2012 FIP Global Pharmacy Workforce Report

Fédération Internationale Pharmaceutique

International Pharmaceutical Federation

1912 · 2012
100 YEARS OF
ADVANCING PHARMACY WORLDWIDE

Developing the health care Workforce of the Future

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 ofcrucial 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
International Pharmaceutical Federation (FIP)

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 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 associa tions, 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 on going challenge in the increasingly dynamic environment of rising health care costs, increased demand for health services, and increased burden of chronic diseases. Fuelled 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 foundation 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.

(www.fip.org/education)

PART 2

INTRODUCTION

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, work force 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 crisis is possibly the greatest health system constraint on 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 this 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 [3] states that the health workforce shortages and inefficiencies are also seriously hampering effective implementation of primary health care. The 2010 World Health Report [4] 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 2011 WHO resolution on health workforce strengthening recognises the centrality of human resources for health to the effective operation of health systems [2].

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 [7] 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 systems 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 maximize the expertise and scope of pharmacists and minimize expansion barriers for an already existing and successful health care delivery model [10].

Recent focus on the pharmacy workforce in Australia, Canada, Great Britain, and the USA [11-18]; the 2006 and 2009 FIP Global Pharmacy Workforce reports [19,20]; and a systematic review of the literature [21] 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 focuses 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 are 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 predictor of job satisfaction. Other factors identified as increasing pharmacist retention were good remuneration, good relationships with co-workers, and flexible schedules. Factors increasing staff turnover included high stress, insufficient or unqualified staff, and poor salary. Further, job stress and excessive workload negatively affect job satisfaction. Evidence also suggests that pharmacists engaged in shift work might present unique characteristics, which has implications for labour supply and pharmacy services delivery.

Workforce development: education, training, and leadership

Continuing professional development (CPD) has the potential to be useful in pharmacy workforce revalidation. Time, financial costs, resource issues, understanding of CPD, facilitation 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 widespreadand 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.

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.

References

1. The World Health Report 2006: Working together for health. Geneva: World Health Organization; 2006. Available from: http://www.who.int/whr/2006/en/index.html

2. WHO Assembly, 64th year. "Resolution WHA 64.6 [Health workforce strengthening]". 16-24 May 2011, p. 9. In Resolutions and Decisions Annexes (WHA64/2011/REC/1). Official Record. Geneva: World Health Organization; 2011. Available from: http://apps.who.int/gb/ebwha/pdf_files/WHA64-REC1/A64_REC1-en.pdf#page=21

3. The World Health Report 2008: Primary health care (now more than ever). Geneva: World Health Organization; 2008. Available from: http://www.who.int/whr/2008/en/index.html

4. The World Health Report 2010: Health systems financing - The path to universal coverage. Geneva: World Health Organization; 2010. Available from: http://www.who.int/whr/2010/en/index.html

5. WHO, Global Health Workforce Alliance 2008. The Kampala Declaration and Agenda for Global Action [cited 12 July 12]. Available from: http://www.who.int/workforcealliance/knowledge/resources/kampala_declaration/en/index.html

6. G8 Communiqué on Africa and Development 8 July 2008.

7. Closing the gap in a generation: Health equity through action on the social determinants of health [cited 12 July 2012]. Geneva: World Health Organization; 2008. Available from: http://www.who.int/social_determinants/thecommission/finalreport/en/

8. The Taskforce on Innovative International Financing for Health Systems. Civil Society Forum on the High Level Taskforce on Innovative International Financing for Health Systems. London: The Taskforce on Innovative International Financing for Health Systems; 2009.

9. Horton R. Venice statement: global health initiatives and health systems. Lancet 2009; 374: 10-12.

10. Giberson S, Yoder S, Lee MP. Improving Patient and Health System Out comes through Advanced Pharmacy Practice. A Report to the U.S. Surgeon General [cited 12 July 2012]. Rockville, Maryland, USA: Office of the Chief Pharmacist, U.S. Public Health Service; Dec 2011. Available from: http://www.accp.com/docs/positions/misc/Improving_Patient_and_Health_System_Outcomes.pdf

11. Human Capital Alliance. Pharmacy workforce planning study literature review [cited 01 July 2012]. Human Capital Alliance; 2008. Available from: http://www.humancapitalalliance.com.au/documents/Literature%20Review%2023102008.pdf

12. Pharmaceutical Society of Australia. Issues paper on the future of pharmacy in Australia [cited 12 July 2012]. Canberra, Australia: PSA; 2010. Available from: http://careers.curtin.edu.au/data/shared/documents/faculty_specific_resources/health_sciences/psa_futur e_of_pharmacy2010.pdf

13. Human Capital Alliance. Analysis of secondary data to understand pharmacy workforce: Initial supply report [cited 12 July 2012]. Human Capital Alliance; 2008. Available from: http://www.humancapitalalliance.com.au/documents/Initial%20Supply%20Report%20final%20-%2022102008.pdf

14. Canadian Pharmacists Association. Blueprint for pharmacy: The vision for pharmacy [cited 12 July 2012]. Ottawa, Canada: Canadian Pharmacists Association; June 2008. Available from: http://blueprintforpharmacy.ca/docs/pdfs/the-vision-for-pharmacy_apr-1-09.pdf

15. Guest D, Battersby S, Oakley P. Future Pharmacy Workforce Requirements; Workforce Modelling and Policy Recommendations Executive Report (Pharmacy Workforce Planning & Advisory Group). London: Royal Pharmaceutical Society of Great Britain; 2005.

16. Seston, EM, Hassell K. Workforce update-joiners, leavers, and practising and non-practising pharmacists on the 2010 register. The Pharmaceutical Journal. 2011; 286:473-476.

17. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions. The Adequacy of Pharmacist Supply: 2004 to 2030 [cited 01 July 2012]. Rockville Maryland, USA: DHHS; December 2008. Available from: http://bhpr.hrsa.gov/healthworkforce/reports/pharmsupply20042030.pdf

18. Pharmacy Manpower Project (PMP), Inc. 2009 National Pharmacist Workforce Survey [cited 12 July 2012]. Alexandria, Virginia, USA: PMP; 1 March 2010. Available from: http://www.pharmacy.wsu.edu/information/2009.Pharmacist.Workforce.Survey.pdf

19. International Pharmaceutical Federation (FIP). 2006 International Pharmaceutical Federation (FIP) global pharmacy workforce and migration report: A call for action. The Hague, The Netherlands: FIP; 2006. Available from: http://www.fip.org/menu_sitemap?page=hrfh_introduction

20. International Pharmaceutical Federation (FIP). 2009 global pharmacy workforce report [cited 01 July 2012]. The Hague, The Netherlands: FIP; 2009. Available from: http://www.fip.org/hr

21. Hawthorne N and Anderson C. The global pharmacy workforce: A systematic review of the literature [cited 01 July 2012]. Human Resources for Health. 19 June 2009; 7:48. Available from: http://www.human-resources-health.com/content/7/1/48

PART 3

GLOBAL PHARMACY WORKFORCE DESCRIPTION

Authors

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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 2.5 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 indicators 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 more than 65%.
- Most pharmacists are employed in community retail pharmacy, followed by hospital, industry, research and academia, and regulation. The distribution across sectors varies among countries though regional trends can be seen.

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 (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. 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, 10 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 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 country and territory level responses and the global WHO member states.

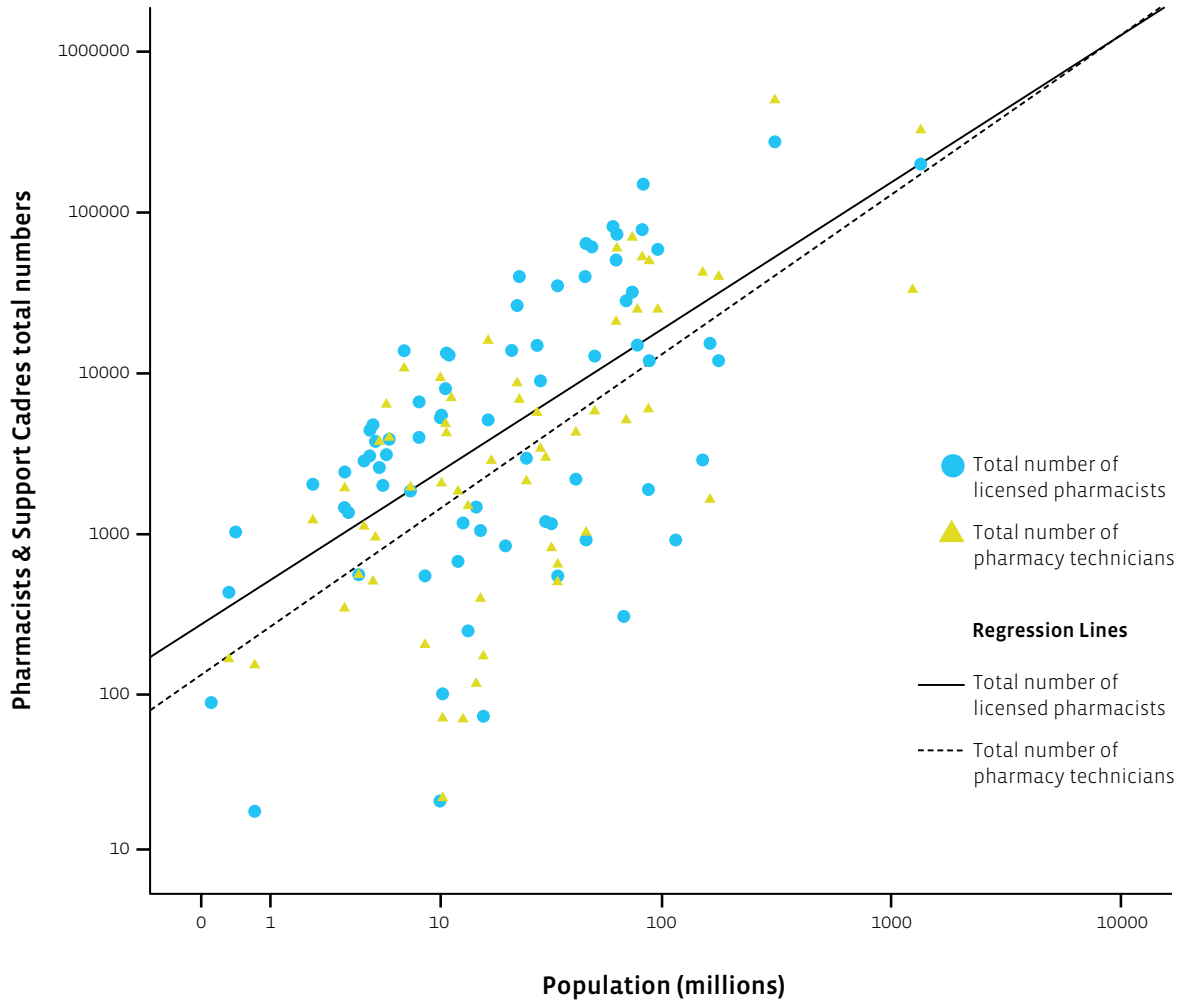
Table 3.1. Respondent frequencies by WHO region

WHO Region	FIP 2012 Report	%	All WHO member states	%
Africa	20	25.0	46	23.7
Americas	9	11.3	35	18.0
Eastern Mediterranean	6	7.5	22	11.3
Western Pacific	22	15.0	27	13.9
South East Asia	6	7.5	11	5.7
Europe	27	33.8	53	27.3
Total	90	100.0	194	100.0

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, $R^2 = 0.36$, $p<0.0001$ and $R^2 = 0.45$, $p<0.0001$ 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).

Figure 3.1.
Pharmacists/Support cadres and country/territory population (logarithmic scales)



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.

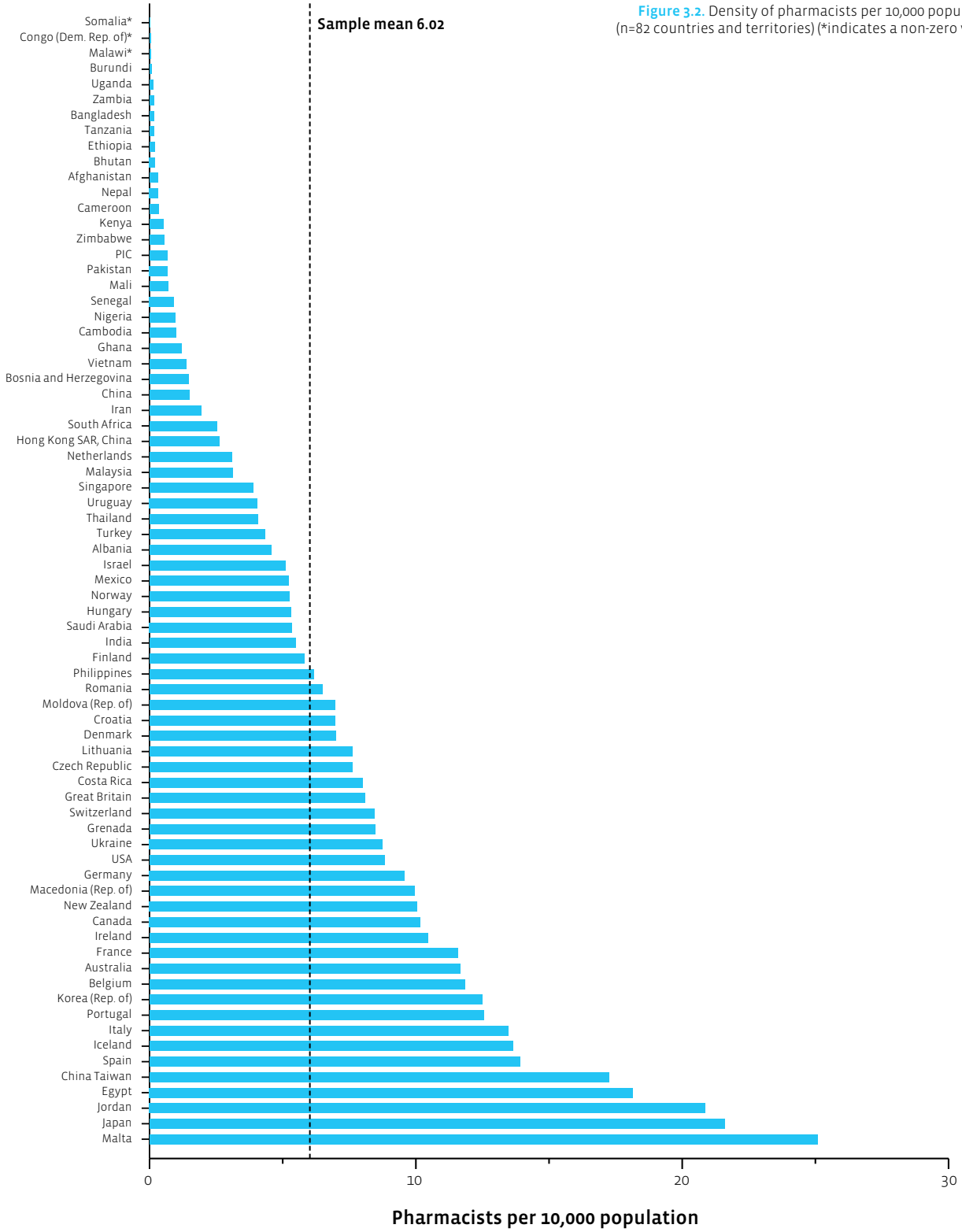
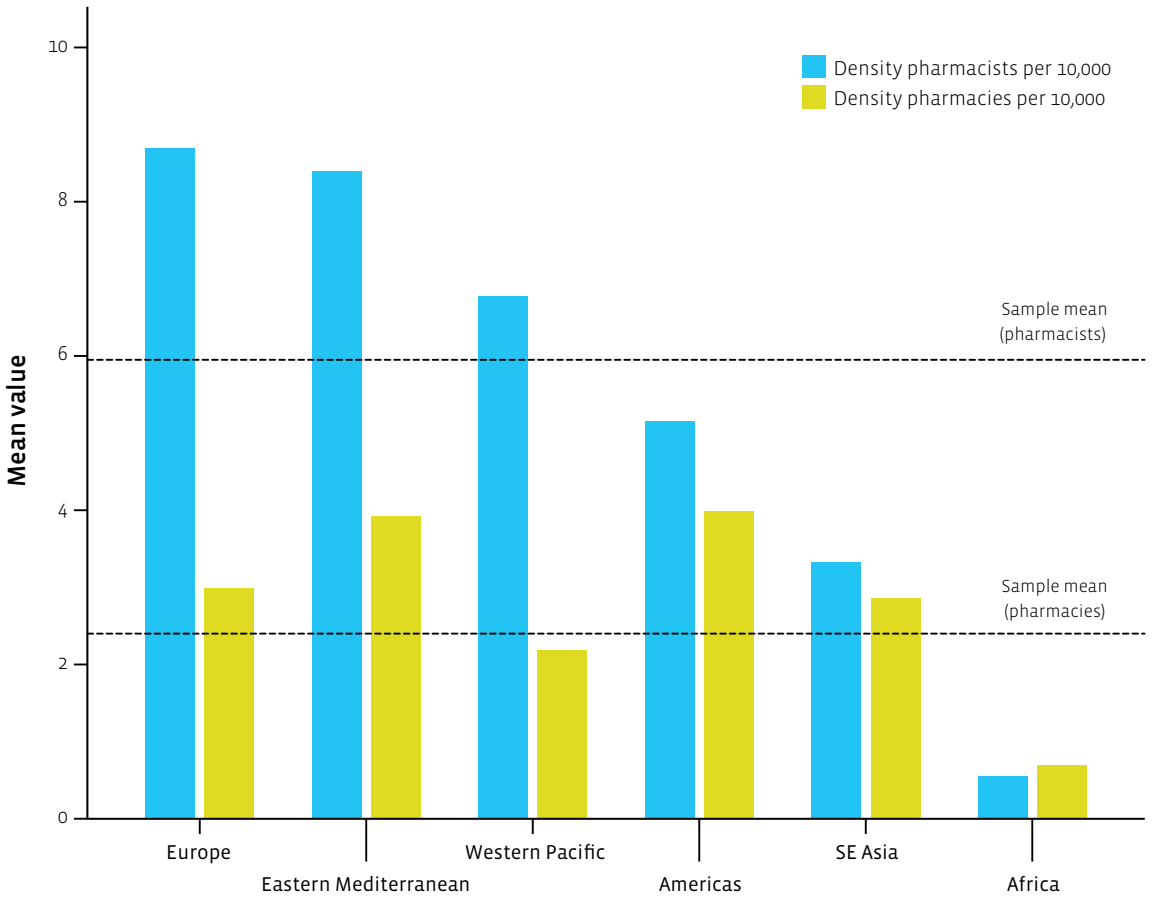


Figure 3.2. Density of pharmacists per 10,000 population (n=82 countries and territories) (*indicates a non-zero value)

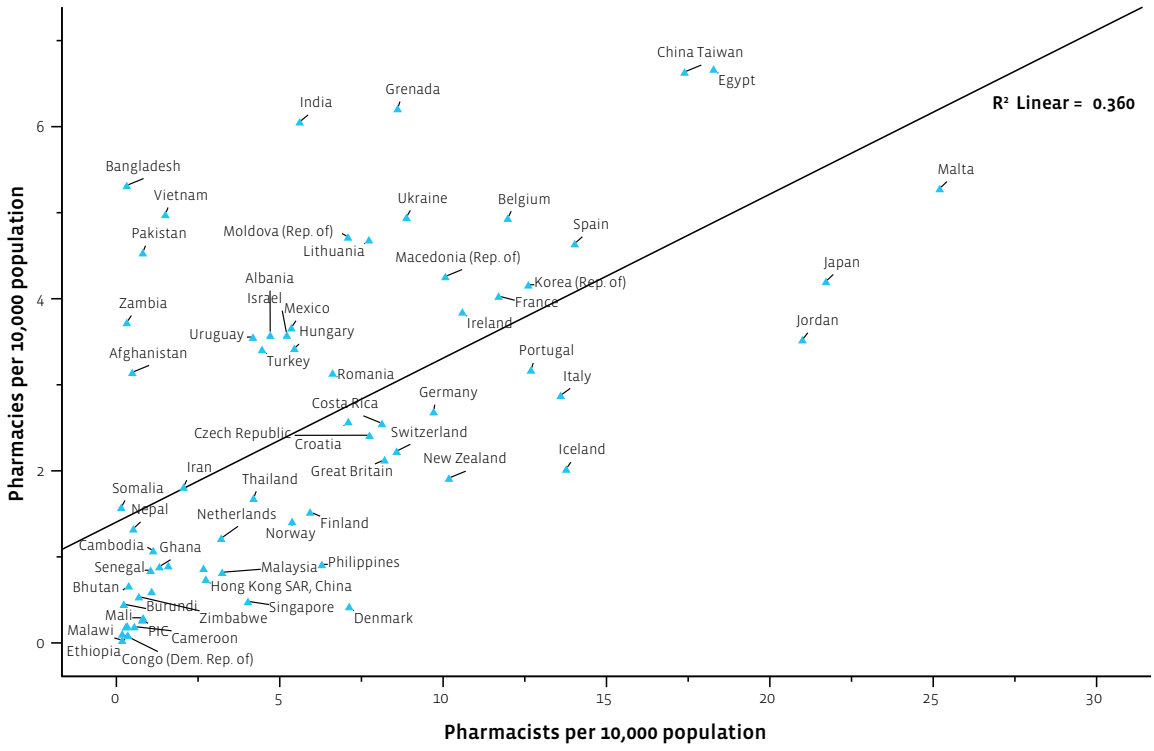
In most countries and territories, there is a greater density of pharmacists than pharmacies. However, some have many times more pharmacies than pharmacists (Afghanistan, Bangladesh, Bhutan, Burundi, India, Nepal, Pakistan, Somalia, Vietnam and Zambia; see also Figure 3.4), flagging the issue of appropriate 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 as a smaller gap between pharmacists and pharmacies per capita.

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



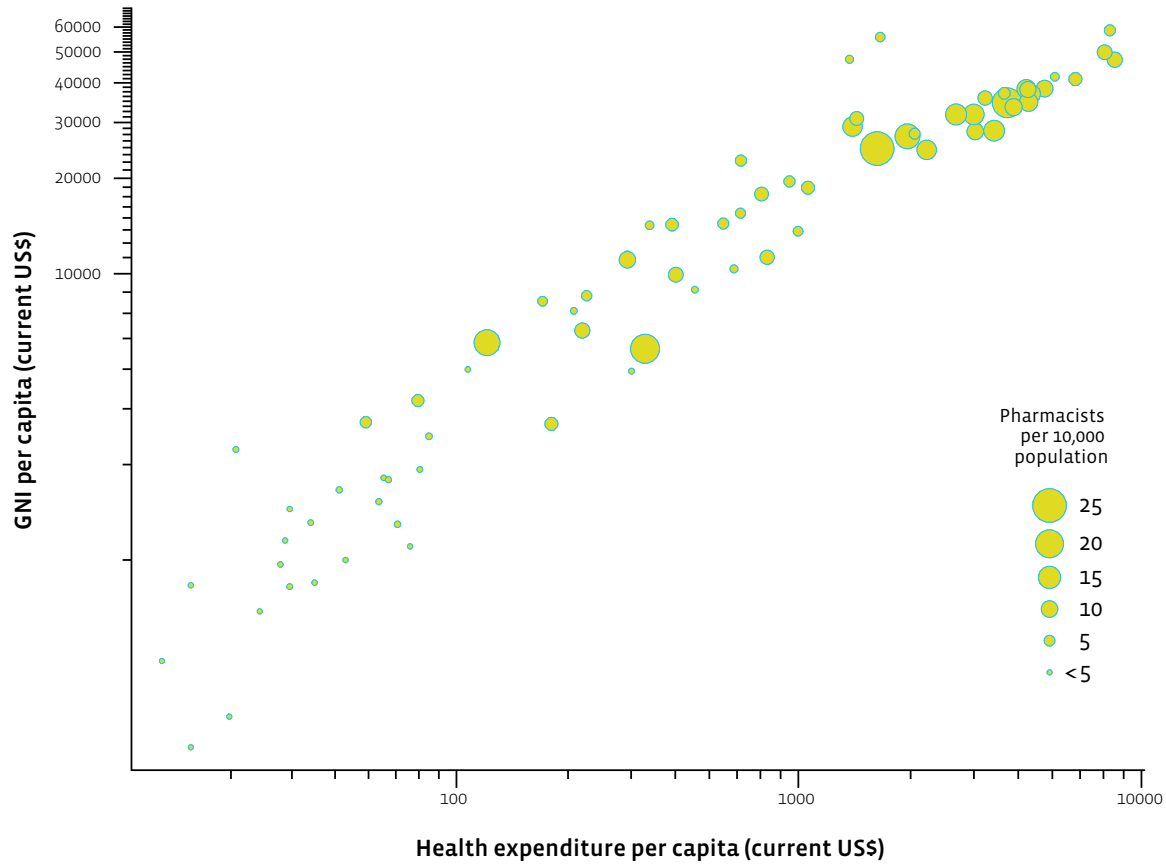
There is a correlation between the density of pharmacies (facilities that dispense medicines) and pharmacists (Figure 3.4). Countries with higher densities of pharmacists also tend to have higher densities of pharmacies ($R^2 = 0.38$, $p < 0.001$). African countries lack both pharmacies and pharmacists, 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.

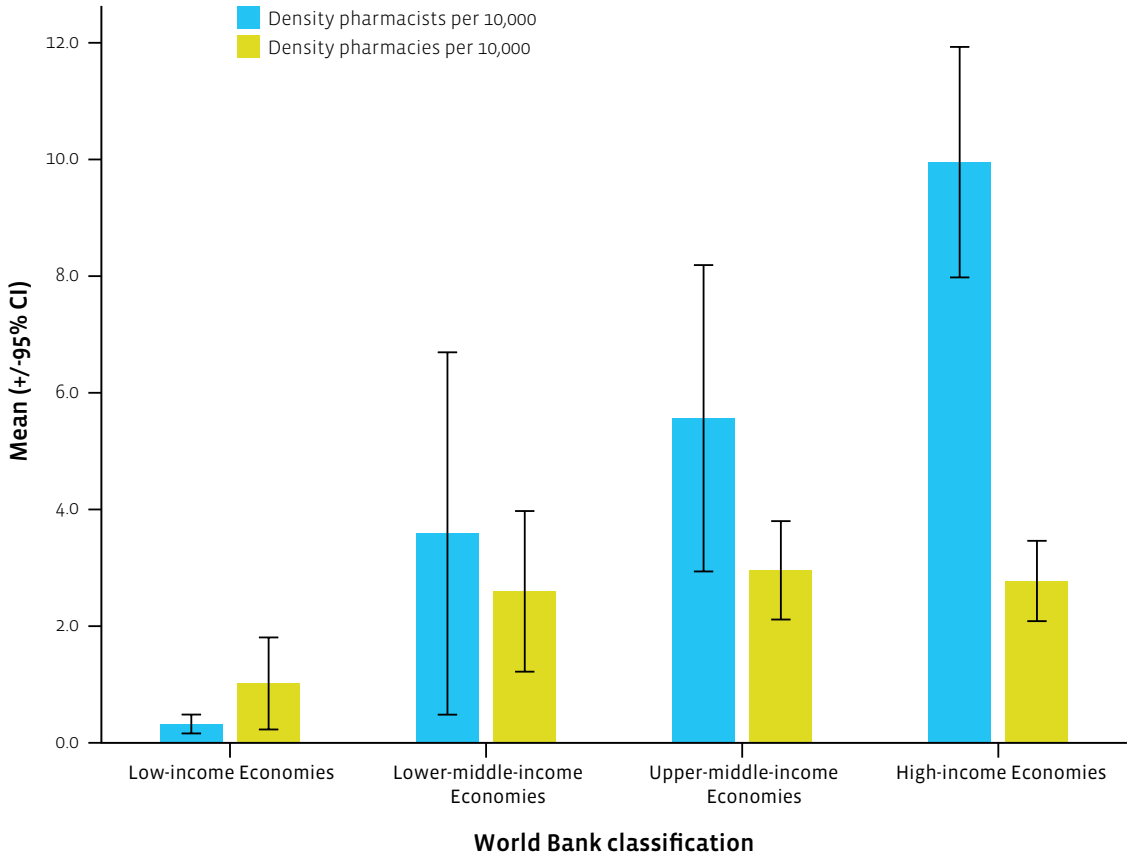
Figure 3.5. Pharmacists and health expenditure (n=82 countries and territories) per 10,000 population



[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)

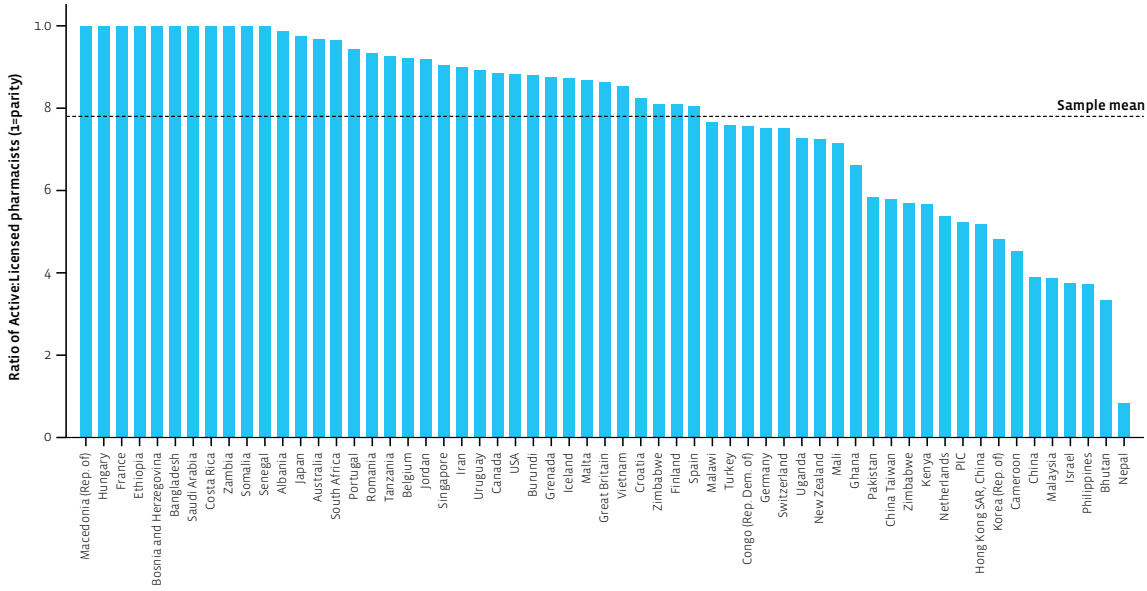


Table 3.2. Active: Registered workforce ratios by WHO region.

WHO Region (sample n)	Mean ratio	SD	Minimum	Maximum
Africa (16)	.80	.18	.45	1.00
Americas (6)	.92	.06	.88	1.00
Eastern Mediterranean (4)	.85	.18	.58	1.00
Western Pacific (11)	.65	.24	.37	.98
SE Asia (4)	.47	.39	.08	1.00
Europe (19)	.84	.16	.38	1.00

(ANOVA, F=2.34, p=0.034)

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.

Figure 3.8. Pharmacist workforce gender distribution (n=67 countries and territories)

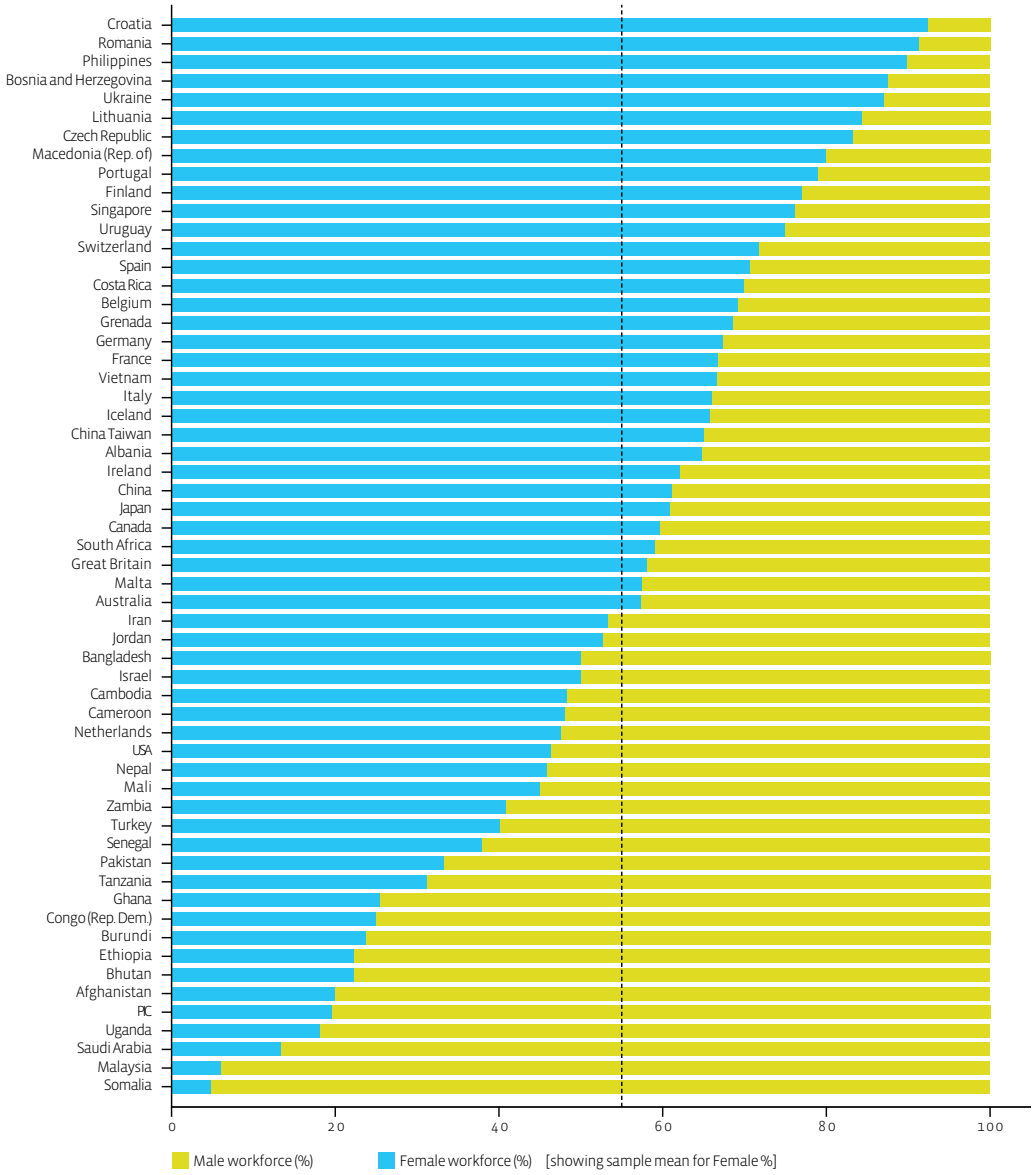
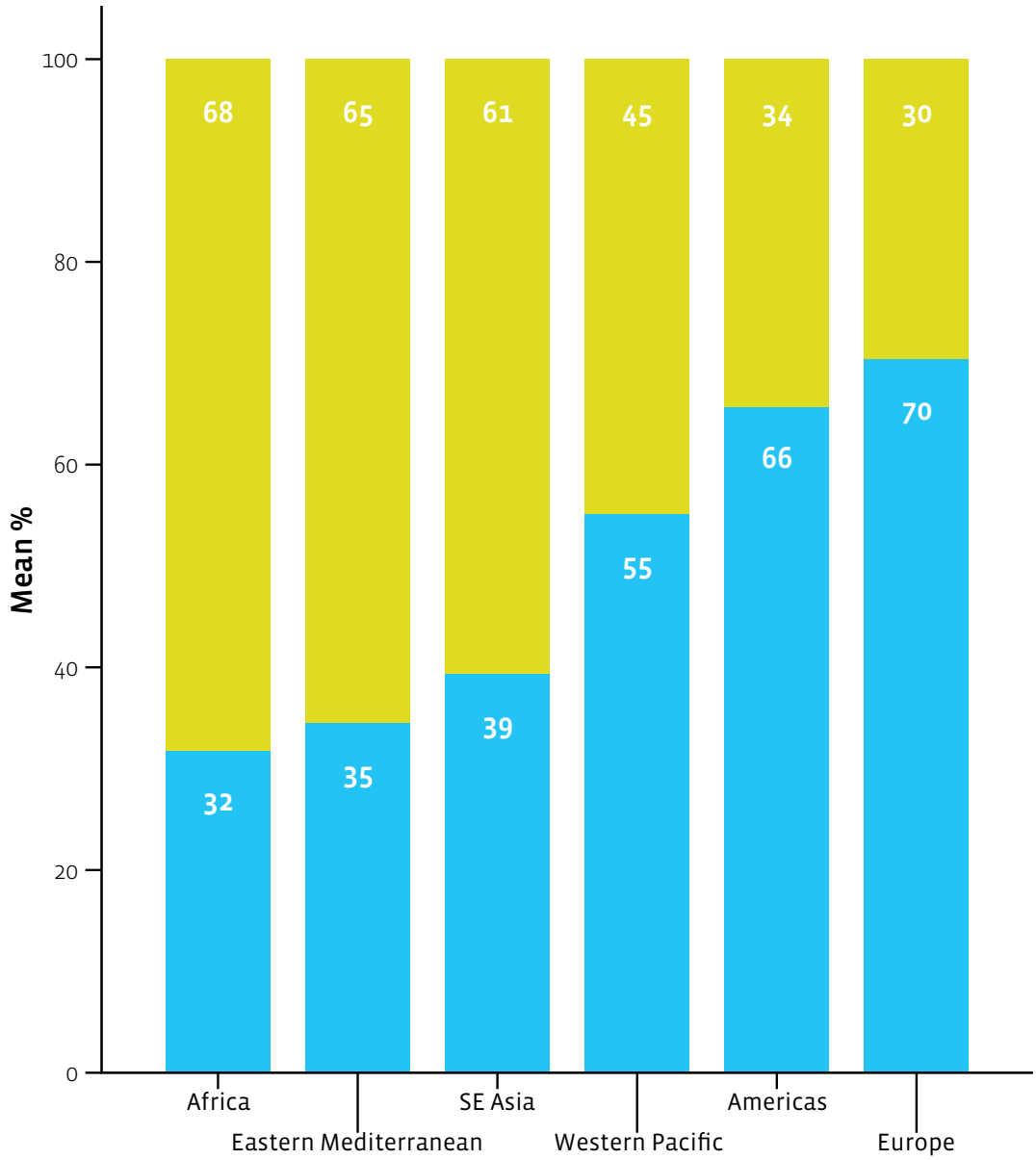


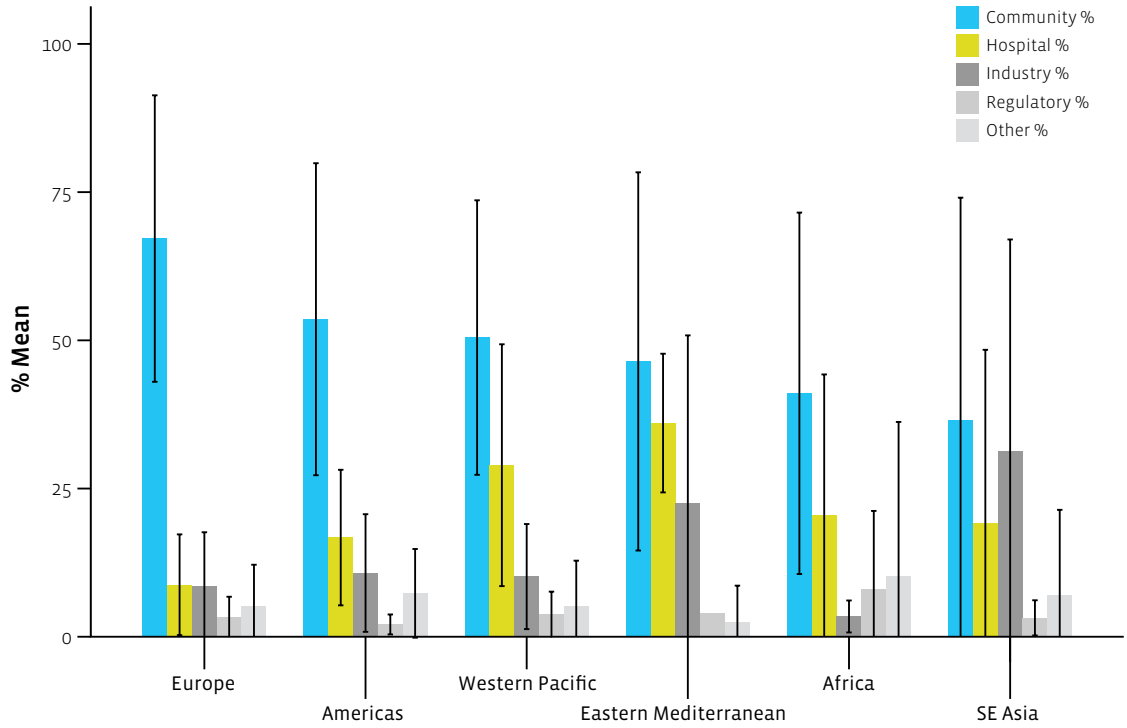
Figure 3.9. Gender distribution by WHO region



Workforce distribution by sector

The 2012 global sample reveals that, on average, 55% of pharmacists were found to work in community pharmacy enviroments, 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.

Figure 3.10. Pharmacist distribution (%) by employment area (+/- SD)



PART 4

PHARMACY EDUCATION

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Summary

- As part of a tri-partite 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 2011/2012 was developed to continue and expand the work, as well as a strategic vision for 2012 and beyond.

- FIP Education Initiatives (FIP*Ed*) 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

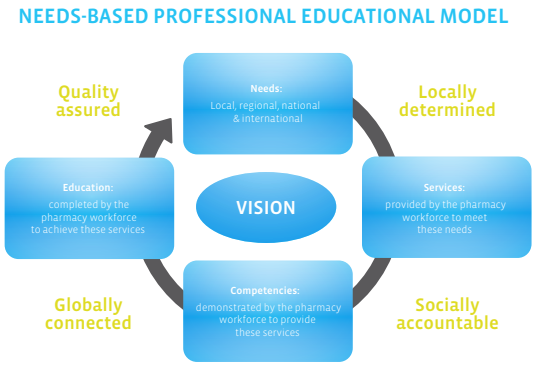
FIP Education Initiatives (FIP*Ed*) is the umbrella directorate bringing together all of FIP's education focused actions, strengthening projects and partnerships with WHO and UNESCO.

FIP*Ed* comprises the Academic Institutional Membership (AIM), the Academic Pharmacy Section (AcPS) and the Pharmacy Education Taskforce (PET). FIP*Ed* 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.

FIP*Ed* 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. FIP*Ed* 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. FIP*Ed* 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.

Figure 4.1. Needs-based professional educational model (PET 2008-present)



The global workforce needs to be competent, capable, adaptable, and oriented to a medicinescentered, patient-focused approach, with development and professional practice, centred on the tenets of needs-based education [2-5].

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 patientfocused 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 [4-7]. 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.

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, academia) 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, post-graduate, 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. FIP*Ed* 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 2011/2012, 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 (1) vision and competency, (2) academic and institutional capacity, (3) quality assurance, (4) pharmacy support worforce, and (5) 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.

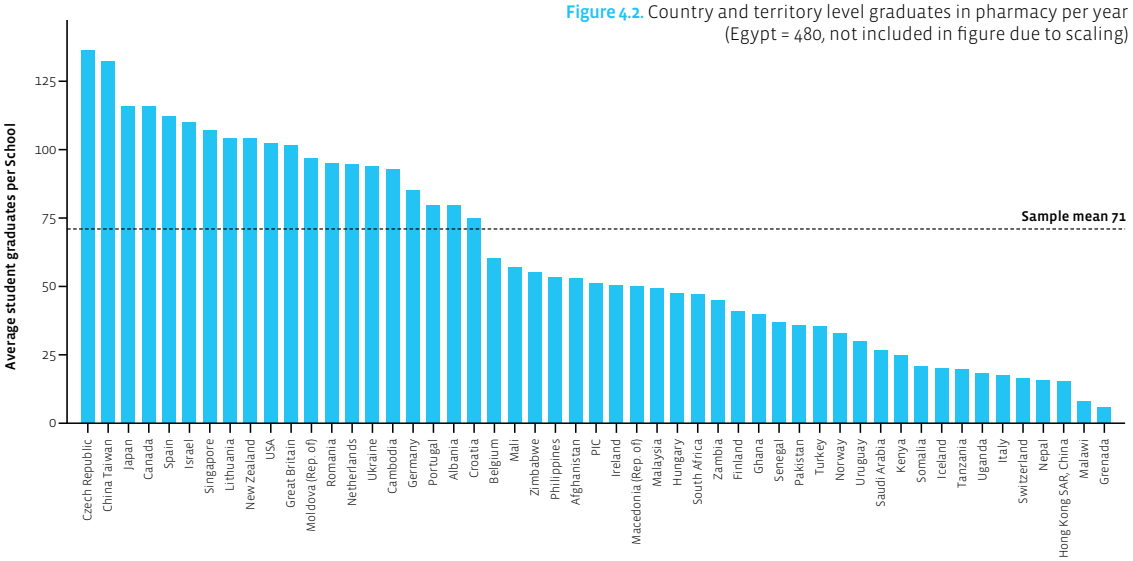
4.2 Pharmacy education capacity and training institution distribution

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 90 country/territory level responses across a number of variables. Three countries in our sample reported 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 1400. The sample reported a total of 2347 schools of pharmacy from 82 countries and territories, of which 1568 were reported as accredited. The reported academic workforce (as a proportion of the total pharmacy workforce) ranges from 0.1% (China) to 35.7% (Cameroon) with a sample mean of 5.2% of the workforce.

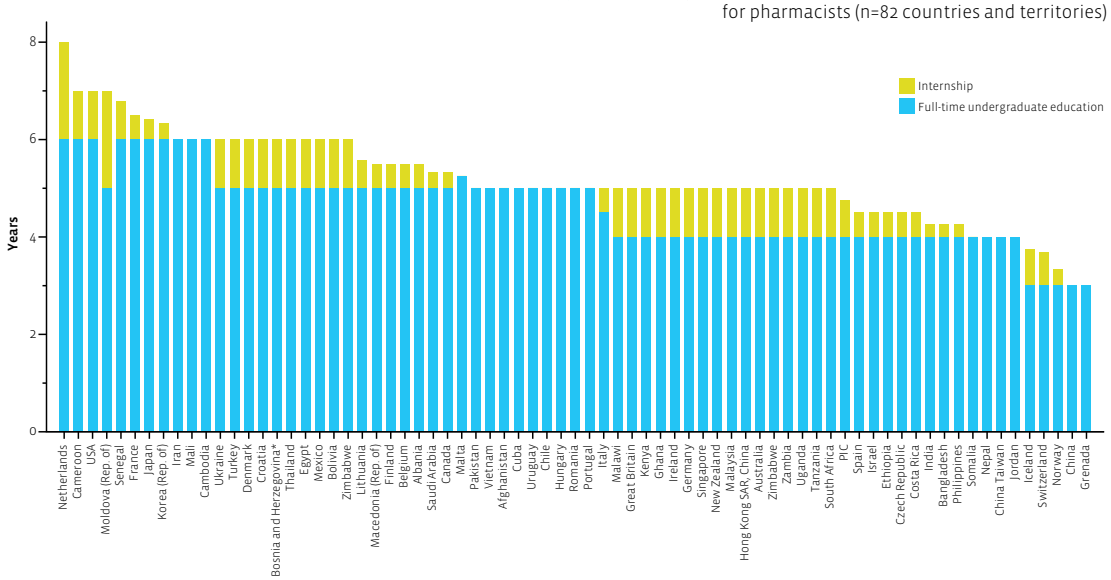
The respondents reported a total of 58,239 (n=54 countries and territories) pharmacy graduates per year, with a sample mean of 71.4 graduates per year per school. Figure 4.2 shows the country and territory level production of newly qualified graduate pharmacists per year (for available data).

Figure 4.2. Country and territory level graduates in pharmacy per year (Egypt = 480, not included in figure due to scaling)



There is also variance associated with length of education and training programmes leading up to registration. Figure 4.3 shows both the length of time for the full-time undergraduate period and any additional time for internship (or pre-registration) periods before licensing of the practitioner.

Figure 4.3. Undergraduate and internship periods of initial education for pharmacists (n=82 countries and territories)



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).

Figure 4.4. Schools of pharmacy by population and by WHO region (n=61 countries and territories)

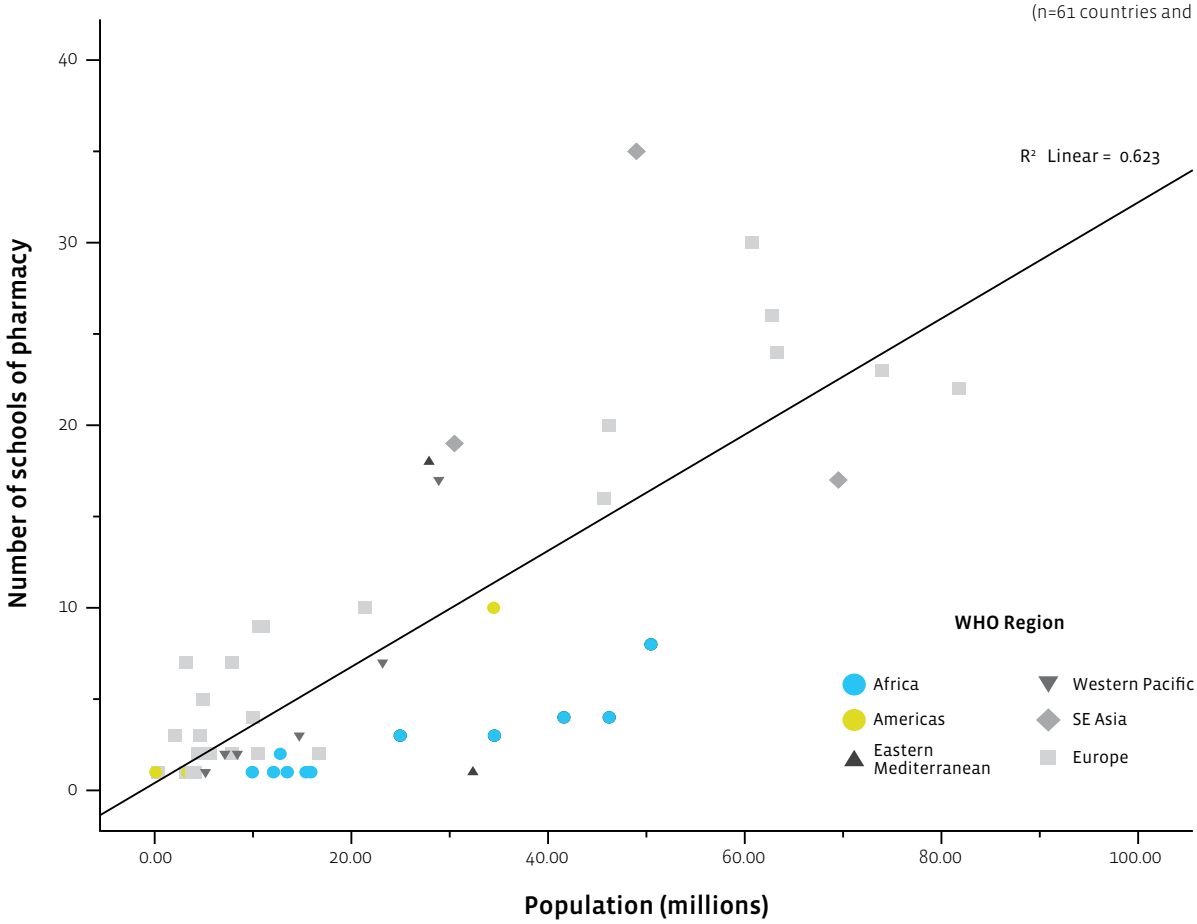
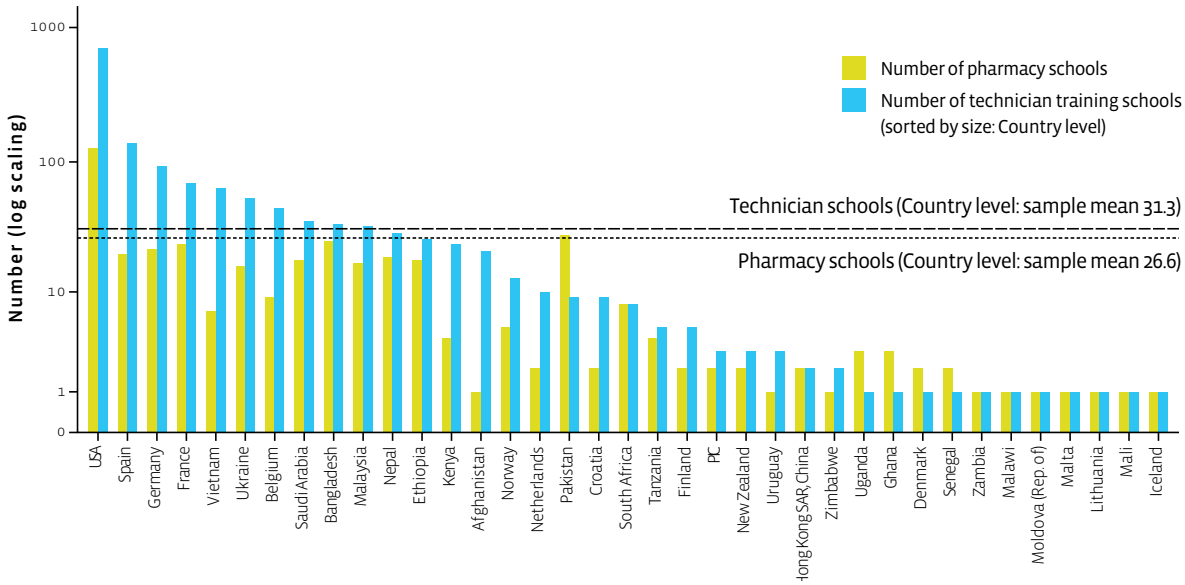


Figure 4.5. Comparative frequencies for pharmacy schools and pharmacy technician training schools (logarithmic scale to enable case comparison)



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 FIP*Ed*.

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 49) 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 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.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 or QA system, but comments on different approaches that exist and outlines trends that are emerging globally [11].

In 2008, WHO and PET supported studies in Ghana and Zambia to undertake a preliminary examination of the potential relevance of the Framework for advancing quality assurance of pharmacy education through detailed stakeholder analysis. Content validity of the Framework was evaluated by the Department of Pharmacy at the University of Zambia and the Faculty of Pharmacy at the Kwame Nkrumah University of Science and Technology in Ghana. There was an overwhelming acceptance of the concept by policy makers, regulators, educators, and practitioners who emphasized the need for broader stakeholder involvement in developing QA systems.

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 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; 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-forpurpose 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 [16]. 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 skills during their initial degree, always with country specifications in mind (the GbCF does not imply that there should be a 'single' global curriculum that would fit all countries). Table 4.1 indicates the terminology used by PET regarding the theme of competence.

Table 4.1. Terminology used by PET [17]

Competency	Single item of knowledge, skill or professional value.
Competency Framework	A complete collection of competencies that are thought to be essential to performance.
Competence	Full repertoire of competencies.
Competencies	The knowledge, skills, behaviours and attitudes that an individual accumulates, develops, and acquires through education, training, and work experience.
Performance	Effective and persistent behaviour.
Performance Indicators	A measure of performance against a specified criteria or standard.
Practice Standards	The systems, procedures, and information used by the pharmacists in providing professional services that serve as a standard against which performance can be assessed.

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.

Table 4.2. Prevalence of practitioner development (or competency) framework

Pharmacists			
2009 Workforce Report (n=52)		**2012 Workforce Report (n=81)**	
Yes	20 (38%)	Yes	27 (33%)
In development	13 (25%)	In development	17 (21%)
No	19 (37%)	No	37 (46%)
Pharmacy Technicians			
2009 Workforce Report (n=41)		**2012 Workforce Report (n=74)**	
Yes	8 (20%)	Yes	18 (24%)
In development	9 (22%)	In development	8 (11%)
No	24 (59%)	No	48 (65%)

Data gathered from the global workforce report survey in 2012 indicate that 27 countries (33%) have a competency framework for pharmacists, 17 countries (21%) are currently developing one and 37 countries (46%) do not have one in place. For pharmacy technicians, 18 countries (24%) reported having a competency framework, 8 countries (11%) reported they are developing one and 48 countries (65%) 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 data also support the growing body of evidence that suggests that frameworks that use a competency approach are being implemented by pharmacists and pharmacy technicians as a way of operationalising otherwise vague concepts of CPD and CPD policy. [18-22].

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. This is a key moment in global education development and should form the basis for further research and development into advanced practice development strategies.

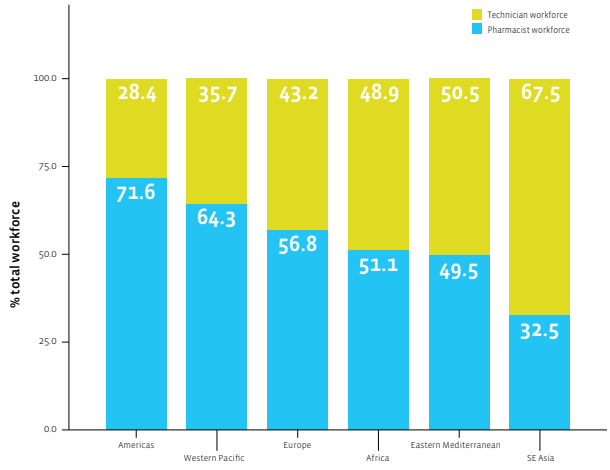
4.5 Pharmacy support workforce

FIP acknowledges that health care facilities cannot operate without medicines [14]. The availability of both medicines and a pharmacy workforce in adequate numbers with appropriate competencies is crucial to ensuring a well-functioning pharmaceutical system [14].

In low-income countries where a shortage of pharmacists and technologies exists, other cadres are required to have extended responsibilities. This reliance on mid-level cadres is consistent with global trends and often reflects the unavailability of more highly qualified health professionals in those countries [23, 24]. In middle to high-income countries, well-trained pharmacy support staff allow pharmacists more time for clinical activities, which can translate into improved patient health outcomes and savings in health expenditure [25-27].

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.

Figure 4.6. Percentage of regional means for pharmacy and technician workforce (n=62 matched variable pairs)



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 ofexpected competency patterns. It should be noted that the International Labour Organisation adopted a definition for pharmacy technicians "Pharmacy technicians and assistants perform a variety of tasks associated with dispensing medicinal products under the guidance of a pharmacist, or other health professional" [28]. However is not used consistently, with many countries requiring these cadres to work unsupervised (especially in rural environments) [29].

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 indicate the varied nature of workforce distribution, cadre names, competency expectations, supervision, regulation systems and education needs.

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

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 webbased communication systems have created opportunities for more robust discussions of collaborative but needs-based educational models for pharmacy services [30]. Taking full advantage of these opportunities will require new insights, skills, and perspectives at every leadership level.

However, 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 [31]) increasingly value inclusion of leadership instruction. Some professional organizations have created special interest groups and frameworks (e.g., the Royal Pharmaceutical Society Leadership Competency Framework [32]) to support leadership development across the career of the pharmacy professional. Such models tend to be focused on a single system or population, however, and additional work is needed to determine the potential for cross applicability. Further, as educational systems continue to connect, there is a need for specific training for leaders to become competent in cross-cultural awareness and practices.

Although there are numerous local, regional, and national efforts for leadership communication, development and recognition, some resources with an international focus include, but are not limited, to:

- **International Leadership Association** - http://www.ila-net.org/ This association is a global network for all those who practice, study and teach leadership.
- **The Leadership Quarterly** - http://www.sciencedirect.com/science/journal/10489843 | This journal brings together a focus on leadership for scholars, managers, and administrators, as well as university academic staff across the world who teach leadership courses.

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.

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 [33].

An essential part of this is 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 sof the content of the journal, soon to be published in Pharmacy Education. This review confirmed that Pharmacy Education historically 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.

Figure 4.7. First author reporting in Pharmacy Education since inception of the journal by WHO region (2000-2011)

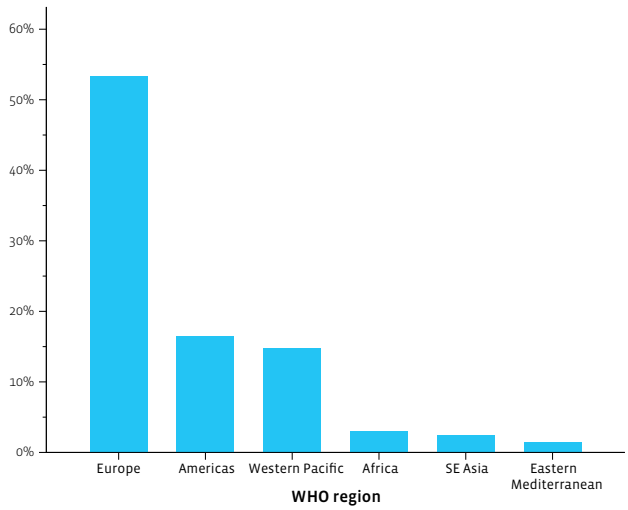
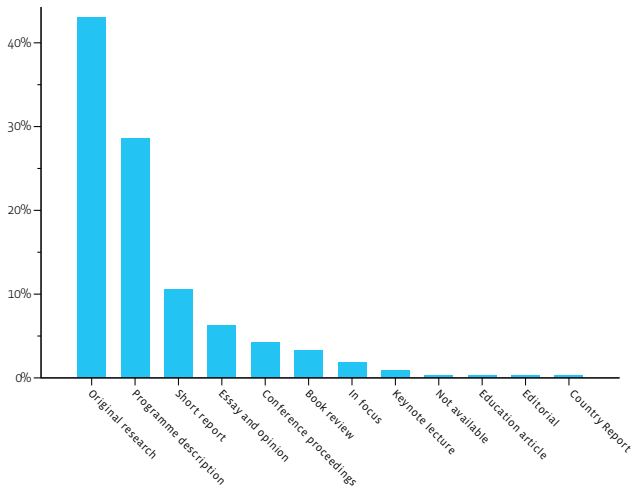


Figure 4.8. Volume of published articles by article type (2000- 2011)



4.8 Summary and future steps

- FIP*Ed* 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 [34]. 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 (GPhED)', the publication of an updated version of the FIP Quality Assurance Framework for Pharmacy Education, further validation and development of the GbCF, finalisation of the pharmacy support workforce competency survey and the compilation of leadership development resources.

References

1. The W1. International Pharmaceutical Federation (FIP), United Nations Educational, Scientific and Cultural Organization (UNESCO), World Health Organization (WHO). Global Pharmacy Education Taskforce Action Plan 2008-2010. Available from: www.fip.org/education_taskforce/resources.
2. Lim Z, Anderson C, McGrath S. Professional skills development in a resource-poor setting: The case of pharmacy in Malawi. Int J Educ Dev. 2012; 32:654–64.
3. Frenk J, Chen L, Bhutta ZA et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. The Lancet, 2010; Vol. 376 No. 9756 pp 1923-1958.
4. Anderson C, Bates I and Brock T. Seven Billion Humans and 98 Trillion Medicine Doses. Am J Pharm Educ, 2011; 75(10): article 194.
5. Anderson C, Bates I, Brock T. Seven billion humans and 98 trillion medicine doses. Am J Pharm Educ. 2011; 75(10):194.
6. FIP Pharmacy Education Taskforce Advisory Group. Health professionals for a new century: Transforming education to strengthen health systems in an interdependent world. Lancet. 9 April 2011; 377(9773):1236-7.
7. Anderson C, Bates I, Futter B, Gal D, Rouse M, Whitmarsh S. Global perspectives of pharmacy education and practice. World Medical & Health Policy. 2010: 2(1):2.
8. International Pharmaceutical Federation (FIP). Global pharmacy workforce and migration report: A call for action. The Hague, The Netherlands: FIP; 2006. Available from: http://www.fip.org/menu_ sitemap?page=hrfh_introduction.
9. Anderson C, Bates I, Beck D, Manasse Jr. HR, Mercer H, Rouse M et al. FIP roundtable consultation on pharmacy education: Developing a global vision and action plan. Int Pharm J. 2006; 20:12-13.
10. International Pharmaceutical Federation (FIP). A global framework for quality assurance of pharmacy education (version 1.0). The Hague, The Netherlands: FIP; 2008.
11. International Pharmaceutical Federation (FIP) Pharmacy Education Taskforce. Quality assurance in pharmacy education: A cornerstone for strengthening the pharmacy workforce in India. 2nd Global Forum on Human Resources for Health. 2011.
12. Rouse M. Continuing professional development in pharmacy. J Am Pharm Assoc. 2004; 44(4):517-520.
13. Interprofessional Education Collaborative Expert Panel. Core competencies for interprofessional collaborative practice: Report of an expert panel. Washington, D.C.: Interprofessional Education Collaborative. 2011.
14. International Pharmaceutical Federation (FIP). 2009 Global pharmacy workforce report. The Hague, The Netherlands: FIP; 2009.
15. International Pharmaceutical Federation (FIP). FIP Statement of Professional Standards on Continuing Professional Development (2002, Nice). The Hague, The Netherlands: FIP, 2002.
16. Bruno A, Bates I, Brock T, Anderson C. Towards a global competency framework. Am J Pharm Educ. 2010; 74(3):56.
17. Bruno AF. The feasibility, development and validation of a global competency framework for pharmacy education [PhD Thesis]. London: University of London, The School of Pharmacy; 2011.
18. Mestrovic A, Stanicic Z, Hadziabdic M, Mucalo I, Bates I, Duggan C, et al. Individualized education and competency development of Croatian community pharmacists using the general level framework. Am J Pharm Educ. 2012; 76(2):23.
19. Mestrovic A, Stanicic Z, Hadziabdic M, Mucalo I, Bates I, Duggan C, et al. Evaluation of Croatian community pharmacists' patient care competencies using the general level framework. Am J Pharm Educ. 2011; 75(2):36.
20. Coombes I, Avent M, Cardiff L, Bettenay K, Coombes J, Whitfield K, et al. Improvement in pharmacist's performance facilitated by an adapted competency-based general level framework. J of Pharm Prac and Res. 2010; 40(2):111-18.
21. Mills E, Farmer D, Bates I, Davies G, Webb D. The general level framework – Use in primary care and community pharmacy to support professional development. Int J of Pharm Prac. 2008, 16:325-331.
22. Antoniou S, Webb DG, McRobbie D, Davies JG, Wright J, Quinn J, et al. A study of the general level framework: Results of the south of England competency study. Pharm Educ. 2005; 5:201-7.
23. Brown A, Cometto G, Cumbi A, et al. Mid-level health providers: A promising resource. Rev Peru Med Exp Salud Publica. 2011; 28(2):308-315.
24. Fulton BD, Scheffler RM, Sparkes SP, Auh EY, Vujicic M, Soucat A. Health workforce skill mix and task shifting in low income countries: A review of recent evidence. Human Resources For Health. 2011; 9(1):1-1.
25. Adams AJ, Martin SJ, Stolpe SF. "Tech-check-tech": A review of the evidence on its safety and benefits. Am J of Health Syst Pharm. 1 October 2011; 68:1834-5.
26. Myers CE. Opportunities and challenges related to pharmacy technicians in supporting optimal pharmacy practice models in health systems. Am J Health Syst Pharm. 15 June 2011; 68(12):1128-36.

27. Shane R. [Commentary on] Advancing technician roles: An essential step in pharmacy practice model reform. Am J of Health Syst Pharm. 1 October 2011; 68(19):1834-5.

28. ILO. International Standard Classification of Occupations Draft ISCO 08 Group Definitions in Health. 14 September 2011. Available from: http://unstats.un.org/unsd/class/intercop/expertgroup/2007/AC124-12.PDF

29. Smith N. Competencies to practice for pharmacists, pharmacy technicians and pharmacy assistants in Fiji. Suva: Fiji Ministry of Health; 2006.

30. Brock T. Fostering careers and leadership. Int Pharm J. 2011; 27(2):19-20.

31. Accreditation Council for Pharmacy Education. Accreditation standards and guidelines for the professional program in pharmacy leading to the Doctor of Pharmacy degree. Chicago: Accreditation Council for Pharmacy Education; 2011. Available from: https://www.acpe-accredit.org/pdf/ACPE_Revised_PharmD_Standards_Adopted_Jan152006.pdf

32. Royal Pharmaceutical Society. Leadership competency framework for pharmacy professionals. NHS Institute for Innovation and Improvement and Academy of Medical Royal Colleges; 2010. Available from: http://www.rpharms.com/you-and-your-career/developing-leadership.asp

33. Carnevale AP, Smith N, Gulish A, Beach BH. Healthcare. Washington, D.C.: Center on Education and the Workforce, Georgetown University; 2012.

34. Anderson C, Bates I, Brock T, Brown AN, Bruno A, Futter B, et al Needs- based education in the context of globalization. Am J Pharm Educ. 2012; 76(4):56.

PART 5

PHARMACY WORKFORCE PLANNING, MANAGEMENT AND DEVELOPMENT CASE STUDIES

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

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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 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 36% live below the poverty line. Life expectancy is 48 years and while mortality rates have declined significantly over the last 10 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 [1].

With approximately 1,163 pharmacists and 822 pharmacy assistants in the country, this workforce is outnumbered seven-fold by the 10,131 private pharmacies, 2,082 public sector pharmacies, 677 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.

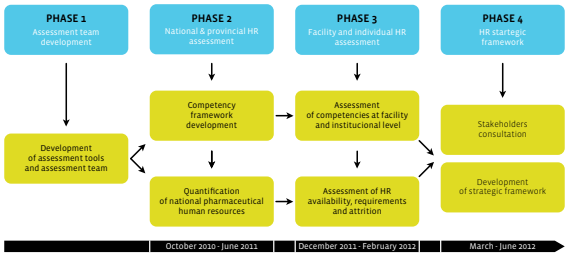
Stakeholders identified eight major areas of services across the public and private pharmaceutical sector in 2010 (described in the *Competency Framework for Pharmaceutical Services in Afghanistan*):

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 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 sustainabilityof 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'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 pharmaceutical human resources strategic framework in 2012 (Figure 5.1.1).

Figure 5.1.1. Overview of the assessment and strategic framework development process



5.1.2. Key Issues

Major pharmaceutical human resources issues in Afghanistan include:

Gaps in information and information flow

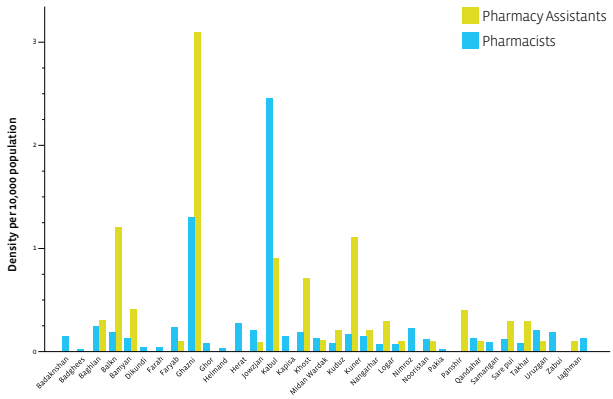
Prior to 2010, there was limited information available about the pharmaceutical human resources in Afghanistan with regards to density, distribution, roles, competency development needs, or projected human resources requirements. Information on pharmaceutical human resources was also not disaggregated by cadres. Information regarding pharmacist and pharmacy assistant graduates and vacancies did not systematically flow among training institutions, GDPA, and GDHR. The lack of a licensing 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 11% were pharmacists and 21% were pharmacy assistants; the majority were other cadres including nurses, physician assistants, teachers, school students, and lay workers. Although pharmaceutical establishments outnumber the pharmaceutical workforce, only 57% of pharmacists who graduated between 2009 and 2010 worked in the pharmaceutical sector, and 20% were unemployed at the time of the graduate tracking survey in February 2012.

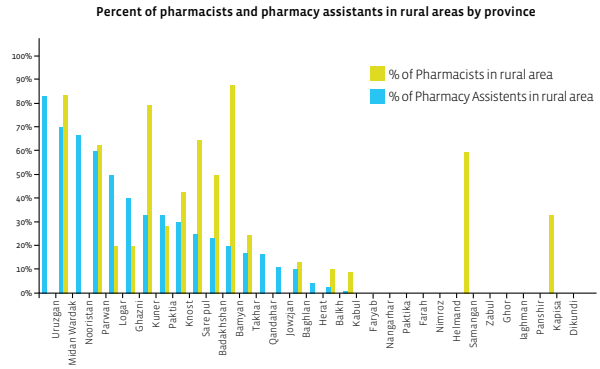
The survey also found maldistribution of pharmacists and pharmacy assistants, with the density varying from zero to more than three per 10,000 population in different provinces (Figure 5.1.2).

Figure 5.1.2. Density of pharmacists and pharmacy assistants per 10,000, by province (Provincial Health Authorities, 2011)



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).

Figure 5.1.3. Proportion of pharmacists and pharmacy assistants in rural areas, by province (Provincial Health Authorities, 2011)



In a February 2012 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 physician 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,
- 36% 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 5,500 to 7,500 Afghanis per month or US$115 to 155). 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 development 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.

Table 5.1.1. Purpose of assessments at each level

Assessment levels	Purpose
National	To identify total number of pharmaceutical personnel, data sources for information on pharmaceutical human resources, and current policies and strategies for pharmaceutical human resources.
Provincial	To identify number of facilities providing pharmaceutical services and total pharmaceutical human resources and distribution, and to gather facility lists.
Facility	To determine employee demographics, cadres providing pharmaceutical services, and human resources policies in each facility.
Individual	To examine the work environment, supervisory support provided and received, support for training received, and competencies of cadres providing pharmaceutical services.

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 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 muchneeded 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

individual-level assessment tool, providing data on their background, working conditions, and competency development needs.

Table 5.1.2. Pharmaceutical human resources assessment: Facilities

FACILITY TYPE	NUMBER OF FACILITIES
Manufacturers	4
Wholesalers	10
Private hospitals	9
Private pharmacies	125
Public hospitals	46
Governmental pharmacies	8
Other: Government directorates, Quality Control Lab	3

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).

Table 5.1.3. Pharmaceutical human resources strategic framework objectives

Pharmaceutical human resources planning
• To strengthen the pharmaceutical human resources information system
• To advocate to related health organizations and authorities on the importance of the pharmaceutical human resources and human resources issues within the health sector
• To advocate for increases in private sector salaries for pharmacists and pharmacy assistants
• To revise the national salary policy pay grading system in MoPH regarding salary, danger pay, overtime, and insurance for pharmaceutical human resources by 2013
Pharmaceutical human resources management
• To establish a Pharmacy Council responsible for regulating pharmacists and pharmacy assistants, and setting pharmacy practice standards
• To recruit minimum pharmaceutical human resources in all 34 provinces in both public and private sectors to improve quality pharmaceutical services
• To revise human resources regulatory procedures for more transparent pharmaceutical recruitment processes in the public sector at central and provincial levels
• To revise guidelines and job descriptions for supportive supervision for pharmaceutical services and to scale up supportive supervision across all 34 provinces
• To improve the capacity of the GDPA and the Legislation Implementation Ensuring Directorate in monitoring and supervision
• To improve occupational health and safety and accessible and safe work environments for pharmaceutical human resources
• To improve safety and security for staff in the Quality Control laboratory
• To revise, improve, and enforce the use of existing job descriptions for pharmacists, pharmacy assistants, and others providing pharmaceutical services in the public sector
Pharmaceutical development
• To establish academic institutions at the provincial level to train more pharmaceutical human resources
• To strengthen the pharmaceutical human resources in the medicines regulatory system
• To build the capacity of pharmacists and pharmacy assistants to perform pharmaceutical roles
• To revise and enhance the pre service curriculum of pharmacists and pharmacy assistants

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 curriculum, forming a Pharmacy Council to license and regulate pharmacists and pharmacy assistants, improving basic pharmaceutical service competencies, and advocating for 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 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.

References

1. Afghanistan Mortality Survey 2010. Afghan Public Health Institute, Ministry of Public Health (APHI/MoPH) [Afghanistan], Central Statistics Organization (CSO) [Afghanistan], ICF Macro, Indian Institute of Health Management Research (IIHMR) [India], and World Health Organization Regional Office for the Eastern Mediterranean (WHO/EMRO) [Egypt]. 2011. Calverton, Maryland, USA: APHI/MoPH, CSO, ICF Macro, IIHMR and WHO/EMRO. Available from: http://measuredhs.com/pubs/pdf/FR248/FR248.pdf

2. Pharmaceutical Human Resources Fact Sheet. Ministry of Public Health [Afghanistan] and Strengthening Pharmaceutical Systems Project. Afghanistan. February 2012.

3. Tata H, Wuliji T, Cinnella E. Pharmaceutical Human Resources Assessment Tools. WHO. 2011. Available from: http://apps.who.int/medicinedocs/en/m/abstract/Js18717en/

5.2 Country Case Study: Costa Rica

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Summary

- The Colegio de Farmacéuticos de Costa Rica (Costa Rica's Pharmacists Association) has regulated general pharmacist practice since 1902 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 3,378 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 (64.60%) and the pharmaceutical industry (31.68%).
- On average, there is one private pharmacy for every 4,454 inhabitants, although the geographical distribution is unequal; there is an average of one public (state) pharmacy for every 15,390 inhabitants.
- 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 [1]. 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].

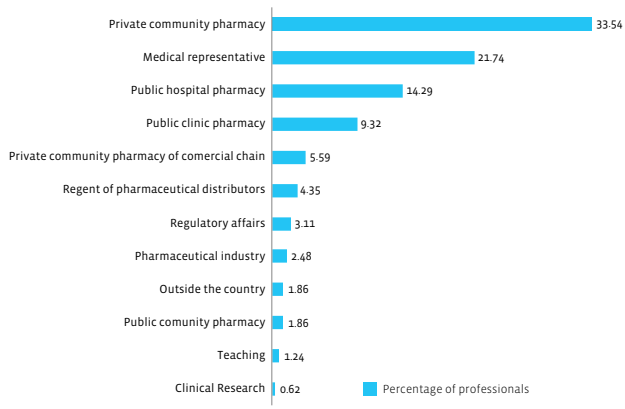
Pharmaceutical human resources in the country

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 78.5. There are no unemployed pharmacists in the country [3]. 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 (64.60%) 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, 1.24% 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.

Figure 5.2.1. Distribution of pharmacy practice areas



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

Community pharmacies and hospitals are divided between the public and private sectors. The roles developed in this area of practice include: dispensing, pharmaceutical advice, pharmacovigilance, and pharmaceutical care-all activities carried out under the standards and regulations issued by the Ministry of Health of Costa Rica [4]. In a study conducted in 2009, it was found that the main services offered in pharmacies include providing written information for promoting health and providing injections, blood pressure, and blood glucose measurement [5].

The roles of pharmacists in the pharmaceutical industry are indispensable, as national legislation requires that all pharmaceutical companies and medicines distribution companies must have a professional pharmacist who is in charge. Even the roles of medical representatives must be performed by a pharmacist or a physician.

To practice as a pharmacist in Costa Rica, enrollment in the Colegio de Farmacéuticos de Costa Rica and possessing a degree in pharmacy is required; however there is no pre-regitration exam.

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 5.2.1 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.

Table 5.2.1. Distribution of pharmacies

Province	Number of public pharmacies	Population per public pharmacy	Number of private pharmacies	Population per private pharmacy
ALAJUELA	57	16085	156	3486
CARTAGO	22	19295	77	2948
GUANACASTE	29	7698	70	1744
HEREDIA	22	19551	123	2140
LIMÓN	30	13548	42	6889
PUNTARENAS	46	5503	66	2388
SAN JOSÉ	59	26051	407	2080
Total	**265**	**15816**	**941**	**4454**

Source: Data obtained from, and used with the permission of, the Colegio de Farmacéuticos de Costa Rica, 2012.

Regulation of professional practice

In Costa Rica, professional practice is regulated by the Colégio 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 (CONESUP) 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 (UCIMED) 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 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 Farmacéuticos de Costa Rica, by university of origin and year of registration, from 2001 to 2011

Year												
University	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	**Total**
UIA	16	58	114	73	22	42	35	54	58	42	77	**591**
UNIBE	33	33	42	40	54	56	74	89	43	75	113	**652**
UCIMED	0	11	7	46	13	18	8	33	10	21	19	**186**
UCR	77	94	75	77	50	34	56	43	55	44	58	**663**
Total	126	196	238	236	139	150	173	219	166	182	267	**2092**

Source: Data obtained from, and used with the permission of, Colegio de Farmacéuticos de Costa Rica. 2012

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, 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 261 professionals, most of whom are specialists in management health facilities (96), followed by specialists in the analysis and quality control of medicines (26) [6].

5.2.2. 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 3.3 years; at UCIMED, 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.

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 [7]. 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.
Badilla 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 or legal courts.

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 Farmacéuticos 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 Farmacéuticos has a professional recertification programme, which is voluntary and charges an annual fee to the professional who wants to participate. This programme aims to encourage the participation of pharmacists in professional development activities and, through the commission of recertification and continuing education committee, 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.

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 [9].

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 overturn the widespread view of private pharmacies as mere commercial establishments and turn them into true health care centers. Also it is intended that 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].

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 salaried 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.

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

1. Instituto Nacional de Estadísticas y Censos. Costa Rica. Available from: http://www.inec.go.cr/Web/Home/pagPrincipal aspx
2. Caja Costarricense de Seguridad Social. Costa Rica. Available from: http://portal.ccss.sa.cr/portal/page/portal/Portal
3. Gutiérrez I, Valverde L, González R, Alfaro X. Consejo Nacional de Rectores, Oficina de Planificación de la Educación Superior Seguimiento de la condición laboral de las personas graduadas 2000-2007 de las Universidades Costarricenses. San José : CONARE 2012.
4. Ministerio de Salud. Manual de Normas de Habilitación de Farmacias. Gaceta 175. 2004.
5. Jiménez Díaz AP, Rojas Morera MT, Arias Mora F. Caracterización de los servicios brindados en las farmacias privadas en Costa Rica. Pharmaceutical Care La Farmacoterapia. 2012; 1(1):4-10.
6. Colegio de Farmacéuticos de Costa Rica. Comisión de especialistas. 2012.
7. SINAES. Lista de carreras con acreditación oficial. Available from: http://www.sinaes.ac.cr/carreras_acreditadas/acreditadas_por_area.htm
8. Badilla B. and Bolaños C. Armonización Curricular de las facultades de Farmacia de Costa Rica. Informe Final. 2011.
9. SINAES. ¿Qué es la acreditación?. Available from: http://www.sinaes.ac.cr/faq/
10. Conferencia Panamericana de Educación Farmacéutica. Propuesta de acreditación para carreras de Farmacia de América Latina. Borrador discutido por Representantes de Facultades de 17 países y OPS/OMS, 19 and 20 November 2008.

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 population, their management, and rational use, all these being vital components of the architecture to improve access to 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 a 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 in Ghana. Anecdotal evidence from the Pharmacy Council of Ghana identified workforce retention as the greatest challenge contributing to the key findings observed. The following strategies were adopted to address the workforce challenges, namely: expansion of training institutions, improved remuneration packages in the public sector, and the development and implementation of the Doctor of Pharmacy (Pharm D) degree and other continuous professional development (CPD) programmes.

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. Pharmacy has generally undergone tremendous changes both in concept and practice since then-major changes resulting in an emphasis on patients rather than medicines.

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 2969 pharmacists, 2139 technicians and 4250 medicine counter assistants, only a total of 1,966 are actively practicing pharmacists (0.81 per 10,000 population), 1,075 actively practicing pharmacy technicians (0.44 per 10,000), and 3,000 medicine counter assistants (1.24 per 10,000). In 2011, public and private sectors employed 35% and 65% 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.

Table 5.3.1. Number of pharmacists per employment sector

Sector		No. of pharmacists (N=1,966)	%
Public Health Institucions	Public Hospitals & Christian Health Association of Ghana (CHAG)	505	
	Quasi Gov't Hospitals	65	
	Regulatory	75	33.0
Private Hospitals & Clinics		16	0.8
Private retail/wholesale pharmacies*		1,931	98.2
Pharmaceutical manufacturers		80	4.0
Academia/teaching		60	3.0
Multilateral/bilateral/NGOs		6	0.3
Not currently working		N/A	N/A

Data source: Assessment of Pharmaceutical Human Resources 2011(1).
*Pharmacists are allowed to work in more than one sector of employment.

Table 5.3.2. Total number of premises providing pharmaceutical services

Types of premise	Number	Percentage	Number of pharmacists
Public hospital pharmacies	172	1.3	570
Private hospitals/clinics dispensaries	925	6.7	16
Private retail/wholesale pharmacies	2,007	14.6	1,931
Licensed Chemical Sellers	10,602	77.4	N/A
Total	**13,706**	**100.0**	

Data source: Pharmacy Council Register of Pharmaceutical Facilities 2011

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

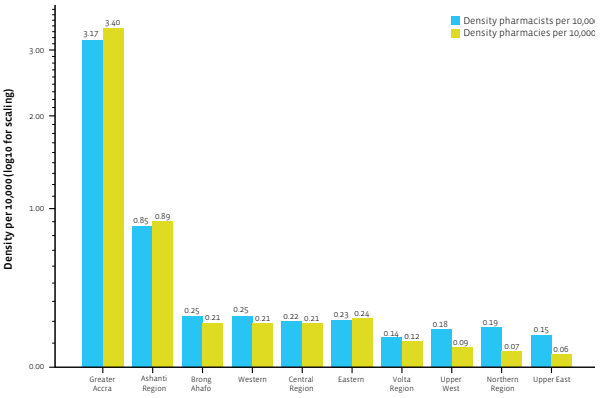
Projection and supply

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 cadres are concentrated in urban regions with the ratio of pharmacy personnel in each region ranging between 0.14-3.17 per 10,000 population for pharmacists (Table 5.3.3) and 0.12-0.52 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.

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

Region	Number pharmacists	Number pharmacies	No. of public health facilities	No. of private hospitals, clinics & maternity homes (PHCM)	Pharmacists % change 2009-11	Technicians % change 2009-11	Density pharmacists /10,000 population	Density pharmacies /10,000 population
Greater Accra	1238	1328	34	51	18.9	28.6	3.17	3.40
Volta Region	30	25	175	55	7.1	2.4	0.14	0.12
Eastern	60	62	357	26	34.8	0.0	0.23	0.24
Central Region	46	44	106	84	2.2	8.1	0.22	0.21
Western	58	50	110	242	3.6	0.0	0.25	0.21
Ashanti Region	400	420	159	269	21.2	9.6	0.85	0.89
Brong Ahafo	58	48	82	130	38.1	0.0	0.25	0.21
Northern Region	47	18	196	15	67.9	42.1	0.19	0.07
Upper East	47	18	196	15	67.9	42.1	0.19	0.07
Upper West	12	6	57	2	50.0	0.0	0.18	0.09
TOTALs	**1966**	**2007**	**1310**	**925**	**20.1**	**15.6**	**0.81**	**0.83**

Figure 5.3.1. Comparative frequencies for density of pharmacists per 10,000 and density of pharmacies per 10,000 in the different regions of Ghana (logarithmic scale to enable region comparison)



Sources: Ghana Statistical Service, 2010 Population and Housing Census; Private Hospitals and Maternity Homes Board Report, 2011; Pharmacy Unit MoH/Ghana Health Service (GHS) November 2011; Pharmacy Council, 2011

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 90; and 21 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 implmented to provide further opportunities for post-graduate and specialist training locally.

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 cies. 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.

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 2001 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 2004 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 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 plans 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 Workforce Observatory by the MoH is expected to address this challenge as the technical committee on training has membership of all stakeholders in training.

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 regulation and management of human resource data that will go a long way to ensure effective distribution of staff. The system will serve as the human resources information system of a sub-regional body called the Economic Community of West African States.

5.3.3. Strategies used and lessons learnt

Table 5.3.4. Strategies used and lessons learnt

Strategy	Stakeholders Involved	Activity/Processes	Opportunities/Barriers	Outcomes
1.0 To integrate pharmaceutical human resources planning with broader human resources for health planning	Pharmaceutical human resources technical working group, Human Resource Development Directorate (HRDD) GHS; Human Resource for Health and Development (HRHD) MoH; Human Resource for Health (HRH); Teaching Hospitals, WHO	**1.1** To actively engage in the broader sectoral HRH planning processes of the MoH and GHS **1.2** To integrate the 2011 – 2016 pharmaceutical human resource plan into the 2011 – 2016 human resources for health plan	**Opportunities** **a.** Pharmaceutical human resources planning already institutionalised within the Ministry of Health and its agencies **b.** WAHO to pilot internet based human resource information system for the pharmaceutical sector **c.** Pharmaceutical human resource indicators included in the District Health Management Information System (DHMIS) **Barriers** **a.** Inadequate funding for human resource development **b.** Lack of clarity on processes to request public sector funding for pharmaceutical human resource development	Ghana National Human Resource strategic plan for the health sector been revised to integrate the pharmaceutical human resource plan.
2.0 To reduce delays in recruitment and improve retention of public sector pharmaceutical personnel	Technical working group on pharmaceutical human resource; Pharmacy Council; Ghana Hospital Pharmacist Association (GHOSPA), Pharmacy Unit MoH; HRDD GHS; HRHD MoH; Ministry of Finance and Economic Planning (MOFEP)	**2.1** Pharmacy Council to build its capacity on pharmaceutical human resource issues by end 2012 **2.2** To develop the capacity of the technical working group to advocate, negotiate, and follow up on recruitment of pharmaceutical human resources **2.3** To negotiate for improved remuneration and other incentive packages.	**Opportunities** **a.** Two new schools of pharmacy to increase intake **b.** Commonwealth scholarships available for further study **c.** The MoH ensures that only programmes that are not available in the country are granted external fellowships **Barriers** **a.** Lack of well developed career pathway for pharmaceutical cadres **b.** Lack of practice oriented post-graduate training programs **c.** Annual fellowship plans are not fully implemented because the budgetary allocation	Public sector recruitment increased from 26% in 2009 to 35% in 2011. Public sector salaries improved. It is now more attractive to work in the public sector than the private sector.
3.0 To further develop, review and dissemina te a comprehensive set of practice standards for both the public and private sector	PC, Pharmacy Unit/MoH, Ghana National Drugs Program, Pharmaceutical Society of Ghana (PSGH)	**3.1** To form a review committee to examine existing practice standards documents (Standards for Pharmaceutical Care, Practice Standards for Pharmacists, Licensed Chemical Sellers, Pharmacy Technicians and MCAs) **3.2** To develop one draft comprehensive standards document and circulate to all stakeholders	**Opportunities** **a.** Public and private sector facilities are sponsoring upgrade training (eg, pharmacy technicians to undergo BPharm program) **b.** Pharmacy Council (PC) has an existing website which can be improved and used to run online CPD programmes as well as to disseminate information	Practice standards for all categories of pharmacy workforce developed.
4.0 To review and reform curriculum of preservice education to be needs-based, practiceoriented and linked to required competencies within the scope of practice for each cadre	Training institutions, Pharmacy Council, Pharmacy Unit/MoH, PSGH, HRHD/MoH, HRDD/GHS, Ghana Education Service, MoE, World Health Organization (WHO)	**4.1** To establish a pharmacy education reform working group **4.2** To evaluate existing tools for quality assurance and standardize them into single quality assurance tool **4.3** To conduct curriculum review and quality assessment of all pre service training programmes **4.4** To develop and implement plans for curriculum reform based on findings	**Opportunities** **a.** Kwame Nkrumah University of Science and Technology (KNUST) is reviewing its BPharm curriculum to develop a PharmD programme **b.** Pharmacy Council is developing a five year CPD programme plan for training of pharmacists, pharmacy technicians and licensed chemical sellers	The PC in collaboration with KNUST and Ohio Northern University has developed the PharmD curriculum. KNUST to admit the first batch of PharmD students this academic year. CPD programme for pharmacists undertaken by the PC annually. Similarly, LCS are trained annually.
5.0 To strengthen the academic capacity of training institutions	MoE, Local and international training Institutions; Private sector, Development Partners; Ghana Education Trust Fund (GETFund)	**5.1** To establish a working group on academic capacity development **5.2** To identify relevant postgraduate programmes and scholarships for academic staff **5.3** To build national and international exchange programmes between training institutions as a mechanism for sharing and expanding academic capacity **5.4** To improve library capacities of training institutions and subscribe to databases and journals	**Opportunities** **a.** The establishment of Advisory Boards composed of most key stakeholders for holistic decision-making.	KNUST has signed a memorandum of understanding with other international training institutions to develop faculty members and access to other training logistics.

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 pharmacy education, job descriptions not specific to functional job areas, limited opportunities for career development, 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.

References

1. Ghana Demographic and Health Survey 2008. Ghana Statistical Service (GSS), Ghana Health Service (GHS), and ICF Macro. Accra, Ghana: GSS, GHS, and ICF Macro; 2009. Available from: http://www.measuredhs.com/pubs/pdf/FR221/FR221.pdf

2. Assessment of Ghana Pharmaceutical Human Resources 2009 (unpublished).

3. Specialist Health Training and Plant Research Act, ACT 833, 2011.

4. Ghana National Human Resource Strategic Plan for the Health Sector, 2007 – 2011.

5.4. Case study: Great Britain

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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.
- 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 2010 (previously, the regulator was the Royal Pharmaceutical Society of Great Britain). Mandatory registration of pharmacy technicians with the GPhC has been in place since July 2011. Pharmacy assistants are not formally regulated but pharmacists are professionally accountable for this part of the workforce. The GPhC's functions include approving qualifications, accrediting education and training providers, maintaining registers, setting standards, and establishing fitness to practice requirements. The Royal Pharmaceutical Society (RPS) is now the professional leadership body for pharmacists and pharmacy in England, Scotland, and Wales. The RPS promotes pharmacy to ensure that pharmacists are recognised within the NHS and wider society as experts in medicines. The RPS is facilitating effective approaches to workforce planning and development for the profession.

Effective workforce planning and development supports pharmacy service quality by ensuring that a sufficient number of pharmacy staff with the right skills are in the right place, at the right time, at the right price [1]. 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/exits from the register. Numbers of independent and supplementary prescribers were also described.

Findings from the pharmacy workforce census [3] 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 69.6% of registered GB resident pharmacists) indicates that most pharmacists were employed in the community sector (71.0%), with 21.4% working in hospital pharmacy. Significantly, community pharmacy locum posts accounted for 23.1% of all posts.

5.4.2. Key issues

The NHS

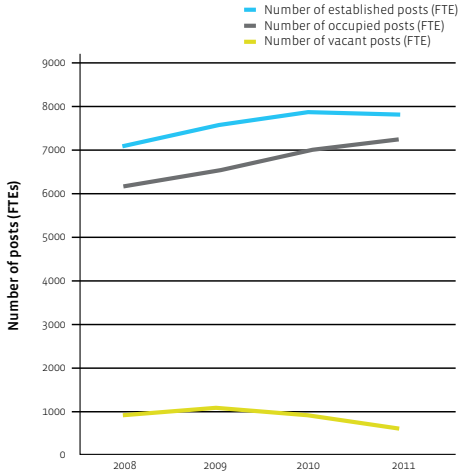
Over the decade between September 2000 and September 2010, the National Health Service (NHS) workforce grew by 30% [4], reaching 1.4 million people employed and maintaining its place as the third largest workforce in the world. The UK's (Great Britain and Northern Ireland) economic difficulties and restrictions 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 2010 community pharmacies dispensed 926.7 million prescription items [5], an increase of 3.5% from 2009 and an increase of 58.2% 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 0.1% 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



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 [7].

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 acredited 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.

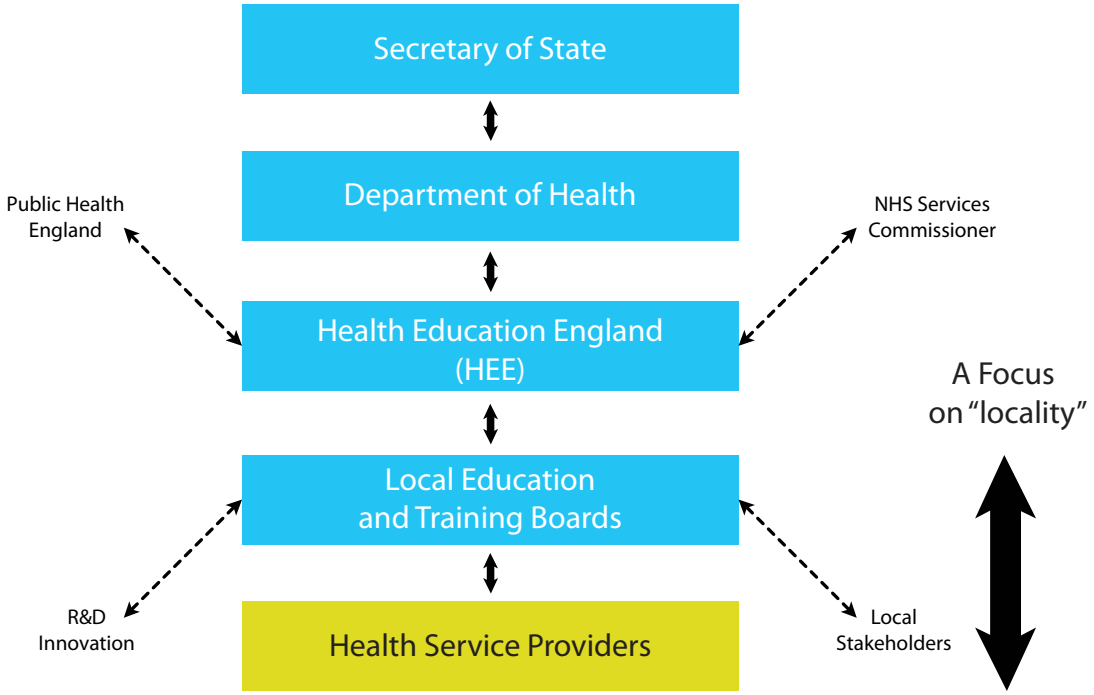
The Centre for Workforce Intelligence (CfWI) provides advice to health and social care planners, clinicians and commissioners in England about workforce planning and development. In 2011, the CfWI identified other risks to the pharmacy workforce, [10] including:

- 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

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).

Figure 5.4.2. Education and training system



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 11 reported across the rest of England. The LETBs will be health care provider lead 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 lead times 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 recognise general and advanced levels of skills and enable 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 Commission's green paper Modernising 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 commissions.
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 GB's devolved 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 is also 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 10 years - consultant pharmacists, pharmacist prescribers, and up-skilled pharmacy technicians have all emerged. The next 10 years will be challenging, but new opportunities are already on the horizon.

References

1. Hurst K. Evaluating the strengths and weaknesses of NHS workforce planning methods. Nurs Times 2010;106(40):10-14.

2. Seston E, Hassell K. Joiners, leavers, and practising and non-practising pharmacists on the 2010 register. Pharm Journal 2011;286: 473-476

3. Hassell K, Seston E, Eden M. The Pharmacy Census 2008: Main findings. London: The Royal Pharmaceutical Society; 2009.

4. The Health and Social Care Information Centre. NHS Workforce: Summary of staff in the NHS. Results from the September 2010 Census. 22 March 2011 [cited 21 October 2011]. Available from: http://www.ic.nhs.uk/webfiles/publications/010_Workforce/nhsstaff0010/Census_Bulletin_March_20 11_Final.pdf

5. The Health and Social Care Information Centre. Prescriptions Dispensed in the Community: England Statistics for 2000 to 2010. 27 July 2011 [cited 27 January 2012]. Available from: http://www.ic.nhs.uk/statistics-and-data-collections/primary-care/prescriptions/prescriptionsdispensed-in-the-community-england-statistics-for-2000-to-2010

6. NHS Pharmacy Education and Development Committee. National NHS Pharmacy Staffing Establishment and Vacancy Survey 2010 [cited 27 January 2012]. Available from: www.nhspedc.nhs.uk

7. Institute for Employment Research. University of Warwick. Who does workforce planning well: A rapid review for the workforce review team. November 2007 [cited 16 March 2012]. Available from: www.healthcare workforce.nhs.uk/option,com_docman/task,doc_download/gid,1500.html

8. Pharmacy Workforce Planning and Policy Advisory Group. Future Pharmacy Workforce Requirements: Workforce Modelling and Policy Recommendations. London: King's College London. 2005.

9. Migration Advisory Committee. Skilled, shortage, sensible: Full review of the recommended shortage occupation lists for the UK and Scotland. 12 September 2011 [cited 21 October 2011]. Available from: http://www.ukba.homeoffice.gov.uk/sitecontent/documents/aboutus/workingwithus/mac/skilledshortage-sensible/

10. Centre for Workforce Intelligence. Pharmacy. Workforce risks and opportunities. July 2011 [cited 21 October 2011]. Available from: www.cfwi.org.uk

11. Liberating the NHS: Developing the Healthcare Workforce. Department of Health. London; 2010.

12. Tooke J. Aspiring to Excellence. Final Report of the Independent Inquiry into Modernising Medical Careers. London: MMC; January 2008 [cited 21 October 2011]. Available from: www.mmcinquiry.org.uk/Final_8_Jan_08_MMC_all.pdf

5.5. Country case study: Japan

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Summary

- 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 90.33 trillion yen (USD 1.11 trillion). Of this, expenditure for social security, 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 and 2) a four-year programme that aims to educate pharmaceutical scientists. In April 2012, 8,182 pharmacists graduated from the 6-year programme to enter the workforce.
- In a revision of the sales system for over-the-counter (OTC) drugs, an examination system regarding registered assistants to sell OTC medicines was implemented.
- The development of the community health care programme is scheduled for 2013. In this proposed government policy, pharmacies and 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 90.33 trillion yen ($1.11 trillion). Of this, expenditure for social security, including medical expenses accounts, was 26.39 trillion yen ($320 million) [1, 2]. In Japan, the numbers of pharmacists and pharmacies as of December 2008 are 267,751 and 53,304, respectively, as summarized in Table 5.5.1. The number of pharmacists is 209.7 for every 100,000 people. As compared with 2006, the number of pharmacists and pharmacies increased 15,218 and 1,352, respectively.

Table 5.5.1. Number of pharmacists and pharmacies

	2006		2008	
	NUMBER	%	NUMBER	%
Total Pharmacists	**252,533**	**100.0**	**267,751**	**100.0**
Community Pharmacist	*125,254*	*49.6*	*135,716*	*50.7*
Hospital Pharmacist	*48,964*	*19.4*	*50,336*	*18.8*
Academia/Graduate student	*8,845*	*3.5*	*9,276*	*3.5*
Pharmaceutical Industry	*45,415*	*18.0*	*37,643*	*14.1*
Government	*5,951*	*2.4*	*6,280*	*2.3*
Others	*18,086*	*7.2*	*18,476*	*6.9*
Total Community Pharmacies	**51,952**	--	**53,304**	--

Source: Data from Ministry of Health, Labour and Welfare [3, 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 [5], all schools (excluding universities) need a designated pharmacist (school pharmacist) to monitor appropriate environmental conditions (classroom illumination, air ventilation, examination of tap water 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 this career direction. However, it has been pointed out that this may lead to unequal workforce distribution.

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 pharmaceutical scientists. 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.

Table 5.5.2. Results of national examination of pharmacists carried out March 2012 [6]

	Number
Total	
Candidates	9,785
Successful candidates	8,641
Pass rate (%)	88.31
Graduates of 6 year programme	
Candidates	8,583
Successful candidates	8,182
Pass rate (%)	95.33
Others	
Candidates	1,202
Successful candidates	459
Pass rate (%)	38.19

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.

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 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 governor of each prefecture. The number of registered salespersons is 95,696 as of March 2011 [8].

Table 5.5.3. Classification of OTC drugs [7]

Risk category of OTC drugs	Specialists in charge	Active information supply even without question from purchasers	Response when consulted by purchasers
First-class	Pharmacists	Necessary information for proper us should be provid in writing	Mandatory
Second-class	Pharmacists or registered sales persons	Effort should be made to provide necessary information for proper use	
Third-class		Not required	

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 31.5% [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 2013, 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, pharmacies and pharmacists 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.

5.5.3. 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 [10]. 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 pharmacies 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.

5.5.4. 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 [11]. 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 [12]. 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 (31.5%). Many pharmacists did not have enough experience in dealing with OTC drugs in the past because they focused on dispensing of 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 are 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 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.

References

1. Nippon Communications Foundation. Japan's 2012 Budget. 2012 [cited 15 May 2012]. Available from: http://nippon.com/en/features/h00007/

2. Ministry of Health, Labour and Welfare in Japan. Service guide (English). 2011 [cited 15 May 2012]. Available from: http://www.mhlw.go.jp/english/org/pamphlet/dl/pamphlet-about_mhlw.pdf

3. Ministry of Health, Labour and Welfare in Japan. The survey of the numbers of doctors, dentists, and pharmacists in 2010. 2011 [cited 15 May 2012]. Available from: http://www.mhlw.go.jp/toukei/saikin/hw/ishi/10/dl/kekka_3.pdf

4. Japan Pharmaceutical Association (JPA). Annual Report of JPA 2010-2011. Tokyo: JPA. 2011 [cited 15 May 2012]. Available from: http://www.nichiyaku.or.jp/e/data/annual_report2010e.pdf

5. School Health and Safety Act. http://law.e-gov.go.jp/htmldata/S33/S33HO056.html [cited 7 July 2012]

6. Ministry of Health, Labour and Welfare in Japan. 2012 [cited 15 May 2012]. The Results of 97th National Examination for Pharmacist. Available from: http://www.mhlw.go.jp/stf/houdou/2r98520000016lphatt/2r98520000016lqy.pdf

7. Ministry of Health, Labour and Welfare in Japan. Part 2 Chapter 2 Section 10 Promotion of Measures for Safety and Security of People - White Papers & Reports Annual Health, Labour and Welfare Report 2009- 2010. 2009 [cited 15 May 2012]. Available from: http://www.mhlw.go.jp/english/wp/wphw4/dl/honbun/2_2_10.pdf

8. Ministry of Health, Labour and Welfare in Japan. The condition of examination of registered sales person and the number of registered sales person in FY 2010. 2011 [cited 15 May 2012]. Available from: http://www.mhlw.go.jp/bunya/iyakuhin/ippanyou/pdf/shiken_2011.pdf

9. Ministry of Health, Labour and Welfare in Japan. The report of survey of the state of the supply system of the over-the-counter medicines. 2012 [cited 15 May 2012]. Available from: http://www.mhlw.go.jp/stf/houdou/2r9852000000205gu.html

10. Ministry of Health, Labour and Welfare in Japan.Long-term Care Insurance in Japan. 2002 [cited 15 May2012]. Available from: http://www.mhlw.go.jp/english/topics/elderly/care/index.html

11. Japan Accreditation Board for Pharmaceutical Education. Outline of JABPE. 2008 [cited 15 May 2012]. Available from: http://www.jabpe.or.jp/english/index.html

12. Japan Pharmaceutical Association. Japan Pharmaceutical Association Lifelong Learning Support System. 2012 [cited 15 May 2012]. Available from: http://www.nichiyaku.or.jp/action/wpcontent/uploads/2012/02/jpals_flyer.pdf

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.
- Approximately 300 pharmacy personnel are distributed throughout the public sector of PICs, with more than 80% of these filled by 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 within identified 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.
- 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 organizations, 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 1170 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 (eg Tonga and Fiji). Community pharmacy is active in most of the region's countries, with non-pharmacist cadres playing a significant role in many countries.

Health care in PICs is delivered in rural environments where approximately 80% 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 health care level (Level 1); pharmacy supply and health personnel at the provincial/regional level (Level 2); and pharmacists where available and stores managers at the national level (Level 3) [3]. (Figure 5.6.1)

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

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 develo ment 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 [3].

Generalised EMSM 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. No formal certificate training is available for mid-level cadres involved in EMSM, apart from semi-structured localised training in the Solomon Islands and Tonga.
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 [3].

Health personnel need to be competent in relevant aspects of EMSM in order to direct their country supply systems effectively. This material is often missing from pre-service curricula, while skills in appropriate EMSM are often assumed. As a result, many heath personnel lack the skills required for this essential part of their day-to-day work [3].

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 zrequired 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.

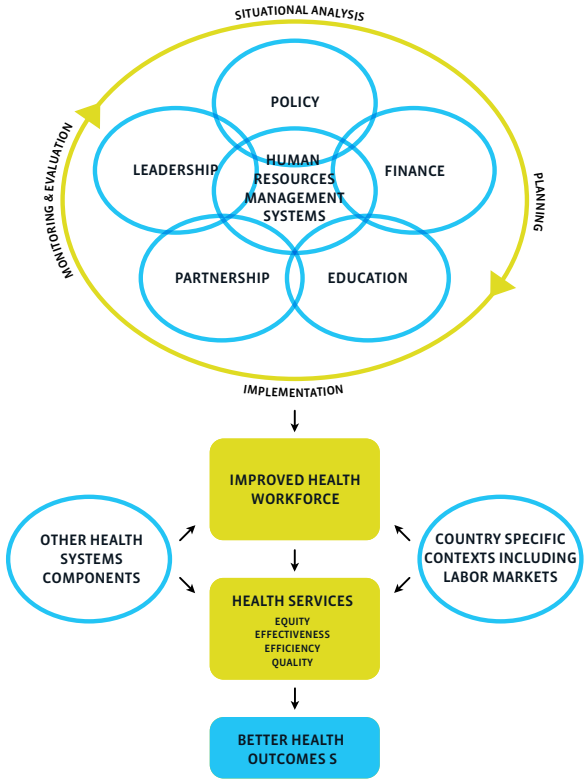
In the health sector, PAR is based on reflection, data collection, and action that aims to improve health and reduce health inequities through involving heath personnel who, in turn, take actions to improve their own circumstances [18]. Any resultant action is then further researched, and an interactive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

Figure 5.6.2. WHO Global Health Workforce Alliance (GHWA) Health Action Framework (HAF) [19]

(The HRH Action Framework is an initiative of the GHWA and represents a collaborative effort between the U.S. Agency for International Development (USAID) and WHO. Republished with permission)



Through engaging in this regional strategy, we have learnt that considering culture and countryspecific 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 organizations, and academia is a constructive way to promote the needs and best practice of pharmacy education.

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 20 principles that should be considered when preparing training for PICs (publication in process). 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 113 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 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 opperating 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 the basis of the experiential workshop with limited use of computer projection and maximum involvment by local health care personnel. Selected competencies and participant self-assessment are measured before and after the workshop. Three months after the workshop, heath care personnel are visited by a local supervisor to note the translation of developed compitencies into the local environment anddiscuss any workplace-related issues.
Level 1 workshops have been conducted in nine countries with a total of 224 particpants. Participant feedback indicates that the practical nature of the workshop with specific reference to workplace activities has enabled compenency improvment. This has been confirmed though 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 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 16 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 a 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 2012, 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

1. UNFPA. United Nations Population Fund Pacific Sub Regional Office. 2012 [cited 7 February 2012]. Available from: http://countryoffice.unfpa.org/pacific/

2. UNSW-HRH. Mapping Human Resources for Health Profiles from 15 Pacific Island Countries; 2009.

3. Brown A. A systematic review of the literature addressing competencies, training and workforce requirements for any health care worker in Pacific Island Countries involved in essential medicines supply management. Report to the Pharmaceuticals Programme, Western Pacific Regional Office, World Health Organization; 2009.

4. Brown A, Cometto G, Cumbi A, de Pinho H, Kamwendo F, Lehmann U, et al. Mid-level health providers: A promising resource. Rev Peru Med Exp Salud Publica. 2011;28(2):308-15.

5. Fulton BD, Scheffler RM, Sparkes SP, Auh EY, Vujicic M, Soucat A. Health workforce skill mix and task shifting in low income countries: A review of recent evidence. Human Resources For Health. 2011;9(1):1.

6. FIP. 2009 FIP Global Pharmacy Workforce Report. 2009 [cited 10 February 2012]. Available from: http://www.fip.org/programmesandprojects_pharmacyeducationtaskforce_humanresources?filename=fip 2009%20GPWR%20cover%20contents%20foreword.pdf

7. WHO-WPRO. Regional Strategy on Human Resources for Health, 2006-2015. 2007 [cited 10 February 2012]. Available from: http://www.wpro.who.int/publications/PUB_978+92+9061+2445.htm

8. WHO. The World Medicines Situation 2011 Medicines Prices, Availability and Affordability. 2011 [cited 10February 2012]. Available from: http://www.who.int/medicines/areas/policy/world_medicines_situation/WMS_ch6_wPricing_v6.pdf

9. AusAID. Tracking development and governance in the Pacific. 2008 [cited 10 February 2012]. Available from: http://www.ausaid.gov.au/publications/pdf/track_devgov.pdf

10. AusAID. Pacific Regional Aid Strategy 2004–2009. 2004 [cited 10 February 2012]. Available from: http://www.ausaid.gov.au/publications/pdf/pacific_regional_strategy.pdf

11. UNFPA. Reproductive Health Commodity Security (RHCS) Status Assessment Reports for 10 Pacific Islands. 2008 [cited 10 February 2012]. Available from: http://210.7.20.137/Pages/Connect_RHCS.html

12. UNFPA. UNFPA Annual Report 2010. 2010 [cited 10 February 2012]. Available from: unfpa.org/public/home/publications/pid/7797

13. WHO-WPRO. Regional Strategy for Improving Access to Essential Medicines in the Western Pacific Region 2005-2010. 2005 [cited 10 February 2012]. Available from: http://www.wpro.who.int/publications/PUB_9290611855.htm

14. WHO-WPRO. Special Issue on EC/ACP/WHO Partnership on Pharmaceutical Policies (Year 5). Essential Drugs Medicines Policy. 2010;2010(4):1-12.

15. Brown A. Supply training package for essential reproductive health medicines & devices for 1st level Health Workers, A report for the United Nations Population Fund. Suva: UNFPA Suva; 2009.

16. Bailey MC, Khaiyum E, Prasad VR. Fiji School of Medicine Diploma in Pharmacy graduates, ten year analysis-where are they now? Pac Health Dialog. 2006;13(2):151-4.

17. Anderson C, Bates I, Futter B, Gal D, Rouse M, Whitmarsh S. Global perspectives of pharmacy education and practice. World Medical & Health Policy. 2010;2(2):5-18.

18. Reason P, Bradbury H, editors. The SAGE Handbook of Action Research: Sage Publications; 2008.

19. WHO-GHWA. HRH Action Framework. 2012 [cited 14 February 2012]. Available from: http://www.capacityproject.org/framework/

5.7. Country Case Study: Singapore

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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 safe, 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

5.7.1. Background

Singapore is an island city-state with a population of 5.18 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 16 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 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 are necessary.

Pharmacists in Singapore work in diverse settings, including community pharmacies, hospitals, pharmaceutical industry, academia, and research. As of December 2011, there are 2013 pharmacists registered with the Singapore Pharmacy Council. Approximately 50% 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

Ageing population and increase in burden of chronic diseases

Singapore has one of the lowest fertility rates in the world (the total fertility rate for 2007 is 1.27) and one of the fastest ageing populations. By 2030, 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 23.5%, 11.3% and 17.4% 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 focussing on disease prevention, promotion of healthy lifestyles, and health screening.

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 [5].

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).
Building capacity and capability of health care professionals are crucial means to ensure the accessibility and quality of health care delivery. Integrating care and ensuring seamless continuity is critical to produce desired health outcomes for patients as the health care focus shifts from hospital to the community. Pharmacists play significant roles to improve care and treatment for patients across the health care continuum, particularly in cost-effective drug therapy management and adding value to the health care team through reducing drug-related problems and preventable adverse drug events.

Table 5.7.1. Emerging practice trends in Singapore

1	Technology-driven, cost-effective management of drug distribution. Centralized and automated medication preparation and distribution in major hospitals. Health information technology interconnectivity and support.
2	Interdisciplinary and team-based health care delivery, education, and training. Majority of pharmacists' time is spent providing direct patient care in many practice settings, in high risk and therapeutically complex patients requiring specialist knowledge and skill.
3	Allocation of health care resources driven by metrics and outcomes. Health care 2020 Master Plan focuses on three strategic objectives: enhancing the accessibility, quality, and affordability of care. Benchmarking systems incorporate measurements of treatment outcomes, medication safety, and total cost of care.
4	Expanding job roles of pharmacists and pharmaceutical scientists to keep up with changes such as new regulatory frameworks and product groups.

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
4- Policies and regulation
5- Leadership

Table 5.7.2. The key strategies and proposed actions

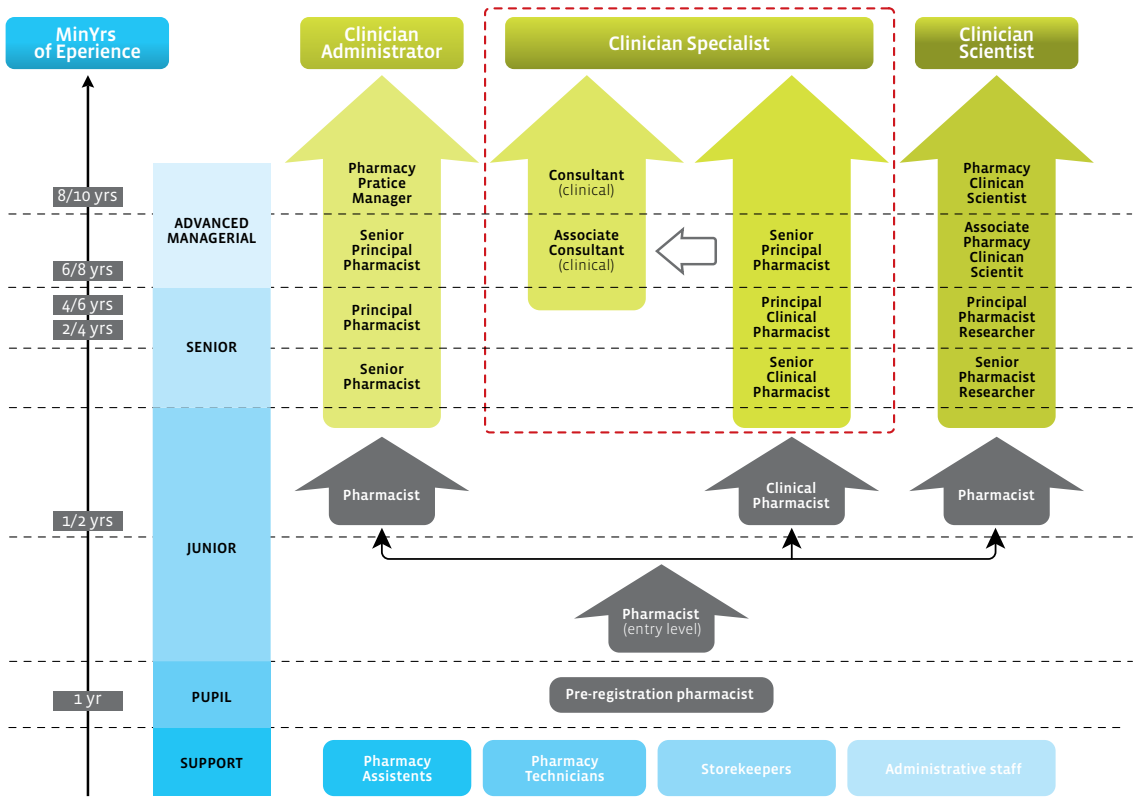
Strategic Areas	Proposed Key Actions
1. Manpower Management Coordinated approach to ensure the pharmacy workforce meets future health care system and Singaporeans' needs	- Achieve consensus on enhanced skills and knowledge for pharmacists within key pharmacy practice sectors. - Promote greater understanding of factors determining pharmacist and pharmacy support workforce workplace satisfaction. - Address manpower numbers, recruitment, and retention i sues. - Encourage pharmacists to pursue positions of leadership in government, educational institutions, and stakeholder organizations. - Lead and collaborate in research initiatives to evaluate the effect of pharmacy practice on patient health, population health, and health care services and the effect of changes in the utilization of pharmacy human resources. - Promote the availability of appropriate numbers of pharmacy support workforce with better qualifications, expanded responsibilities, and accountability as pharmacists' roles evolve.
2. Education and continu.ing professional development (CPD) Collaborative approach to ensure high quality education and CPD programmes to support patient centred, outcomes-focused care.	- Collaborate with the University to ensure that core pharmacy curricula address the knowledge, skills, and values required for future pharmacy practice - Lead and collaborate with key stakeholders to implement accessible programmes to upgrade competencies to support the implementation of new services, specialty practices, and new practice models - Create partnerships to develop learning programmes, including promotion and increase in inter professional and intr professional education and training - Conduct and utilize research to develop, evaluate, and improve education and CPD programmes
3. Information, communication and automation technology (ICAT) Create a profession wide strategy for development and use of technology to facilitate delivery of safe and effective use of medication to patients.	- Address policies and practice issues relevant to electronic transfer of prescriptions and automation technology - Promote adequate funding for implementation and maintenance of ICAT in pharmacy - Ensure that the development and implementation of ICAT in various settings facilitates continuity of care and improves the delivery of safe and effective use of medication to patients - Lead and collaborate in research to evaluate how the use of ICAT by pharmacy affects health care services and outcomes
4. Policies and Regulation Change supported by regulatory authorities, committed to review and amend policies, regulation or legislation to address and encourage necessary initiatives, such as interdisciplinary team based care.	- Protect the public through ongoing reconciliation of professional practice, professional competencies, and competency performance assessment, in parallel with broadening scopes of practice - Enabling regulatory framework, authorizing pharmacists to deliver expanded services in new practice models, including but not limited to: initiating, modifying, continuing, and monitoring drug therapy; ordering and accessing laboratory results; and administering drugs and vaccines by injection, in both collaborative and independent practice models - Develop a regulatory framework that grants more authority, responsibility and accountability to pharmacists and pharmacy support workforce.
5. Leadership Coordinated strategy to capitalize on collective strengths of professional organisations and academia to focus on the profession's effort towards a unified philosophy of pharmacy practice.	- Lead and collaborate with organisations in succession planning to achieve a unified philosophy of pharmacy practice - Lead and collaborate with professional organisations and academia to create a national programme for leadership development and training in pharmacy

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.

Figure 5.7.1. Pharmacy career framework in the public health care sector



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 exciting 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 accredit 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 process, 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,

oncology and pharmacotherapy geriatrics, cardiology, psychiatry, and infectious disease. This will allow pharmacists to practise at a specialist level dealing with complex disease states and pharmacotherapy problems. It is also congruent with advancing pharmacists' careers and fulfilling aspirations in clinical areas.

The Electronic Transaction Act in Singapore allows electronic prescriptions to be recognised and this has further strengthened our push towards making computerised physician order entry a reality nationally. Even prescriptions for controlled drugs can be performed electronically if there are sufficient security measures.

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 efficient. 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 focussing 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.

5.7.5. 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

1. Department of Statistics Singapore. 2012 [cited 15 May 2012]. Available from: http://www.singstat.gov.sg/stats/latestdata.html#12
2. WHO. World Health Report 2000 - Health systems: Improving performance. Geneva: WHO; 2000 [cited 15 May 2012]. Available from: http://www.who.int/whr/2000/en/
3. Ministry of Health, Singapore. Cited 15 May 2012. Available from: http://www.moh.gov.sg/content/moh_web/home/our_healthcare_system.html
4. Singapore Pharmacy Council. Annual Report 2011.
5. Singapore Pharmacy Council [website]. 2012 [cited 15 June 2012]. Available from: http://www.spc.gov.sg

5.8. Country case study: South Africa

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Summary

- South Africa has 12,813 pharmacists; the majority work in community (43%) 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. 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 476 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 2010, 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 (43%) 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.

Context of the South African health system

South Africa is situated at the southern tip of Africa and has a population of 50 million, of whom 57% reside in urban areas. Whilst it is ranked as an upper middle-income country, a distinguishing feature is its very high inequality (Gini coefficient), which has not improved since the establishment of the first democratic government in 1994.

South Africa has poor health outcomes for the proportion it spends on health, and will be one of the countries likely to miss its health Millennium Development Goal targets [1]. The reasons for poor health outcomes put forward recently in the Negotiated Service Delivery Agreement (NDSA) are South Africa's quadruple burden of disease characterised by the coexistence of diseases associated with underdevelopment, non-communicable diseases, a high injury burden, and HIV and TB epidemics; poverty and unemployment; and an inequitable and underperforming health service [2].

Approximately eight million (17%) South Africans are covered by private medical schemes, but a larger proportion use parts of private delivery systems such as general practitioners (24.3%) and pharmacies. The remainder rely on public health services.

South Africa began reforming its fragmented hospital-centric health departments in 1994 to a unified health system with a primary health care (PHC) approach based on the district health system and published a national drug policy in 1996

on improving health outcomes [5]. 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 over a 14-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 2012/13-2016/17 published towards the end of 2011 [9].

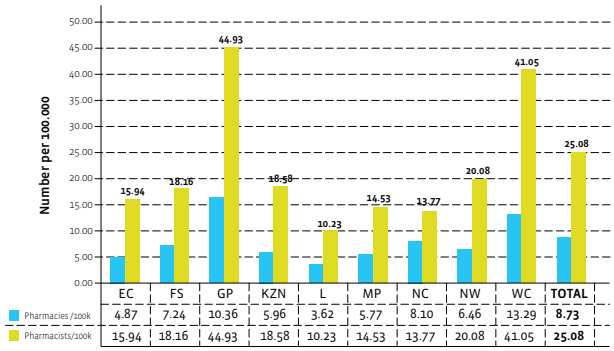
Pharmacy workforce shortages

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 in one province. However, the situation has changed recently in that private hospitals and community pharmacies also report difficulties in attracting and retaining pharmacists. Workforce shortages are a factor of the production of pharmacy graduates, as well as recruitment and retention.

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).

Figure 5.8.1. Pharmacies and pharmacists per 100,000 for all provinces



	EC	FS	GP	KZN	L	MP	NC	NW	WC	TOTAL
Pharmacies /100k	4.87	7.24	10.36	5.96	3.62	5.77	8.10	6.46	13.29	**8.73**
Pharmacists/100k	15.94	18.16	44.93	18.58	10.23	14.53	13.77	20.08	41.05	**25.08**

Source: Stats SA, 2009; SAPC Register, April 2010

SAPC records from 2010 show that 63% of pharmacists worked in the private sector, 29% in the public sector, and 8% were unknown. Considering that over 80% of the population rely on public health services and only 29% of pharmacists work in the sector, the inequity in access to the pharmacy workforce is glaring. Previous records indicate even lower proportions of pharmacists working in the public sector, especially in rural and underserved areas.

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 practise in South Africa. Recent estimates indicate that the number of graduates needs to double to meet projected demands. This means that the eight existing Schools of Pharmacy need to increase their outputs 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, 9,071 to 12,813, 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

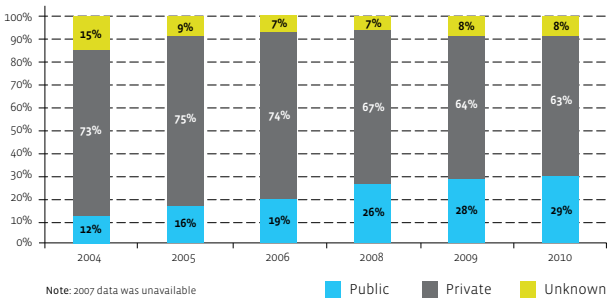
The Pharmacy Human Resources in South Africa 2011 published by the SAPC is the culmination of extensive work by a joint task team comprising stakeholders from pharmacy practice and education [8]. The publication provides comprehensive information on the current pharmacy workforce situation in the country, 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 following 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 479 additional pharmacists into the public sector each year, not all of whom remain in the public sector after completion of the mandatory year of service. 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 it.
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 (OSD), which consolidated the previous two allowances and included a re-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 29% in 2010 (Figure 5.8.2). 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, and the introduction of the dispensing fee in 2006, have affected other sectors of the pharmacy profession during this period.

Figure 5.8.2. Pharmacist distribution per sector 2004-2010



Source: SAPC Register, June 2010

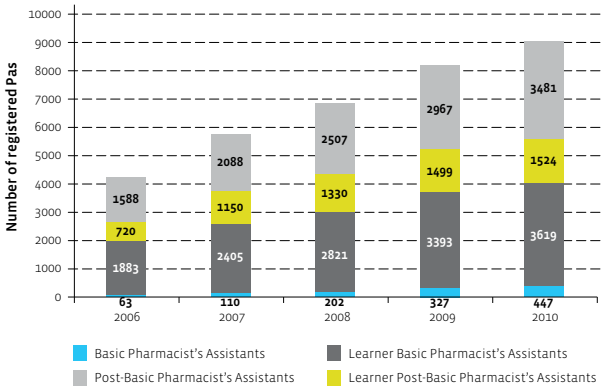
A recent initiative commenced by the National Department of Health, applicable to the health workforce in both the private and public sectors, is the Excellence in Health care Awards, which recognise outstanding achievements in the health care sector. In collaboration with the SAPC, the National Pharmacist 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 2000 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 [10]. 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 18-25 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).

Figure 5.8.3. Registered pharmacist assistants (Pas), 2006-2010



Source: SAPC Register, 2010 [8]

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 (pharmacist 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 [11]. 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 undergradates 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 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 [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 specialities in industrial pharmacy, clinical pharmacy, and pharmaceutical services in public health [15, 16]. How all these new roles will integrate into the PHC re-engineering 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 [6, 7].

5.8.4. Outcomes

- Pharmacy Human Resources in South Africa 2011 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 2015 to meet pharmacy workforce needs, particularly for the ARV rollout and a re-engineered PHC system.

- Increasing production of pharmacy graduates remains a challenge in the current higher education environment and is an area that the SAPC and pharmacists in academia are giving urgent attention.

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References

1. Chopra M, Lawn JE, Sanders D, Barron P, Abdool Karim SS, Bradshaw D, et al. Achieving the health Millennium Development Goals for South Africa: Challenges and priorities. Lancet. 2009;374(9694):1023-31.
2. National Department of Health. Negotiated Service Delivery Agreement. A long and healthy life for all South Africans. Pretoria: National Department of Health; 2010.
3. Department of Health. National Drug Policy for South Africa. Pretoria: Department of Health; 1996.
4. Department of Health. The White Paper for the Transformation of the Health System in South Africa. Pretoria: Government Gazette No: 17910; 1997.
5. Harrison D. An overview of health and health care in South Africa 1994-2010: Priorities, progress and prospects for new gains. Muldersdrift: Henry J. Kaiser Family Foundation; 2009.
6. Department of Health. Re-engineering Primary Health Care in South Africa. In: Discussion Document, editor. Pretoria: National Department of Health; 2010.
7. Minister of Health. National Health Insurance in South Africa: Policy Paper. Pretoria: Department of Health; 2011.
8. South African Pharmacy Council. Pharmacy Human Resources in South Africa 2011. Pretoria: SAPC; 2012.
9. National Department of Health. HRH Strategy for the Health Sector: 2012/13 – 2016/17. Pretoria: National Department of Health; 2011.
10. South African Pharmacy Council. The New Approach to the Training of Pharmacist's Assistants in South Africa. Pretoria: South African Pharmacy Council; 2003 [updated 12 December 2006; cited 12 December 2006].
11. South African Pharmacy Council. Scope of practice, supervision of pharmacy support personnel and qualifications. Board Notice 123 of 2011. Government Gazette No 34428; 2011.
12. Bheekie A, Obikeze K, Bapoo R, Ebrahim N. Service learning in pharmacy: opportunities for student learning and service delivery. African Journal of Pharmacy and Pharmacology. 2011;5(23):2546-57.
13. Suleman F. Relooking pharmacy training: what are the new approaches. South African Pharmaceutical Journal. 2012;79(1):40-2.
14. South African Pharmacy Council. Rules relating to the services for which a pharmacist may levy a fee and guidelines for levying such a fee or fees, Board Notice 193 of 2010. Government Gazette 33898; 2010.
15. South African Pharmacy Council. Specialities for pharmacists. Pharmaciae. 2011;19(1):22.
16. South African Pharmacy Council. Scope of practice and qualification for authorised pharmacist prescriber. Board Notice 122 of 2011. Government Gazette No 34428; 2011.

5.9. Country Case Study: Tanzania

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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.

- Pharmaceutical workforce challenges in Tanzania include:

1- Critical shortage of all categories of pharmaceutical workforce;

2- Inadequate growth in pharmaceutical human resources;

3- Skills mix imbalance, especially in the area of patient care; and

4- Distribution imbalances.

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

5.9.1. Background

The human resources for health crisis affects 57 countries worldwide, including Tanzania [1-5]. In Tanzania, it is estimated that public and private sector dispensaries (ie, lowest level of facilities for health care provision), where primary care to most of the population is provided, were staffed by only 31% and 16%, respectively, of the required 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 improve access to medicines. Therefore, their availability is of critical importance in meeting national and global health goals, thus requiring special attention.

There is a pressing need for appropriate pharmaceutical human resources planning to develop local strategies 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.

5.9.2. Key issues

Human resources shortages

The pharmaceutical human resources report of 2009 [7] 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 5241 pharmaceutical outlets served by 1495 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.
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 pharmaceutical technicians between 2007 and 2009, with a low level of new pharmaceutical personnel entering the workforce each year (Table 5.9.1).

Table 5.9.1. Total pharmaceutical human resources 2007 to 2009

Cadre	2007	2008	2009
Pharmacists	568	593	640
Pharmaceutical technicians	369	402	479
Pharmaceutical assistants	315	327	376

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 50 and an output rate of 12 to 50 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 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 pharmacy technician diploma programmes were admitted in 2008 [7].

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.

Distribution imbalance

The distribution of pharmaceutical personnel is inequitable 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 0.01-1.37 for pharmacists and 0.02-0.56 for pharmacy technicians [7]. 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.

5.9.3. Strategies

The findings of the 2009 Assessment of Pharmaceutical Human Resources led to the development o 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 (MOHSW) 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 2010 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).

Table 5.9.2. Human resources issues and policy goals

	HR Planning	Policy goals
1	Human resources planning	1.3 To strengthen partnerships between the Pharmaceutical Society of Tanzania (PST), Pharmacy Council (PC), Pharmaceutical Services Unit (PSU) and Human Resources for Health Department to coordinate pharmaceutical human resources planning 1.4 To formulate and implement a pharmaceutical human resources plan with stakeholders' input 1.5 To review and revise the pharmaceutical human resources establishment in the public sector that reflects needs at different levels 1.6 To strengthen the PC register to ensure accurate and up-to-date human resources information of all pharmaceutical cadres
2	Job descriptions	2.1 To develop clear job descriptions for each pharmaceutical cadre in the public sector
	HR Management	**Policy goals**
3	Recruitment and retention	3.1 To improve human resources management at district levels 3.2 To develop and establish retention schemes for underserved areas 3.3 To improve the physical working environment in underserved areas 3.4 To implement remote supervisory support systems for pharmaceutical services in the public sector 3.5 To revise and improve retirement benefits 3.6 To review the salary structure of all pharmaceutical cadres
	HR Development	**Policy goals**
4	Training institution and academic capacity	4.1 To establish new training programmes, particularly for pharmaceutical technicians and assistants 4.2 To build the teaching and physical capacity of existing training institutions (public and private) 4.3 To review academic staff recruitment criteria to allow recognition of professional performance, expertise, and experience 4.4 To develop training programmes for teachers in teaching methods 4.5 To revise incentive packages for academic members 4.6 To expand post-graduate (master's, PhD) education programmes to build expertise for academia (teaching and research) 4.7 Increase output of graduates to reach a target of 950 pharmacists, 1450 pharmaceutical technicians, and 1500-2600 pharmaceutical assistants by 2015 4.8 Review competency requirements and curriculum of each cadre to optimize length of training without compromising quality
5	Continuing professional development (CPD)	5.1 To develop and certify CPD programmes for all pharmaceutical cadres through a partnership among the PC, PST, and training institutions

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 9 for Health Systems Strengthening ($149 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, 36% 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 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 BPharm 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 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 earn a diploma will have the option to exit the programme early after completing several modules and receive a certificate instead. This certificate gives them recognition by the PC as dispensers, and they can continue their education later with higher modules until they complete the full diploma. This approach will allow Accredited Drug Dispensing Outlets (ADDO) dispensers with limited training to enrol and receive adequate training and recognition by the PC. With the cascading curriculum, they have a chance for career growth and increased opportunities to work not only in the private sector but also in the public sector. As per the Tanzania Food and Drug Agency, currently there are 10,445 ADDO dispensers in the country with 3,873 ADDO outlets distributed throughout the country and mainly in rural areas (personal communication).

Table 5.9.3. Pharmacy schools, location, year of establishment, and qualification offered

	Pharmacy school	Type of Institution	Town/City	Year it started	Academic qualification offered (no. of students per enrolment)
1	Muhimbili University of Health and Allied Services (MUHAS)	Public	Dar es salaam	1974	BPharm (50) MPharm, PhD, and Diploma1
2	St John's University of Tanzania (SJUT)	Faith-Based Organisation	Dodoma	2008	BPharm Degree (65)
3	Bugando Catholic University of Health and Allied Services (CUHAS)	Faith-Based Organisation	Mwanza	2011	BPharm (35) and Diploma[1] (55)
4	Kilimanjaro School of Pharmaceutical Sciences	Faith-Based Organisation	Moshi	2010	Diploma (20) and Certificate (20)
5	Ruaha University College (RUCO)	Faith-Based Organisation	Iringa	2010	Diploma (35)
6	Kampala International University (KIU)	Private	Dar es salaam	2011	BPharm[2], Diploma (3), and Certificate (7)
7	Royal Pharmaceutical Collage	Private	Dar es salaam	2010	Certificate (50)

[1]The diploma programmes started much earlier
[2]The enrolment capacity is 100 students per cadre but did not get enough students last year due to higher entrance requirements.

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. However, capacity building of teaching staff to meet such transformations has remained a challenge. MUHAS, as a higher learning institution, is required to review its curricula regularly, usually every five years, previously undertaken in 2002. In addition, the government, through the Tanzania Commission for Universities (TCU), the regulatory authority for higher education, directed that all curricula in higher learning institutions be transformed from content-based to competencybased curricula to address the various needs of the country. Therefore, MUHAS embarked on a curriculum review in November 2008 through a partnership project, the Academic Learning Project, between 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 to make 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 student 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 various continuing education programmes so as to build capacity of the pharmaceutical workforce and enable personnel to cope up with innovations in pharmacy. Currently, MUHAS is implementing a short course in good manufacturing practice and other aspects of industrial pharmacy to support regulatory functions and build capacity of local manufacturers.

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 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. Al though 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 frontline in designing and instituting well-structured continuing education programmes so as to provide the support needed for pharmaceutical 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 enrolees and output. The implementation of these recommendations will definitely bring change in the right direction in pharmaceutical workforce development.

References

1. Stenson B, Syhakhang L, Ericksson B, Tomson G. Real world pharmacy: Assessing the quality of privatepharmacy practice in Lao People's Democratic Republic. Soc Sci Med. 2001;52(3):393-404.

2. Dayrit MM, Dolea C. The health workforce crisis – where are the pharmacists. Inter Pharm J. 2006;20:5-7.

3. Ward K, Butler N, Mugabo P, Klausner J, McFarland W, Chen S, et al. Provision of syndromic treatment of sexually transmitted infections by community pharmacists: A potentially underutilized HIV prevention strategy. Sex Trans Dis. 2003,30(8):609-613.

4. Wuliji T. Current status of human resources and training in hospital pharmacy. Am J Health Syst Pharm. 2009;66(5 Suppl 3):S56-S60.

5. Anderson C, Bates I, Beck D, Brock TP, Futter B, Mercer H, et al. The WHO UNESCO FIP Pharmacy Education Taskforce. Hum Resour Health. 2009;7:45.

6. The United Republic of Tanzania Ministry of Health and Social Welfare. Human Resource for Health Strategic Plan 2008-2013. January 2008. Available from: http://www.unfpa.org/sowmy/resources/docs/library/R223_MOHTanzania_2008_HRH_Strategic_Pla n_2008_2013.pdf

7. The United Republic of Tanzania Ministry of Health and Social Welfare. Report on Pharmaceutical Human Resource for Health. 2009. Available from: http://apps.who.int/medicinedocs/documents/s17397e/s17397e.pdf

PART 6

STRENGTHENING THE PHARMACY WORKFORCE THROUGH TRANSFORMING AND SCALING UP EDUCATION

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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 institutions; regulation and accreditation; financing; 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 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].

Recognizing the importance of pharmaceutical human resources development, and in line with the World Health Organization (WHO) Medicines Strategy 2008–2013 to enhance human resources capacity to improve 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 services.
- The pharmaceutical course enrolment levels were low in all four countries. For example, only one out of 10 applicants were enrolled in Nigeria. The enrolment levels are 20% for BPharm and 33% for MPharm 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. 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 stakeholders recognized 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 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 and universities overseas, 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 under development of regular curriculum review in training institutions. The use of a competency-based approach to education and curriculum development has been identified by the countries as 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. Educational 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 [5].

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 order to meet current and future needs, existing continuing professional development and post-graduate programmes should be developed to optimize pharmacists' competencies [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 opportunities for correcting skill mix imbalances and for scaling up the annual output of pharmaceutical assistants include: large labour market demand for pharmaceutical cadres; the availability of university laboratories that are underused and that could 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 the four countries form 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 in multiple spheres, 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 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 together 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; and
5- Monitoring and evaluation.

There are some countries, which have made significant steps to scale up health professional education and/or 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 5,453 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." [13]

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 2009. 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. A other programme will add several thousand new doctors to address the country's shortage of physicians.

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 2020. 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 workforce since the level reported in the HRH Observatory data is 0.84 health workers per 1000 population which is below the standard set by WHO of 2.3 health workers per 1000 population (based on the numbers of doctors, nurses, and midwives).

In terms of pharmacy workforce production, the number of providers, especially in the private sector, has expanded greatly in the past 10 years with currently over 18 pharmacy schools graduating almost 1900 students in 2011 and 26 technician training programs graduating 6000 technicians in 2011. The government strategic plan outlines a projected need of 2200 pharmacists and 10,000 pharmacy technicians by 2020.

6.3. Recommendations for scaling up workforce production

A total of 17 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 17 recommendations, all governments are recommended to adopt five. Under the areas of governance and implementation, they cover:

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.

2- Alignment of the education plan with HRH and health systems national plans.

3- 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.

4- Alignment of information on HRH training and education with HRH information systems.

5- 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 or 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 better patient care.
- Introducing technologies (simulation, technology, eLearning) 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.

- Retention of health workers in rural and remote areas where there are usually hard-to-reach and underserved populations.
- Adequate investment in health professional education both at the international and domestic level (addressing funding and addressing economic constraints) and instituting mechanisms that make education and training more accessible to those wishing to pursue a career as a health professional.

References

1. World Health Organization [Website]. Resolutions on health workforce development. Geneva: WHO. Available from: http://www.who.int/hrh/resolutions/en/index.html

2. Hirschhorn L, Ogunda L, Fullem A, Dreesch N, Wilson P. Estimating health workforce needs for antiretroviral therapy in resource-limited settings. Hum Resour Health. 26 January 2006; 4:1.

3. Frost LJ, Reich MR. Access: How do good health technologies get to poor people in poor countries? Cambridge: Harvard Center for Population and Development Studies; 2008. Available from: http://www.hsph.harvard.edu/faculty/michael-reich/files/accessbook.pdf

4. World Health Organization. WHO Medicines Strategy 2008–2013. Geneva: WHO; 2008.

5. Tata H, Wuliji T, Cinnella E. Pharmaceutical human resources assessment tools. Geneva: WHO; 2011.

6. Framework for the development of human resources in the pharmaceutical sector. Nigeria: Federal Ministry of Health; 2010

7. Assessment of the pharmaceutical human resources in Tanzania and the strategic framework. Tanzania: Ministry of Health and Social Welfare; 2009

8. Marriott JL, Nation RL, Roller R, Costelloe M, Galbraith K, Stewart P, and Charman W. Pharmacy education in the context of Australian practice. Am J Pharm Educ. 2008: 72(6):131.

9. Framework for the development of human resources in the pharmaceutical sector. Sudan: National Ministry of Health; 2010.

10. Sosabowski MH, Gard PR. Pharmacy education in the United Kingdom. Am J Pharm Educ. 2008: 72(6):130.

11. Assessment of human resources of pharmaceutical services in Ghana. Ghana: Ministry of Health; 2009.

12. International Pharmaceutical Federation (FIP). 2009 Global pharmacy workforce report. The Hague, The Netherlands: FIP; 2009.

13. Department for International Development (DFID), Management Sciences for Health (MSH), Management Solutions Consulting Limited (MSC). Evaluation of Malawi's emergency human resources programme. Cambridge, Massachusetts, USA: MSH; 2011. Available from: http://www.msh.org/news-bureau/upload/Evaluation-of-Malawi-s-Emergency-Human-Resources-Programme.pdf

14. Africa Health Workforce Observatory. Human Resources for Health Country Profile: Ethiopia. AHWO; June 2010. Available from: http://www.hrh-observatory.afro.who.int/en/hrh-country-profiles/profile-by-country.html

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 90 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 distribuition 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 is 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 FIP*Ed* 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 life long 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.

Annex 1. Data Table

	Human resources/workforce				Establishments		Education		
	Pharmacists			Pharmacy technicians	Total Pharmacies	Community Pharmacies	Pharmacies graduates/year	Schools	
	Total licensed	Total female licensed	Newly licensed/year	Total				Pharmacy	Pharmacy technicians
Afghanistan	1163	232	-	822	10131	10131	53	1	21
Albania	1465	950	64	346	1139	1096	557	7	0
Australia	26434	15144	-	8714	-	5167	1400	-	19
Bangladesh	2897	1449	0	42407	79902	0	-	25	34
Belgium	13000*	9000*	500*	-	5400*	5072	543	9	45
Bhutan	18	4	1	153	46	53	-	0	1
Bolivia	5500	-	2077	-	-	-	-	-	-
Bosnia and Herzegovina◇	560	490	50	560	340	327	-	1	-
Burundi	101	24	4	71	445	385	-	0	1
Cambodia	1477	713	144	117	1556	763	279	3	0
Cameroon	847	407	38	-	352	221	32	6	-
Canada	35051	20925	1138	504	-	8870	1157	10	-
Chile	-	-	-	2870	2727	2507	40	9	-
China	200000	122200	11461	325817	-	74204	-	74	-
China Taiwan	40000*	26000*	927	6874	15345	7558	927	7	-
Congo (Dem. Rep. of)	308	77	14	-	671	189	-	0	7
Cook Islands	-	-	-	-	3	1	3	0	0
Costa Rica	3779	2644	183	957	1199	946	-	5	-
Croatia	3070	2837	-	-	1127	1081	150	2	9
Cuba	-	-	-	7047	-	-	-	-	-
Czech Republic	8041	6698	375	4856	2530	2439	273	2	-
Denmark	3900	-	-	4000	228	228	-	2	1
Egypt	150000	-	10000	-	55000*	50000	12000	25	-
Ethiopia	1898	424	-	6000	667	482	-	18	26
Fiji Islands	146	83	13	57	82	52	70	1	1
Finland	3125	2406	105	6417	812	812	82	2	5
France	73259	48864	-	-	25426	-	-	24	70

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	Human resources/workforce				Establishments		Education		
	Pharmacists			Pharmacy technicians	Total Pharmacies	Community Pharmacies	Pharmacies graduates/year	Schools	
	Total licensed	Total female licensed	Newly licensed/year	Total				Pharmacy	Pharmacy technicians
Germany	78322	52758	1874	52882	21860	21441	1874	22	93
Ghana	2969	755	179	2139	2179	2007	120	3	1
Great Britain	50664	29413	2945	21000*	13264	12891	2639*	26	-
Grenada	89	61	8	0	65	35	6	1	0
Guinea (Republic of)	-	-	-	22	895	405	-	-	-
Hong Kong SAR, China	1859	-	95	1961	518	518	31	2	2
Hungary	5301	-	190	9400	3400	2413	190	4	-
Iceland	435	286	-	167	64	58	20	1	1
India	680482*	-	-	-	750000*	750000*	70000*	1400*	-
Iran	15000	8000	500	25000	14000	11000	-	22	-
Ireland	4793	2978	340	510	1757	1682	151	3	-
Israel	4000	2000	300	-	2800	1300	220	2	0
Italy	81856	54024	-	-	17400	17898	529	30	-
Japan	276517	168449	8641	-	71970	53301	8583	74	0
Jordan	13840	7289	745	10784	2328	2200	-	9	-
Kenya	2200	-	140	4300	-	-	100	4	24
Korea (Republic of)	61114	-	-	-	20320	20320	-	35	0
Lithuania	2440	2058	-	1938	1500	1465	104	1	1
Macedonia (Republic of)	2046	1636	138	1225	874	842	150	3	-
Malawi	73	-	-	174	28	-	8	1	1
Malaysia	8993	546	934	3409	2330	1943	836	17	33
Mali	1055	475	57	398	427	427	57	1	1
Malta	1033	594	37	-	217	217	-	1	1
Marshall Island (Republic of)	4	3	2	5	3	1	-	0	0
Mauritius	-	-	-	-	-	275	-	-	-
Mexico	921	686	-	0	41890	21521	-	59	-
Moldova (Republic of)	2858	-	97	1119	1933	914	97	1	1

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	Human resources/workforce				Establishments		Education		
	Pharmacists			Pharmacy technicians	Total Pharmacies	Community Pharmacies	Pharmacies graduates/year	Schools	
	Total licensed	Total female licensed	Newly licensed/year	Total				Pharmacy	Pharmacy technicians
Nauru	2	0	1	4	1	0	-	0	0
Nepal	1200	550	400	3000	4000	5	300	19	29
Netherlands	5144	2446	189	16000*	2007	2007	189	2	10
New Zealand	4440	-	169	-	840	810	208	2	3
Nigeria	15377	-	681	1645	9469	3249	-	14	26
Niue	0	0	0	0	1	0	0	0	0
Norway	2599	-	164	3766	692	660	164	5	13
Pakistan	12000	4000	2500	40000	80000	80000	1000	28	9
Palau	1	1	1	9	4	3	1	0	0
Papua New Guinea	354	-	35	68	82	55	18	1	1
Philippines	59000	53000	1250*	25000*	8600*	5800*	2400*	45	-
Portugal	13379	10559	715	4259	3365	2918	717	9	-
Romania	13890	12685	-	-	6686	7259	950	10	-
Samoa	-	-	-	-	5	4	-	-	-
Saudi Arabia	14928	2002	-	5700	-	6147	480	18	36
Senegal	1175	446	31	70	1060	963	74	2	1
Singapore	2013	1532	200	-	242	171	107	1	-
Somalia	21*	1*	20*	-	1550*	1532*	21*	1	-
South Africa	12813	7560	479	5822	4304	2841	378	8	8
Spain	64203	45332	826	-	21364	21364	2247	20	139
Switzerland	6651	4774	205	-	1742	1742	115	7	-
Tanzania	923	288	79	1027	855	855	79	4	5
Thailand	28272	-	1440	5126	11592	-	-	-	17
Togo	-	-	-	-	164	155	-	-	-
Tonga (Kingdom of)	9	4	1	39*	19*	8*	6	0	1
Turkey	32000	12836	1183	70000*	25118	24311	815	23	-
Tuvalu	0	0	0	0	1	0	3	0	0

Annex 1. Data Table

	Human resources/workforce				Establishments		Education		
	Pharmacists			Pharmacy technicians	Total Pharmacies	Community Pharmacies	Pharmacies graduates/year	Schools	
	Total licensed	Total female licensed	Newly licensed/year	**Total**				Pharmacy	Pharmacy technicians
Uganda	550	100	10	650	600	800	55	3	1
Ukraine	40000	34800*	5000*	-	22555	-	1500	16	54
Uruguay	1365*	1022*	30*	-	1194*	1100*	30*	1	3
USA	275000	127600	12000	500000*	-	-	13000	127	700*
Vanuatu	35	17	0	23	14	9	0	0	0
Vietnam	12000	8000	-	50000*	43629	9037	1200	7	64
Zambia	250*	102*	36*	1500*	5000*	120*	45*	1	1
Zimbabwe	678	-	82	1850	633	375	65	1	2

Notes
(hyphen): Data not available
* : Estimated data
◊ Data only reported by the Republika Srpska, one of the two entities forming Bosnia and Herzegovina. Year and data source of data vary.

Definitions
Pharmacist: A professional who in accordance to the local legal provisions and definitions may provide pharmacy services (in the community, hospital, academia, research, industry etc) in your country.

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

Licensed: Registered to provide pharmacy services.

Pharmacies: Premises which in accordance to the local legal provisions and definitions may operate as a facility in the provision of pharmacy services in the community or hospital settings.

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