and international organizations (3).

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The results of the four country studies revealed that:
- Pharmaceutical human resources development was identified as a challenge and not based on the specific needs of the countries’ pharmaceutical services.
- The pharmaceutical course enrolment levels were low in all four countries. For example, only one out of 30 applicants were enrolled in Nigeria. The enrolment rates are 20% for BPharm and 37% for BPharm in Tanzania, while in Ghana the enrolment for BPharm is 13% (130 enrollees per 1,000 applicants).
- Pharmaceutical workforce development in all four countries is also hindered by issues with their pharmacy training facilities inadequate infrastructure, lack of funding, insufficient teaching staff, weak accreditation system, and substandard quality of the education are amongst the main issues.

Based on the study results, each country developed a pharmaceutical human resources strategic framework to address these issues. All the stake holders were involved in the development of a national strategy that identifies the opportunities in each educational system that should be used to help overcome barriers and achieve policy goals for human resources development. For example, improving training facilities can be achieved by making optimal use of private sector contributions and funding from other sectors, including from governmental and nongovernmental organizations. In Nigeria, funding opportunities for research and infrastructure were identified from the federal government, and the National Universities Commission and the Raw Materials Development Council (6). Funded, collaborative partnerships between local universities, all the stakeholders involved, such as that between the United Republic of Tanzania and United States of America, can be expanded and used as an opportunity to build teaching and infrastructure capacity to train pharmacists, pharmacy technicians, and assistants (7).

Another weakness of the pharmacy education systems in the four countries is the underdevelopment of regular curriculum review in training institutions. The use of a competency-based approach to education and curriculum development has been identified as strengthening the countries’ policies for a policy goal. The involvement of all stakeholders in recognizing the importance of needs-based education is the necessary starting point for instigating improvements in the pharmacy curriculum. Education outcomes should be clear. This can be achieved by having a detailed indicative curriculum for accreditation of pharmacy courses that provides curriculum developers and evaluators with a checklist of the items that should appear in a curriculum (8). To overcome the financial difficulties involved in adapting international models to national requirements (5), the tools already developed and used in some of the countries such as Sudan can be borrowed (9). All the countries provide academic training programmes to train teaching staff. The issue of academic staff shortages can be resolved by improving remuneration and defining a clear career structure for teacher practitioners (9).

An investment in the development of e-learning facilities and systems may bring a long-term solution to the problem of academic capacity internationally developed e-learning packages can provide access to international academic research databases. In some of the countries, like Nigeria, the National University Commission provides online access to e-books and journals (5). Moreover, donor agencies are willing to invest in this area (5). The willingness of donor agencies to fund the development of information and communication technology-compliant facilities should also be explored.

Pharmacists’ roles are evolving worldwide and pharmacy education systems should be flexible enough to respond to educational needs (7). The pharmacy profession is moving from a purely dispensing role to a medication management role (10). The education system must therefore have the flexibility necessary to respond to the evolving nature of the profession. In light of the current and future needs, existing continuing professional development and post-graduate programmes should be developed to optimize pharmacists’ competences (11). The further specialization of the pharmacy profession requires the strengthening of pharmaceutical support staff, such as pharmacy technicians and assistants (12) in Tanzania, the training of relevant mid-level health care providers and for scaling up the annual output of pharmaceutical assistants (13).

The availability of university laboratories that are underused and that could offer evening programmes, the availability of faculties outside training institutions (halls, centres, etc.), and collaboration with nongovernmental organizations and the Ministry of Health and Social Welfare, to advertise to prospective students (6).

The results of the assessment of the pharmaceutical workforce universities in the four countries were on the basis on which to transform and scale up pharmacy education in order to strengthen the workforce.

6.2. Increasing capacity for workforce production
It is important to keep in mind that the purpose of addressing workforce production is to improve population health. This requires fundamental reforms not only modification and use of teaching methods that have proven most effective in adult education to be applied within education and training institutions, but also modifications of curricula to focus on national/community needs, improving the competency of and increasing the number of faculty or using health service providers as adjunct faculty; and of course increasing the numbers of adequately-trained health professionals, while ensuring that they are equitably distributed among all geographical areas and health services, from primary to tertiary levels, to provide high quality care.

Our global challenge today is to educate and manage the largest expansion of health workers in history. This should be done on the basis of the best available evidence in capacity building to ensure models of best practice are replicated and adapted within country and regional contexts.

Expanding the number of health professionals must be part of a national health plan. This requires political commitment and leadership at the highest levels, as well as strong governance at the institutional level that views communities as partners in improving health outcomes. The guidelines on transforming and scaling up health professional education and training tackle these complex and interconnected issues in five different areas.

1. Governance and implementation,
2. Education and training institutions,
3. Regulation and accreditation,
4. Financing,
5. Monitoring and evaluation.

There are some countries, which have made significant steps to scale up health professional education and address the quality of health worker training.

Malawi
In Malawi, an evaluation of the UK Department for International Development (DFID) funded programme has shown that the programme was successful in achieving its primary objective of “increasing the number of professional health workers in Ministry of Health and the Christian Health Association of Malawi (CHAM) institutions.” The evaluation reported that across the 11 priority cadres, the total number of professional health workers increased by 53%, from 5,435 in 2004 to 8,369 in 2009. However, “only 4 of the 11 cadres met or exceeded their targets, as set out in the original EHRP design document.” The conclusion of the evaluation report further stated that “the investments made by the Government have resulted in tangible increases in access to health services and lives saved for the people of Malawi” (12).
In terms of the pharmacy workforce, the country previously relied on foreign training until establishing the first pharmacy course and graduating the first cohort of local pharmacists in 1999. There is also currently one technician training institution, which aims to train over 50 technicians a year.

**Ethiopia**

In Ethiopia, there was a decision made by the government to adopt a ‘flooding’ policy of producing a significant number of health workers, including not only health professionals but also health extension workers.

There is a big shortage of health workers at every level throughout the country, but this is particularly the case in rural areas. Information from the Human Resources for Health (HRH) observatory shows that 84% of the population resides in rural areas while the remaining 12 million (16%) live in urban areas, making Ethiopia one of the least urbanized countries in the world [14]. Rural areas, therefore, are where the toll of a host of communicable and non-communicable diseases is most acutely felt. The government, therefore, decided to focus its efforts on areas where they can save the most lives. In fulfillment of this effort, the government has trained and placed teams of specialized health officers, midwives, and anesthesia professionals aimed at reducing maternal mortality at each of the nation’s 800 primary hospitals.

The country’s HRH Plan [14] has taken into account the skill mix of health workers based on needs and determinants. *This model is considered appropriate as it takes into consideration the health service location, the staffing level, population growth and economic growth as the bases for estimating health workforce requirements* (and projecting them for the future). The projections for the health workforce requirements of Ethiopia by the year 2020 are based on the assumption of universal primary health service coverage, and hence a three-fold increase in the production of HRH by 2022. It is expected that this plan will increase the health workforce density level from 0.8 to 1.8 per 1000 population.” However, this is not to say that Ethiopia will not face a lack of adequate health workers at every level, hence a three-fold increase in the production of HRH by 2020.

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**6.3. Recommendations for scaling up workforce production**

A total of 27 recommendations are being made in the WHO guidelines on transforming and scaling up health professional education and training that can be subsumed under the 5 domains listed above. Among the 27 recommendations, all governments are recommended to adopt five. Under the areas of governance and implementation, they cover:

- Political commitment and leadership for health professional education and training into the human resources for health plan of the country/state/province in keeping with administrative/legislative responsibilities.
- Alignment of the education plan with HRH and health systems national plans.
- Formal collaboration and shared accountability between the Ministry of Health and the Ministry of Education as well as other relevant ministries and/or the civil service commission in the country.
- Alignment of information on HRH training and education with HRH information systems.
- Ensuring platforms/mechanisms to support the implementation of the reform and scale-up plan, for instance the creation or strengthening of national or sub-national institutions, capacities and mechanisms (e.g. legislation, policies, procedures).

Other recommendations that are included under the remaining four domains include:

- Either instituting and/or strengthening the regulation of health professional education to ensure quality and relevance and ensuring accreditation of institutions and programmes.
- Strengthening and updating faculty as well as recruiting health professionals as adjunct faculty where feasible and acceptable.
- Ensuring continuing professional development for both health professionals and faculty, in the case of the latter, through policy that makes it mandatory.
- Curriculum development for relevance to community needs.
- Streamlining educational pathways, or ladder programmes, for the advancement of practicing health professionals, in both undergraduate and postgraduate programmes.
- Improving interprofessional education for collaboration and acceptable.
- Introducing technologies (simulation, technology, e-learning) that enhance and support patient care, diversify health care capability, link facilities, and increase the accessibility of trained health workers to information and material to keep practice relevant.
- Human resources for health information systems that allow for better planning of skill mix and deployment, but are also indicators of the adequacy of health professionals.

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**6.3. Recommendations for scaling up workforce production**

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1. Political commitment and leadership for health professional education and training into the human resources for health plan of the country/state/province in keeping with administrative/legislative responsibilities.
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**References**


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75
As governments, health care systems, and communities strive to provide quality, effective and safe health care to their populations, resource constraints will continue to raise the question of how to best use available resources, equally important is how to better use future health resources. In a global context of repeated “calls to action” from international bodies, it is clear that a strong focus will remain on the provision of adequate and capable human resources for health. For the global pharmacy workforce, this is a time when opportunities are opening up for the profession to innovate, add value to health care systems, and improve health through ensuring the responsible use of medicines.

The key themes identified throughout the case reports are concerned with leadership, partnership and collaboration. There is a strong sense of the importance of empowering pharmacists to be leaders in health care and their communities, and to be innovators in order to best face the challenges ahead in improving health. Multi-stakeholder collaboration is identified as an additional important factor for progressing and improving the pharmaceutical human resources in every country. FIP strongly endorses workforce solutions that are based on collaborative best practice and the formation of strong national and regional partnerships. FIP Education initiatives are committed to the principles of sharing best practice.

FIP has collaborated closely with WHO in pharmacy education and the pharmacy workforce, and as such, it is important for FIP to be actively involved in the development and dissemination of the newly adopted WHO Guidelines on Transforming and Scaling up Health Professions Education (see Part 6). These guidelines present evidence-based information and guidance that is relevant to consider, adapt, and apply in every country context. It is equally important to realise that we are at the initial stages of mapping the international workforce and associated influences. From this perspective, we are only just beginning to recognise the enormity of the task facing workforce developers and professional leadership bodies, this will be a sustained global effort.

FIP is committed to fostering a greater understanding of the global pharmacy workforce and invites all actors not just to read this report but to actively participate and share experiences and strategies in addressing pharmacy workforce challenges through the global FIPED platform and communities of practice.

Reports such as this, and the previous 2009 Global Pharmacy Workforce Report, have set out to recognise the major challenges facing both the profession and global healthcare systems. The quality, scope and capability of the workforce are dependent on the nature of initial and lifelong professional development curricula, and the quality of available practitioner support and recognition structures. It is crucial that professional leadership bodies, and their stakeholder partners, consider and act to ensure that the talents developed at the educational level impact the access to, and quality of, medication use. The 2020 Vision and mission adopted by FIP recognises this important linkage between lifelong professional education and innovation, and driving health care improvement.

### SUMMARY

PART 7

**As governments, health care systems, and communities strive to provide quality, effective and safe health care to their populations, resource constraints will continue to raise the question of how to best use available resources, equally important is how to better use future health resources. In a global context of repeated “calls to action” from international bodies, it is clear that a strong focus will remain on the provision of adequate and capable human resources for health. For the global pharmacy workforce, this is a time when opportunities are opening up for the profession to innovate, add value to health care systems, and improve health through ensuring the responsible use of medicines.**

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PART 7

SUMMARY

As governments, health care systems, and communities strive to provide quality, effective and safe health care to their populations, resource constraints will continue to raise the question of how to best use available resources; equally important is how to better use future health resources. In a global context of repeated “calls to action” from international bodies, it is clear that a strong focus will remain on the provision of adequate and capable human resources for health. For the global pharmacy workforce, this is a time when opportunities are opening up for the profession to innovate, add value to health care systems, and improve health through ensuring the responsible use of medicines.

The 2012 FIP Global Pharmacy Workforce Report presents the current pharmacy workforce situation in 50 countries and territories around the world, representing nearly four million pharmaceutical human resources for health. Analyses in this report reveal a pharmacy workforce distribution and composition with wide variance across (and within) countries and territories. Meanwhile, Africa remains the region with the most intense pharmacy workforce crisis, having the least capacity to provide appropriately supervised pharmaceutical services for their populations. Pharmaceutical human resources capacity building is a priority in several African countries and strategies from three of these countries (Ghana, South Africa and Tanzania) are presented in depth in this report. Collaboration at every level ensures that well-coordinated pharmaceutical human resource planning takes place and that strategic plans are successfully resourced and implemented.

The nine case studies in this report provide examples of the challenges, strategies, and outcomes achieved in the area of pharmacy workforce planning, management, and development in varying settings from low to high-income and small to large populations. Overall, these case studies identify similar challenges, including significant workforce shortages and distribution imbalances, lack of integrated workforce planning, the need for transforming pre-service education and continuing professional education, ensuring appropriate skills mix and clear role definition as well as the challenge of assessing professional and clinical roles/performance. However, the approaches taken to tackle these challenges differ and important lessons can be learned from each separate case study. In reviewing each separate country’s needs and strategies, the importance of having a needs-based approach to the provision of quality pharmaceutical services and pharmacy education is reinforced.

Needs-based professional pharmacy education is the foundation for the development of a competent and capable pharmaceutical workforce. This report highlights the status of pharmacy education with data from 90 countries, including over 3800 educational institutions that educate and train pharmacists and the pharmacy support workforce. These institutions must be socially accountable to and play a key role in delivering a pharmacy workforce that is capable and adaptable to local needs.

The key themes identified throughout the case reports are concerned with leadership, partnership and collaboration. There is a strong sense of the importance of empowering pharmacists to be leaders in health care and their communities, and to be innovators in order to best face the challenges ahead in improving health. Multi-stakeholder collaboration is identified as an additional important factor for progressing and improving the pharmaceutical human resources in every country. FIP strongly endorses workforce solutions that are based on collaborative best practice and the formation of strong national (and regional) partnerships. FIP Education initiatives are committed to the principles of sharing best practice.

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<td>France – Hélène Leblanc, Ordre National des Pharmaciens.</td>
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<td>Finland – Sanna Passi, Finnish Pharmacists’ Association.</td>
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<td>Cambodia – Soshit Chrong, Pharmacist Association of Cambodia.</td>
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<td>Cameroon – Samanta Thome Abeng, National Conference of Pharmacy.</td>
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<td>India – Nandita Nair, National Aeronautical University.</td>
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<td>Ireland – Lorraine Horgan, Pharmaceutical Society of Ireland.</td>
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<td>Japan – Yoshitaka Nishio, Showa Pharmaceutical University, Japan Pharmaceutical Association.</td>
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<td>Jordan – Mohammad Alhaddad, Jordan Pharmaceutical Association; Nima Bader, University of Nottingham, United Kingdom.</td>
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<td>Maldives – Bhasha Mokh, University of Maldives.</td>
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Annex 1. Data Table

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Definitions
◊ Data only reported by the Republika Srpska, Year and data source of data vary.

Pharmacy technician: A person who supports pharmacists in the delivery of pharmacy services. Also includes qualified assistive personnel such as pharmacy technologists.

Annex 2: Acknowledgements

Afghanistan – Abdul Khalid Annis, Management Sciences for Health; GPE, Ministry of Public Health
Albania – Elvira Itoi, Pharmacy Order of Albania
Australia – Stephen Armstrong and Patrick Reid, Pharmacy Guild of Australia
Bangladesh – Mohammad Kawsar Shorif Sany, Pharmacy Students’ Society of Bangladesh
Belgium – Joe Savelli, Association Pharmaceutique Belgique
Brunei – Ngawang Dima, Drug Regulatory Authority, Sarawak; Wong Soo Sing, Faculty of Medicine, National University Hospital
Bolivia – Lilia Verazain, Caja de Salud de la Banca Privada
Bosnia and Herzegovina – Republic of Srpska – Pharmaceutical Association of Republic of Srpska
Cambodia – Sokhath Chheng, Pharmacists Association of Cambodia
Canada – Janet Cooper, Canadian Pharmacists Association
China – Dechun Jiang, Chinese Pharmaceutical Association
Christmas Island – Ray Manolese, Medicaments Envelopes at Technologies de Santé, OMS
Cote d’Ivoire – Adrane Patrice Acoua, Immoce, Faculty of Pharmacy, University of Valparaiso
Croatia – Deieke Jang, Chinese Pharmaceutical Association
Cuba – Oscar Corrales, Cuban College of Pharmacists; Cuban Pharmaceutical Society
Cyprus – Ozan Yavuz, Ministry of Health
Costa Rica – Adrian Espinosa, Colegio de Farmacéuticos de Costa Rica
Côte d’Ivoire – Michel Dori, Pharmaceutical Association of Taiwan
Cook Islands – Biribo Tekanene, Ministry of Health
Cote d’Ivoire – Adrane Patrice Acoua, Immoce, Faculty of Pharmacy, University of Valparaiso
Cuba – Olayy Corrales, Cuban College of Pharmacists; Cuban Pharmaceutical Society
Czech Republic – Stanislav Hovorka, Czech Chamber of Pharmacists; Veronika Sampathova
Denmark – Helle Jacobsen, Association of Danish Pharmacists
Egypt – Adel Sal, Faculties University, Egypt; Waled Shokry, Cairo Chamber of Commerce, Sama El-Behery, Faculty of Pharmaceutical Sciences and Pharmaceutical Industries
Ethiopia – Edmemelem Elge, Addis Ababa University and Araya Hytem, Ethiopian Pharmaceutical Association
Finland – Arponiisaavalta, FIP, Pharmaceutical and Biomedical Supplies Center
France – Benoît Brachard, Ordre National des Pharmaciens.
Germany – Bernd Knip, Bundesverband Der Deutschen Apothekerverbände (BDA) Federal Union of German Associations of Pharmacists.
Great Britain – Christopher John, Royal Pharmaceutical Society
Greenland – Anthony Eyrich, Pharmacy Council
Guinea (Republic of) – Civil Service Kol, Ministere de la Santé
Hong Kong SAR, China – Benjamin Tung Yan Chor, Open University of Hong Kong, Li Ka Shing Institute of Professional and Continuing Education
Hungary – Georgina Gal
Iceland – Sigurdur Jónsson, Pharmaceutical Society of Iceland, Helga Gardsdóttir
India – Akshata Amr, O&M, Marjy-Q; Indian Pharmaceutical Association; Anurita Nihal Nagrape, Association of Community Pharmacists of India; GuruPharm.md, Kama University, New Delhi
Isabel – Maryam Bahjaijani, Iranian Association of Pharmaceutical Scientists (IAPS)
Ireland – Lorraine Morgan, Pharmaceutical Society of Ireland
Italy – Mauro Lanzolotto, Federfarma.
Japan – Yoshinori Nishiwaki, Showa Pharmaceutical University, Japan Pharmaceutical Association
Jordan – Mohammad Alshobak, Jordan Pharmaceutical Association; Lisa Bader, University of Nottingham, United Kingdom
Kenya – Stephen Kijemal, Pharmacy & Poisons Board; Elizabeth Irene Egho, Ministry of Medical Services.
Kenya Republic – Myon Seung Ky, The Korean Pharmaceutical Association
Korea (Republic of) – Hyun Seung Kim, The Korean Pharmaceutical Association
Lithuania – Suntine Gritiene, Lithuanian University of Health Science
Malaysia – Stanley Chiu Yaw, O&M; Zhe Li, University of Nottingham
Malawi – Stanley Chiu Yaw, O&M; Zhe Li, University of Nottingham
Mexico – Felipe Munoz, Mexican Pharmaceutical Society, Nue Ariana Abdullah, Pharmaceutical Services Division, Ministry of Health
Moldova (Republic of) – Zinaida Bezverhni, State University of Medicine and Pharmacy "Nicolae Testemițanu";
Monaco – Guirfa Ilyes, Pharmacists Association of Monaco
Morocco – Abdelkader Benjelloun, University Hospital, Ministry of Health
Namibia – Smit Kau, Namibia University of Science and Technology; Huub Overgaag, KNMP
Netherlands – Frans van de Vaart, KNMP/Royal Dutch Association for the Pharmaceutical Society.
New Zealand – Goa Toa, O&M; Waihanga O’Mara, University of Otago
Nigeria – Therese J. Egbulem, University of Nigeria, Faculty of Pharmacy; Elfah Mohammad Alshobak, Jordan Pharmaceutical Association
Pakistan – Aziz Ullah Khan, University of Peshawar; Khaliq ur Rehman Khan, Pharmaceutical Society of Pakistan
Peru – Eduardo Teran, Universidad Peruana del Magdalena; Ricardo Sanz, Universidad Peruana del Magdalena
Philippines – Rhona E. Reyes, O&M; Jocelyn P. Salazar, University of Santo Tomas
Portugal – Eduar Gomes, Portuguese College of Pharmacists; Felipe Lopes, Minister of Health
Puerto Rico – Jesus Cruz-Loria, Universidad de Puerto Rico
Qatar – Fahad Al-Hajri, Qatar University; Fahad Al-Hajri, Qatar University
România – Constantin Iordache, Faculty of Pharmacy, University of Bucharest
Russia – Valery S. Pavlov, University of Veterinary Medicine; Gustavo Riesco, University of Chile
Saint Vincent and the Grenadines – Milton Johnson, Saint Vincent and the Grenadines, Ministry of Health and Social Development
San Marino – Silvia Trignani, University of Medicine and Management “Nicola Toti”
Saudi Arabia – Aiman Al-Jassim, University of Science and Technology; Fahad Al-Hajri, Qatar University
Scotland – Christopher Smith, Royal Pharmaceutical Society
Serbia – Svetoljub Kanarek, Faculty of Pharmacy, University of Belgrade; Anica Vukicevic, Ministry of Health
Singapore – Poh Choon Hoh, National University of Singapore; Eric Yee Fong, Lee Kong Chian School of Medicine
Slovakia – Ljudmila Pavlovská, Slovakian Medical University; Peter Vacek, Slovakian Medical University
Slovenia – Blaž Marinc, University of Ljubljana; Tomaz Pernar, University of Ljubljana
South Africa – Candice Wybrow, University of Witswatersrand; Mark McDonald, South African National Department of Health
Spain – Asunción Téllez López, Universidad Autónoma del Estado de Hidalgo; Eduardo Troche Del Río, Consejería de Salud; Dirección General de Farmacia y De la Salud del Estado de Hidalgo; Eva Paola Huertas, Liubomir Stanic, Centro Pastora, Asemicn de la Universidad de Salamanca
Sweden – Mikael Eklind, University of Gothenburg; Per Olsson, University of Copenhagen
Switzerland – Brian J. Stewart, University of Basel; Peter A. Schmid, University of Basel
Thailand – Itthiporn Sira, Prince of Songkla University; Peerapong Sin, King Mongkut’s University of Technology Thonburi
Tunisia – Mohammed Chattergui, Faculty of Pharmacy, University of Tunis; Hassen Rekik, Ministry of Health
Turkey – Muzaffer Gökhan, Turkish Pharmaceutical Society
Uganda – Muhammad Amin, Uganda University of Pharmacy and Allied Sciences
United Arab Emirates – Saleh Al-Saleh, University of Sharjah; Nada Al-Mosawi, College of Pharmacy, University of Sharjah
United Kingdom – Christopher M. A. Wood, Royal Pharmaceutical Society; Susan Ann Rutter, University of Manchester
United States – Shannon Furbee, University of Kentucky; Tamer Elabd, University of Iowa
Uruguay – Adalberto Aguirre, Ministry of Health; Edna Guzmán, Universidad de la Republica
Venezuela – Jennifer Trinidad, University of Caracas; John H. Forman, University of North Carolina
Vietnam – Tran Thanh Binh, University of Medicine and Pharmacy; Tran Quoc Duc
Venezuela – Enrique Martínez, University of Caracas; John H. Forman, University of North Carolina
Yemen Arab Republic – Zinaida Peshtykh, State University of Medicine and Pharmacy “Nicolae Testemițanu”
Zambia – James Muyiwa, University of Zambia; Steven Bwalya, University of Zambia
Zimbabwe – Tito Sibanda, University of Zimbabwe; Tania Mnene, University of Zimbabwe

Annex 2: Acknowledgements

New Zealand – Bronwyn Clark, Pharmacy Council of New Zealand; Linda Bryant, Comprehensive Pharmaceutical Solutions; William (Bill) Allan, Health’s Bay Hospital/New Zealand Hospital Pharmacists’ Association.

Nigeria – Ismaila Araba, National Hospital, Abuja; Anthony Obesere, Pharmacists Council of Nigeria.

Niue – Bob Talagi, Niue Health Department.

Norway – Kristin Widén, Tore Reinholdt, Norwegian Pharmacy Association; Tove Ytterbø, The Norwegian Association of Pharmacists.

Pakistan – Nazinuddin Ahson, Pharmacy Council of Pakistan; Syed Khalfil Saleed Bukhari, Pakistan Pharmaceutical Association; Ahsan Hossein, Hamdard University.

Palau – Clarette Matlab, Ministry of Health.

Papua New Guinea – Jackson A K Lauwo, School of Medicine and Health Sciences, University of Papua New Guinea.

Philippines – Leonila Ocampo, Philippine Pharmacists Association, Inc.

Portugal – Luís Caria, Ordem dos Farmaceuticos; Bruno Sarmento (ISCS–N).

Romania – Ionita Rodica, Romanian Federation of Pharmaceutical Owners’ Associations.

Saudi Arabia – Salma Alghamdi.

Senegal – Elhassan Ouattara, Ordre des Pharmaciens du Sénégal(OPS).

Singapore – Felicia Ling, Singapore Pharmacy Council.


South Africa – Anri Gagiano, Pharmaceutical Society of South Africa; Henry Hutchison, East Cape Department of Health.

Spain – Carmen Peña Lopez, Consejo General de Colegios Oficiales de Farmacéuticos de España (CGCOF).

Switzerland – Stéphanie Arsac, Comité International de la Croix-Rouge; Dominique Jordan, pharmaSuisse– Swiss Association of Pharmacists.


Thailand – Kamonsak Reungjarearnrung, Bumrungrad Hospital; Wongwiwat Tassaneeyakul, Faculty of Pharmaceutical Sciences, Khon Kaen University.

Togo – Sakariyaou Alaniyin, Ordre National des Pharmaciens du Togo.

Vanuatu – Amanda Sanburg, Ministry of Health.


Zambia – Lungwani Tyson Mungu, University of Zambia, School of Medicine.

Zimbabwe – Charles Maponga, University of Zimbabwe, College of Health Sciences, School of Pharmacy; Ian Malaya, Pharmacists Council of Zimbabwe.

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WHO – Gilles Forte, Helen Tota, Erica Wheeler, Maria Diaz Ruiz.
Annex 2: Acknowledgements

New Zealand – Bronwyn Clark, Pharmacy Council of New Zealand; Linda Bryant, Comprehensive Pharmaceutical Solutions; William (Bill) Allan, Henderson’s Bay Hospital/New Zealand Hospital Pharmacists’ Association

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Pakistan – Nawazuddin Akbar, Pharmacy Council of Pakistan; Syed Khalid Saeed Bukhari, Pakistan Pharmaceutical Association; Anwar Hussain, Hamdard University

Palau – Gregorio Sanchez, Ministry of Health

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Portugal – Luis Baiao, Ordem dos Farmaceuticos; Bruno Sarmento (ISCS-CN)

Romania – Ionita Rodica, Romanian Federation of Pharmaceutical Owners’ Associations

Samoa – Lepaitai Hansell, National Health Service

Saudi Arabia – Dalia Almaghaslah

Senegal – Cheikhou Oumar Dia, Ordre des Pharmaciens du Senegal (OPS)

Singapore – Felicia Ling, Singapore Pharmacy Council

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South Africa – Anri Gagiano, Pharmaceutical Society of South Africa; Henry Hutchison, East Cape Department of Health

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