Technicians and pharmacy support workforce cadres working with pharmacists

An introductory global descriptive study

2017

fip International Pharmaceutical Federation

Colophon

Contents

Acknowledgements

Glossary of terms

Term	Definition
Cadres	A group of people specially trained for a particular purpose or profession.
Mid-level cadres	Health workers with two to three years of post-secondary school health care training who undertake tasks usually carried out by doctors, pharmacists, nurses or other health professionals.[1]
Pharmacy support workforce	Pharmacy technicians, assistants and other mid-level cadres that assist in the delivery of pharmaceutical services in a variety of practice contexts.[2]
Pharmaceutical services	Refers to the range of activities required to deliver effectively pharmaceutical products to patients to optimise effective, safe and quality use of medicines. These services vary according to each practice environment.
Pharmacy workforce	Refers to the whole of the pharmacy related workforce (e.g. registered pharmacist practitioners, pharmaceutical scientists, pharmacy technicians and other pharmacy support workforce cadres, pre-service students/trainees) working in a diversity of settings (e.g. community, hospital, research and development, industry, military, regulatory, academia and other sectors) with a diversity of scope of practice.[3]

Foreword

The world is evolving and, consequently, health systems in many countries must adapt accordingly. This development also affects the pharmacy sector. The driving forces for these changes are all too well known, of which some examples are: the demographic evolution with a population becoming older, the lack of general practitioners, the development of new technologies, increasing health costs and the development of innovative treatments. In order to adapt to this new environment and to answer to the expectations of patients, politicians and the health system, pharmacists created and prepared for new roles, providing new services. All these new tasks are performed in addition to pharmacists' traditional role of delivering, dispensing and compounding medicines. The evolution of the pharmacists' profession, providing additional patient-centred services, demands that pharmacists rethink their existing structures and processes. Tomorrow, it will no longer be possible for a single pharmacist to fulfil all the current jobs according to his or her role today and at the same time provide all the new services. It is an absolute necessity to anticipate and to redefine the professional needs regarding the work setting, and to distribute the different tasks according to the competencies of each collaborator and the needs of patients.

In addition, the lack of a sufficient number of pharmacists is a significant factor in environments with inequalities and impaired access to medicines, and often human resources of pharmacy support workforce are used extensively to ensure basic services and improve access to pharmaceutical care.

A change is needed. This procedure must be well prepared and cannot be performed within a few months. Much work will be required in the different domains in order to achieve the right models fitting to the environment of each country. Furthermore, the task does not end with the definition of the roles, competencies and responsibilities of the different actors of the workforce. Consequently, education has to be adapted in correspondence to the new roles. This has to be organised according to the defined needs in order to assure work quality and patient safety. Special attention must be given to the legal framework in order to assure for the workforce defined status. Avoiding discrepancies in the implementation is equally important as having a means of controlling this process of distributing the pharmaceutical tasks, including the transfer of respective responsibilities.

This report "Technicians and pharmacy support workforce cadres working with pharmacists" gives an excellent overview of the different options chosen by different countries. Independently of which activity sectors we consider, be it community, hospital, supply chain or emergency pharmacy, the collaboration among pharmacists and their workforce becomes mandatory. The detailed case studies in particular give us a pragmatic view of possible formats of collaboration. The four country specific workforce models, issued from the data, highlight the fact that there is more than one possibility to organise the collaboration between pharmacists and their co-workers. Each country, according to its environment, has to find the best way to use the synergies among the different actors in order to provide optimal pharmaceutical services. Use this report as a catalyst for your thoughts and find new ways of collaboration with your workforce, according to your local and regional needs and possibilities, in order to improve patient care.

I would like to express a big thank you to all the volunteers involved in this report, without whom it could not have been put together. I thank them for the huge work they accomplished, for the quality of their expertise and for the excellent collaboration the Board of Pharmaceutical Practice had with members of the working group during the entire process. I hope you will make good use of this report and, without delay, start elaborating your best strategy on this essential issue.

I will conclude by quoting the general conclusions from the academic literature review of the report you hold in your hands. They describe best our most important objective for the future regarding the organisation of the workforce in the pharmaceutical workforce: "Where pharmacists, pharmacy technicians and other pharmacy support workforce cadres work together in the context of their local environment, with a focus on improved patient care, optimal pharmaceutical services delivery can be provided."

Dominique Jordan
Chair of the International Pharmaceutical Federation Board of Pharmaceutical Practice (BPP)

Executive summary and key messages

This report was commissioned by the FIP Board of Pharmaceutical Practice (BPP) in 2015 and aims to provide an introductory global picture of how pharmacy support workforce cadres work with pharmacists in the delivery of pharmaceutical services. It is clearly noted that the relationship, roles and responsibilities of pharmacy support workforce cadres varies greatly between countries. This report describes this global variety without giving recommendations or preferred practice models. It should also be noted that health systems improvement in any given context requires that this report be considered with reference to all World Health Organization building blocks.[4]

There is a vast global variety with respect to the pharmacy support workforce:

- **Roles and competency**
  From no pharmacy technicians or other pharmacy support workforce cadres in Japan, through a variety of cadre interactions with pharmacists, to the autonomous practice of pharmacy support workforce cadres in Malawi.
- **Responsibilities**
  From strictly supervised practice with a focus on supply, through autonomous practice for a variety of responsibilities, to independent practice.
- **Supervision**
  From complete supervision for all tasks, through geographical varied supervision, to independent practice.
- **Education**
  From on the job training, through certificate level vocational courses, to three to four year diploma programmes.
- **Legislation, regulation and liability**
  From well regulated and registered, through part regulation with weak implementation, to completely non-regulated contexts.

Four different country specific workforce models emerge from the data:

- Countries where there are **no pharmacy support workforce cadres**, only pharmacists (e.g. Japan).
- Countries where **pharmacy support workforce cadres are supervised by the pharmacist** by direct or delegated methods (e.g. Australia and South Africa).
- Countries where **certain pharmacy support workforce cadres are regulated**. They have accountability to undertake independent practice in a team with pharmacists. (e.g. Canada, Denmark).
- Countries with weak legislative structures but where, out of necessity, **pharmacy support workforce cadres work by themselves** (e.g. many low income countries).

In recent years, pharmaceutical services delivery has moved from a focus on medicines availability to an increasing need to deliver extended pharmaceutical clinical services to optimise patient health outcomes. As this change has unfolded, the role of pharmacists, pharmacy technicians and other pharmacy support workforce cadres has evolved in different contexts in an attempt to meet this need. The pharmaceutical literature has documented this evolution most notably in advanced economies, with many key insights provided. These insights should be considered by other countries as they reflect on the ongoing evolution of pharmaceutical services delivery and the human resource requirements to meet this need.

Case study vignettes in this report provide specific workplace context to the variety of ways in which the pharmacy support workforce interacts with pharmacists in the delivery of pharmacy services. Community, hospital, emergency and supply chain fields of practice are presented.

Detailed case studies from Canada, Denmark, Malawi, Singapore, South Africa and the United Kingdom demonstrate how pharmacists and pharmacy support workforce cadres have worked together to develop country-specific approaches to pharmaceutical services delivery to improve patient care.

Where required, pharmacy support workforce cadres can help to fill pharmacist shortages, but long-term pharmaceutical workforce planning with a vision of clearly articulated roles and of developing sufficient number of pharmacists (and pharmacy support workforce) remains imperative to serve the population.

Effective deployment of mid-level cadres requires particular attention to competency requirements based on clearly articulated roles between pharmacists and pharmacy support workforce cadres, adequate education (in terms of costs and duration) required to meet these competencies, and the regulatory framework to support them.

Patients deserve high quality pharmaceutical services. The need to make the best use of existing pharmacists in various country and clinical settings is clear, as is the need to utilise the pharmacy support workforce as an integral part of the pharmacy workforce. Any country-based approach that aims to increase the availability and range of pharmaceutical services should take into account the 2011 "FIP WHO guidelines on good pharmacy practice: standards for quality of pharmacy services"[5] and consider a stepwise implementation approach when starting from a low base of pharmaceutical services delivery.

1. Introduction

1.1 Global health

1.1.1 Universal health coverage and the sustainable development goals

In 2016, the world transitioned from a focus on the Millennium Development Goals (MDGs) to a renewed focus on international equity through the cross-sectional application of 17 Sustainable Development Goals (SDGs).[6,7] Although significant progress has been made globally to address medicines access, inequality continues in many poor countries and associated regions. The lack of sufficient human resources to provide pharmaceutical services is a significant factor in these environments, and often pharmacy technicians and other pharmacy support workforce cadres are used extensively to ensure basic services where pharmacists are unavailable.[8] This is in contrast to high-income environments where pharmacy technicians and other pharmacy support workforce cadres are working more closely with pharmacists to allow delivery of a greater range of more complex pharmaceutical services.

The SDGs adopted in 2015 aim to "end poverty, protect the planet, and ensure prosperity for all" as part of a new sustainable development agenda focusing on equity. Each goal has specific targets to be achieved over the next 15 years, with a recognition of the interrelationship between poverty, sustainability and prosperity and a link to health outcomes. Goal 3 (Increased health and wellbeing), provides the focus for health improvements with the acknowledgement that pharmaceutical service delivery will again be essential for progress to be noted in many countries.[7]

Understanding how pharmacy technicians and other pharmacy support workforce cadres assist pharmacists in the health care system will facilitate developing health systems that can universal health coverage as it is defined in different country contexts.

1.1.2 Medicines availability, access and people centred health systems

The WHO published "The world medicines situation" report in 2011 which, alarmingly, notes that one third of the world's population does not have access to regular life-saving medicines.[9] This reality sees millions of people suffering from death and significant morbidities from preventable or treatable diseases such as pneumonia, malaria, HIV/AIDs, tuberculosis, malnutrition and dehydration from diarrhoea. In high-income countries, ageing populations, polypharmacy, use of more complex medicines and rising costs of health care is placing pressure on health systems with many countries exploring how to better use pharmacists for their clinical skills. FIP acknowledges that there is a need to increase medicines access to patients in all countries while also ensuring the optimal use of the pharmacist in a variety of clinical settings.[5, 10]

To help us understand the complexity of health systems the WHO describes six building blocks that need to be present for quality and sustainable health care to be delivered (Figure 1).[4] Within these building blocks "Medical products" and "Health workforce" are essential but not isolated components for considering how to increase medicines access and improve pharmaceutical services. In this report, we focus on the detail of how pharmacy technicians and other pharmacy support workforce cadres work with pharmacists to contribute to the health system. Health systems improvement in any given context will require that this report is considered with reference to all WHO building blocks.

Figure 1. WHO Health System Building Blocks. [4]

1.2 Global human resources for health crisis and the role of pharmacists, pharmacy technicians and other pharmacy support workforce cadres

In 2006, the WHO brought to the world's attention the vast shortage of the human resources required for minimum health service delivery.[11] At that time, an estimated global shortage of 4.3 (currently 7.2) million health workers was noted, with critical shortages in 57 of the poorest countries in the world. Since then, increased urbanisation, an increased middle class in low- and middle- income countries and an ageing population in many high-income countries has seen increasing demands on health services and increased pressure to deliver quality pharmaceutical services globally. In 2013 WHO released its "A universal truth. No health without a workforce" report which further amplified the urgent need to act in low-income countries.[12] The FIP 2012 "Global pharmacy workforce Report" and recent "Global pharmacy workforce intelligence trends" report also highlight the shortage of pharmacy workforce cadres in high-income countries, as they seek to increase the range of pharmaceutical services delivered to patients.[2, 13]

Recognising the urgency, the 67th WHO Assembly (2014) endorsed the commitments and the call to action outlined in the Recife Political declaration on Human Resources for Health (Renewed commitments towards universal health coverage)[7] which was adopted at the Third Global Forum on Human Resources for Health convened by WHO. This action has refocused the world's attention on the global dimension and complexities of the health workforce crisis and the interconnected nature of both the problems and the solutions necessary to achieve universal health coverage. This renewed focus is reflected in the "Global strategy on human resources for health: Workforce 2030".[14] The strategy covers all workforce including pharmacy workforce and its requirements. It seeks to present strategies to meet the human resources for health needs of all countries.

Within this WHO strategy, the use of mid-level cadres for the delivery of health care services is an essential component. The WHO describes mid-level providers as "health workers with 2-3 years of post-secondary school health care training who undertake tasks usually carried out by doctors, nurses, or other health professionals." The use of these cadres is due to their wider availability, country-specific nature, lower cost and shorter "production" times.[8, 15] Pharmacy technicians and other pharmacy support workforce cadres are a key subset of mid-level cadres.

Effective deployment of mid-level cadres requires particular attention to competency requirements, education to meet these competencies and the regulatory framework to support them.[10] While this is a greater requirement in low- and middle-income countries to ensure basic provision of pharmaceutical services, in middle- to high-income countries pharmacy support workforce cadres are being expanded to allow the provision of clinical services by pharmacists in those health care contexts.[16, 17]

1.2.1 FIP guidelines and standards that engage pharmacy support workforce

FIP has had a focus on pharmacy workforce requirements for many years, with the 2009-2012 Pharmacy Education Taskforce documenting the global shortage of pharmacists and pharmacy support workforce cadres in their 2009 and 2012 Global Pharmacy Workforce Reports.[2, 18] Other articles published by experts in this field have further documented the shortage of pharmacists, pharmacy technicians and other pharmacy support workforce cadres, with an emphasis on exploring local "needs-based" approaches to human resources issues.[19, 20] That is, approaches that consider local issues rather than impose global standards. In 2014 FIP Education (FIP*Ed*) introduced a new structure that incorporates pharmacy workforce planning issues and provides the platform for ongoing work in this area by FIP. Under this new structure the "Global pharmacy workforce intelligence: Trends report 2015" was published.[13] This report highlighted two workforce issues relevant to pharmacy support workforce considerations:

- The aspiration of many countries towards establishing universal health coverage will require an enhanced health workforce, including pharmacists that can meet the need for pharmaceutical expertise in the population it serves. It is important to monitor trends in the workforce over time.
- There is still much to be done, with some regions and low-income countries still displaying a disproportionately low number of pharmacists or limited overall capacity for delivering pharmacy services.

Patients deserve high quality pharmaceutical services. The need to make the best use of existing pharmacists in various countries and clinical settings is clear, as is the need to utilise pharmacy support workforce cadres as part of the pharmacy workforce in many countries. As countries work towards increasing the availability and range of pharmaceutical services they should take into account the "FIP WHO Guidelines on good pharmacy practice: Standards for quality of pharmacy services" and consider a stepwise implementation approach' to ensure high quality service provision to patients.[5,21]

1.2.2 FIP 2020 Vision and a focus by the FIP President on "people, services and sustainability"

FIP's mission is to:

> *"Improve global health by advancing pharmaceutical education, pharmaceutical sciences and pharmaceutical practice thus encouraging, promoting and enabling better discovery, development, access to and responsible use of appropriate, cost-effective, quality medicines worldwide."*[22]

The situational analysis that underpins the FIP 2020 Vision notes that "health care is becoming more and more patient-focused" and "the gap in health care services between developing and developed countries needs to be urgently addressed".[23] Further, it is the pharmacist who is increasingly playing a key role in assuring a safe and effective supply of medicines and pertinent information directly to the patient. In many countries, pharmacy support workforce cadres play a role, mostly with pharmacists, in the delivery of pharmaceutical services.

FIP President Dr Carmen Peña, in her opening speech of the 2015 FIP congress in Düsseldorf, Germany, declared an emphasis on people, services and sustainability:

- "People, because they are the heart of all our strategies;
- Services, because that is what people expect, need and demand; and
- Sustainability, because everything we do must be viable."

Pharmacy support workforce cadres work with pharmacists in support of the FIP mission.

1.2.3 Specific aims of this technical report

This report was commissioned by the FIP Board of Pharmaceutical Practice (BPP) in 2015 and aims to provide an introductory global picture (with illustration via case studies in Appendix 1), of pharmacy technicians and other pharmacy support workforce cadres and their contribution to the delivery of pharmaceutical services.

An approved terms of reference document was provided for the working group, by the BPP, with the following objectives (Appendix 2):

- To provide an overview of the different roles and responsibilities of the pharmacy support workforce, as well as their education and legal framework;
- To provide a definition of the different types of pharmacy support workforce (e.g. pharmacy technicians, pharmacy assistant);
- To identify practice models that will allow them to make the best contribution possible within the pharmacy team, thus assisting in ensuring responsible medicines use.

The aim and objectives of the working group are met in this report by:

- Providing an overview of the different roles and responsibilities of the pharmacy support workforce as well as their education and legal framework.
- Identifying the variety of practice models that allow them to make the best contribution possible within the pharmacy team - thus assisting in ensuring the availability of pharmaceutical services and responsible medicines use.

2. Overview of report methodology and structure

Three main inputs were used for the development of this report a) literature review; b) primary survey data; and c) case studies.

a) Literature review

A methodical literature scan was conducted using the Medline, Ebscohost and Embase bibliographic databases. A key word search string was used aiming to retrieve citations investigating aspects of pharmacy technician, pharmacy assistant or other non-pharmacist cadres in the delivery of pharmaceutical services in a variety of practice contexts. With more than 1,000 citations retrieved, Tamara Koehler and Andrew Brown conducted a title and abstract review, then selected articles that represented the variety of work published in this field to embed in the report. A systematic literature review was not conducted because this was not possible within the resources of the working group.

b) Primary survey data

The aim of the survey was to address the objectives outlined in the approved Terms of Reference for this working group with the focus in this report of describing global variety. In 2012, Andrew Brown, the then FIP*Ed* Pharmacy Support Workforce (PSW) Lead, conducted an initial global survey of pharmacy support workforce cadres through the University of Canberra with the aid of a masters student, Katie Doherty.[24] This survey instrument was approved by FIP for circulation in 2012 and was slightly modified for use in this report. The survey data that was retrieved was rich and more extensive than anticipated. It was decided that in this report we would provide a general overview outlining the global variety of pharmacy technician and pharmacy support workforce practice from the general perspective of all respondents. A copy of the survey tool can be found in Appendix 3.

c) Case studies

The global diversity of the pharmacy technician and pharmacy support workforce and the models that are used in different practice environments are best articulated in case study format. The working group established an agreed set of comprehensive case studies that were developed by partners to reflect this diversity and variety of practice environments. These more detailed case studies are supplemented by abridged case study vignettes that are used to describe the variety of ways that pharmacy support workforce cadres engage with pharmacists in different practice settings (e.g. community, hospital, supply chain etc.).

The content of this report has been reviewed by the members of the FIP Pharmacy Support Workforce Working Group and is representative of the experts contained in that group.

3. Describing global variety (the research)

3.1 Survey methodology

The main aim of the survey was to describe the global variety of the pharmacy technician and pharmacy support workforce with reference to roles, responsibilities, education, supervision and regulation. A survey methodology was chosen to enable data to be collected easily from a variety of environments, in a way that enabled timely analysis.

Previous research investigating global aspects of pharmacy technician and pharmacy support workforce cadres was conducted in 2012. [24] The survey instrument used in the 2012 research was reviewed by the pharmacy support workforce technical working group with minor edits made to contextualise the survey. The survey was circulated to FIP member organisations through the FIP Head Office and a variety of global list serves where pharmaceutical service delivery is discussed (e.g. E-DRUG, FIP conference of parties, The International Association of Public Health Logisticians (IAPHL), Reproductive Health Supplies Coalition-Systems Strengthening Working Group (RHSC-SSWG)). The survey was conducted between October 2015 and January 2016.

The data presented in this report captures the view of "all respondents" rather than country specific details and is presented in a general way in this report to note the extent of global variety in this field. It is anticipated that the data collected using the above survey tool can be further analysed to produce validated "pharmacy technician and pharmacy support workforce data sheets" for each country and provide more detailed analysis and trends in the data through consideration of country income status etc. This report is to be considered as an introductory overview.

3.2 Results overview

It is clearly noted that the relationship, roles and responsibilities of pharmacy support workforce cadres varies greatly between countries. This report describes this global variety without giving recommendations or preferred practice models. The results in this survey document the vast global variety with respect to the pharmacy technician and pharmacy support workforce cadres.

- **Roles and competency**
  From no pharmacy technicians or other pharmacy support workforce cadres in Japan, through a variety of cadre interactions with pharmacist, to the autonomous practice of pharmacy support workforce cadres in Malawi
- **Responsibilities**
  From strictly supervised practice with a focus on supply, through autonomous practice for a variety of responsibilities, to independent practice
- **Supervision**
  From complete supervision for all tasks, through geographical varied supervision, to independent practice
- **Education**
  From on the job training, through certificate level vocational courses, to three to four year diploma programmes
- **Legislation, regulation and liability**
  From well-regulated and registered, through part regulation with weak implementation, to completely non-regulated contexts

Four different country specific pharmacy workforce models emerge from the data:

- Countries where there are **no pharmacy support workforce cadres**, only pharmacists e.g. Japan.
- Countries where **pharmacy support workforce cadres are supervised by the pharmacist** by direct or delegated methods e.g. Australia and South Africa.
- Countries where **certain pharmacy support workforce cadres are regulated**. They have accountability to undertake independent practice in a team with pharmacists. (e.g. Canada, Denmark).
- Countries with weak legislative structures but where, out of necessity, **pharmacy support workforce cadres work by themselves** (e.g. many low-income countries).

3.3 Demographics of respondents

Final analysis included 193 entries (n=193) from 67 countries and territories representing each of the WHO regions. Of these, 62 (35%) completed the whole survey. These completion results are similar to those experienced by Brown and Bruno in their separate research using similar workforce surveys.[25, 26, 27]

The full list of countries and number of respondents per country appears in the Table 1 below.

Table 1: List of countries and number of respondents per country

Country	Number of respondents	Country	Number of respondents	Country	Number of respondents
Afghanistan	1	Iceland	2	Slovenia	1
Algeria	2	India	7	Solomon Islands	1
Australia	4	Iraq	2	South Africa	17
Belgium	1	Ireland	3	Spain	6
Botswana	1	Japan	2	Sri Lanka	2
Brazil	4	Kenya	1	Sudan	2
Cameroon	1	Lebanon	2	Swaziland	1
Canada	3	Malawi	4	Sweden	1
China	1	Malaysia	3	Switzerland	3
China Taiwan	2	Mongolia	1	Thailand	2
Croatia	3	Morocco	2	Tonga	1
Democratic Republic of the Congo	6	Nepal	4	Uganda	3
Denmark	3	Netherlands	2	Ukraine	1
Dominican Republic	1	New Zealand	5	United Arab Emirates	3
Ecuador	1	Nigeria	10	United Kingdom	9
Ethiopia	3	Norway	1	United Republic of Tanzania	5
Fiji	3	Pakistan	6	USA	14
France	1	Papua New Guinea	1	Vanuatu	1
Germany	3	Philippines	1	Viet Nam	1
Ghana	5	Portugal	1	Zambia	2
Greece	1	Romania	1	Zimbabwe	2
Grenada	1	Senegal	1		
Hungary	1	Sierra Leone	1		

Figure 2. Word map with countries of respondents in blue

Of those respondents who completed the demographic section (n=105), the majority of respondents were pharmacists (Table 2), with most respondents having significant experience both in their profession and current role (60% with more than 5 years experience; Table 2). Respondents distributed well across the main practice areas of pharmacy, noting that 21 (20%) of participants were from pharmacy and pharmacy technicians' associations within the "Other" category, academia (18%), hospital (16%), government ministry or department (14%) and community (12%).

Table 2. Respondents' profile

Senior medical professionals	Pharmacist	Pharmacy assistant/ technician	Managerial/ leadership role	Administrative service professionals	Other	Response count
3	72 (69%)	7	13 (23%)	4	6	105

3.4 Cadre names

For this technical report the focus of our analysis was on the main pharmacy support workforce cadre present in the country as identified by respondents. The most frequent name given to the predominant pharmacy support workforce cadre in countries was "technician", 75%, with a multitude of other titles used across countries (Figure 3). This result was similar to that found by Doherty in her global survey in 2012, where technician was also the predominant title.[24]

Figure 3. Word cloud documenting the variety of names used globally for pharmacy support workforce cadres emphasising the predominance of the terms "technician" and "assistant"[24]

Where no pharmacy support workforce cadres were identified, participants noted that this was the case because there were sufficient pharmacists available (Japan) or that there was no existing legislation to support other cadres working in this space or the current legislation did not reflect what was actually happening in the country context.

3.5 Roles and scope

Our survey results confirm that globally the roles and scope of work for pharmacy support workforce cadres vary greatly according to country and practice areas within that country. In the following sections of this report our survey findings regarding supervision, education and legislation are presented. This information outlines the extent of this diversity from the perspective of the respondents surveyed.

Only 50% (n=110) of our respondents indicated that a scope of practice document existed for the main pharmacy support workforce cadre in that country (18% did not know). A scope of practice document clearly defines the role of a particular cadre in a work context. Clear scope of practice documentation for pharmacy support workforce cadres exists in many countries but not every country. Examples of scope documentation include: Germany, Ghana, Netherlands, Nigeria, Spain, Switzerland, Tanzania, United Arab Emirates, United Kingdom and the USA. The general trend is for middle- and high- income countries to have more detailed documentation and legislation supporting all cadres that contribute to the delivery of pharmaceutical services.

As the following section on supervision will explain, current international labour definitions for pharmaceutical technicians and assistants reflect the core functions (Box 1), of these cadres but do not reflect how these cadres practice in many countries of the world. For example, registered pharmacy technicians in the United Kingdom and Denmark practise dispensing without the supervision of a pharmacist.[28]

Box 1. Core functions defined in ISCO 08 Code 3213: "Pharmaceutical technicians and assistants"[29]

Pharmaceutical technicians and assistants perform a variety of tasks associated with dispensing medicinal products under the guidance of a pharmacist or other health professional.

Tasks include:

  (a) Preparing medicines and other pharmaceutical compounds under the guidance of a pharmacist or other health professional;
  (b) Dispensing medicines and drugs to clients and giving written and oral instructions on their use, as prescribed by medical doctors, veterinarians or other health professionals;
  (c) Receiving prescriptions or refill requests from health professionals and verifying that information is complete and accurate according to medical record-keeping standards;
  (d) Maintaining proper storage and security conditions for drugs;
  (e) Filling and labelling containers with prescribed medicines;
  (f) Assisting clients by answering questions, locating items or referring them to a pharmacist for medical information;
  (g) Pricing and filing prescriptions that have been filled and establishing and maintaining patient records, including lists of medicines taken by individual patients;
  (h) Ordering, labelling and counting stocks of medicines, chemicals and supplies, and entering inventory data into record-keeping systems.;
  (i) Cleaning and preparing equipment and containers used to prepare and dispense medicines and pharmaceutical compounds.

In recent years there have been a number of papers published exploring new and expanding roles for the pharmacy support workforce. Many of these new roles have been explored with the aim of freeing up the pharmacist, while in countries with few pharmacists these workers have extended roles due to necessity. Table 3 provides a summary of examples of some of these different roles as noted by a variety of publications from different countries (also see Section 4. of this report).

Table 3 Studies on different roles for the pharmacy support workforce

Year	Practice area	Role or service	Country	Ref.
2009	Hospital	Facilitation of admission & discharge of elderly patients	United Kingdom	30
2012	Hospital	Hospital ward stock top up service	Denmark	31
2012	Hospital	Check Tech Check	USA	28, 32
2013	Hospital	Clinical pharmacy technician roles	USA	33
2013	Community	Medication therapy management	USA	34
2013	Hospital, community	Medicines reconciliation	USA	35, 36
2013	Hospital	Contributing to geriatric treatment in bed-wards	Denmark	37
2014	Community	Vaccine advocacy	USA	38
2014	Medical centre	Medication history taking	USA	39
2014	Community	In home medication therapy	USA	40
2014	Hospital	Subacute aged care ward service	Australia	41
2014	Health centre	Enhanced cadre of pharmacy assistants for health centres	Malawi	42, 43
2014	Community	Community pharmacy-based adherence programmes	Multiple	44

FIP 2012 pharmacy workforce data further documents the large variation of numbers of pharmacy support workforce cadres between countries and WHO regions, with low income regions having less pharmacy workforce compared with higher income regions (Figures 4 and 5). It is also interesting to note the large variation in the ratio of pharmacy technicians to pharmacists in different countries (Figure 6).
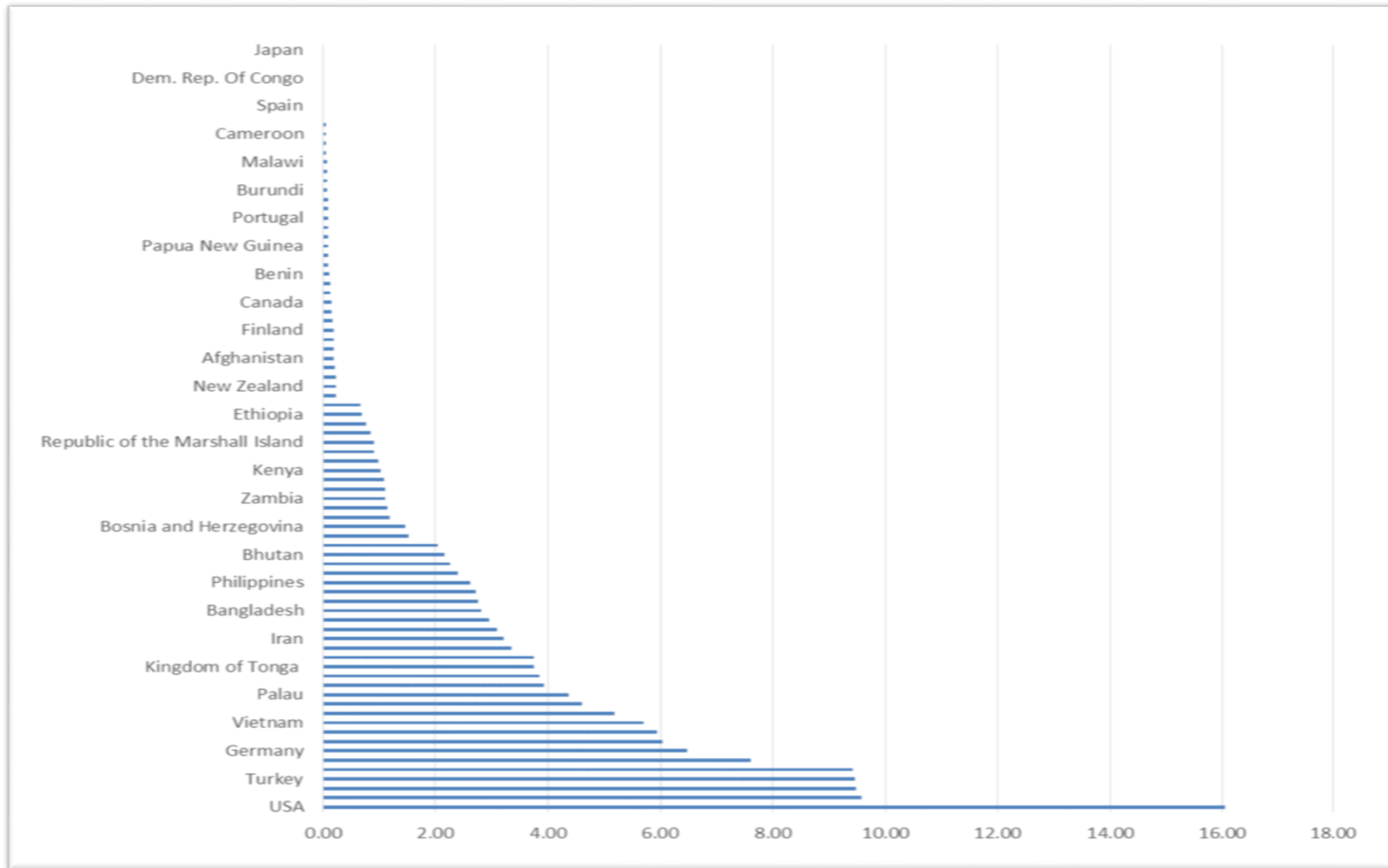
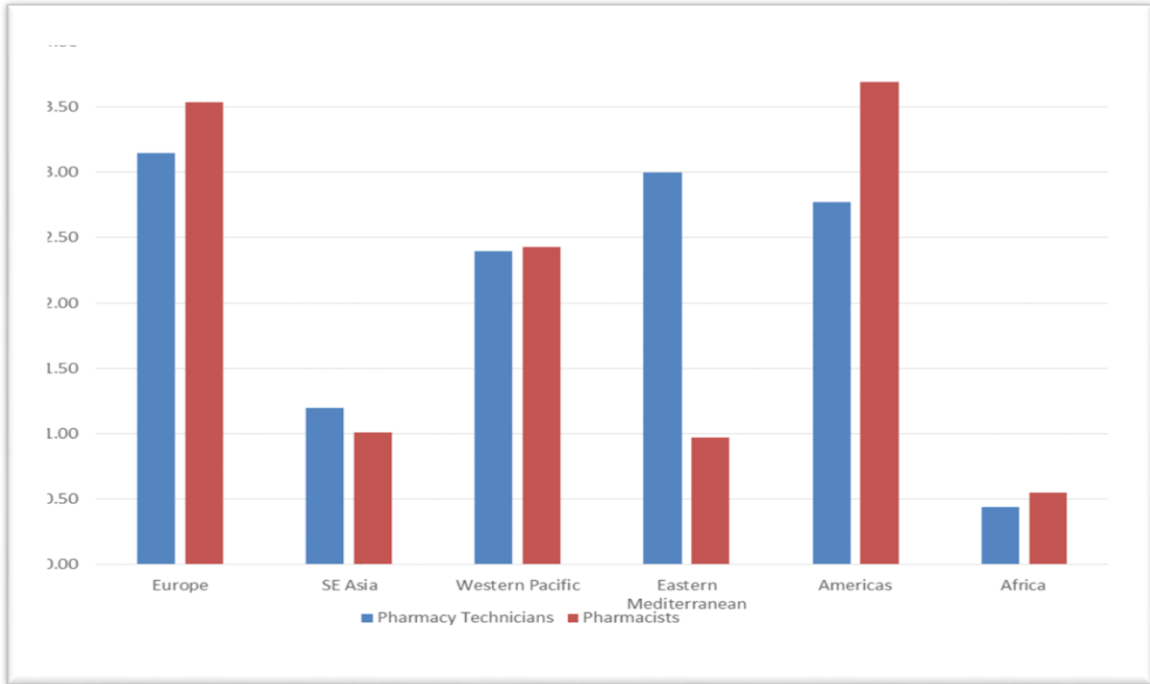**Figure 4**. Density of pharmacy technicians per 10,000 population[2]

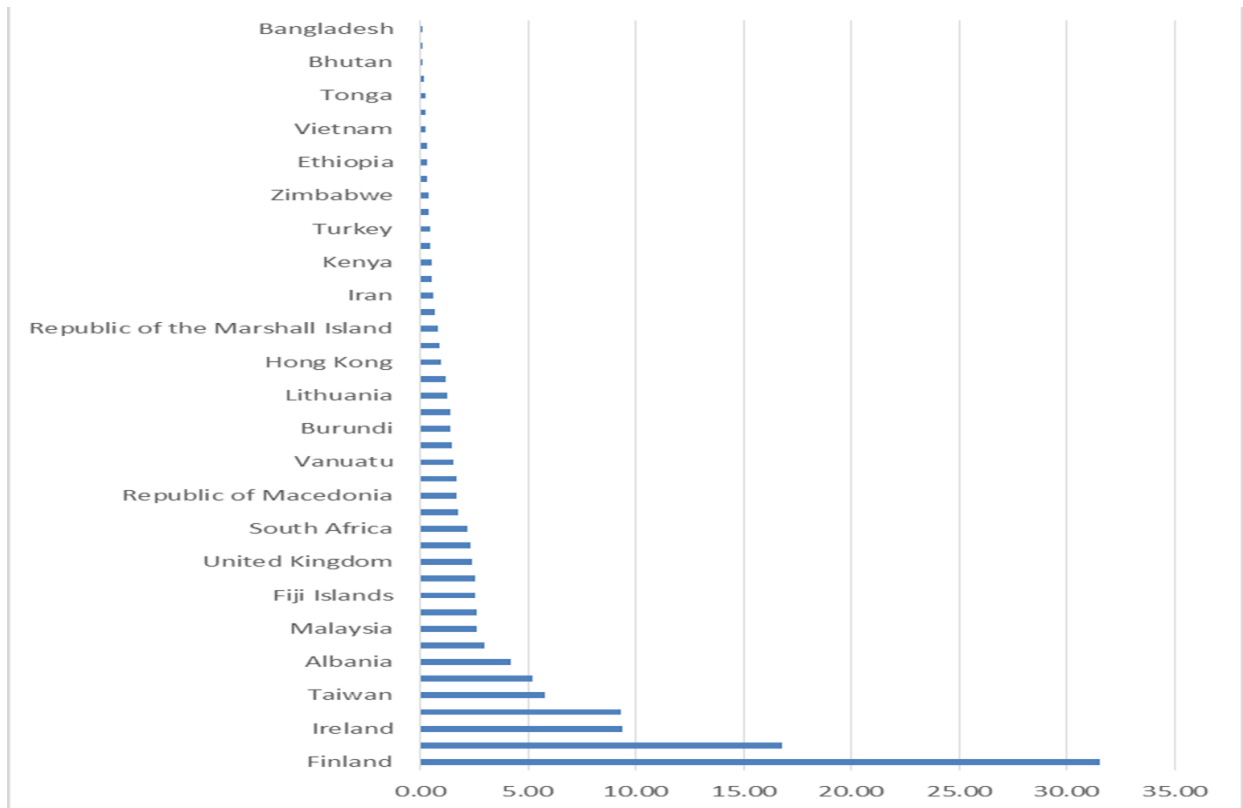**Figure 5**. Comparison of pharmacy technician and pharmacist average density per 10,000 population by WHO region [2]

Figure 6. Ratio of pharmacists to pharmacy technicians [2]

3.6 Supervision

There is global variety in the supervision requirements of pharmacy support workforce cadres, with 12% (n=167) of respondents indicating that these cadres work independently all the time, 67% indicating that they work independently some or most of the time and 19% respondents indicating that pharmacy support workforce cadres never work independently, that is, they are always supervised (Figure 7).
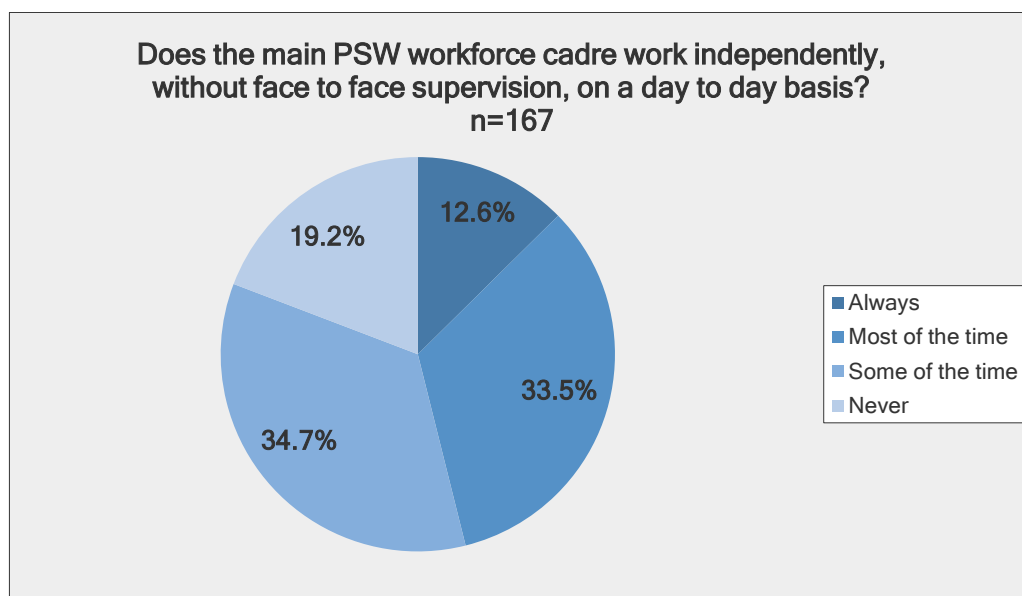
Figure 7. Response to question on supervision

The supervision of pharmacy technicians and other pharmacy support cadres may vary in a country depending on geographical location and the availability of other pharmacists or medical cadres. In general, high-income countries (World Bank groupings), with well-developed health systems, have strong regulatory systems and sufficient numbers of pharmacists to deliver pharmaceutical services with limited need for non-supervised activity by other pharmacy cadres. In remote locations "telepharmacy" or other remote pharmacist supervised mechanism may be used, where technology, funding and legislation allows (e.g. Kansas).[45] There are also a number of countries, for example the United Kingdom and Denmark, where pharmacy support workforce cadres practise a variety of activities unsupervised in a regulated environment (e.g. final checking of prescriptions after dispensing). These activities are described more fully in the country case studies in Section 9 of this report.

A variety of associations (e.g. Australia and the United Kingdom), have published guidelines to support quality supervision of pharmacy technicians and other pharmacy support workforce cadres.[46, 47]

3.7 Competency profiles and supervision

Respondents (30%) indicated that supervision requirements were different in urban environments compared with rural environments, with 40% of respondents indicating unchanged supervision when considering urban rural distribution.

In low- to middle- income countries with less well developed health systems, less funding and a lower number of pharmacists and other medical staff, pharmacy support workforce cadres take on a greater role in the delivery of some of pharmaceutical services without supervision (focusing on ordering, supply to dependent facilities, dispensing and basic medicines counselling). Pharmacists and other medical staff are less likely to be found in rural and remote environments. It is in these environments that other pharmacy cadres often work unsupervised to ensure the delivery of services. South Africa serves as an example of this type of approach where pharmacists are available for supervision in urban areas but not in rural and remote areas. This may be the case even if there is no legislation or special government policies to support the practice (e.g. Vanuatu and Papua New Guinea).[48,49] These arrangements are contextually specific within countries and regions of countries depending on the local health needs and availability of staff.

Reports in the literature also discuss a variety of supervision situations. The issue of situational competence was documented by Brown in his study of the Vanuatu pharmaceutical system where across the country he noted that the supervisory circumstances varied according to the availability of staff and the competence they

were expected to demonstrate.[25, 48] In the extreme sense, if the driver of the delivery van was the only person in the pharmacy then they would be responsible for dispensing medicines directly to patients without further supervision. A similar situation was noted in Papua New Guinea.[49] The overriding principle was that pharmaceutical service delivery to patients and clinics must go on irrespective of the cadres that were present in the pharmacy section. Results from this current study suggest that this is a more global phenomenon, especially in low- and middle- income country contexts. Indeed, situational competence can be expected in any country experiencing a shortage of pharmacy workforce cadres. [2, 12]

The most supervised competency area is patient consultation and diagnosis, while procurement and stock ordering was the least supervised competency area of survey respondents (Table 4). Of those competency areas listed in the survey receiving donations of medicines and patient consultation and diagnosis were competency areas not considered relevant to primary pharmacy technician and other pharmacy support workforce roles by a third of respondents (Table 4).

NB. By analysing this survey data by World Bank income groupings it is expected that the supervision profiles would show significant differences to the averages noted here (Table 4).

Table 4. Question on main competences that require supervision for the main PSW cadre in respondent's country

Answer Options	Full supervision	Some supervision	No supervision	Area n/a	Response count
Procurement (stock ordering)	40 (25%)	69 (43%)	41 (25%)	11 (7%)	161
Receiving donations of medicines	33 (20%)	42 (26%)	24 (15%)	62 (39%)	161
Distribution of medicines to facilities	47 (29%)	68 (43%)	34 (21%)	11 (7%)	160
Packing/repacking of medicines	44 (28%)	70 (44%)	33 (21%)	13 (8%)	160
Disposal of medicines	49 (30%)	65 (40%)	32 (20%)	15 (9%)	161
Budget and reimbursement	46 (30%)	44 (28%)	22 (14%)	43 (28%)	155
Giving medicines information and advice to patients	55 (34%)	57 (35%)	30 (19%)	19 (12%)	161
Health promotion of non-medicine strategies	34 (21%)	67 (41%)	32 (20%)	29 (18%)	162
Patient consultation and diagnosis	66 (42%)	27 (17%)	16 (10%)	50 (31%)	159
Taking a medication history of patients, including medicines reconciliation	53 (33%)	45 (28%)	19 (12%)	44 (27%)	161
Dispensing medicines to patients	57 (35%)	62 (39%)	29 (18%)	13 (8%)	161
Reconstituting of medicines	60 (38%)	50 (31%)	26 (16%)	23 (145)	159
Preparation or compounding of medicines	64 (40%)	52 (32%)	25 (16%)	20 (12%)	161
Consult with other health care professionals	44 (27%)	60 (37%)	26 (16%)	31 (19%)	161
Checking prescriptions	61 (38%)	49 (31%)	27 (17%)	23 (14%)	160

48% of respondents noted that expected competencies of pharmacy support workforce cadres requiring supervision varied across hospital and primary health care facilities. Open comments from respondents supported this number clearly noting differences in expected competencies for cadres in different practice environments (examples were given from respondents in low- income country contexts). In general terms, within hospital environments cadres appear to be more involved in local compounding, IV additive services and medicines reconciliation services, while in community pharmacies and primary health care facilities

pharmacy support workforce cadres take on larger primary health care roles and direct medicines supply activities.

3.8 Education

From a global perspective there is significant variety in pharmacy support workforce education approaches, with respondents reporting certificate (one to two years) and diploma (three to four years) as the most common, spanning the vocational and academic education pathways. Table 5 further documents the variation around aspects of education. (NB. The suitability of education to specific country contexts and need was not assessed in the survey. Nor did the survey ask what competencies were covered in any given training type.)

Table 5. Variation around aspects of education

Type of education	% (n)
No education required	6 (7)
Work based education	8 (9)
Certificate level (vocational)	35 (42)
Diploma level	33(40)
Degree level (academic)	12 (14)
Masters level	0 (0)
PhD	0 (0)
Other	7(8)
Number of responses	**100 (120)**
Length of education	**% (n)**
Less than 1 year	18 (20)
Less than 2 years	20 (22)
Less than 3 years	39 (43)
Less than 4 years	15 (16)
More than 4 years	8 (9)
Number of responses	**100 (110)**
Length of education	**% (n)**
Less than 1 year	18 (20)
Less than 2 years	20 (22)
Less than 3 years	39 (43)
Less than 4 years	15 (16)
More than 4 years	8 (9)
Number of responses	**100 (110)**

Public and private institutions both play a significant role in providing education, with payment for this education nearly equally distributed between students and other sources (government, employer, donations).

Satisfaction regarding current education approaches was varied with only 50% of respondents noting some degree of satisfaction with the education provided, 15% of respondents were neutral on the issue. When asked

"how could education for pharmacy support workforce cadres be improved" the top four responses from 123 respondents were:

- *There should be sufficient financial and academic resources available (#16)*
- *There needs to be a "needs-based" review of education approaches (#15)*
- *Education should be more practice based (#11)*
- *Education approaches need improved accreditation and quality assurance processes (#13)*

FIP encourages a "needs-based" approach to pharmaceutical education where the services required to be delivered in a context are locally determined, the competencies required for specific cadres who deliver these services are agreed and education approaches are developed to meet local development needs for these competencies.[20, 50] Further, FIP suggests guarding against seeking globally standardised curriculum approaches, noting that any country education efforts for the pharmacy workforce must be relevant to local service delivery.[20,51] Efforts taken to apply this approach to pharmacy support workforce cadres of small island states of the Pacific Islands is one example where excellent engagement and local acceptability has been demonstrated.[52]

For any extended role for pharmacy support workforce cadres to be effective the education requirements must change to meet this new need. The USA Report of the "2013-2014 Professional Affairs Standing Committee: advancing the pharmacy profession together through pharmacy technician and pharmacy education partnerships" notes this in detail and suggests that education institutions should consider forming effective collaborations to ensure appropriate education, training, and certification of pharmacy technicians.[53] This USA report was tabled, noting a call for improved accountability regarding pharmacy technician education in 2011.[54]

Other countries are also pursuing this aim, including South Africa who has recently reviewed the roles of pharmacy support workforce cadres and related education requirements.[55, 56, 57] An overview of the approach taken to educate pharmacy technicians cadres in the USA was recently published, where a state based system is in force.[58] The paper notes that rigorous debate and discussion is needed regarding the future of pharmacy technician roles and the training required fitting those roles. The United Kingdom takes a wider view when it comes to the education of pharmacy technicians and has published a robust review of education and training with a view to ensuring it was aligned with the changing scope of practice in that context.[59, 60] Intense discussion regarding the appropriateness of pharmacy support workforce training in Germany formed part of the annual FIP congress held in 2015, and reflects a robust review of roles and associated supportive education structures.[61]

Quality assurance is the system put in place at a country and/or institutional level to ensure that the curriculum content and delivery meets minimum and expected standards.[58] It is interesting to note that only 53% (n=43) of respondents stated that quality assurance of education was in place with significant numbers of respondents less than completely satisfied with current quality assurance processes. When asked "how could quality assurance (QA) of education for pharmacy support workforce cadres be improved", respondents (n=114) noted the following answers (top 4):

- *Improve the supervision around implementation and accountability regarding QA processes (#17)*
- *QA processes for education should be introduced or strengthened (#15)*
- *Nothing to do as the process is currently working well (#10)*
- *Improve transparency and feedback during the quality control (QC) process for education (#8)*

3.9 Legislation, regulation and liability

Participants were asked to comment on legislation and regulations (Figure 8), scope of practice (Figure 9), and registration (Figure 10), for up to three pharmacy support workforce cadres present in their country context. In the Figures 8-10 the Cadre 1 refers to the most common pharmacy support workforce cadre in the participant's country and Cadre 2 and 3 refer to the next most common pharmacy support workforce cadre in the participant's country, as indicated by the participant.
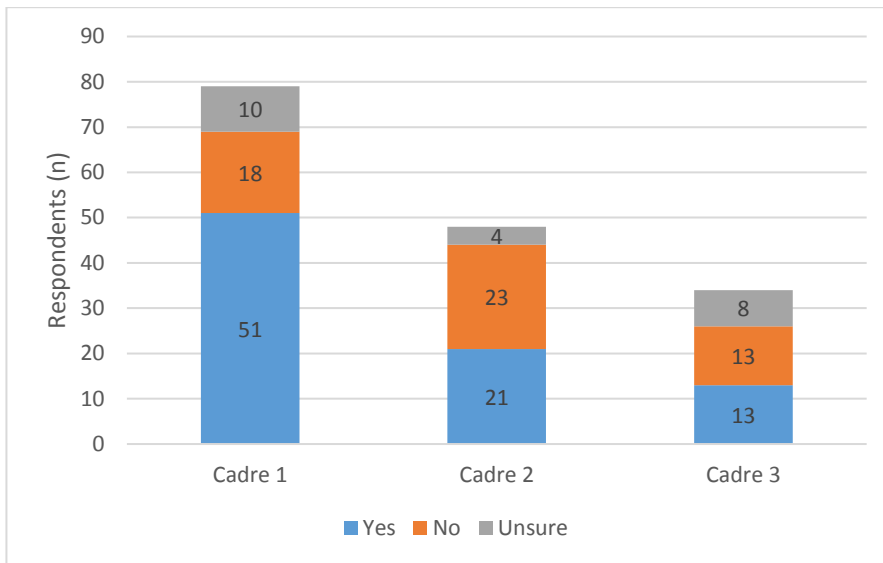
Figure 8. Legislation and regulation to frame the practice of each of the national PSW cadres
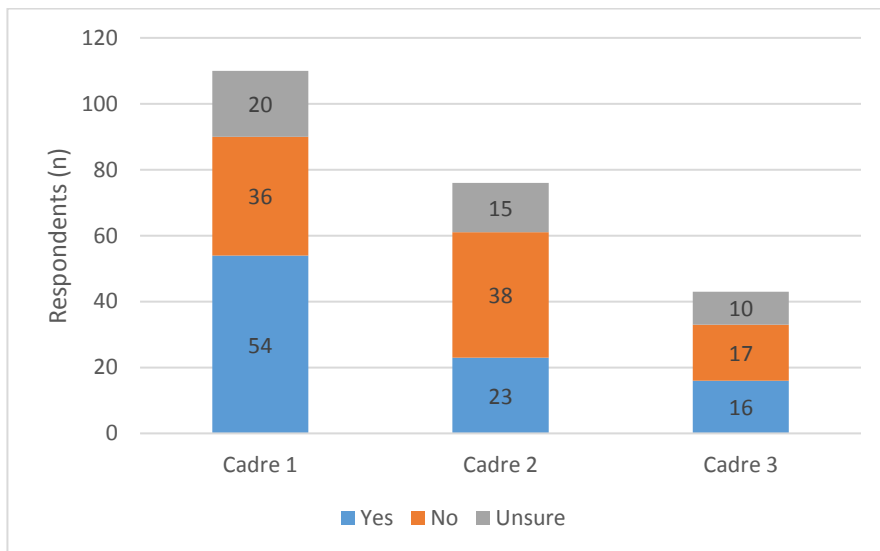

Figure 9. Existence of a defined scope of practice for each of the national PSW cadres

The data again points to significant global variety; from robustly regulated and registered, through part regulation with weak implementation to completely non-regulated contexts. It is interesting to note that cadres apart from those listed as the main pharmacy support workforce cadre are less likely to be regulated by legislation and have reduced requirements for registration. Scope of practice definitions were also reported as being absent by a large number of respondents.

When asked "how could legislation and regulatory requirements" for pharmacy support workforce cadres be improved respondents (n=110) noted the following (top 3):

- *Call for registration or re-registration requirements for pharmacy support workforce cadres (#26)*
- *Review and updating of legislation and regulations (#10)*
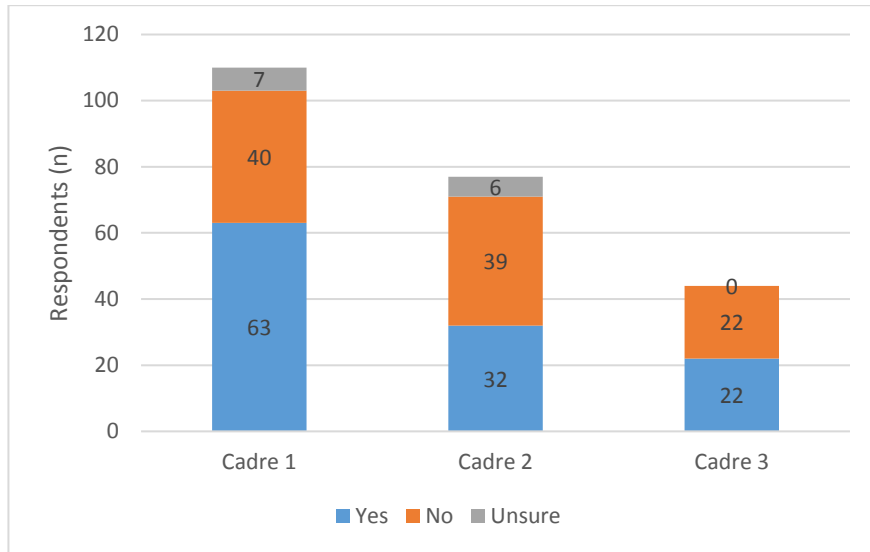- *Enforcement of legislation (#5)*

Figure 10. Need of the national PSW cadres to be registered by government in order to work

In 2010, the Global Health Workforce Alliance (GHWA) released a report summarising the importance of mid-level cadres in meeting health care needs. This paper suggests that all who practise health related competencies, including pharmacy support workforce cadres, should work under and be held accountable by appropriate legislation.[1] As our data shows, registration of pharmacy technicians and other pharmacy support workforce cadres is not routine across countries, with even OECD countries (Organisation for Economic Cooperation and Development) such as Australia and Spain, not requiring the registration of these cadres. In countries which have registered pharmacy support workforce cadres (e.g. Canada, United Kingdom), they have done so to increase accountability of these cadres within their health care context.

4. A variety of practice models

In this section of the report the intent is to share evidence from the published peer reviewed literature that documents the evolution of pharmacy technician and pharmacy support workforce cadres working with pharmacists and supplementing this information with mini case study vignettes. These vignettes document practice specific situations in specific country contexts rather than the detailed country overview case studies which are presented in the following section of the report. Data for these case study vignettes was obtained by FIP section representatives and reviewed by the relevant FIP member organisations.

4.1 The evolution of the relationship between the pharmacy support workforce and pharmacists to support patient care (literature 2009-2015)

Summary

Since 2009 there has been a focus on the relationship between pharmacy technicians, pharmacy support workforce cadres and pharmacists in the literature. 2009-2011 saw a framework of role evolution develop, with publications from 2012-2015 documenting further maturity in the development of practice models for improved patient care and optimal use of personnel. The dominant narrative in the published academic literature has been made by certain high- income countries (mainly Canada, Denmark, United Kingdom and the USA). In these countries there are significant numbers of pharmacists available and there has been an increasing interest to utilise pharmacy support workforce cadres to allow the extension of clinical roles of pharmacists in these contexts. This is not a systematic presentation of all the literature available but rather an overview of the main themes presented in the peer reviewed literature (2009-2015), through the use of key articles. Key points from this literature include:

- *Initial interest in this area resulted from a growing desire to increase the visibility of the pharmacist in line with the evolution of pharmacy practice, investigating how to move the pharmacist away from administrative roles and more towards clinical care. In this context the optimal use of other pharmacy cadres has gained momentum with numerous examples provided where pharmacists have been able to extend their clinical role with greater use of pharmacy technicians or other pharmacy support workforce cadres.*

- *As an expanded role for a variety of pharmacy support workforce cadres has developed, issues around education, regulation and registration have been discussed. As has the importance of clearly defining the role of both the pharmacist and other pharmacy cadres in specific practice settings. Where these partnerships have been developed successfully there has been detailed attention to change management and stakeholder engagement, with improved patient care as the focus. Significant guidance has been provided to aid implementation.*

- *In more recent years, pharmacy support workforce roles have expanded in some country practice settings, moving from administration and supply functions to independent checking of prescriptions by cadres and more recently to the management of patient adherence programmes (e.g. United Kingdom, USA).*

- *With a continued focus on freeing up the pharmacist for expanding clinical roles, the most recent literature (USA) explores the need to further develop the leadership skills of the pharmacy support workforce.*

To allow the reader to clearly understand the country of origin of the themes presented, care has been taken to note the country of origin of the papers used in this section.

Theme 1. Increasing the visibility of the pharmacist starts the discussion on pharmacy support workforce roles and skills mix

The discussion regarding the role of pharmacy technician and pharmacy support workforce roles is strongly influenced by the discussion on the pharmacist's role and the evolution of that discussion from a consideration of core pharmacy roles based within a dispensary to a discussion of decentralised roles where pharmacists conduct more activities in patient-care areas. According to Horon *et al* (Canada), this debate can

be seen as a positive indicator of the progress that the profession has made in clarifying the pharmacists role as clinical, to deliver patient-centred pharmaceutical services.[62]

In 2012, this discussion speaks of opportunities to improve the quality of health care and continuation of the process in which the profession moves forward from product care to patient care (USA).[64] It is suggested that in this new environment a different role for pharmacy support workforce cadres is required to complete more administrative tasks to fill the gap created by the transition of pharmacists to more clinical care roles. It is noted that any new pharmacy support workforce role needs to be aligned with the core strategies of the community and hospital pharmacy, to provide a successful pharmacy practice model, based on a sound drug distribution system that safely and efficiently gets medicines to patients (USA).[17]

Theme 2. The need to explore the changing role of pharmacists and pharmacy support workforce cadres

The literature consistently presents the need to expand the pharmacist's clinical role. Different initiatives have been established to clarify the process of moving the profession forward into the era of clinical care.

From a Canadian perspective, utilising well-trained pharmacy technicians is very important, if the profession is to achieve optimal use of the pharmacy workforce and meet increasing expectations for clinical pharmacy.[62, 63] This will lead to pharmacists being able to concentrate on intellectual decision making and to provide ample patient care and clinical services even though pharmacists are in short supply, both nationally and internationally (Canada).[62]

Also in 2008, the literature presented three drivers for this change. The content-based shift (from product to patient care) creates a void, but there is also a functional gap to fill since pharmacists are having to prioritise their services to the sickest patients and those with complex or high-risk medication regimens. As a result, not all patients that could benefit from clinical pharmacy services, receive them (Canada).[64] At a more basic level, there is often a significant shortage of pharmacists despite their established roles as members of health care teams within hospitals and in communities (Canada).[65] Besides staff shortages to meet the care provision, sometimes pharmacy-based involvement is not present. It is reported to be the case in Australia, where extending all roles of rural health care providers is often necessary to improve access to medication services (Australia).[66] There are many similar experiences in low- and middle- income countries today, where pharmacists are few.[2] For example; Papua New Guinea, Vanuatu and Malawi.[42, 48, 49, 52]

In 2011, the literature presents medicines supply as the most important domain that needs attention to provide pharmacists with time to expand their own roles to patient centred pharmaceutical care (USA).[16] Additionally, the effects of medicines shortages on pharmacy departments and the health care system as a whole can place significant strain on pharmacists (USA).[67] Optimisation of medicines delivery is thought to be achieved by automation and highly trained pharmacy technicians.

Besides the CSHP 2015 Initiative, other guiding documents present a call for action. The blueprint for pharmacy (2005; Canadian Pharmacists Association; optimal drug therapy outcomes for Canadians through patient-centred care) and the pharmacy practice model summit (2010, American Society of Health Systems Pharmacists), are seen as a basis to encourage hospital and health-system practice leaders to examine how they deploy their resources to ensure that the efforts of the pharmacy departments are aligned with the most urgent needs of patients and institutions.[61] This advancing of the profession calls for new and more advanced roles for pharmacists, pharmacy technicians and other pharmacy support workforce cadres (USA).[68] They should work to their full scope of practice (Canada).[69] In 2013, medication therapy management is regarded as one of the emerging fields for these advancements (USA).[70]

From 2014, literature from Canada focuses on how the provision of health care becomes increasingly collaborative, as the health care needs of patients grow more complicated (Canada).[71] To improve pharmaceutical patient care in these settings, this collaborative spirit should also occur between pharmacists, pharmacy technicians and other pharmacy support workforce cadres, not just be extended to professionals outside the pharmacy (Canada).[71] Or even more specifically addressed, other health care professions such as nursing and medicine have already, albeit to different extents, embraced the concept of intra-professional collaboration with support personnel to improve patient care, and the profession of pharmacy should be no different (Canada).[65] The increasing scope of practice with the expansion of patient care activities, also makes the work in a pharmacy more demanding. This warrants workflow modifications in terms of traditional roles and responsibilities in dispensing medicines and providing patient care.[71]

Another perspective is presented in a periodical from the United Kingdom, where the expanding roles of pharmacy technicians are noted to provide more time for pharmacists to conduct clinical functions. The article

suggests that pharmacists will need to be reimbursed for these roles, otherwise expanded pharmacy technician roles will place more pressure on pharmacists.[72]

Theme 3. How pharmacy support workforce cadres support the evolving clinical role of pharmacists

Besides explaining the need for the expansion of the pharmacist role, the literature also suggests how the developing role of the pharmacy technician can further support the pharmacist. Again, Canada is used as an example where they state that care is to be provided in a collaborative manner where pharmacists focus on medication management and patient health outcomes, and pharmacy technicians focus on drug distribution (Canada).[69] In this paper the authors have a clear view on the specifics of that role. As pharmacists expand their focus from drug distribution to providing direct patient care, they suggest relying on pharmacy technicians as managers of drug distribution systems. This is a role pharmacy technicians are capable of, willing and ready to do in the Canadian context (Canada). [69]

The demands for supply chain management in rural areas is obviously a strong driver of the role expansion towards drug distribution, as this paper from Australia notes. The benefits of expanding the roles of pharmacy support staff, thereby releasing pharmacists to focus on more advanced roles, becomes clear in rural areas. Rural hospitals that do employ pharmacists often do not use a pharmacist's expertise appropriately, limiting their functions to fulfil basic dispensing tasks. So, pharmacy technicians and other pharmacy support workforce cadres can support medicines supply processes (under supervision) to provide more effective basic pharmacy services (Australia). [66]

Most literature focuses on drug distribution roles for pharmacy support workforce cadres, but some articles try to see beyond this point. Nonclinical activities are mentioned in the community practice setting, on the requirement of regulated pharmacy technicians in Canada. Proposed effects of this revised skills mix include improved professional satisfaction, enhanced patient care opportunities and economic benefits for the pharmacy.[71]

One of the most progressive ideas from the Canadian literature relates to the contribution of competent pharmacy technicians to important elements of clinical pharmacy services, so direct involvement in patient care. Obtaining medication histories and tracking the results of laboratory tests are seen as elements contributing to a more desirable pharmaceutical services model and subsequently allowing pharmacists to focus on the challenges associated with the ascending multidisciplinary collaborative practice.[62]

Theme 4. Exploring the readiness of organisations for change and the importance of following good change management practices

Ideas on the expansion of the roles of pharmacy support workforce cadres that deviate from drug distribution invoke the most interest when more expanded roles are discussed. These papers do not address the appropriateness of the proposed expanded role, but mainly the themes of perception by the pharmacist, and organisational readiness for change.[53, 73] This part of the literature adds insights into the change process by defining possible risks and unwanted outcomes.

The first of these presented insights concerns pharmacy support workforce cadres working without supervision (Canada).[62] Horon *et al* stress the importance of using a collaborative model, inside which these cadres should work. They can be deployed to patient care areas to facilitate the pharmacist's delivery of a comprehensive package of clinical pharmacy interventions, while keeping in mind that pharmacy support workforce cadres are meant to support not replace the clinical role of pharmacists. They acknowledge the fact that more pharmacy technicians in patient areas will lead to more public awareness of pharmaceutical services, but warn of the following possible outcomes: stakeholders (patients, health care professionals, administration) could mistakenly conclude that activities performed by pharmacy technicians represent the full catalogue, depth and quality of clinical pharmacy services. It is interesting to note that in many low- and middle- income countries pharmaceutical services can only be delivered by pharmacy support workforce cadres due to a lack of available pharmacists, particularly in rural and remote areas.[2, 13]

Concerns with regard to organisational readiness were voiced by authors who shared their sense of "think before storming off and change". A paper from Canada provides a good example.[69] If you only get one chance at organisational change, proceed with caution to ensure the successful outcome of effective and safe handover of responsibilities. Questions raised in this context were: "Does the entire pharmacy profession support the concept of pharmacy support workforce cadres taking on this expanded role? Can health care organisations accommodate this change?" And on a more day-to-day basis: "Are pharmacists willing to support and collaborate with pharmacy technicians? Are pharmacy technicians and other pharmacy support workforce cadres equipped to fulfil those responsibilities?" The article provided ways to become well

informed and equipped to initiate transition by formally presenting success stories and the sharing of experiences by early adopters (Canada).[69]

In further considering readiness for change other examples appear in the literature. The assessment of the effect of entrepreneurial orientation, resource adequacy and pharmacy staffing on pharmacy practice change showed, among other factors, that the most commonly reported change in pharmacies over the previous 2 years included the responsibilities and activities of pharmacy technicians (USA).[70] When current and desired roles of pharmacy technicians were investigated as a possible barrier for pharmacists performing clinical services as medication therapy management (MTM), lack of sufficient staffing was reported to be of high influence. Few pharmacy technicians were trained to assist with MTM, but more than 70% of pharmacists would seek technical assistance with scheduling, billing and patient correspondence (USA).[74]

In order to prepare new cadres of mid-level pharmacy staff, a practice analysis was conducted to ensure the programme addressed workplace needs when developing the new educational programme (South Africa).[57] Another example of how research formed pharmacy technician role expansion, comes from the hospital setting. Department leadership and frontline staff identified the need for innovative pharmacy technician leadership roles. When developing those roles, leadership sought input from inside and outside the pharmacy department. Job descriptions and metrics were thus developed. Challenges in this project related to staff training and scalability of the model beyond the pilot setting (acute care). Besides firm ideas on the new pharmacy technician roles, this development has increased stakeholders (nursing, patients, physicians) satisfaction with pharmacy services (USA).[75]

Research with regard to perceptions and attitudes about patient orientated pharmacy practice of pharmacy technicians was conducted.[76] The objective was to obtain more insights into the professional behaviour of pharmacy technicians within a US practice setting. In the educational department changes have already occurred in Canada. Standards of practice for registered pharmacy technicians are developed by the provincial college of pharmacists (Ontario),[65] and a national examination process is offered to pharmacy technicians by the Pharmacy Examining Board of Canada.[75]

The implementation of a successful practice model change is described to be availed by a sound operational strategy, excellent communication skills and the ability to navigate complex political issues, with a critical role for the pharmacist as organisational change leaders (USA).[17, 68] A more applied description of what was done to make the most effective use of pharmacy staff resources to advance pharmacy services and optimise patient care in a USA setting, suggests that pharmacists provide patient centred care and certified, trained and competent pharmacy technicians perform Tech-check-Tech and drug distribution functions that do not require clinical judgement, and other innovative functions.[16] In order to reach that status in pharmacy care, the author recommends to learn (from precursors), share (best practices on current training programmes), collaborate (developing advanced role model training programmes), identify and ensure that this new level cadre is present in the departments.[14] Another example is provided from Tanzania.[77]

Secondly, staffing and education are presented as important elements for effective change management involving pharmacy workforce roles. Harnessing the desire of staff to practise at a higher level is considered to be an important driver for role expansion (USA).[17] Practising at a higher level requires education. Nationally established standardised educational expectations and the introduction of rigorous entry-to-practice criteria are suggestions to address the raised questions on competency of pharmacy support workforce cadres (Canada).[62] Depending on the anticipated extent of (possible) independent provision of services it is suggested that pharmacy support workforce cadres would need additional focused training to support the practical application of knowledge coupled with basic clinical skills. Continuous professional development (CPD) or workplace training may satisfy this need for focused training (Canada).[62]

Some available data beholds a warning. The Pharmacy Practice Model Initiative (PPMI) inspired the following statement: "If pharmacists do not decide what their future practice model will be, others will decide for them. So be bold in planning for transformation of the pharmacy enterprise. Reach out internally and externally" in the health care system to find allies (USA).[64] From the rural environment, where shortages of pharmacists are an important issue, evidence is gathered on functions from the medical department (i.e. nurses) being up-skilled to fill the void in pharmacy-based functions (Australia).[66] This task shifting by up-skilling clinical staff from adjacent health care professions without any formalisation, is also reported in Tanzania where it mainly occurs as a coping mechanism rather than a formal response to the workforce crisis.[77]

Concerns have also been voiced in the context of community pharmacy in the United Kingdom. The extension of the community pharmacist role, sought after by policy makers and pharmacy's representative bodies, involves medicines use reviews. These are often performed outside of the pharmacy. Absence of the pharmacist has an impact on pharmacy support staff and work processes. Consideration should be given to support staff and pharmacist's existing work obligations when developing extended roles. The provisions of

adequate resourcing for the new (or old) services is needed to avoid well-intended improvisations by the staff (United Kingdom).[78]

The need to carefully consider readiness for change and good change management practice is further highlighted in this report through case studies from Canada, Malawi, Singapore, South Africa, and the United Kingdom, which clearly document how these issues were addressed in country specific contexts.

Digitalisation is also changing the work and the job description of people working in a pharmacy, decreasing the time used for manual work and allocating time for digital services.[79] Since 2017, all prescriptions for humans in Finland are electronic prescriptions.[80] Digitalised community pharmacies are using robots in prescription medicines stock control and there are almost 100 pharmacies with online services.[79, 80] In Finland the work description of pharmacy technicians often includes IT and stock-management tasks.[81] It is one of the main tasks of pharmaceutical technicians to check, record to the system and shelve the new stock from wholesalers. In addition to this, technicians do a great deal of office work, creating and sending invoices, recording of documents and updating customer loyalty records. Depending on the pharmacy and the technician, technicians might have been given tasks related to marketing; tasks such as running campaigns, creating posts to pharmacy's social media accounts and updating the pharmacy homepage. Pharmacy technicians are designated IT support persons in many pharmacies where they update the software, create back-ups and help in case of IT issues. Community pharmacies with online shopping services often have more technicians as they are the core workforce helping to run these services. Many of the tasks pharmacy technicians do, such as working as a cashier, taking care of the robot, IT-support and stock-management, are mainly manual tasks.[3] Yet, the general ideology is that allocating these tasks to pharmacy technicians is leaving more time for pharmacists and pharmaceutical assistants to focus on rational medical treatment, dispensing and patient counselling which all require pharmacy education.

Theme 5. Further examples of expanded roles of pharmacy technicians and other pharmacy support workforce cadres

The literature reports on a variety of extended pharmacy support workforce roles that have been studied in specific countries and practice contexts (mainly in Canada, the United Kingdom and USA). Many studies are exploratory in nature with a call for more research in the area.

Research on best possible medication history (BPMH) shows trained pharmacy technicians obtain this history at hospitals as accurately and completely as pharmacists (Canada), while a recent meta-analysis of medicines reconciliation approaches called for further studies to measure the impact of involving pharmacy technicians. [82, 83] A study on pharmacy technician awareness of national medicines shortages aimed to enable pharmacy technicians to understand why shortages occur, and how they can help ameliorate the effect of medicines shortages in their workplace. Pharmacy technicians proved a valuable resource for pharmacists in the management of medicines shortages and can work with pharmacists to perform operational and assessment tasks after a medicines shortage has been identified (USA).[67]

A review of multiple studies supported the practice of Tech-check-Tech (TCT), a system in which pharmacy technicians check the correctness of prescription fulfilment by other pharmacy technicians, instead of the pharmacist. It demonstrated comparable accuracy and in some studies the increase in pharmacist time available for clinical activities was quantified. This overview even called for using the key elements of TCT to serve as a framework for development of future innovation in pharmacy technician roles (United Kingdom, USA).[16]

Economical outcomes are not used frequently in the discussion on pharmacy support workforce role expansion, even though it is essential in today's world of health care reform where pharmacy leaders seek to find ways to optimise patient care without increasing costs. [17] A study that looked at using pharmacy technicians to aid in the completion of a comprehensive medication review concluded that, from an economic point of view, return on investment for role expansion was valuable (USA).[84]

Supporting pharmacists to meet accreditation standards was researched in 2013. It showed five domains in which pharmacy technicians and other pharmacy support workforce cadres can play a role: practice management, patient counselling, patient care services, technology and quality improvement (USA). [85] One of the most recent studies looked at the active role pharmacy technicians can have in the management of adherence programmes, set up to improve medication adherence and reduce health care costs. The burden on community pharmacists running these programmes was reduced (USA). [44]

Theme 6. The role of legislation

As the ideas on the extended role of pharmacy support workforce cadres became clearer, so did the call for legislation of the new objectives of the profession in the literature. This began in 2011 when a USA statement was made that "all drug distribution activities should be performed by technicians in accordance with state law". [17] In 2013, the PPMI again influenced the conversation. The authors conclude that the "PPMI steers towards standard, uniform and accredited pharmacy technician education, combined with some form of licensure. To advance the role of the pharmacy technician, the PPMI recommends the requirement of certified technician" (USA). [86] In that same year, the ASHP guidelines not only talked about sufficient and adequately trained staff, but they also specified requirements for pharmacy technicians in the USA.[87]

Research is used to shape the process of legislation around supervision. As community pharmacist's roles extend into clinical and public health services, the roles and responsibilities of the pharmacy support team may need reconfiguration. Research on supervision is one of the possible sources to feed the department of health to possibly further change legislation around supervision without the physical presence of a pharmacist. [88] In the Canadian context pharmacy technicians are described in 2014 as increasingly becoming part of a regulated profession, allowing them to fulfil a greater role in both dispensing medicines and patient care. [71] In the USA the standardising of education, training certifications and licensing requirements is seen as imperative in order for pharmacy support workforce cadres to be effective in the roles and responsibilities surrounding the provision of optimal patient care. [89] Globally, the situation is varied in this regard as noted through our survey data presented earlier in this report. Not all countries require registration of pharmacy support workforce cadres (examples of countries requiring the registration of some pharmacy support workforce cadres include Canada, Denmark, the United Kingdom, the USA, South Africa). Countries that do not require regulation for pharmacy support workforce cadres have legislation in place that sets the full responsibility of pharmacy practice under the supervision of the pharmacist.

Theme 7. Developing pharmacy support workforce leadership to further assist pharmacists in their role

In the 2012 literature, the importance of developing leadership roles within the pharmacy support workforce community emerged in the USA. In this context, pharmacy technicians have been acknowledged as untapped resources, some have independently assumed informal leadership positions and some have been promoted to a formal leadership position (NB. These positions have been particularly in the areas of stores, activity, business and human resources management). The authors of this paper comment that it is important to take time in mentoring, educating, and training technician leaders to aid in developing their roles and further assisting the pharmacist in theirs. [75]

The PPMI from USA again influences the conversation. As a follow up to the PPMI, Stanford Hospital conducted a review of the existing pharmacy practice model. They identified opportunities for improvement and gaps to be filled by creating innovative leadership positions on the technician level, i.e. manager of clinical effectiveness and manager of professional development (USA). [68]

Theme 8. The importance of the pharmacy workforce working together

From a review of the literature prepared for the report and through careful consideration of the case studies in this report it is clear that the development of new roles and responsibilities for pharmacy support workforce cadres in specific country contexts have been most beneficial to the profession of pharmacy when pharmacists and pharmacy support workforce cadres have acted as a team to consider what is best in the local context. Since 2012, research on improving patient care does show this change in perception.

In a study on the sources of distracting stimuli and interruptions within the pharmacy department in the USA, both pharmacists and pharmacy technicians were asked to give their insights. [90] In addition, an exploration of views of pharmacist's and pharmacy technicians in the USA on a revalidation process for pharmacy professionals was conducted, leading to the conclusion that a single model is not desirable. [91] Other research has concentrated on stakeholder views of pharmacy activities that can/cannot be safely performed during the absence of a pharmacist. Participants were pharmacists, pharmacy technicians and other pharmacy support staff. [88]

In New Zealand, both pharmacists and pharmacy technicians were asked for their opinions on pharmacy technicians taking on an advanced checking role. Extra training was welcomed by both groups. [73] Research on the perceptions of pharmacy technicians of their own work environment looked into elements such as recognition of organisational value, responsibilities, rate of pay, and seeking equity among peers. [92] To be able to get insights in the work engagement of pharmacy technicians and when the quality of the double-check process in the drug distribution system was assessed, the pharmacy team as a whole was involved to come up with an action plan to optimise the work processes. [93]

General conclusions from this literature review

"It is not the strongest of the species that survives, nor the most intelligent, it is the one that is most adaptable to change" — Charles Robert Darwin

In recent years, pharmaceutical services delivery has moved from a focus on medicines availability to an increasing need to deliver extended pharmaceutical clinical services to optimise patient health outcomes. As this change has unfolded, the role of pharmacists and pharmacy support workforce cadres has evolved in different contexts and countries in an attempt to meet this need. The pharmaceutical literature has documented this evolution most notably in advanced economies (e.g. Canada, United Kingdom and the USA), with many key insights of their experiences provided. These insights could be considered by other countries as they reflect on the ongoing evolution of pharmaceutical services delivery and the human resource requirements to meet this need.

Where pharmacists, pharmacy technicians and other pharmacy support workforce cadres work together in the context of their local environment, with a focus on improved patient care, optimal pharmaceutical services delivery can be provided.

4.2 Practice vignette from the pharmacy community setting

In this section mini case study vignettes are presented for a variety of pharmacy practice contexts (community, hospital, emergency and supply chain). The vignettes are context specific and are designed to provide workplace context to the variety of ways in which pharmacy support workforce cadres interact with pharmacists in the delivery of pharmacy services.

The vignettes vary in style and detail reflecting the variety of authors and perspectives.

4.2.1 Community pharmacy practice in Lebanon

Author

Luna El Bizri, The Order of Lebanese Pharmacists (OPL), Lebanon

Vignette overview
In this mini case study, the practice of community pharmacy in Lebanon is presented with reference to the role of pharmacy technicians and other pharmacy support workforce cadres and their interaction with the pharmacist in the workplace.

Overview of the practice model
As per Lebanese law for every 3 pharmacy technicians, there should be one pharmacist managing them. Only the pharmacist is allowed to dispense and be in direct contact with the patient. The law covering the pharmacy technician is neither clear nor specific. It does not clearly define the role, task responsibilities and accountabilities of pharmacy workforce cadres. For example, there is no differentiation between pharmacy technicians and pharmacy assistants.

Community pharmacy in Lebanon can be divided into three models:
1. Large urban community pharmacy, which relies on an organised structured staff
2. Neighbourhood urban community pharmacy or the "local pharmacy store"
3. Rural pharmacy

In model 1 we note that pharmacy support cadres are rather more important than in models 2 and 3. However, in all types of community pharmacies the pharmacist is supported by "pharmacist assistants" and "technicians".

As an overview of the practice model, most pharmacies have a computerised programme to run and manage their pharmacy. There is no common patient record between pharmacies. A recent development from the Ministry of Public Health (MOH) is the use of a "unified prescription". This gives the pharmacist the right to substitute branded medicines with generics, but only if the physician does not note the term NS which refers to "non substitute". No refill or unit dose systems exist in Lebanon, with only packaged medicines dispensed.

There is an emphasis by pharmacists on the process of dispensing rather than counselling. The law is clear, that the presence of the pharmacist in the pharmacy is mandatory and only the pharmacist has the right to dispense medicines to the patient, and to provide instructions regarding prescriptions.

Relationship between community pharmacists and other pharmacy support workforce cadres
The pharmacist assistant role is more elaborate than that of pharmacy technicians. Pharmacy assistants prepare prescriptions, compound after receiving instructions from the pharmacist, can place orders to the drugstores and pharmaceutical companies, and enter new medicines in the computerised pharmacy system. The pharmacy assistant is also involved in the cosmetics and nutritional supplements, after having training on these products. Technicians are more involved in inventory, counting medicines and stocking shelves. They are also involved in the sale of para-pharmaceuticals products such as baby products or diet products.

The pharmacy assistant holds a university degree usually in biology, chemistry or biochemistry and they must always operate in the presence of a pharmacist. A pharmacy technician holds a technical degree from a college, with two or three years' study, after first completing an official governmental degree in the "Lebanese Brevet". Technicians too, must operate in the presence of the pharmacist. In Lebanon, there is no law that specifies the education level for pharmacy support workforce cadres and as a result, there is a large variation. In addition, pharmacist student trainees assist in pharmacies, under the supervision of a pharmacist to complete their 12-month internship after completing their five years' pharmacist education.

In summary, the Lebanese practice of community pharmacy legally requires the pharmacist to complete the majority of dispensing and counselling tasks compared to other pharmacy support workforce cadres in the pharmacy. Only neighbourhood pharmacists are close to their patients and spend more time with them in counselling and giving health care advice. Lebanese community pharmacists could rely more on appropriately trained pharmacy support workforce cadres to reduce the time pharmacists spend in compounding and preparing prescriptions.

4.3 Practice vignettes from hospital pharmacy

4.3.1 A Dutch example, applying the FIP hospital pharmacy Basel Statements

Author
Robert J Moss, hospital pharmacist
Vice-president Europe, FIP Hospital Pharmacy Section, the Netherlands

Vignette overview
In this mini case study, the practice of hospital pharmacy in the Netherlands is presented with specific reference to the role of pharmacy support workforce cadres filling in the "FIP Basel statements on the future of hospital pharmacy" in partnership with pharmacists.

Background
Hospital pharmacy practice is guided by the FIP Basel statements on the future of hospital pharmacy.
The Dutch hospital pharmacy practice involves the delegation of several hospital pharmacist tasks to pharmacy support staff. The role of pharmacy support staff in the different aspects of practice is highlighted below in the description of their role in relation to the applicable Basel statements. Numbering coincides with the revised statements. [94]

Pharmacy technicians are referred to as such. In practice, pharmacy technicians can advance their practice level by additional training in clinical practice (pharmacy consultants). These will not be specifically referred to. Other pharmacy support staff include all other staff not licensed as a pharmacy technician.

Overarching and governance statements
1. The overarching goal of hospital pharmacists is to optimise patient outcomes through collaborative, inter-professional, responsible use of medicines and medical devices
NL: Pharmacy support staff are an integral part of the hospital pharmacy team

6. Hospital pharmacists should serve as a resource regarding all aspects of medicines use and be accessible as a point of contact for patients and health care providers.
NL: Pharmacy technicians are the primary point of contact on clinical wards for nurses

7. All prescriptions should be reviewed, interpreted, and validated by a hospital pharmacist prior to the medicines being dispensed and administered.
NL: Pharmacy technicians review all computerised physician order entry system (CPOE) orders before validation by the hospital pharmacist. They can advise doctors on or are allowed to make minor changes, e.g. time changes because of interactions of drugs. All within a defined set of rules.

8. Hospital pharmacists should monitor patients taking medicines to assure patient safety, appropriate medicine use, and optimal outcomes for inpatients and outpatients. When resource limitations do not permit pharmacist monitoring of all patients taking medicines, patient-selection criteria should be established to guide pharmacist monitoring.
NL: Pharmacy technicians on the wards identify hazardous situations or suboptimal use of medicine. In minor cases they can intervene. In other cases, they inform the pharmacist.

10. Hospital pharmacists should ensure that patients or care givers are educated and provided with written information on the appropriate use of medicines.
NL: Pharmacy technicians provide instructions to patients. In a few cases directly to the patient, in other situations written information is provided.

13. Hospital pharmacists should actively engage in research into new methods and systems to improve the use of medicines and of human resource needs in hospital pharmacy.
NL: Pharmacy technicians in some larger hospitals engage in practice research.

14. Hospital pharmacists should take responsibility for the management and disposal of waste related to the medicines use process, and advise on disposal of human waste from patients receiving medicines.
NL: Pharmacy technicians on clinical wards advise on and implement waste disposal management as set in standards.

16. Hospital pharmacists must ensure proper storage to maintain the integrity of medicines across the supply chain to ensure quality, safety and security.
NL: Logistic pharmacy support staff ensure a managed (cold) chain delivery throughout the hospital. On the clinical wards pharmacy technicians are responsible for the storage and integrity of the (cold) chain according to protocol, or advise responsible hospital personnel on supply chain integrity.

18. Each pharmacy should have contingency plans for medicines shortages and emergencies.
NL: Pharmacy procurement staff, logistic staff and pharmacy technicians play an important part in identifying potential medicines shortages within a hospital.

19. The "seven rights" (right patient, medicine, dose, route, information, documentation and time) should be fulfilled in all medicine-related activities in the hospital.
NL: An underlying principle for all pharmacy technician activities.

Theme 1 – Procurement
23. Procurement must be supported by a reliable information system that provides accurate, timely, and accessible information.
NL: Pharmacy procurement staff and pharmacy logistic staff are the key users of the medicines logistic information system within the hospital.

Theme 2 - Influences on prescribing
24. Hospitals should utilise a medicines formulary system (local, regional, and/or national) linked to standard treatment guidelines, protocols, and treatment pathways based on the best available evidence.
NL: During the review of the CPOE pharmacy technicians identify deviations of formulary prescribing. They advise the doctor or hospital pharmacist depending on protocol.

28. Hospital pharmacists should promote seamless care by contributing to the transfer of information about medicines whenever patients move between and within health care settings.
NL: Pharmacy technicians perform medicines reconciliation during or prior to hospitalisation. Protocol dependent interventions (formulary interchangeability, interactions) are handled or transferred to the hospital pharmacist.

Theme 3 - Preparation and delivery
30. Hospital pharmacists should assume responsibility for storage, preparation, dispensing, and distribution of all medicines, including investigational medicines.
NL: See statement 16. Pharmacy technicians are an integrated part of the clinical trial team.

31. Hospital pharmacists should assume responsibility for the appropriate labelling and control of medicines stored throughout the facility.
NL: Pharmacy technicians have been delegated by the hospital pharmacists to ensure adherence to the SOP's on labelling and storage. Ready-to-administer medicines, when prepared by pharmacy technicians, is labelled according to SOP.

32. Hospital pharmacists should be involved in determining which medicines are included in ward stock and standardising the storage and handling of ward medicines.
NL: Pharmacy technicians advise the hospital pharmacist whenever they notice deviations of standard stock management.

33. Hospital pharmacists should ensure that compounded medicines are consistently prepared to comply with quality standards. This includes taking responsibility for ensuring medicines not commercially available in a suitable formulation are prepared to accepted practice standards, and ensuring that injectable admixture services comply with accepted practice standards.
NL: All compounded medicines in hospitals are prepared by pharmaceutical manufacturing staff and/or pharmacy technicians according to protocol in line with GMP.

34. The preparation of hazardous medicines including cytotoxics should be under the responsibility of the hospital pharmacist and prepared under environmental conditions that minimise the risk of contaminating the product and environment, as well as minimising exposure of hospital personnel to harm using accepted practice standards.
NL: All hazardous medicines are prepared by pharmacy technicians according to appropriate SOPs and according to GMP standards

36. Hospital pharmacists should support the development of policies regarding the use of medicines brought into the hospital by patients, including the evaluation of appropriateness of complementary and alternative medicines.

38. Concentrated electrolyte products (such as potassium chloride and sodium chloride) and other institutionally-identified high-risk medicines should be dispensed in ready-to-administer dilutions, and stored in secure, separate areas with distinct labels.
NL: Many ready-to-administer dilutions are prepared by pharmacy technicians on the ward or by pharmaceutical manufacturing staff.

Theme 4 – Administration
42. Hospital pharmacists should ensure that medicines are packaged and labelled to ensure identification and to maintain integrity until immediately prior to administration to the individual patient.
NL: Pharmacy technicians fill individual medication in the medicine carts.

Theme 5 - Monitoring of medicines use
51. An easily accessible, non-punitive reporting system for medication errors, including near misses, should be established and maintained. Reports of medication errors should be reviewed internally and sent to regional or national medication error reporting or regulatory programmes. These data should be regularly reviewed to improve the quality and safety of medicines use practices.
NL: Pharmacy technicians are part of the ward-based medication error response teams

Theme 6 - Human resources, training and development
59. Hospital pharmacy workforce plans should describe strategies for human resource education and training, recruitment and retention, competency development, remuneration and career progression pathways, diversity-sensitive policies, equitable deployment and distribution, management, and roles and responsibilities of stakeholders for implementation.
NL: HR aspects of hospital pharmacy workforce are, in most circumstances, managed by a pharmacy technician with advanced training in management skills.

61. The training programmes of pharmacy support staff should be nationally formalised, harmonised, and credentialed within a defined scope of practice.

NL: Pharmacy technician is an accredited title. Further specialisation as e.g. pharmacy consultant is offered at specialised centres yet is not formalised in job requirements. Other pharmacy workforce is trained locally and accredited locally.

4.3.2 Hospital pharmacy practice in the USA

Author
Marianne F. Ivey, Pharm. D., M. P. H., FASHP
Professor Emerita
University of Cincinnati College of Pharmacy
Pharmacy Practice and Administrative Sciences
Cincinnati, OH, USA

Vignette overview
In this mini case study, how the role of pharmacy support workforce cadres has developed in the outpatient clinic setting is discussed, with specific reference to the day-to-day tasks of these cadres and their relationship with pharmacists in the workplace.

The development of pharmacy support workforce roles

Since the 1960's the profession of pharmacy in the USA has been moving toward a more direct patient care practice. This has been particularly true for both inpatient and outpatient (ambulatory) care as practised in hospitals. One of the early direct patient care activities started in the 1980s is anticoagulation clinics in which the drug therapy is managed by pharmacists. This has been a patient care area in which the quality of care can be measured in a number of ways since patients are seen sometimes as often as every two weeks.

Patient satisfaction can be measured as well as clinical outcomes such as major and minor complications, INR data within therapeutic range, etc. With this data pharmacists were able to demonstrate to their physician colleagues that quality care could be provided to anticoagulated patients by pharmacists. This resulted in anticoagulation clinics managed by pharmacists growing rapidly in both numbers of clinics around the country as well as in numbers of patients referred to each clinic. So many patients, in fact, that the initial small number of pharmacists were not able to care for all of the patients without additional professionals.

This led to an analysis of the various activities that pharmacists were performing in the anticoagulation clinics. It was noted that many of the time-consuming activities were those which could be completed by pharmacy technicians with specific orientation to this group of patients. Many anticoagulation clinics now have pharmacy technicians routinely a part of the staff caring for these patients. Job duties have been written for these advanced technician practices and additional orientation has been specified.

Technician duties have been listed as the following:
Obtaining vital signs on patients, documenting point of care results, scheduling of patients, triaging patients who need to be seen first, documenting results of office visits, medication therapy management billing using available electronic billing software and identifying patients who are at risk by review of their charts (for such things as non-adherence, poly pharmacy etc.)

These activities of the pharmacy technician have now been extended to other patients with chronic conditions such as hypertension, heart failure, diabetes, asthma, arthritis etc.

Pharmacy technician duties for this group of patients include the following daily, monthly or as-needed categories of activities:
Clean blood pressure cuffs with antimicrobial-infused cloths; retrieving patient charts for scheduled patients; recording of vital signs; checking the electronic database for new referrals; answering patient phone calls related to reschedules; refill requests; and triaging. Patients who need reminder tools such as medisets are reviewed for adequate medicines; send refill slips to pharmacy for medisets; bill for mediates; call patients who are no shows; update patient databases; and identify and document when patients are lost to follow up.

On an as-needed basis the pharmacy technicians file old charts, prepare documents which need to be scanned into the electronic data base, conduct inventories and provide clinic supplies such as educational handouts, smoking cessation folders and mediset boxes. The pharmacy technician also tracks vacations and staffing adequacy, facilitates getting physician signatures and stocking supplies such as bandages, test strips, folders, charts, ink, control solutions etc. On a monthly basis the pharmacy technician records patient visits, outcome statistics and other data in a spreadsheet for further analysis by pharmacists and administrators.

As these activities are a routine and regular part of pharmacist-managed chronic therapy, policies and procedures for the specific clinic are written. Job descriptions include the required experience of the pharmacy technician to qualify for the position and the training needed to attain and maintain competency.

Several articles have been written in the pharmacy literature, which describe these clinics and the positive clinical and satisfaction outcomes in patient care. It is obvious that without the pharmacy technician's participation as part of the health care delivery team, fewer patients could be seen and/or higher costs to the patient would be a result if only pharmacists could carry out all of the responsibilities in these clinics.

4.4 Practice vignettes from emergency pharmacy
Authors
Commander Sylvain Grenier, Pharmacy National Practice Leader, Canadian Armed Forces, Canada
Mohammad Alkhalili, PharmD Candidate, University of Toronto, Canada
Janice Ma, Drug Use Evaluation manager, Department of National Defense, Canada

Vignette overview
In this mini case study, a general overview of the provision of pharmaceutical services in the three phases of an emergency is presented, with specific reference to the roles of pharmacy support workforce cadres and their relationship to pharmacists.

An overview of emergency pharmacy
There is more and more recognition that the activities required surrounding an emergency situation (i.e., disaster) can be grouped in three phases: 1. **Preparation**; 2. **Response**; and 3. **Recovery**.

Preparation phase
The preparation phase includes two main areas, reduction (risk mitigation) and readiness (preparedness). Both involve planning and preparation to either reduce the risk of a disaster happening or to decrease the impact of a disaster once it occurs. This phase is performed ahead of a disaster by personnel branching across many professions (e.g. administrators, health care professionals, emergency workers, etc.) and includes pharmacists and pharmacy support workers, such as pharmacy technicians and assistants. This preparation is conducted at various levels; from having each pharmacy prepared for a disaster (e.g. records back-up, generators, emergency supplies, etc.) to having a national emergency plan to deal with a disaster.

During the preparation phase, unregulated pharmacy support personnel can be expected to:

- *Familiarise themselves with the basic principles of emergency preparedness and response;*
- *Personally prepare themselves to work effectively during an emergency situation; and*
- *Provide general clerical, administrative and basic technical support for pharmacy preparedness activities, such as collating information for future reference.*

Regulated pharmacy support personnel such as regulated pharmacy technicians can be expected to:

- *Familiarise themselves with key principles of emergency preparedness and response, and apply these to prepare themselves to work during an emergency situation; and*
- *Provide specialised and/or advanced technical support for pharmacy preparedness activities, such as developing standard operating procedures for delivery of pharmacy services.*

Pharmacists can be expected to:

- *Incorporate key principles of emergency preparedness and response into existing work duties;*
- *Adapt or develop new work processes for use in an emergency situation; and*
- *Apply existing clinical and other professional knowledge to support pharmacy preparedness activities, such as developing treatment protocols for efficient administration of medical countermeasures to affected individuals.*

Response phase
During the response phase of a disaster, pharmacy personnel must work together as a team and in conjunction with other health and civil authorities, to deliver necessary medical supplies and clinical services to affected individuals. Pharmacy personnel may also be required to offer professional advice regarding how to address other challenges that are specifically introduced by the particular event, such as coordinating use of medical countermeasures following a nuclear, biological or chemical disaster (NBCD).

During the response phase, unregulated pharmacy support personnel can be expected to:

- *Perform general clerical, administrative, and basic technical tasks to support the delivery of medicines and clinical services (e.g., download copies of patients' prescription records);*
- *Complete tasks as directed by other members of the pharmacy team or as specified in the emergency response plans (e.g., initiate a rotating work schedule involving longer shifts);*
- *Under supervision, perform tasks that would normally be reserved to regulated pharmacy technicians*

Regulated pharmacy support personnel such as regulated pharmacy technicians can be expected to:

- *Independently perform specialised or advanced technical tasks to ensure delivery of medicines and clinical services to affected persons (e.g., record and fill prescriptions, prepare compounds, etc.);*
- *Work collaboratively with other members of the pharmacy team to execute designated components of the organisational or the pharmacy-specific work plan (e.g., evacuation of critical supplies from a disaster-affected dispensary); and*
- *Under supervision, perform tasks that would normally be reserved to pharmacists.*

Pharmacists can be expected to:

- *Independently perform clinical and professional activities to support patient care (e.g., administer vaccinations as part of a mass immunisation clinic);*
- *Provide direction and/or supervision of the activities of pharmacy personnel noted above;*
- *Under a delegation, prescribe pharmaceuticals to replace chronic medications that patients may have lost or forgotten, in order to alleviate the increased workload of emergency departments attending to the disaster victims; and*
- *Liaise with pharmacy colleges and associations to ensure that the pharmacy team's work activities are aligned with active priorities.*

Recovery phase
During the recovery phase, the intensity of the health care response will diminish. Pharmacy team members must resume their usual operating procedures, and — in the case of foreign health teams in particular — this can involve a transfer of responsibilities to other personnel.

During the recovery phase, unregulated pharmacy support can be expected to:

- *Perform general clerical, administrative, and basic technical tasks to conclude emergency pharmacy operations (e.g. provide input into lessons learnt, ensure health information is transferred securely to authorised health care personnel, ensure supplies and materials go back to pre-disaster state, etc.); and*
- *Complete tasks as directed by other members of the pharmacy team, to support future pharmacy operations in the affected region.*

Pharmacy support personnel such as regulated pharmacy technicians can be expected to:

- *Independently perform specialised or advanced technical tasks to conclude emergency pharmacy operations (e.g. provide input into lessons learnt, ensure health information is transferred securely to authorised health care personnel, ensure supplies and materials go back to pre-disaster state, etc.); and*
- *Apply in-depth technical knowledge to enable the team to assess the quality of their emergency response.*

Pharmacists can be expected to:

- *Provide direction and oversight for conclusion of emergency pharmacy operations (e.g., provide input into lessons learned, ensure health information is transferred securely to authorised health care personnel, ensure supplies and materials go back to pre-disaster state, etc.);*
- *Independently perform clinical and professional activities for individuals patients under their care during the emergency (e.g., complete follow-up and therapeutic monitoring for individual patients where possible, or arrange for ongoing care from an alternate care provider, ensure that care plans are appropriately documented for future reference, prepare discharge plans for patients where necessary, etc.) ; and*
- *Provide input to pharmacy and other health authorities regarding potential improvements to the emergency response.*

4.5 Practice vignettes from health supply chains

4.5.1 Pharmacy supply chain in the USA

Author
Shane P. Desselle, PhD, RPh, FAPhA, Professor, College of Pharmacy, Touro University California, USA

Vignette overview
In this mini case study, a general overview of the roles of pharmacy support workforce cadres in the drug distribution system (pharmacy supply chain) of the USA is presented.

Background
The supply chain for pharmaceuticals in the USA is characterised by large companies having achieved vertical integration throughout various components of procurement and delivery. These companies can be described as their own integrated delivery systems, comprised of any, several, or all of the following:

- **A health insurance company**, which covers medical (including pharmacy) and hospital care benefits, and in some cases may administer the pharmacy benefit versus contracting it to a PBM
- **A pharmacy benefits manager** (PBM), who adjudicates the prescription drug benefit "carved out" of the larger health benefit,
- **A full-service wholesale distributor**, who procures pharmaceuticals, supplies and other items from manufacturers and sells them to pharmaceutical providers,
- **Specialty wholesale distributors**, who are involved with acquisition and distribution of products such as expensive biologics or niche items, and
- **Hospital- and community-based pharmacies**, where pharmaceutical products and services are dispensed and administered.

Those companies not fully vertically integrated contract with one another in the supply chain, including independently owned community pharmacies. Companies in the supply chain can be either for-profit or not-for-profit entities, and include government agencies. Additionally, many large firms whose primary namesake is under the auspices of a health insurance company or PBM (including Federal government entities such as the Veterans Administration (VA)), typically operate large mail-order pharmacies serving thousands, even tens to hundreds of thousands, of "covered lives".

The role of pharmacy support workforce cadres
Pharmacists' scope of practice is evolving to one that is more clinical, patient-centric and interdisciplinary. To that end, more responsibilities (activities) previously and solely conducted by pharmacists, are now being delegated to pharmacy technicians, with supervision, depending upon the nature of the activity, as per ethical and legal requirements.

In community pharmacy, technicians play a significant role in patient communication, including development of rapport and medication and health history taking, and activities around preparing and filling prescriptions, along with assistance in inventory management, third party and claims submission management, and working with pharmacists on health and wellness activities such as health screening.

Hospital pharmacy technicians' roles are a bit more disparate, often compartmentalised, and employing job rotation in various areas of the pharmacy hospital system, including sterile compounding, billing activities, repackaging, medicines cart filling, management of floor stock, and assistance with delivery of medicines throughout the facility.

In large integrated delivery system operations, pharmacy technicians manage the use of automated dispensing technology to prepare vast numbers of prescriptions, which are verified by a pharmacist before their distribution either to patients who present physically or to the many to whom these prescription orders are mailed by postal service.

The mail service operations that exist within and even outside these integrated delivery systems perform a number of functions in managing the supply chain. They have a pharmacy and therapeutics (P&T) committee, primarily of physicians and pharmacists who determine patient rules of eligibility, the drugs comprising the covered formulary, the tiered (patient co-payment) status of drugs, and whether drugs require prior authorisation in their approval for use in populations of patients, and even individual patients. Members of the P&T committee review pharmaco-economic data, literature, rebate proposals from manufacturers, and requests and testimonials from employers, labour unions, and individual patients.

In all settings, technicians, in addition to assistance with managing automated dispensing technologies and other prescription filling activities, also field phone calls and requests from the patients and providers. In some practices, technicians assist pharmacists and other providers with submitting or processing requests to approve or deny appeals for coverage of certain medicines and provide counselling and advice to prescribers and to patients seeking information about drug interactions, contraindications, warnings, storage, and other information.

Technicians also assist with inventory management, purchasing, controlled substances systems management, patient/customer service, and increasingly, where allowed by law, supervising and checking the work of other technicians. Technicians involved with distribution of specialty products assist with preparation, compounding, and shipping of these agents. More often than not, technicians have different workstations, such as central fill (ambulatory patients; oral and topical medicines), medicines dispensing checkers (work of other technicians), phone stations, sterile compounding, and patient/customer service. They rotate in and out of different stations throughout the day to prevent burnout and errors from prolonged activity in one particular station, as the volume of work is typically very high and comes at a rapid pace.

Regulation, licensure, training and certification

Technician practice is governed primarily by state law, rules and regulations. Individual states of the USA determine whether a technician has to be registered, licensed and/or certified. Registration and licensure are primarily a mechanism to maintain a registry of those working, with few if any requirements beyond those promulgated through their employer or through the certification process.

Certification is increasingly required by more states and by more employers, though it is not mandated at any Federal level. Certification is a self-study examination process administered through the Pharmacy Technician Certification Board (PTCB). PTCB has certain standards for re-certification. The standards to sit for PTCB's examination are relatively minimal. Most employers, especially larger, corporate ones in the supply chain (such as insurance companies, PBMs, health systems, and large chain pharmacies) have formal on-the-job (OJT) training programmes. Some will not only mandate but also financially support technicians' certification.

Technicians have reported OJT programmes to be most helpful in preparing them for work, but also have reported benefit from PTCB certification and vocational school training. Many technicians have completed education and training from a vocational programme, but these programmes vary considerably in the nature and quality of their training, and some are accredited by the Pharmacy Technician Accreditation Commission (PTAC; established by the American Society of Health-Systems pharmacists (ASHP) and the Accreditation Commission on Pharmacy Education (ACPE)), whereas others are not. There are a minority of technicians who have two- and four-year associate and baccalaureate degrees, respectively, from institutions of higher learning.

Ratios of pharmacists-to-technicians also vary by state in their legal requirements, but might also differ by practice setting, employer, and nature of activities in which they are involved. The current system, or integrated myriad subsystems in the USA, allow for flexibility in technician practice, varying levels as desired of technician and pharmacist collaboration, and training of most technicians in a wide spectrum of activities. Still, stricter standardisation of education requirements would allow for more rapid professionalisation of technicians and facilitate even greater confidence among pharmacists to delegate even further responsibilities to technicians in supply chain management. Many states consider the PTCB certification for advanced technician activities or increased technician ratios.

Currently, there is relatively little to distinguish technicians from clerks and other support staff, and technicians could become that much more involved in various activities of work, for example, assistance with medication assistance programmes sponsored by manufacturers of branded pharmaceutical products. Finally, technicians, just like pharmacists, have reported a high amount of stress from workload volume and from needed improvements in workflow design and need for further training in certain areas, and efficient and effective utilisation of technicians and technology.

4.5.2 A practice model from Nigeria

Authors
Azeez Adesina, Pharmacist/Warehouse Advisor
Adebayo Adekola, Senior Consultant/Training Officer

Vignette overview
In this mini case study, a general overview of the practice of pharmacy in Nigeria is presented with the roles of pharmacy support workforce cadres explained.

An overview of the Nigerian pharmacy system
The pharmaceutical practice in Nigeria is regulated by the Pharmacist Council of Nigeria (PCN). The body is charged with the responsibility of pharmacy education and training. Over the past 40 years, the pharmacist's role has evolved from that of just compounding and dispensing medicines to that of a "drug therapy manager". This involves responsibilities of medicines selection, procurement, storage and distribution, and policy formulation for the overall wellbeing of the patient.

The role of pharmacy support workforce cadres
The scope of pharmacy practice also includes patient-centred care with all cognitive functions of counselling, drug education and drug therapy assessment. To achieve this, the pharmacist works in collaboration with the pharmacist technician. Pharmacy technicians are health care providers who perform pharmacy-related functions, generally working under the direct supervision of a licensed pharmacist.

Pharmacy technicians work in a variety of locations usually in community, retail, and hospital pharmacies with the responsibility of supporting the licensed pharmacist in drug dispensing and reviewing prescription requests from the doctors' offices and insurance companies to ensure correct medicines are provided and payments are received. Also included in the pharmacy support workforce is the pharmacist assistant or aides who assist in daily administrative tasks. Pharmacy assistants work with pharmacists and technicians, but have fewer responsibilities that include accepting orders, packaging prescriptions and preparing prescription labels.

In Nigeria, the relative importance of pharmacy technicians and assistants within the pharmacy workforce has been amplified in recent years largely because of skill shortage in certain geographical areas. They have been involved in the successes recorded at primary health care level where the presence of a pharmacist is often lacking at times.

Advantages and disadvantages of the practice model

Advantages:
1. Reduced workload on the pharmacists so that they concentrate on pharmaceutical services.
2. Data visibility through proper documentation of pharmacy activities.
3. Improved health outcomes of patients through effective health care delivery and patient interaction.

Disadvantages:
1. Increased workload due to reluctance of some pharmacists to work in remote areas thereby leaving the pharmacy technician and assistant with more functions as deemed fit.
2. The dearth of licensed pharmacists in the country has led to pharmacist technician and assistants supervising the pharmacy in most primary health care facilities.
3. The monopoly of the sector by pharmacists has been a major challenge between the pharmacist and other pharmacy support workforce, which might affect the quality of health care services rendered to patients.

5 References

1. GHWA- The World Health Organization (WHO). Mid-level health providers - a promising resource to achieve the health Millennium Development Goals. Final Report. WHO/HSS/HWA/Mid level providers/2010/A [Online]; 2010 [cited 2016 Dec 8]. Available from: http://www.who.int/workforcealliance/knowledge/resources/Final_MLP_web_2.pdf

2. The International Pharmaceutical Federation (FIP). 2012 FIP Global Pharmacy Workforce Report. [Online]; 2012. [cited 2016 December 8]. Available from: http://www.fip.org/static/fipeducation/2012/FIP-Workforce-Report-2012/?page=hr2012

3. The International Pharmaceutical Federation (FIP). Pharmaceutical Workforce Development Goals [Online]; 2016.[cited 2016 Dec 8]. Available from: http://fip.org/files/fip/PharmacyEducation/Global_Conference_docs/WDGs_online_version.pdf

4. Don de Savigny and Taghreed Adam (Eds). Systems thinking for health systems strengthening. Alliance for Health Policy and Systems Research,WHO; 2009.[cited 2016 Dec 8]. Available from: http://apps.who.int/iris/bitstream/10665/44204/1/9789241563895_eng.pdf?ua=1.

5. Joint FIP/WHO guidelines on good pharmacy practice: standards for quality of pharmacy services. WHO Technical Report Series, No. 961, 2011 [Online]. Geneva: World Health Organization; 2011.[cited 2016 Dec 8]. Available from: http://www.fip.org/good_pharmacy_practice

6. United Nations (UN). The Millennium Development Goals Report 2015 [Online]. New York, USA: United Nations; 2015. [cited 2016 Dec 8]. Available from: http://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%201).pdf

7. United Nations (UN). Sustainable Development Goals [Online]; 2016 [cited 2016 Dec 8]. Available from: http://www.un.org/sustainabledevelopment/sustainable-development-goals/

8. 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 Jun;28(2):308-15.

9. Cameron A, Ewen M, Auton M, Abegunde D. The World Medicines Situation 2011 Medicines Prices, Availability and Affordability [Online]. 3rd ed. Geneva: The World Health Organization; 2011 [cited 2016 Dec 8]. Available from: http://www.who.int/medicines/areas/policy/world_medicines_situation/WMS_ch6_wPricing_v6.pdf

10. The International Pharmaceutical Federation (FIP). FIP Statement of Policy on Improving Access to Medicines in Developing Countries Cairo [Online]. Egypt: International Pharmaceutical Federation; 2005 [cited 2016 Dec 8]. Available from: www.fip.org/statements

11. The World Health Organization (WHO). The World Health Report 2006 - Working Together for Health [Online]. Geneva: World Health Organization; 2006. [cited 2016 December 8]. Available from: http://www.who.int/whr/2006/en/index.html

12. The World Health Organization (WHO). A Universal Truth: No Health Without a Workforce Third Global Forum on Human Resources for Health Report. Geneva, Switzerland: World Health Organization; 2013 [cited 2016 Dec 8]. Available from: http://www.who.int/workforcealliance/knowledge/resources/GHWA-a_universal_truth_report.pdf?ua=1

13. The International Pharmaceutical Federation (FIP). Global Pharmacy Workforce. Intelligence trends report. The Hague: International Pharmaceutical Federation; 2015 [cited 2016 Dec 8]. Available from: http://fip.org/files/fip/PharmacyEducation/Trends/FIPEd_Trends_report_2015_web_v3.pdf

14. The World Health Organization (WHO). Global strategy on human resources for health: Workforce 2030 [Online]; 2016. [cited 2016 December 8]. Available from: http://who.int/hrh/resources/pub_globstrathrh-2030/en/

15. 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. Hum Resour Health. 2011 Jan;9(1):1.

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

17. Knoer S. Strategies for success in implementing practice model change. Am J Health Syst Pharm. 2011 Jun;68(12):1146.

18. The International Pharmaceutical Federation (FIP). 2009 FIP Global Pharmacy Workforce Report [Online]; 2009 [cited 2016 Dec 8]. Available from: http://fip.org/files/fip/publications/2009_FIP_Global_Pharmacy_Workforce_Report.pdf

19. Hawthorne N, Anderson C. The global pharmacy workforce: a systematic review of the literature. Hum Resour Health. 2009 Jun;7:48.

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

21. The International Pharmaceutical Federation (FIP). Good pharmacy practice in developing countries - Recommendations for stepwise implementation [Online]. The Hague: International Pharmaceutical Federation; 1998. [cited 2016 December 8]. Available from: http://www.fip.nl/files/fip/Statements/latest/Dossier%20003%20total.PDF

22. The International Pharmaceutical Federation (FIP). FIP Statues [Online]. Buenos Aires: International Pharmaceutical Federation; 2016. [cited 2016 December 7]. Available from: http://www.fip.org/statutes

23. The International Pharmaceutical Federation (FIP). 2020 Vision. FIP's Vision, Mission and Strategic Plan. The Hague: International Pharmaceutical Federation; 2008 [cited 2016 Dec 8]. Available from: http://www.fip.org/files/fip/strategic%20plan%20no%20annexes.pdf

24. Doherty K. A review of the current Global Pharmacy Support Workforce: how scarcity and need drive the development of a new competent workforce. Canberra: University of Canberra; 2014. [cited 2017 Jan 24] Available from: http://www.canberra.edu.au/researchrepository/file/ce2815ee-801d-40fa-8bbd-2386e9b7a760/1/full_text.pdf

25. Brown AN. New tools for culturally appropriate training, to develop competency in Pacific Island Countries in pharmaceutical health care service delivery. Canberra, Australia: University of Canberra; 2013. [cited 2017 Jan 24] Available from: http://www.canberra.edu.au/researchrepository/file/faa38e11-70ee-2fc7-9e8f-a6bd274b7d64/1/full_text.pdf

26. Bruno A, Bates I, Brock T, Anderson C. Towards a Global Competency Framework. Am J Pharm Educ. 2010 Apr; 74(3):56.

27. Bruno A. The feasibility, development and validation of a Global Competency Framework for Pharmacy Education. London: University of London; 2011. [cited 2017 Jan 24] Available from: http://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.586727

28. Gabay M. Tech-check-tech: An overview. Hosp Pharm. 2012 Jun; 47(6):444-5.

29. International labour organization (ILO). International Standard Classification of Occupations: Structure, group definitions and correspondence tables. ISCO–08 Volume I. Geneva: ILO; 2009 [cited 2016 Dec 9]. Available from: http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_172572.pdf

30. Scott J, Lumsden C, Taylor J, Todd G. Developing the role of a ward based pharmacy technician in facilitation of admission and discharge of elderly patients. Pharmacy World & Science. 2009; 31(1):99-.

31. Mud A. Pharmacist activities in the pharmacy technician lead ward top up service. Eur J Hosp Pharm. 2012; 19(2):108.

32. Adams AJ, Martin SJ, Stolpe SF. "Tech-check-tech": A review of the evidence on its safety and benefits. Am J Health Syst Pharm. 2011 Oct. 68(19): 1824-33.

33. Cho J, Chen S. Development and evaluation of clinical pharmacy technician roles in a safety net organization. Pharmacotherapy. 2013; 33(10):e263.

34. Fuller K, Pope N, Lawson K, Weems J, Montemayor D. Addressing the barriers to medication therapy management: Training community pharmacy technicians for roles in medication therapy management. J Am Pharm Assoc. 2013; 53(2):e57-e8.

35. Siemianowski LA, Sen S, George JM. Impact of pharmacy technician-centered medication reconciliation on optimization of antiretroviral therapy and opportunistic infection prophylaxis in hospitalized patients with HIV/AIDS. J Pharm Pract. 2013 Jan;26(4):428-33.

36. Smith SB, Mango MD. Pharmacy-based medication reconciliation program utilizing pharmacists and technicians: A process improvement initiative. Hosp Pharm. 2013 Feb;48(2):112-9.

37. Grønkjær LS, Rosholm RU. Pharmacy technicians can contribute to an improvement in the drug treatment in geriatric bed-wards. Eur Geriatr Med. 2013 Sep; 4:181. (suppl).

38. Humphries C, Gatton O, Cates L, Ferreri S, Marciniak M. Addressing barriers to pneumococcal vaccination: Training pharmacy technicians for roles in vaccine advocacy. Journal of the American Pharmacists Association. 2014;54(2):e114.

39. Kobayashi K, Le H. Determining the impact of a new medication-history Pharmacy Technician Program. Pharmacotherapy. 2014;34(10):e243.

40. O'Connor S, Akers J. Impact of a pharmacy technician on cost of providing in-home medication therapy management services. Journal of the American Pharmacists Association. 2014;54(2):e208.

41. Elliott RA, Perera D, Mouchaileh N, Antoni R, Woodward M, Tran T, et al. Impact of an expanded ward pharmacy technician role on service-delivery and workforce outcomes in a subacute aged care service. J Pharm Pract Res. 2014 Sep;44(3):95-104.

42. Ziba M, Babigumira J, Crawford J, Kandaya J, Chimenya C, Jenny A, et al. Introducing an enhanced cadre of pharmacy assistants to improve dispensing, management, and availability of medicines at the health centre level in Malawi. J Pharm Policy Pract. 2014; 7(Suppl 1):1-2.

43. Lubinga SJ, Jenny AM, Larsen-Cooper E, Crawford J, Matemba C, Stergachis A, et al. Impact of pharmacy worker training and deployment on access to essential medicines and health outcomes in Malawi: protocol for a cluster quasi-experimental evaluation. Implement Sci. 2014 Oct; 9:156.

44. Kadia NK, Schroeder MN. Community Pharmacy-Based Adherence Programs and the Role of Pharmacy Technicians. A Review. J Pharm Technol. 2015; 31(2):51.

45. Gebhart F. Kansas launches remote supervision for hospital pharmacy techs. Drug Topics. 2012;156(4).

46. Society of Hospital Pharmacists of Australia. Standards of Practice for Clinical Pharmacy Services. Chapter 9: Staffing levels and structure for the provision of clinical pharmacy services. J Pharm Pract Res. 2013; 43 (suppl 2).

47. Association of Pharmacy Technicians UK (APTUK). Supervision – An enabler for modern patient-centred Pharmacy Services[Online]. APTUK; 2011 Oct. [cited 2016 December 7]. Available from: http://www.aptuk.org/media/dynamic/files/2011/10/07/Supervision_steves_paper1.pdf

48. Brown A, Gilbert B. The Vanuatu medical supply system - documenting opportunities and challenges to meet the Millennium Development Goals. South Med Rev. 2012 Jul;5(1):14-21.

49. Brown A, Gilbert B. The Papua New Guinea medical supply system - documenting opportunities and challenges to meet the Millennium Development Goals. Article being considered by Southern Med Review. 2013.

50. Anderson C, Bates I, Brock T, Brown A, Bruno A, Futter B, et al. Needs-Based Education in the Context of Globalization. Am J Pharm Educ. 2012 May;76(4):56.

51. Brock T, Brown A, Rennie T, Rouse M. Global pharmacy education: Are we there yet? International Pharmacy Journal. 2012;28(1):4-11.

52. Brown A. Sustaining Pharmacy Education, where pharmacists are few. International Pharmacy Journal. 2011;27(1):29-35

53. Mobley-Smith MA, Boyle CJ, Keresztes JM, Liles J, MacLean LG, McAllister EB, et al. Report of the 2013-2014 Professional Affairs Standing Committee: Advancing the Pharmacy Profession Together through Pharmacy Technician and Pharmacy Education Partnership. Am J Pharm Educ. 2014 Dec; 78(10):S22.

54. Manasse HR Jr, Menighan TE. Pharmacy technician education, training, and certification: Call for a single national standard and public accountability. J. Am. Pharm. Assoc. 2011 May-Jun;51(3):326-7.

55. Gilbert L. 'Re-Engineering the Workforce to Meet Service Needs': Exploring 'Task-Shifting' in South Africa in the Context of Hiv/Aids and Antiretroviral Therapy. SARS. 2013 Jun;44(2):54-75.

56. Boschmans SA, Fogarty TL, Schafermeyer KW, Mallinson RK. Practice analysis for mid-level pharmacy workers in South Africa. Pharmacy Education. 2015;15(1):31-8.

57. Fogarty T, Boschmans S. An improved pharmacy midlevel worker qualification in South Africa: possibility of coteaching pharmacists and pharmacy technicians. Pharmacy Education. 2013;13(1):107-8.

58. Draime J, Anderson D, Anderson T. Description of pharmacy technician training programs in the United States. J Am Pharm Assoc. 2015;55(2):251.

59. Rosado H, John C, Puaar D, Bates I. An analysis of the initial education and training standards for pharmacy technicians and views on their fitness for purpose. A report to the General Pharmaceutical Council. Report. London: General Pharmaceutical Council; 2015 Nov [cited 2016 Dec 6]. Available from: https://www.pharmacyregulation.org/sites/default/files/lpet_ucl_iet_stds_analysis_pts_final_report_november_15.pdf

60. Schafheutle E, Jee S, Willis S. Fitness for purpose of pharmacy technician education and training in Great Britain. Int J Pharm Pract. 2015;23:20-1.

61. Rücker D. Future congress: Controversy about PTA training. Pharmazeutische Zeitung. 2015;160(6). Available from: http://www.pharmazeutische-zeitung.de/index.php?id=56272

62. Horon K, Hennessey T, Gorman SK, Heukshorst S. Should pharmacy technicians provide clinical services or perform patient care activities in areas without a pharmacist? Can J Hosp Pharm. 2010 Sep-Oct; 63(5):391-4.

63. Management Committee, Moving Forward: Pharmacy Human Resources for the Future. Final Report. Ottawa (ON): Canadian Pharmacists Association; 2008 Sep [cited 2017 Jan 20]. Available from: http://tools.hhr-rhs.ca/index.php?option=com_mtree&task=att_download&link_id=4506&cf_id=68&lang=en

64. Zellmer W. The future of health-system pharmacy: Opportunities and challenges in practice model change. Ann Pharmacother. 2012 Apr; 46(4):S41-S5.

65. Chant C. "Partners in crime": pharmacists and pharmacy technicians. Can J Hosp Pharm. 2010 Sep-Oct; 63(5):353-4.

66. Tan ACW, Emmerton L, Hattingh L, Jarvis V. Medication supply and management in rural Queensland: Views of key informants in health service provision. Res Soc Adm Pharm. 2012 Sep-Oct; 8(5):420-32.

67. Mangan MN, Powers MF. Drug shortages and the role of the pharmacy technician: A review. J Pharm Technol. 2011 Nov-Dec; 27(6):247-50.

68. Hertig JB, Radman D, Sisodiya D, Dabestani A. Creating innovative leadership roles to improve pharmacy practice. Am J Health-Syst Pharm. 2013 Feb;70(4):306-7.

69. Raymond CB, Santos CE, Caligiuri C, Levesque J. Should pharmacy technician managers be responsible for the drug distribution system within hospital pharmacy departments? Can J Hosp Pharm. 2011 May-Jun; 64(3):218-20.

70. Doucette WR, Nevins JC, Gaither C, Kreling DH, Mott DA, Pedersen CA, et al. Organizational factors influencing pharmacy practice change. Res Soc Adm Pharm. 2012 Jul-Aug; 8(4):274-84.

71. Houle SK, Rosenthal MM, Tsuyuki RT. A case study in mobilizing all pharmacy team members in the community setting: A clinical facilitation role for pharmacy technicians. Can Pharm J (Ott). 2014 Mar; 147(2):85-8.

72. Eckel F. 10 things that could change pharmacy practice [Online]. Pharmacy Times. 2014 Dec 8. [cited 2017 January 23]. Available from: http://www.pharmacytimes.com/publications/issue/2014/december2014/10-things-that-could-change-pharmacy-practice

73. Napier P, Norris P, Green J, Braund R. Can they do it? Comparing the views of pharmacists and technicians to the introduction of an advanced technician role. Int J Pharm Pract. 2016 Apr;24(2):97-103

74. Bright DR, Lengel AJ, Powers MF. Pharmacists' perceptions of barriers to implementing medication therapy management and the role of pharmacy technicians in overcoming the barriers. J Pharm Technol. 2009 Nov;25(6):361-7.

75. Thompson J, Swarthout MD. Developing pharmacy technicians across the leadership spectrum. Am J Health Syst Pharm. 2012 Dec;69(23):2040-2.

76. Sancar M, Okuyan B, Tamyüksel E, Izzettin FV. Assessment of pharmacy technicians' attitudes and responsibilities toward patient oriented pharmacy practices at community pharmacy. Int J Clin Pharm. 2012 Feb;34(1):204.

77. Wiedenmayer KA, Mapunjo S, Kapologwe N. The reality of task shifting in medicines management- a case study from Tanzania. J Pharm Policy Pract. 2015 Apr; 8(1):13.

78. Latif A, Boardman HF, Pollock K. A qualitative study exploring the impact and consequence of the medicines use review service on pharmacy support-staff. Pharm Pract. 2013 Apr;11(2):118-24.

79. The Association of Finnish Pharmacies. Annual Review 2015 [Online]. Helsinki: The Association of Finnish Pharmacies; 2016. [cited 2017 January 9]. Available from: http://www.apteekkariliitto.fi/media/3-apteekkariliitto.fi/liitto/vuosikatsaukset/vuosikatsaus_2015_en.pdf

80. Halonen I. Apteekkariliitto: Apteekkipalveluiden digikehitystä tärkeää jatkaa [Online]. Helsinki: Apteekkari; 2016 Aug 12. [cited 2017 January 9]. Available from: http://www.apteekkari.fi/uutiset/apteekkariliitto-apteekkipalveluiden-digikehitysta-tarkeaa-jatkaa.html

81. The Association of Finnish Pharmacies. Lääketeknikko [Online]. Helsinki: Association of Finnish Pharmacies, 2014 Oct 31. [cited 2017 January 9]. Available from: http://www.apteekkariliitto.fi/apteekkityo/apteekin-ammattilaiset/laaketeknikko.html

82. Johnston R, Saulnier L, Gould O. Best possible medication history: Comparison of pharmacy technician versus pharmacist obtained medication histories in the emergency department. Can J Hosp Pharm. 2010 Sep-Oct; 63(5):359-65.

83. Mekonnen AB, McLachlan AJ, Brien JA. Pharmacy-led medication reconciliation programmes at hospital transitions: a systematic review and meta-analysis. J Clin Pharm Ther. 2016 Apr;41(2):128-44.

84. Stafford R. Return on investment of using pharmacy technicians to aid in the completion of comprehensive medication reviews. J Am Pharm Assoc. 2014;54(2):e145-e6.

85. Mihalopoulos CP, Powers MF. Roles for pharmacy technicians in community pharmacy practice accreditation. J Pharm Technol. 2013 May;29(3):111-7.

86. Benavides SR, Rambaran K. Pharmacy technicians: Expanding role with uniform expectations, education and limits in scope of practice. J Res Pharm Pract. 2013 Oct-Dec;2(4):135-7.

87. American Society of Health-System Pharmacists. ASHP guidelines: Minimum standard for pharmacies in hospitals. Am J Health-Syst Pharm. 2013 Sep;70(18):1619-30.

88. Bradley F, Schafheutle EI, Willis SC, Noyce PR. Changes to supervision in community pharmacy: Pharmacist and pharmacy support staff views. Health Soc Care Community. 2013 Nov;21(6):644-54.

89. American Society of Health-System Pharmacists. ASHP statement on the roles of pharmacy technicians. Am J Health-Syst Pharm. 2016; 73:928–30 [Online]; 2016 [cited 2016 Dec 8].

90. Raimbault M, Guérin A, Caron E, Lebel D, Bussières JF. Identifying and reducing distractions and interruptions in a pharmacy department. Am J Health Syst Pharm. 2013 Feb;70(3):186-90.

91. Potter H, Hassel K, Noyce PR. Pharmacists' and pharmacy technicians' views on a process of revalidation of pharmacy professionals in Great Britain. Res Soc Adm Pharm. 2013 Mar-May;9(2):142-54

92. Desselle SP. An in-depth examination into pharmacy technician worklife through an organizational behavior framework. Res Social Adm Pharm. 2016 Sep-Oct;12(5):722-32

93. Carre N, Choquet M, Le Mercier F, Tritz T. Evaluation of the double-check in a daily dose unit drug distribution system. Int J Clin Pharm.2015;37(1):240.

94. International Pharmaceutical Federation (FIP). Basel Statements: the future of hospital pharmacy practice [Online]. The Hague: International Pharmaceutical Federation; 2015 Sep 10 [cited 2017 Jan 20]. Available from: http://www.fip.org/basel-statements

6 Appendices

Appendix 1 — Detailed case studies

The following detailed case studies (Canada, Denmark, Malawi, Singapore, South Africa, and the United Kingdom) have been chosen to represent a range of practice models that are present globally. There is also an attempt to be regionally representative. For each of these case studies key country based contacts have been established and have agreed to prepare the information required for each case study.

Canada

Author
Susan James B.Sc.OT, MPA, Director, Competence, Ontario College of Pharmacists

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Pharmacy workforce summary for Canada*

The duration of **pharmacists'** training is 4 – 6 years. Number of pharmacists in the workforce is 40,704[1]

The duration of **pharmacy technicians'** training is 1 or 2 years (minimum 940 hours). Number of pharmacy technicians in the workforce is 6,601.[1]

There is no standard requirement for the duration of the training of **pharmacy assistants/other personnel**. Number of pharmacy assistants/other personnel in the workforce is estimated to be 60,000.

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*Pharmacists and pharmacy technicians must graduate from a programme accredited by the Canadian Council for Accreditation of Pharmacy Programs (CCAPP)

Overview of pharmaceutical sector
Pharmacy is undergoing significant change in Canada. Like many countries, the current health system is strained due to rising health service costs, an aging population and increased drug utilisation. Financial sustainability requires all health care professionals practice to their full potential; therefore, governments are legislating expanded scopes of practice for many professions, including pharmacy.

Canada has about 41,000 pharmacists and over 6,500 newly regulated pharmacy technicians. About 70% of the workforce practices in the 9,750 community pharmacies, 17% in the 6,500 hospitals or institutions and 13% in other settings such as industry, government, professional associations, education.[1]

While pharmacists remain responsible for the overall management of pharmacy services, pharmacy technicians have become a newly regulated health professional and are responsible for the technical functions of drug distribution, product preparation, dispensing of medicines and inventory control.[2] This allows pharmacists to focus on clinical roles that have been expanded to include adaptation of prescriptions, prescribing for minor ailments, ordering and/or interpreting lab tests and administering drugs, including injections for immunisation or other purposes.[3]

History of pharmacy support workforce development
Pharmacists have historically relied on support personnel to assist in the delivery of pharmacy services. Previously, support workers were often trained on-the-job and directly supervised by the pharmacist. Formal education programmes were established 40 years ago, and served to define differences between pharmacy technicians and assistants, although they still overlapped. Around the same time, educators supported development of what is now the national pharmacy technician professional association.[4] Regional associations have also evolved; all primarily offer professional development and networking for members.

As expectations for clinical pharmacy services increased, pharmacists became more dependent on support staff and advocated more knowledge, skill and responsibility of these workers to help decrease the amount of supervision required. Just before regulation of this workforce, surveys revealed an increasing number of tasks assigned to pharmacy technicians in community such as: filling and labelling prescriptions, preparing non-sterile products, reconstituting products and maintaining inventory, making compounding or dosage calculations, gathering patient information, and verifying the accuracy and completeness of prescriptions.

Similar changes occurred in hospital as pharmacists moved on to patient-care floors. Non-regulated pharmacy technicians worked with much less supervision and were delegated responsibility for the final check of

dispensed medicines using a "tech-check-tech" system. The same workforce surveys[5,6] reported these roles included controlling or distributing narcotics, packaging or pre-packaging medicines, preparing sterile products such as intravenous mixtures, parenteral nutrition, or chemotherapy and replenishing automated dispensing equipment, infusion or compounding devices.

Current practice relationship

The practice relationship between pharmacy team members varies by province depending on multiple factors: status of technician regulation, pharmacists' scope of practice, the practice environment and business model. Practice changes across the pharmacy profession have created a state of flux, impacting the nature of working relationships among team members. Recent reports suggest that when pharmacists and pharmacy technicians are able to practise to their full scope they are more likely to have a positive and mutually supportive relationship. [7]

During this period of transition there are individuals reporting difficult working relationships: pharmacists who believe pharmacy technicians are encroaching on and may replace their role and pharmacy technicians who feel under-utilised and restricted in their ability to fulfil their role. Increasingly there is recognition and acceptance that each of these professionals has a distinct and important role to play to achieve optimal pharmacy services.

Education of pharmacy support workforce

Formal pharmacy technician education programmes began at community colleges in the 1970s and evolved throughout the country with limited standardisation in length and content. [8] The regulation of pharmacy technicians provided an impetus for change in the education landscape, so while programmes still vary from one to two years in length they have common educational outcomes through the requirement to become accredited.

Two national organisations contribute to the standards of pharmacy technicians' education programmes; the Canadian Pharmacy Technician Educators Association (CPTEA) and the Canadian Council for the Accreditation of Pharmacy Programs (CCAPP). CPTEA is an affiliation organisation open to educators from across Canada, with a mission to lead, advance, support, and promote excellence in pharmacy technician education. [9] CCAPP is the national organisation responsible for accreditation of pharmacist and pharmacy technicians' education programmes. Their mission is to evaluate the quality of pharmacy programmes and promote continued improvement.[10]

When regulation of pharmacy technicians was in development, CPTEA identified the need for a national accreditation process and consistent educational outcomes. The National Educational Outcomes for Pharmacy Technician Programmes in Canada, [11] first published in 2007 and recently revised, is aligned with the Professional Competencies for Canadian Pharmacy technicians at Entry to Practice. [2]

CCAPP, established in 1993 for the purpose of accrediting professional pharmacy degree programmes, worked with CPTEA and other key stakeholders to establish the accreditation standards and process for pharmacy technician programmes. Standards for Accreditation of Pharmacy Technician Programs [12] were first published in 2008 and recently revised in 2015. Accreditation began in 2008 with 13 programmes in three provinces and by 2015 there were 44 accredited pharmacy technician programmes within eight of 10 provinces and one international programme. [13] Many other programmes that did not seek or achieve accreditation have been discontinued or transitioned as pharmacy assistant programmes.

Regulation environment

In Canada the regulation of health professions is managed provincially by a regulatory authority established through government statute, with a mandate to protect the public interest. The regulatory model provides title protection for individuals who have met specified entry-to-practice requirements. Members of the profession are expected to meet the standards of practice and code of ethics for the profession.

Although regulation is a provincial/territorial responsibility, there is a National Association of Pharmacy Regulatory Authorities (NAPRA) that provides a forum for a national approach to regulation. [2] Through strong relationships among provincial regulatory authorities and other national pharmacy stakeholder organisations a national model for the regulation of pharmacy technicians was achieved. In 2010 two provinces registered their first pharmacy technicians and by 2016 regulation exists in nine of 10 provinces, with the remaining jurisdiction actively pursuing regulation as well.

In all cases, governments' decision to regulate pharmacy technicians occurred in conjunction with other legislative changes to support expanded scope for pharmacists; the intent being that accountable pharmacy technicians would enable pharmacists to provide increased patient care services. [14] With this goal in mind, governments chose to regulate pharmacy professionals and pharmacies under one governing body and thus

the regulatory model and requirements for pharmacy technicians mirror that of pharmacists in each province including: graduation from an accredited educational programme, completion of a national qualification exam (written and practical) based on the entry-to-practice competencies, completion of a jurisprudence exam, structured practical training/experience and demonstration of language proficiency. [14]

In most provinces in Canada, the term "pharmacy technician" is now restricted to those who meet qualifications for, and are registered by, their provincial regulatory body. In many community pharmacies, both pharmacy technicians and pharmacy assistants continue to work side by side. While the registration of all pharmacy support staff may appear to be a desirable aim, it seems unlikely that this will be attainable in the near future. Conversely, in hospital pharmacies, non- regulated pharmacy support workers are in decline, with many hospitals requiring all pharmacy technicians to be registered.

Current challenges and trends
The biggest challenge for pharmacy technicians presently is achieving the confidence and recognition needed to practise to their full scope. [5] Integration through new business models and collaborative intra-professional relationships among the pharmacy team is in development but is expected to take time. Concurrent changes for pharmacists to become confident and recognised as drug experts and patient care professionals by all members of the health care team are also needed in order to reinforce the value of a regulated pharmacy technician workforce.

National pharmacy stakeholders including professional associations, educators, examining bodies and regulators have modelled a truly collaborative and coordinated effort to support the integration of pharmacists, pharmacy technicians and other support workers. New business models and workflow that capitalise on the expanded roles of pharmacists and technicians are emerging but there is still need for further efforts that will support both professions to practise to their fullest scope to achieve optimal patient care. [15]

References

1. National Association of Pharmacy Regulatory Authorities. National Statistics [Online]. 2016 Jan 1 [cited 2017 Jan 23]. Available from: http://napra.ca/pages/Practice_Resources/National_Statistics.aspx
2. National Association of Pharmacy Regulatory Authorities. Professional Competencies for Canadian Pharmacy technicians at Entry to Practice [Online]. Ottawa, ON: NAPRA; 2014 Mar. [cited 2016 Jan]. Available from: http://napra.ca/Content_Files/Files/Comp_for_Cdn_PHARMTECHS_at_EntrytoPractice_March2014_b.pdf
3. National Association of Pharmacy Regulatory Authorities. Practice Environments: The Pharmacist's Role [Online]. 2014 [cited 2016 Jan]. Available from: http://www.pharmacistsgatewaycanada.ca/what-practice-environments.shtml
4. Canadian Association of Pharmacy Technicians. About Us [Online]. 2015 [cited 2016 Jan]. Available from: http://capt.ca/about-us/
5. Management Committee, Moving Forward: Pharmacy Human Resources for the Future. The Pharmacy Technician Workforce in Canada: Roles, Demographics and Attitudes. Ottawa (ON). Canadian Pharmacists Association; 2007. [cited 2017 Jan 23] Available from: http://docplayer.net/8205620-The-pharmacy-technician-workforce-in-canada-roles-demographics-and-attitudes.html
6. MacNair K, Wilgosh C. H- Pharmacy technicians. In: Hall K, Wilgosh C. (eds) 2011/12 Hospital Pharmacy in Canada Report; Hospital Pharmacy in Canada Editorial Board; 2013. [cited 2017 Jan 23] Available from: http://www.lillyhospitalsurvey.ca/hpc2/content/2012_report/chapter_h%20.pdf
7. Alberta College of Pharmacists. Pharmacy Technician Registrant Survey. Advanis; 2014 Dec. [cited 2016 Jan] Available from: https://pharmacists.ab.ca/sites/default/files/TechnicianSurvey2014.pdf
8. Folkman R, Hill D, Meier B, James S. Summary Report of the Development of Educational Outcomes for Pharmacy Technician Programs in Canada. Canadian Pharmacy Technician Educators Association (CPTEA); 2007 Mar. [cited 2017 Jan 23] Available from: http://tools.hhr-rhs.ca/index.php?option=com_mtree&task=att_download&link_id=6164&cf_id=68&lang=fr
9. Canadian Pharmacy Technician Educators Association [Internet]. Mission Statement. [cited 2016 Jan]. Available from: http://www.cptea.ca/mission.html
10. Canadian Council for Accreditation of Pharmacy Programs. About the council [Online]. Toronto: CCAPP; 2017 [cited 2017 Jan 23]. Available from: http://ccapp-accredit.ca/ccapp/
11. Canadian Pharmacy Technician Educators Association. Educational Outcomes for Pharmacy Technician Programs in Canada [Online]. Canadian Pharmacy Technician Educators Association; 2007 Mar [cited 2017 Jan 23]. Available from: http://docplayer.net/6867808-Educational-outcomes-for-pharmacy-technician-programs-in-canada.html
12. Canadian Council for Accreditation of Pharmacy Programs. Standards for Accreditation of Pharmacy Technician Programs in Canada. Toronto: The Canadian Council for Accreditation of Pharmacy Programs; revised 2015 [cited 2017 Jan 23]. Available from: http://ccapp-accredit.ca/wp-content/uploads/2016/01/Technician-Stds-2014.pdf

13. Canadian Council for Accreditation of Pharmacy Programs. Annual Report and Directory of Accredited Programs; 2014-2015. [cited 2017 Jan 23]. Available from: http://ccapp-accredit.ca/wp-content/uploads/2016/01/directory_annual_report_2015.pdf
14. National Association of Pharmacy Regulatory Authorities. Pharmacy technicians [Online]. [cited 2016 Jan]. Available from: http://napra.ca/pages/PharmacyTechnicians/default.aspx
15. Blueprint for Pharmacy Steering Committee. Blueprint for Pharmacy: Our Way Forward [Online]. Ottawa (ON): Canadian Pharmacists Association; 2013. [cited 2017 Jan 23] Available from: https://www.pharmacists.ca/cpha-ca/assets/File/pharmacy-in-canada/blueprint/Blueprint%20Priorities%20-%20Our%20way%20forward%202013%20-%20June%202013.pdf

Denmark

Authors
Esben Hansen, Danish Association of Pharmaconomists

Pharmacy workforce summary for Denmark

The duration of **pharmacists'** training is 5 years. Number of pharmacists[1] working in

- Community pharmacy: 867
- Public sector: 1,060
- Elsewhere: 2,850*

The duration of **pharmaconomists'** training is 3 years. Number of pharmaconomists[1] working in

- Community pharmacy: 2,825
- Public sector: 770
- Elsewhere: 450*

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*Only members of associations

Brief overview of the pharmaceutical sector
There are two types of pharmacies in Denmark, hospital and community. The only pharmacy support cadres are called pharmaconomists. In hospitals there are 711 pharmaconomists and 476 pharmacists employed, though most work in hospital pharmacies, many are also employed elsewhere in the hospitals. [1] Community pharmacies employ 2,825 pharmaconomists and 648 pharmacists. In addition, there are 219 sole proprietors of community pharmacies, who must also be pharmacists. [1]

The 867 pharmacists and 2,825 pharmaconomists in community pharmacies translates into 15 pharmacist and 50 pharmaconomists in community pharmacy per 100,000 population. In two other case studies in this report, Canada and the UK, the numbers of pharmacist in community pharmacies per 100,000 population are many times higher, at 70 and 52 respectively. [2, 3]

There are no precise numbers of how many pharmaconomists and pharmacists work outside the pharmacy sectors, however there are 770 pharmaconomists and 1,060 pharmacists in total employed in the public sector (including hospitals).[4] Outside pharmacies, the professional associations of pharmaconomists and pharmacists have 450 pharmaconomists and 2,850 pharmacists as members.[5] They both mainly find employment in the pharmaceutical industry, however there is no exact and updated information on the total number of pharmaconomists working outside community pharmacies or the public sector.

The vast majority of hospitals in Denmark are public, making the hospital pharmacies part of the public sector. Community pharmacies, on the other hand, are privately owned and only a pharmacist can own a community pharmacy, as a sole proprietor. As of 2015, there are 367 community pharmacies, supplementary units and branch pharmacies, meaning units where you can have a prescription handled and medicines dispensed directly. These 367 units cover 219 individual entities. Each individual entity can have a maximum of eight of these units. The number and placement of the pharmacies and supplementary units are decreed by the Ministry of Health. Branch pharmacies can be freely established within a 75km radius of the main pharmacy. The pharmacy sector was reformed in 2015; before this there were greater restrictions on branch pharmacies.[6]

History of pharmacy support workforce development in the country
The pharmaconomist education has its origin in community pharmacy and pharmaconomist students are still trained at community pharmacies. The education was established in 1958 and the name changed from "pharmacy assistant" to "pharmaconomist" in 1999. The parallel retail oriented *Defektrise* education stopped in 1972.

The education has undergone continuous change in line with the evolution of tasks in community and hospital pharmacy. A key change was in 1984, when compounding was discontinued at individual community pharmacies and instead centralised in a handful of community pharmacies. The tasks and, therefore, the education shifted focus from compounding to information, bringing more counselling and information into the education. Another key change was in 1997, when the then pharmacy assistants were granted similar

authority to handle prescriptions, dispensing and counselling as pharmacists, further shifting the profession towards direct interaction with patients.

Current practice relationship between pharmacists and technicians/pharmacy support workforce cadres
The pharmaconomist is allowed to receive the prescription and question the patient on the drug, about allergies, interactions dose, etc. He/she gathers, dispenses, conducts the final check and counsels the patient on the use of the medicines. All this is done independently, though a pharmacist must be present at the 237 community pharmacies or supplementary units for queries by the pharmaconomist or directly reachable by phone at the 130-branch pharmacy. The pharmaconomist is legally required to answer medical inquires by a patient. He/she is liable for any information or dispensing errors they conduct, with the National Agency for Patients' Rights and Complaints having punitive authority, though rarely more than an official reprimand. As a result, most of the daily dispensing services and related activities at the counter of community pharmacies are carried out by pharmaconomists.

Responsibility for medicines errors etc. falls on the pharmaconomist, pharmacist or proprietor pharmacist, who are to blame for the error. The operation of the pharmacy is the legal responsibility of the proprietor pharmacist, such as proper work routines.

Comparable to pharmacy support cadres in many other countries, the pharmaconomist has a high level of responsibility. This is also part of the education.

In Denmark, there is a high proportion of pharmaconomists in the pharmacies. That could be described as a ratio of 3.5 pharmaconomists per pharmacist.

Education of pharmacy support workforce cadres
The education of pharmaconomists is a 34 months' education, which takes place partly in a community pharmacy and partly at Pharmakon, the college of pharmacy practice, the only education institution for pharmaconomists in Denmark. The entry requirement to the education is a minimum of 12 years of primary and secondary schooling and it is possible to split the practical training between community and hospital pharmacy. The education is financed through a fee paid by all community pharmacies.

During the 3 years of study, students attend eight courses at Pharmakon (in total 23 weeks) with examinations following the first, second and third year. During the periods of 34 months of apprenticeship, the students have 90 study days planned and developed by Pharmakon. The students are provided with a laptop at the beginning of the education and work with electronic portfolio, exercises, videoconferences and e-learning programmes. At the pharmacy, a coach, trained by Pharmakon, supports the students in the training of their skills. Furthermore, pharmacy tutors and supervisors help the students acquire sufficient professional knowledge. The Danish Ministry of Education regulates the education of pharmaconomists. The details are in the Ministry of Education Executive Order[7] and curriculum from 2007 [8].

Regulation environment
In order to work as a pharmaconomist in a hospital or community pharmacy, the person must have a certificate from Pharmakon, or be approved by the Ministry of Health. There are extremely few known cases of this being violated.

Current challenges and trends
Since the pharmaconomist education is financed by community pharmacies, the education has a greater focus on the skills demanded by community pharmacies than the hospital pharmacies. This means that pharmaconomists receive more training in retail aspects of pharmacy and less in compounding and clinical pharmacy, activities carried out within hospital pharmacies.

Though the education is regulated by the Ministry of Education, the pharmaconomist education is not one of the standardised professional bachelor programmes in Denmark. In addition, individual community pharmacies are not accredited for training of students. Pharmaconomists and pharmacists are not part of the Danish Patient Safety Authority's register of health professionals, meaning that they do not have a certificate that needs continuous approval.

References
1.   Kommunerne og Regionernes Løndatakontor. SIRKA [Online]. Copenhagen: Kommunernes og Regionernes Løndatakontor; 2016 [cited 2016 May 2]. Available from: https://www.krl.dk/#/sirka

2. National Association of Pharmacy Regulatory Authorities. National Statistics (Canada). Ottawa (ON): National Association of Pharmacy Regulatory Authorities; 2016. [cited 2016 May 2]. Available from: http://napra.ca/pages/Practice_Resources/National_Statistics.aspx?id=2103

3. The Centre for Workforce Intelligence. A strategic review of the future pharmacist workforce: Informing pharmacist student intakes. London: CfWI; 2013 Sep [cited 2016 May 2]. Available from: http://www.cfwi.org.uk/publications/a-strategic-review-of-the-future-pharmacist-workforce

4. Moderniseringsstyrelsen. Finansministeriets forhandlingsdatabase [Online]. Copenhagen; 2016. [cited 2016 May 2]. Available from: http://www.oes-cs.dk/fhdb/opslag/fhdbs.cgi

5. The Danish Association of Pharmaconomists; Pharmadanmark (Dec 2015)

6. The Association of Danish Pharmacies. Ny apoteksregulering 1. juli 2015: Apoteker sikrer sundhedsfaglighed og øger tilgængelighed i byerne – men yderområder og vagt presses. Copenhagen: Danmarks Apotekerforening; 2015 Jun 24. [cited 2017 Jan 25] Available from: http://www.apotekerforeningen.dk/~/media/Apotekerforeningen/analysertilgaengelighed/24062015 _NyApotekerlov.ashx

7. Ministry of Education. Unofficial translation of the Danish Executive Order on the Education of Pharmaconomist No. 769 (Bekendtgørelse om farmakonomuddannelsen nr 769), 27/06/2007. [cited 2016 May 2]. Available from: http://net.pharmakon.dk/data/files/FkU/Bekendtgoerelse_UK_2007_17-jun-08.pdf

8. Ministry of Education. Curriculum Danish Education of Pharmaconomist: Danish College of Pharmacy Practice. 2007 Sep [cited 2016 May 2]. Available from: http://net.pharmakon.dk/data/files/FkU/Uddannelsesordning_UK.pdf

Malawi

Authors
Erin Larsen-Cooper, MPH, MSW; VillageReach, Seattle, WA
Jessica Crawford, MPH, MA VillageReach, Seattle, WA
Matthew Ziba, MSc, VillageReach, Lilongwe, Malawi
Carla Blauvelt, MA, VillageReach, Lilongwe, Malawi

Pharmacy workforce summary for Malawi

The duration of **pharmacists'** training (degree) is five years. Number of pharmacists in the workforce is 28*.

The duration of **pharmacy technicians'** training (diploma) is three years. Number of pharmacy technicians in the workforce is 87*.

The duration of **pharmacy assistants'** training (certificate) is two years. Number of pharmacy assistants in the workforce is 49*.

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*Public sector figures only.

Brief overview of the pharmaceutical sector

Malawi has an extreme shortage of pharmacy personnel; it is one of three countries with the fewest number of pharmacy staff in the world. [1] The country has three pharmacy cadres: pharmacists, pharmacy technicians, and pharmacy assistants. According to the 2009 human resources for health country profile for Malawi there are less than 300 pharmacy personnel working in the country in all three cadres combined [2] to serve a population of more than 13 million people. [3] Only 2% of these personnel are pharmacists with the other 98% being part of the pharmacy support workforce. Approximately 58% of the country's pharmacy personnel work in the public sector, with the remaining split between faith-based and non-profit organisations (27%) and the private, for-profit sector (14%). [3] The majority (58%) of this very scarce human resource work in urban areas [4], despite the fact that 85% of Malawi's population live in rural areas. [3]

In Malawi's public sector, pharmacists generally work at central hospitals or high-level administration positions within the Ministry of Health. According to the 2011 Health Sector Strategic Plan (HSSP), there are only *five* pharmacists in the country's public health sector to fill an estimated 90 positions. [5] Pharmacy technicians are assigned to work in district hospitals, where they are in charge of managing and dispensing medicines. Pharmacy technicians also play a key role in ensuring sufficient medical supply through their role in tracking the consumption and availability of medicines in their facility and managing the supply chain. However, only 24% of the established positions for pharmacy technicians are filled.

Pharmacy assistants, a recently re-introduced cadre, work in health centres, where the majority of Malawians receive their medical care. However, from 1999 to 2015, there were no pharmacy staff at any of Malawi's 630 public health centres, leading to unskilled and untrained staff managing medicines and dispensing to patients. Health centres suffer from frequent shortages of medicines and supplies largely attributable to poor supply chain performance. A key contributor to the poor supply chain performance in Malawi is the lack of a qualified supply chain workforce within the health system and the resulting assignment of supply chain responsibilities to health workers whose primary focus should be on their patients. For example, the supply chain tasks at a health centre such as inventory management, data collection and reporting fall to the nurses and medical assistants to complete; often with little to no training and little interest in logistics tasks. Not only does this distract them from providing care, it is a key contributor to the lack of information at higher levels in the system.

History of pharmacy support workforce development in the country

Until 1999, Malawi had trained certificate-level pharmacy staff, called pharmacy assistants, and deployed them at district and central hospitals. Pharmacy assistants had secondary school education but no higher education degree, and their skill set was very limited for the complex pharmaceutical management responsibilities needed to manage infectious diseases at the hospital level. Human resource policy called for diploma or post-graduate level pharmacy staff, but limited resources prevented the country from training high-level pharmacy staff. In 1999, the Ministry of Health and the Malawi College of Health Sciences (MCHS) stopped the training of pharmacy assistants in order to instead focus on developing both a diploma (pharmacy technician) programme and a masters-level programme (pharmacists) to fill necessary gaps in national and hospital-level pharmacy services.

In 2012, VillageReach, in close partnership with the Ministry of Health, the Malawi College of Health Sciences (MCHS) and University of Washington Global Medicines Program, revitalised and enhanced a two-year,

certificate-level pharmacy assistant training programme to fill the gaps in Malawi's health workforce, especially at the lower levels of the health system, in rural pharmacies and health centres. The Ministry of Health has set a goal of having a pharmacy assistant in every health centre.[5] The first 50 pharmacy assistants graduated and were deployed to health centres in 2015. The graduates have made immediate positive impacts on the health centres where they have been deployed – strengthening medicines management, improving dispensing and counselling to patients and reducing the time clinical staff have to spend on logistics and medicines management. The University of Washington Global Medicines Program is currently conducting a three-year evaluation of the programme to determine pharmacy assistants' impact on child morbidity and mortality; results are expected mid-2017.

Current practice relationship between pharmacists and pharmacy support workforce cadres
Pharmacists are tasked with providing support and supervision to pharmacy technicians. However, due to the extreme shortage of pharmacists they are not able to perform adequately their supervision duties. Pharmacy assistants work in health centres and are supervised by the pharmacy in-charge based at the district health office, most often a pharmacy technician. During their training, the pharmacy assistant students build strong relationships with the pharmacy technicians while undergoing ten months of practical training at district hospitals and health centres. At the health centre, the in-charge position is most often filled by medical assistants. Pharmacy assistants are highly respected and appreciated by medical assistants because they receive a similar level of training and education (two-year certificate programme). In addition, pharmacy assistants relieve medical assistants of logistics and supply chain tasks they had neither training nor time to do.

Education of pharmacy support workforce cadres
The MCHS is currently the only institution that is accredited to train pharmacy support workforce professionals in Malawi (pharmacy technicians and pharmacy assistants). Pharmacy technicians are trained for three years while pharmacy assistants are trained for two years. The college graduates about 30 pharmacy technicians and 50-100 pharmacy assistants per year.

When the pharmacy assistant programme was introduced, VillageReach and the University of Washington Global Medicines Program provided technical assistance for curriculum improvements using a competency-based approach — including the development of a robust field-based training experience for the practical component of the curriculum and strong emphasis on supply chain management, and an evaluation of pharmacy assistants' impact on access to medicines at the community level. The Ministry of Health provides overseeing of the training programme, including assisting the supervision, monitoring, and management of the practical component of the training programme.

The curriculum structure was modelled after a lab assistants programme piloted in the southwest region of Malawi. The curriculum starts with ten weeks of classroom instruction, after which the students split into two cohorts. One cohort is deployed in hospital and health centre practicum sites, while the other cohort does classroom-based study at MCHS. After each semester, the cohorts rotate so that at any one time, one cohort of students is in the field and one is in the classroom. This pattern continues throughout the two-year training programme. As a result, the pharmacy assistants deployed through this programme are well suited for fieldwork and will be contributing to improved pharmacy and supply chain management at the service delivery point from the beginning of their training. The Ministry of Health recruits a portion of pharmacy assistant candidates from community health workers already working in rural facilities, effectively providing a career path for high-performing staff committed to rural work. A considerable body of research from both high- and low- income countries shows that recruiting for mid-level health positions from rural areas increases the likelihood of future rural practice, an important consideration for the sustainability of this programme.[4]

Regulation environment
The Malawi Pharmacy, Medicines, and Poison's Board (PMPB) approved the curriculum and the training of the pharmacy support workforce at MCHS. Pharmacy personal must complete the required education and examination before becoming registered by the PMPB. The Ministry of Health, Health Technical Support Services Sirectorate oversees the placement and retention of all pharmacy staff in the public sector.

Current challenges and trends
Pharmacy assistants lead to improved pharmaceutical practice and storeroom management
While graduates have not been at health centres long enough to capture quantitative results, we have robust evidence (Figure 1) that students are making tangible improvements during their practical placements at health centres:

- Pharmacy assistant students improve the quality of patient care. Pharmaceutical practice measures the quality of care and information patients receive when they are dispensed treatments. During students' practicums at health centres, the average score for pharmaceutical practice increased 25 percent across the first two cohorts of students.

- Pharmacy assistant students enhance supply chain performance. Managing a medical commodity store can be complicated; many drugs and vaccines are temperature or light sensitive, and must be stored appropriately. A poorly organised storeroom increases the risk that medicines will expire or lose potency before they are dispensed, leading to poor patient care and to costly inefficiencies and wastage. The average score for storeroom management increased roughly 14 percent on average during student practicums.
- Pharmacy assistant students improve data quality. Data quality increased by seven percent at health centres that had a pharmacy assistant, meaning that pharmacy assistants are providing more accurate information on consumption and stock-on-hand, leading to more accurate resupply orders.
- Pharmacy assistant students help clinical staff serve more patients. Deploying pharmacy assistants to health centres reduces the logistics burden on doctors and nursing staff, allowing them to spend more time serving patients. During student practical training in Malawi, clinical staff time at health centres spent on logistics tasks decreased 80 percent, from 48 hours to only nine hours each month. This means that pharmacy assistants helped each health clinic gain nearly a full workweek – or 39 hours per month – to spend on patients.
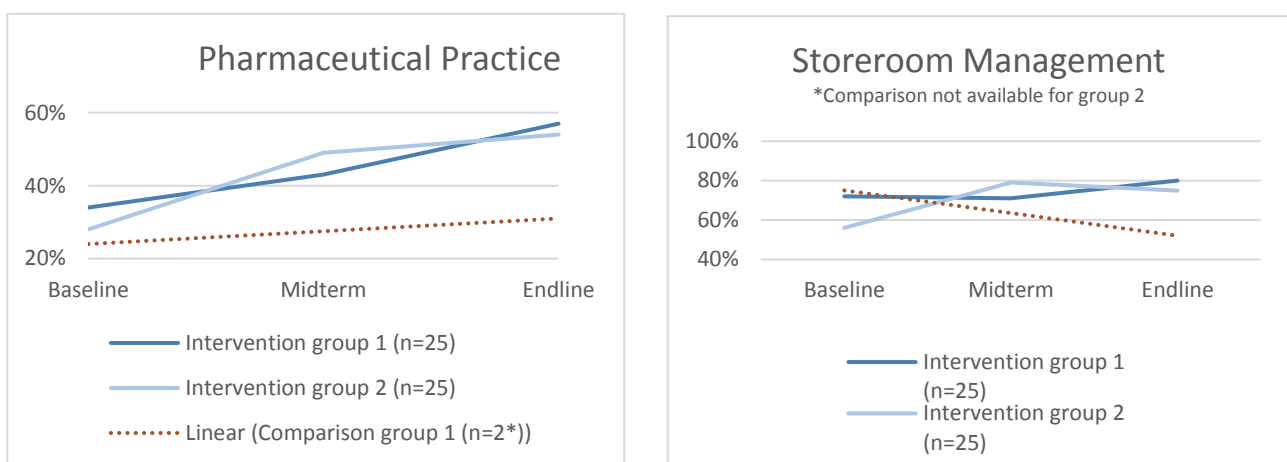
Figure 1. Comparison of improved pharmaceutical practice and storeroom management

- Low annual output of pharmacy personnel is a challenge to the Ministry of Health reaching its target. Pharmacists are only trained at the Malawi College of Medicine, which graduates less than 10 pharmacists per year. As previously mentioned, the MCHS is the only institution that trains pharmacy support workforce, training less than 30 pharmacy technicians per year and 50-100 pharmacy assistants. This leads to high vacancy rates at every position that is exacerbated by high rates of personnel leaving the public sector for jobs in the private sector. Vacancy rates are particularly high for pharmacy assistants since the position is so new. At the current rate of training, it could take 10+ years for the Ministry of Health to reach its goal of placing a pharmacy assistant in every health centre. Strategies to increase the capacity of the MCHS and/or bring on additional institutions to train pharmacy assistants are being explored by VillageReach and partners.

About VillageReach
VillageReach is a global organisation that develops, tests, implements and scales innovative solutions to improve health outcomes by better supply chain design, software development, human resources for health, advocacy and change management, and private sector engagement. It focuses on the most critical barriers at the latter stages of health care delivery: *lack of infrastructure, information availability, health care access, and human resource constraints*. For more than a decade of working in low-resource communities around the globe, in partnership with governments, local communities and other non-governmental organisations, VillageReach combines expertise across public health, technology, and business to bring life-saving innovation — new systems, programmes and technologies — to scale and sustainability.

References

1. International Pharmaceutical Federation (FIP). 2012 Global Pharmacy Workforce Report [Online]. The Hague, Netherlands: International Pharmaceutical Federation; 2012. [cited 2016 March]. Available from: http://www.fip.org/static/fipeducation/2012/FIP-Workforce-Report-2012/?page=hr2012#/0

2. Global Health Workforce Alliance, World Health Organization. World Human Resources for Health Country Profile –Malawi. Africa Health Workforce Observatory; 2009 Oct. [cited 2017 Jan 23] Available from: http://www.ecsahc.org/wp-content/uploads/2016/08/malawi_country_profile-Human-Resources.pdf

3. National Statistical Office. 2008 Population and Housing Census Results; 2009. [cited 2017 Jan 23] Available from: http://www.nsomalawi.mw/2008-population-and-housing-census.html

4. Grober L, Marais B, Mabunda S. Interventions for increasing proportion of health professionals practicing in rural and other underserved areas. Cochrane Database of Systematic Reviews 2015. 16(CD005314). DOI: 10.1002/14651858.CD005314.pub3; 2015. [cited 2016 March]. Available from: http://www.cochrane.org/CD005314/EPOC_interventions-for-increasing-the-proportion-of-health-professionals-practicing-in-rural-and-underserved-areas

5. Ministry of Health. Malawi Health Sector Strategic Plan 2011 – 2016. Government of Malawi; 2009. [cited 2016 March]. Available from: http://www.nationalplanningcycles.org/sites/default/files/country_docs/Malawi/2_malawi_hssp_2011_-2016_final_document_1.pdf

Singapore

Authors
Assistant Professor Lita Chew, Chief Pharmacist, Ministry of Health, Singapore
Ms Lim Hui Leng, Senior Manager, Manpower Standards & Development Division, Ministry of Health, Singapore
Mrs Ng-Hong Mok Shiang, Deputy Director (Pharmacy Operations), National Health care Group Pharmacy

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Pharmacy workforce summary for Singapore

The duration of **pharmacists'** training (bachelor of science) is four years and nine months of pre-registration. Number of pharmacists in the workforce is 2,757.[1][*]

The duration of **pharmacy technicians'** training is three years (diploma) and 11 months (Advanced Certificate for Health care Support). Number of pharmacy technicians in the workforce is 1,091.[2]

The duration of **pharmacy assistants'** training is 10 months (Higher Certificate for Health care Support). Number of pharmacy assistants in the workforce is 115.

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[*] Additional info: 1,049 (no. in public health care institutions as of Dec 2015)

Overview of development of pharmacy workforce
Singapore is an island city-state with a population of 5.4 million people. [3] It has a well-established health care system, comprising of public and private health care, with an excellent reputation for quality medicine. As of December 2015, there are 2,757 pharmacists registered with the Singapore Pharmacy Council. [1] Approximately 57% of the registered pharmacists practice in the patient care sectors with a majority working in public institutions. Pharmacists are embracing new professional roles, besides their traditional dispensing role, to ensure the provision of optimal and cost-effective pharmaceutical services. Areas where pharmacists are making a significant difference to the care of patients include chronic disease management through pharmacist-run clinics, antibiotic stewardship, specialty practice (oncology, infectious disease, critical care and psychiatry), medication review, medicines reconciliation, and medication therapy management services.

With this shift in the practice model of pharmacists, there is an increased need for a well-qualified and competent pharmacy technician workforce to step up and support the model of care transformation in the pharmaceutical landscape. The pharmacy workforce needs to create better value for patients and the health care system as a whole. The role extension of pharmacy technicians into the various technical and patient care areas through skills upgrading facilitates this workforce transformation.

Demographics of pharmacy support workforce
The pharmacy technician workforce forms a key pillar of overall pharmacy workforce in public health care sector, accounting for an average of 41% of the total pharmacy workforce in the acute hospitals and 64% in the primary care polyclinics.[4] A majority of them work in the outpatient setting (73%), and 22% work in inpatient setting. There are also a minority who work in the aseptic dispensing laboratories (3%) and drug purchasing departments or warehouses (2%). The pharmacist to technician ratio is approximately 1:2 in the outpatient setting, and 1:1 in the inpatient setting. As at December 2015, there are a total of 1091 pharmacy technicians working in the public health care system.[2] There are also some pharmacy technicians who work in the private hospitals, nursing homes, community hospitals and retail/community pharmacies. The actual number of technicians in the private sector is unavailable and is expected to be small.

Pharmacy assistants are also part of the pharmacy support workforce, but their roles are limited to picking and packing, and thus the number has remained small in view of the extensive automation of the pharmacy dispensaries in recent years. Most pharmacy assistants will eventually be converted into pharmacy technicians after they have completed the relevant certification course.

Practice and regulatory status of pharmacy technicians
In general, the pharmacists manage the overall pharmacy environment and as registered practitioners, they are responsible and accountable to the public for the pharmaceutical products and services provided to patients. As drug therapy experts, they provide leadership in drug therapy related issues and focus on the clinical aspect of direct patient care.
The role of an entry-level pharmacy technician includes processing prescriptions and dispensing medicines; performing basic medication counselling; managing distribution and inventory control of drugs; and preparing extemporaneous products.

Unlike pharmacists, the practice of pharmacy technicians is currently not regulated in Singapore. They perform their different roles under close supervision of the pharmacists. The need for professionalisation of this group is still under review in view of their increasing roles in supporting pharmacists in direct patient care activities.

Career framework and role development of pharmacy technicians
A review of the pharmacy technicians' career framework was conducted in 2013 by the ministry-appointed pharmacy technicians development taskforce, and an enhanced career development framework was rolled out in 2014. The features of the new career framework include the establishment of 3 new executive job levels beyond the existing two-tiered career structure (pharmacy technicians and senior pharmacy technicians) which does not provide sufficient opportunity for career progression. The review also resulted in the repositioning of senior level pharmacy technicians under the allied health career track.

The pharmacy technician executives are competent and experienced in their respective areas of practice and are able to train and coach junior members in small teams. As they progress further to senior executive level, they are expected to take on supervisory and managerial roles besides their day-to-day service delivery and operational duties. They will also play a greater role in service planning, trouble shooting and resource management.

The new career framework also articulates the specific areas for role extension in which pharmacy technicians can support the pharmacists with their advanced skills and expertise to improve the overall service delivery to patients (Figure 2). The job descriptions of each of these extended role areas has also been developed to serve as guidance for customisation of the individual technician's role development and career path, according to the department's service needs and the staff's career aspiration.

Figure 2. Recommended areas of role extension for pharmacy technicians in public sector

Training and education of pharmacy support workforce
Entry-level certification course
The first structured training course for pharmacy technicians was delivered by the Pharmaceutical Society of Singapore (PSS) more than 17 years ago to meet the evolving and increasingly sophisticated pharmacy service needs in hospitals. In 2009, PSS achieved the Approved Training Organisation (ATO) status from the Singapore Workforce Development Agency (WDA) to deliver the WSQ Health care Support (Pharmacy Support), Advanced and Higher Certificate Programmes to train pharmacy technicians and pharmacy assistants respectively. These courses are accredited by the WDA[5] and benefit from heavy subsidy for course fees by the government as part of the country's adult learning and skill development strategy. Specifically, the advanced certificate programme is recognised as an entry qualification for pharmacy technicians in our public health care institutions. It continues to help equip the mid-career entrants without the relevant diploma qualifications to join the pharmacy technician workforce.

Entry-level diploma course

Currently, there are four local polytechnics offering the 3-year diploma in pharmacy / pharmaceutical sciences programme(s) to train the pharmacy technician workforce. The programmes allow for specialisation in different tracks, such as pharmacy practice, clinical trials, industrial pharmacy and marketing, as well as forensics and bioanalytics. The programmes include an internship component which is conducted in the partnering health care institutions, retail pharmacies or pharmaceutical companies. Every year, there is a steady stream of graduates who will join the public health care sector as pharmacy technicians. With the introduction of the National Competency Standards for Entry-Level Pharmacy technicians in 2015[6] focusing on 7 domains covering technical, patient care and behavioural competencies, the programmes are anticipated to align their didactic and internship curriculum for the pharmacy practice track more closely to the national standards. An entry-to-practice assessment framework is also currently in development to ensure the graduates who are interested in joining the health care sector are work-ready and able meet the minimum competency requirements at recruitment.

Advanced diploma course
The concept of an advanced diploma programme for pharmacy technicians was first conceived during the development of the Enhanced Career Development Framework for Pharmacy Technicians in 2014. It was envisioned that the programme will equip the pharmacy technicians with advanced skills and knowledge in the 4 key areas of the role extension, namely, (a) distribution services (b) technical services (c) -patient-care services and (d) quality Assurance services, with a focus on patient care competencies which cannot be sufficiently covered in the entry-level diploma or WDA's advanced certificate programme. The concept came to fruition with the recent development of the Advanced Diploma in Pharmaceutical Sciences Programme and is designed as an 18-month structured programme, consisting of both classroom learning and targeted on-the-job training (OJT). The course is delivered through 3 compulsory plus 1 prescribed Post-Diploma Certificates (PDCs), and additional OJT to allow for development of related skills in the desired area of role extension. The programme is funded by the Workforce Development Authority and is targeted to launch in early 2017.

Key challenges
The attraction and retention of the younger generation diploma graduates in the workforce has been the greatest challenge in the pharmacy technician workforce development, as most of them aspire to pursue a degree qualification in pharmacy or other disciplines, and thus attrition rate is high for this group. The mid-career entrants who join the workforce through the certification route are more likely to stay in the job, but the number is limited. Foreign pharmacy technicians' career lifespan is also limited due to the contractual nature of their employment. With the introduction of the enhanced career development framework and the upcoming launch of the formal advanced diploma programme, to facilitate role extension and career progression of the workforce, we hope to groom more senior and executive level technicians who will be able to play greater roles in supporting pharmacists in the various professional and patient services, and to raise the overall capability of the pharmacy technician workforce.

References

1. Singapore Pharmacy Council. Annual Report 2015. Singapore: Singapore Pharmacy Council; 2016. Available from: http://www.healthprofessionals.gov.sg/content/dam/hprof/spc/docs/forms_downloads/Annual%20Report%202015_SPC.pdf
2. Ministry of Health Singapore. Biannual Manpower Reporting 2H; 2014.
3. Ministry of Health Singapore. Pharmacy technicians Survey 2011; 2011
4. Department of Statistics Singapore. Latest Data [Online]. Government of Singapore; 2016. [cited 2016 March 21] Available from: http://www.singstat.gov.sg/statistics/latest-data#16
5. Singapore Workforce Skills Qualification [Internet]. WSQ Advanced and Higher Certificates in Health care Support (Pharmacy Support). [cited 2016 March 21]. Available from: http://www.ssg.gov.sg/wsq/Industry-and-Occupational-Skills/Health care-Support-WSQ.html
6. Ministry of Health, Singapore. National Competency Standards for Pharmacy technicians (Entry-Level). Singapore: Ministry of Health; 2015. [cited 21 March 2016] Available from: https://www.moh.gov.sg/content/dam/moh_web/HPP/Pharmacists/National%20Competency%20Standards%20for%20Pharmacy%20Technicians%20(Entry%20Level)%20201....pdf

South Africa

Authors
Shirley-Anne Boschmans DipPharm, MSc, PhD, Associate Professor and Head of Department, Pharmacy Department, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.
Teri-Lynne Fogarty Bpharm, MPharm, Lecturer, Pharmacy Department, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa.

Brief overview of the pharmaceutical sector
Pharmacy in South Africa is a dynamic profession with pharmacy support personnel able to work in any of four major areas: manufacturing, wholesale, hospital and community pharmacy. The manufacturing sector includes the non-sterile and sterile manufacture of medicines in line with good manufacturing practices. Currently manufacturing pharmacies constitute 5.7% (n = 257) of total registered pharmacies in South Africa. [1] The warehousing and distribution sector ensures the correct storage and transport of medicines in line with good wholesale and distribution practices (5%, n=227). [1] Hospital or institutional pharmacy in South Africa has a public sector (government sector) (14.3%, n=647), funded by the government, as well as a private sector (6.1%, n=275). [1] The public sector is tiered into 3 levels of care: tertiary hospitals (level 3); regional hospitals (level 2); and district hospitals, community health centres and primary health care (level 1). Finally, community pharmacy is the most prevalent of all the sectors with 68% (n=3090) of total registered pharmacies in South Africa in this sector.[1] Academic institutions for tertiary education (universities) are currently all public higher education institutions partly funded by government (n=10), but no provision is currently made for employment of pharmacy support personnel.

Recently a white paper on National Health Insurance (NHI) was published by the National Department of Health. [2] The NHI aims to balance inequalities in provision of health services across the country. Of the total spend on health 50% is utilised by the private health sector serving just 16% of the population, while the other 50% is utilised to serve the other 84% of the population using public sector health services.[3] It is envisaged that all South Africa citizens will be included in the NHI which will comprise a central fund used to purchase health services from private or public hospitals, clinics or other health care providers that meet specified criteria.

In South Africa, there are three categories of pharmacy support workforce (PSW): basic pharmacist assistants; post-basic pharmacist assistants; and pharmacy technicians. There are currently 4,259 qualified registered basic assistants and 8,137 qualified registered post basic assistants.[1] The first provider commenced training pharmacy technicians in 2014 with the first graduates entering the workforce in 2015. In 2015, 50 graduates entered the workforce and in 2016 an additional 74 pharmacy technicians are expected to qualify.

Currently basic (PAB) and post-basic (PAPB) pharmacist's assistants can only work in the sector that they have trained in, whereas pharmacy technicians (PT) are trained as generalists and can therefore work in any of the above sectors. In addition, PAPB and PT are able to work under the indirect supervision of a pharmacist in a public sector primary health care clinic under specified conditions. [4]

History of pharmacy support workforce development in the country
Pharmacy Support Workers (PSW) have been part of the pharmacy workforce for many decades, however, it is only since 1987 that a register was established by the South African Pharmacy Council (SAPC) for PSWs in South Africa. At the same time (in 1987) the first formal qualifications for PSW was established by the SAPC. Two categories of PSWs were established: qualified pharmacist assistants; and unqualified pharmacist assistants. People entitled to registration as unqualified pharmacist assistants were students who exited from the pharmacist qualification (Dip Pharm or BSc Pharm) prior to graduation.

Since 1987, there have been three iterations of these qualifications. A fourth iteration is being developed at the time of writing this article and should be published for comment in April 2016.

The first iteration of the qualification (1987) was workplace based and the SAPC wrote and issued training manuals. The learner was required to be employed in approved premises and a pharmacist registered with the SAPC as a tutor supervised the training. Assessments were undertaken by SAPC.

Formal scopes of practice for PSWs in South Africa were first published some 13 years later on 20 November 2000. [5] Scopes were published for two categories of PSWs: pharmacist's assistant basic (PAB) and pharmacist's assistant post-basic (PAPB). Allowance was also made for access to the scope of practice for learners in each of the two categories.

Curricula (second iteration of curriculas for PSWs in South Africa) relating to the two scopes of practice were published by SAPC on 20 November 2000.[6] The qualifications were once again workplace based and pharmacists were appointed as tutors. The qualifications were sector specific with training occurring in either community pharmacy, hospital pharmacy, wholesale pharmacy or manufacturing pharmacy. If a qualified

pharmacist's assistant wanted to work in a different sector to that within which they trained they had to first complete additional modules specific to the new sector. On completion of the additional modules the pharmacist's assistant could be registered in the new sector of pharmacy. Face to face contact between the presenter of the qualification and the learner was not required. Assessment was conducted by the provider and the SAPC served as the accreditation and quality assurance body.

The 3rd iteration of the qualifications was published in 2008. There were two qualifications (PAB and PAPB). The requirements pertaining to the third iteration of the qualifications differed in that there was: a stipulated period for face to face contact between the provider and the learner; a maximum period for completion of the qualification i.e. 30 months for the 12 month qualification; and while the qualification was still sector specific no additional modules were required for transition between the community and hospital pharmacy sectors.

At the request of stakeholders and the National Department of Health the PSW qualifications were re-examined and a decision was made to introduce the pharmacy technician qualification. The scope of practice and the qualifications for the pharmacy technician were gazetted for comment in 2011.[7] The pharmacy technician qualification differed from the pharmacist's assistant qualifications in that: it was on the Council for Higher Education (CHE) sub-framework (was to be presented at a university); and it was not workplace based but was a full time on-campus qualification.

To improve access to the pharmacy technician qualifications the SAPC developed criteria for distance presentation on the CHE sub-framework in 2014 and in 2015 commenced parallel development of: on the Quality Council for Trades and Occupations (QCTO) sub-framework the 4th iteration of qualifications for PAB, PAPB, and pharmacy technician; and on the CHE sub-framework a pharmacy technician two year diploma qualification.

Current practice relationship between pharmacists and pharmacy support workforce cadres

Generally, both cadres of PSW may only work under the direct supervision of a pharmacist in all categories of pharmacies.[4, 5] The one exception is a PAPB or a PT working in a public sector primary health care clinic. In a primary health care clinic, a PAPB or PT can work under the indirect supervision of a pharmacist. When working under indirect supervision a PAPB can only dispense pre-packed patient ready packs while a PT can dispense from bulk packs of medicines. Both cadres must work according to written protocols and standard operating procedures. The supervising pharmacist must visit the clinic at least once a month.

The number of PSWs who can be supervised by a pharmacist is prescribed by legislation. The supervisory capacity of a pharmacist was first prescribed in 2000.[5] A pharmacist could supervise three pharmacist's assistants working under direct supervision and five pharmacist's assistants working under indirect supervision. In 2013, the number of personnel a pharmacist could supervise was reduced to a maximum of three.[4] This included any category of personnel requiring supervision e.g. pharmacist's assistants basic, post-basic and learners, pharmacy technicians, pharmacist interns, and pharmacy students. In addition, further stipulations were added to the supervisory conditions for indirect supervision. The additional conditions were: the pharmacist was always to be available by telephone or electronically during working hours; and the PAPB/PT was required to consult with the pharmacist, by telephone, regarding all prescriptions for patients who presented with comorbidities.

Although the PSW practice under the supervision of a pharmacist, they are personally responsible for their own actions. A PSW can be disciplined by SAPC for practicing outside the requirements of relevant legislation.

The addition of PTs to the PSW will support pharmacists in elevating their practice from a product-focused approach to a patient focused approach with increased practice of clinical pharmacy. Clinical pharmacy practice in South Africa is in its infancy. Although non-dispensing services were first delivered by hospital pharmacists in the 1990s progress has been slow. Impetus has been given to the growth of clinical pharmacy by the National Department of Health focus on antimicrobial stewardship and the publication, in 2014, of an Antimicrobial Resistance National Strategy Framework[8]. According to the South African Society of Clinical Pharmacists in 2014 only about 10 pharmacists were providing general clinical pharmacy services in the hospital setting in South Africa.[9]

Education of pharmacy support workforce cadres

To meet the needs of the NHI and with the reengineering of primary health care, it became essential that the new cadre of PSW, pharmacy technician, was equipped to not only dispense and control stock, but to have a better understanding of the medicines they were dispensing as well as improved management and supervisory skills. A major addition to the CHE curriculum from the workplace based training were the topics of anatomy, physiology and pathophysiology, followed by basic pharmacology, and disease states and treatments found in the primary health care standard treatment guidelines and essential medicines list published by the department of health.[10] Management modules were included to equip learners on the

essentials of managing stock, time, staff and budgets. Once a PT has completed the two-year certificate programme at a university, they are required to complete a six-month traineeship in one of the major sectors of pharmacy under the supervision of a registered tutor before registering as a qualified PT with SAPC.[7]

One of the major benefits derived from the introduction of the PT qualification at the university level has been the opportunity to co-teach BPharm and PT students. Joint practicals are run when teaching dispensing systems and dispensing practice thus introducing future pharmacists and PTs to an optimal practice environment embedding best practice in terms of the interplay between the pharmacist and PT in the workplace. The students are also exposed to joint sessions during which scopes of practice are workshopped allowing the development of a fuller understanding of each other's roles.

Regulatory environment
The profession of pharmacy in South Africa is governed primarily by two Acts: the Medicines and Related Substances Act 81 of 1965 [11] and the Pharmacy Act 53 of 1974.[12] The Pharmacy Act is concerned with the profession of pharmacy and publishes ethical rules,[13] code of conduct [14] and good pharmacy practice standards [15]. Scopes of practice for PSP are published in terms of the Pharmacy Act. [5,7] All personnel defined in the Pharmacy Act must be registered with the SAPC. All programmes and providers of training of pharmacy related courses must be accredited by both the SAPC and the South African Department of Education (DoE). The Medicines and Related Substances Act governs the registration and sale of medicines and scheduled substances. It indicates who may sell medicines to the public. In terms of PSP, the Medicines Act refers only to the category of "pharmacist's assistant" as defined by the Pharmacy Act and does not explicitly identify each PSP cadre. In terms of who may handle medicines, the scope of practice of each cadre must, therefore, be considered. Currently PAB and PAPB are the only two cadres that are defined as "pharmacist's assistant" by the Pharmacy Act, however, the legislation which will allow PT to be included in the definition of "pharmacist's assistant" in terms of the act, thereby allowing them to handle medicines, is currently being reviewed by the Director General of Health for publication for public comment.

Current challenges
There are several barriers to implementation of PT into the pharmaceutical workforce in South Africa. These include:

- Absence of supporting legislation. The relevant legislation which would allow PT access to medicines has not been enacted. The Department of Health is preparing the regulations for publication for comment. Until the regulations have been published PT are restricted to the lower scope of practice of a PAPB.
- Workplace acceptance of new cadres of mid-level workers: The PAPB and PAB already in the workplace could feel threatened by the new cadre of PSP, the PT. This could result in an antagonistic workplace environment for the PT.
- Phasing in of new cadre (PT) and integration with pharmacist's assistants already in the workplace. With the implementation of NHI there is a need for more efficient, skilled and knowledgeable PSW i.e. pharmacy technicians at the primary health care level. However, the post structure for pharmacy technicians has not yet been created in the public sector. Thus until this has been corrected PT in South Africa can only be employed in the private sector (community pharmacy, wholesale pharmacy, manufacturing pharmacy).
- Accreditation of sufficient providers. Only one provider has been accredited for presentation of the PT programme. Until the relevant regulations have been promulgated by the Department of Health the SAPC have placed a moratorium on further accreditation. The absence of additional providers can be seen as an inhibitory factor to growth of the PT cadre in South Africa.

References

1. South African Pharmacy Council. For professionals: Statistics for registered persons and organisations [Online]. 2015. [cited 2015 December 8]. Available from: http://www.pharmcouncil.co.za/B_Statistics.asp
2. Department of Health. National health insurance for South Africa: Towards Universal Health Coverage [Online]. Version 40, 2015 Dec 10. [cited 2017 Jan 24]. Available from: http://www.gov.za/sites/www.gov.za/files/National_Health_Insurance_White_Paper_10Dec2015.pdf
3. Department of National Treasury. 2011 Local government budgets and expenditure review 2006/07 – 2012/13. Pretoria: National Treasury; 2011. [cited 2017 Jan 24] Available from: http://www.gov.za/sites/www.gov.za/files/treasury_2011_LGBER_0.pdf
4. Republic of South Africa. South Africa: Consolidated Regulations: Pharmacy Act, no 53 of 1974. Amendments to minimum standards in Annexure A of the Rules relating to good pharmacy practice, Board Notice 271 of 2013. Southern African Legal Information Institute; 2015 Available from: http://www.saflii.org/za/legis/consol_reg/pa5301974rangnr129555/

5. Republic of South Africa. Pharmacy Act, no 53 of 1974. Regulation relating to the practice of pharmacy, GNR.1158 of 20 November 2000. Pretoria: South African Pharmacy Council; 2000. [cited 2017 Jan 24] Available from: https://www.mm3admin.co.za/documents/docmanager/0C43CA52-121E-4F58-B8F6-81F656F2FD17/00010804.pdf

6. Republic of South Africa. Pharmacy Act, no 53 of 1974. Regulations relating to pharmacy education and training, GNR.1156 of 20 November 2000. Pretoria: South African Pharmacy Council; 2000. [cited 2017 Jan 24] Available from: http://www.mm3admin.co.za/documents/docmanager/0C43CA52-121E-4F58-B8F6-81F656F2FD17/00010803.pdf

7. Government Gazette, Republic of South Africa. Pharmacy Act, no 53 of 1974. Scope of Practice, supervision of Pharmacy Support Personnel and qualifications, Vol. 553, no. 34428 of 2011. Pretoria: Government Printer; 2011. [cited 2017 Jan 24]. Available from: https://www.mm3admin.co.za/documents/docmanager/0C43CA52-121E-4F58-B8F6-81F656F2FD17/00015059.pdf

8. National Department of Health. National Department of Health Antimicrobial Resistance National Strategy Framework 2014 – 2024. Pretoria. [cited 2 May 2016]. Available from: http://www.nda.agric.za/docs/media/A5%20Antimicrobial%20Resistance%20National%20Strategy%20Framework%202014-2024_final.pdf

9. Gous AGS, Schellack N. The State of Clinical Pharmacy in South Africa: Current and Future Perspectives. ACCP International Clinical Pharmacist. 2013; 3(4): 1-2.

10. Republic of South Africa. Essential Drugs Programme. Primary Health care Standard Treatment Guidelines and Essential Medicines List. 5th ed. Pretoria: Republic of South Africa: National Department of Health; 2014. [cited 2017 Jan 24] Available from: http://www.health.gov.za/index.php/component/phocadownload/category/197

11. Republic of South Africa. South Africa: Consolidated Regulations: Medicines and Related Substances Act, no 101 of 1965 as amended. Southern African Legal Information Institute; 2014 [cited 2017 Jan 24]. Available from: http://www.saflii.org/za/legis/consol_reg/marsa10101965rangnr510723/

12. Republic of South Africa. Pharmacy Act, no 53 of 1974 as amended. Pretoria: Government Printer; 1974

13. Republic of South Africa. Pharmacy Act, no 53 of 1974. Rules relating to acts or omissions in respect of which the council may take disciplinary steps, GNR.599 of 1989, as amended. Pretoria: South African Pharmacy Council; 1989. [cited 2017 Jan 24] Available from: http://www.mm3admin.co.za/documents/docmanager/0c43ca52-121e-4f58-b8f6-81f656f2fd17/00010766.pdf

14. Republic of South Africa. Pharmacy Act, no 53 of 1974. Rules relating to code of conduct, Board Notice 108. Pretoria: Southern African Legal Information Institute; 2008. [cited 2017 Jan 24] Available from: http://www.saflii.org/za/legis/consol_reg/pa5301974rangnr108555/

15. Government Gazette, Republic of South Africa. Rules relating to Good Pharmacy Practice, as amended. Board Notice 106 of 2011. Pretoria: Government Printer; 2011. [cited 2017 Jan 24] Available from: http://www.gov.za/sites/www.gov.za/files/34330_bn106.pdf

United Kingdom

Authors
Christopher John, Workforce Development Lead, Royal Pharmaceutical Society/Assistant Director (Quality & Development), London Pharmacy Education and Training, Great Britain

> ### Pharmacy workforce summary for Great Britain
>
> The duration of **pharmacists'** training is five years. Number of pharmacists in the workforce is approx. 47,000.
>
> The duration of **pharmacy technicians'** training is two years. Number of pharmacy technicians in the workforce is approx. 21,000.
>
> The duration of **pharmacy assistants'** training is 12 months or less. Number of pharmacy assistants in the workforce is approx. 100,000.

Brief overview of the pharmaceutical sector

The pharmacy workforce in Great Britain is comprised of pharmacists, pharmacy technicians and pharmacy support staff (counter assistants, dispensing assistants and pharmacy assistants.) There are approximately 47,000 pharmacists, 21,000 pharmacy technicians and over 100,000 pharmacy assistants.[1, 2] The pharmacy workforce mainly works across the following sectors: community pharmacy; hospital Pharmacy; primary care; education and research; industry.

History of pharmacy support workforce development in the country

Pharmacy technicians have been registered with the General Pharmaceutical Council (GPhC) (Great Britain's regulator for pharmacists and pharmacy technicians) since the 1st July 2011.[3] Prior to that, the pharmacy technician role existed for many years but was unregulated (although a system of voluntary registration began in 2007).

Pharmacy technicians and pharmacy support staff prepare medicines/health care products and supply them to patients often with additional advice and guidance and are therefore a vital part of the pharmacy team, mainly working in community pharmacies, hospitals and the pharmaceutical industry under the supervision of a pharmacist (though the situation is changing and pharmacy technicians are becoming more autonomous in a number of areas).

The development of extended pharmacy technician roles in hospital/community practice over the last decade or so e.g. the accredited checking pharmacy technician has, in many cases, facilitated the refocusing of pharmacists work on more patient-centred activities. Clinical pharmacy technicians are undertaking medicines reconciliation and also support discharge management in hospitals so are developing from traditional supply and counselling roles. These activities move beyond the pharmacy technician's initial education and training required to enter practice.[4]

The recently developed Foundation Pharmacy Framework (FPF)[5] for pharmacy technicians builds on the competencies that pharmacy technicians have already been assessed against in their entry qualifications. It is an evidence based professional development framework containing a structure of behavioural competencies (clustered into four components) that provides a mechanism for training, development and professional recognition whilst ensuring that the building blocks of initial career development (foundation practice) are in place.

Consequently, pharmacy support staff have taken on more of the core technical duties of pharmacy technicians such as dispensing. Pharmacy support staff have, in the last few years also taken on the role of Health Champion — providing public health advice in the community setting.[6]

Current practice relationship between pharmacists and pharmacy support workforce cadres

Legislation and key policies define the roles and responsibilities of the pharmacy workforce (though there are some differences between the community and hospital sectors)[7] particularly the functions of the pharmacist's role around the sale and supply of medicines. This influences the pharmacy technician's scope of practice and responsibilities. In community pharmacy dispensing, supply and sale of medicines remains the core activities. The roles and responsibilities of the pharmacy workforce in this sector is usually determined by a number of factors including an assessment of the needs of patients/public, the requirements of the employer, the structure/size of the community pharmacy, and the experience, skills and competence of pharmacy

technicians and pharmacy support staff. In some cases the pharmacy technician undertakes dispensing, supply or sale of medicines (sometimes supported by dispensing and counter assistants) under the supervision of pharmacist. In other cases a dispensing or counter assistant is supervised by the pharmacist to dispense, supply or sell medicines.

A pharmacy technician's role is demarcated by its boundaries with the other members of the pharmacy team and dependent on the context of their workplace though in community pharmacy this means working under the supervision of a pharmacist. Under the legislation, supervision arrangements are under review and future changes will have implications for the education and training of pharmacy technicians as new definitions and requirements for supervision (including roles and level of autonomy) will impact a pharmacy technician's scope of practice. In community pharmacy, pharmacy technicians and pharmacy support staff activities are dependent on the presence of a responsible pharmacist, whereas in hospital pharmacy there is greater autonomy for pharmacy technicians working in the NHS across a number of roles in primary and secondary care[8] e.g. once a prescription has been clinically screened by a pharmacist it can be final accuracy checked and supplied to a patient by a pharmacy technician.

Education of pharmacy support workforce cadres
The initial education and training of pharmacy technicians is vocational and comprises simultaneous part-time study and employment. Two qualifications are required — a knowledge-based qualification and a competence-based one.[9] They can be taken simultaneously, they can overlap, or they can be taken consecutively. Some courses are taught face-to-face, mainly in further education colleges and the health service, but others are delivered as distance learning. The route to registration as a pharmacy technician is described in Figure 3.

Figure 3. Education and training to become a pharmacy technician

Pharmacy technician qualifications are approved against the GPhC Initial Education and Training Standards and Criteria.[2] Awarding bodies (the organisations that accredit qualifications in Great Britain) and education and training providers need to meet the standards and criteria to have their pharmacy technician competency or knowledge-based qualification approved.

The curriculum requirements for competency-based qualifications are built on the National Occupational Standards (NOS),[10] a number of which are mandatory. There is flexibility in the optional National Occupational Standards a trainee must complete to reflect differences in practice across pharmacy sectors and practice in England, Scotland and Wales (though once registered a pharmacy technician is not restricted to work in one sector of practice). The curriculum requirements for knowledge-based qualifications reflect their level within the national qualifications framework and are intended to ensure consistency between pharmacy sectors and across England, Scotland and Wales. Therefore minimum standards of competence and qualification are assured and to the same standard and criteria regardless of the pharmacy sector and geographical locations while allowing transferability of skills and knowledge.

For pharmacy support staff e.g. dispensing assistants (pharmacy assistants) who are involved in the dispensing process, this means they must meet the GPhC's minimum training requirements, which are the relevant modules of the Level 2 NVQ (QCF) Certificate in Pharmacy Service Skills or Level 2 NVQ (QCF) Certificate in Pharmaceutical Science (or equivalent in Scotland)[11] whether they work in community or hospital practice.

Regulation environment
Pharmacists and pharmacy technicians are regulated by the GPhC, which holds the register of these two groups and defines the education and training requirements for them as well. The GPhC also sets standards for pharmacy support staff but they are not registered. Pharmacists have a professional obligation to ensure pharmacy support staff are competent to the minimum training requirements or undertaking training towards them in the areas in which they are working. This is monitored and evaluated in a variety ways (including feedback from inspectors' visits).

Current challenges and trends
There are parts of the curricula for the initial education and training of pharmacy technicians that are not considered to be current[12] that could benefit from revision (the addition of areas that reflect the current scope

of practice of pharmacy technicians,[13] e.g. final accuracy checking and the removal or reduction of others, e.g. chemistry). There is no current evidence that the length of the initial education and training as well as the academic level are not appropriate with changes only likely if the role of the pharmacy technician evolves further i.e. if the scope of practice widens to include more patient-facing practice. The GPhC is currently reviewing the initial education and training standards of all members of the pharmacy team in Great Britain.

Another challenge is to define clearly the roles/activities of the pharmacist and pharmacy technician. Completion of the review of the legislation concerned with supervision arrangements may provide a direction of travel for this desired clarity. There has been a trend towards pharmacy technicians taking on more of the traditional dispensing and more technical aspects of the pharmacist's role in order to free up the pharmacist for more patient-focused activities. Pharmacy technicians are also developing more clinical roles e.g. directly working with patients to optimise the use of their medicines. This affords an opportunity for pharmacy support staff to take on more of the technical aspects of the pharmacy technician's role.

References

1. The Centre for Workforce Intelligence. A strategic review of the future pharmacist workforce: Informing pharmacist student intakes. London: CfWI; 2013 Sep [cited 2017 Jan 24]. Available from: http://www.cfwi.org.uk/publications/a-strategic-review-of-the-future-pharmacist-workforce
2. Howe H, Wilson K. Review of post-registration career development: Next Steps. Discussion Paper. Medical Education England; 2012 Jul. [cited 2017 Jan 24] Available from: https://www.hee.nhs.uk/sites/default/files/documents/Modernising-Pharmacy-Careers-Workstream-II-Discussion-Paper-FINAL.pdf
3. The Pharmacy Order 2010. SI 2010 No. 231. 2010. The Queen's Most Excellent Majesty in Council; 2010 Available from: http://www.pharmacyregulation.org/sites/default/files/pharmacy_order_consolidated_july_2015.pdf
4. General Pharmaceutical Council. Standards for the initial education and training of pharmacy technicians. London: General Pharmaceutical Council; 2010. [cited 2017 Jan 24] Available from: https://www.pharmacyregulation.org/sites/default/files/Standards%20for%20the%20initial%20education%20and%20training%20of%20pharmacy%20technicians.pdf
5. Association of Pharmacy technicians UK. Foundation Pharmacy Framework [Online]; 2014. [cited 2016 March]. Available from: http://www.aptuk.org/about-us/education/foundation-pharmacy-frameworkfpf/
6. Duggan C, Evans D, Holden M, Kennington E, Leach R, Root G, et al. Evaluation of the Healthy Living Pharmacy Pathfinder Work Programme 2011-2012. Pharmaceutical Services Negotiating Committee; 2013 Apr. [cited 2017 Jan 24] Available from: http://psnc.org.uk/wp-content/uploads/2013/08/HLP-evaluation.pdf
7. The Medicines (Pharmacies) (Responsible Pharmacist) Regulations 2008 SI 2008 No. 2789. Department of Health; 2009. [cited 2017 Jan 24] Available from: http://www.legislation.gov.uk/uksi/2008/2789/pdfs/uksi_20082789_en.pdf
8. Howe H, Wilson K. Review of Post-registration Career Development of Pharmacists and Pharmacy technicians. Background paper. Medical Education England; 2012 Jul. Available from: https://hee.nhs.uk/sites/default/files/documents/MPC-WSII-Background-Paper-v1.0.pdf
9. General Pharmaceutical Council. Criteria for registration as a pharmacy technician. London: General Pharmaceutical Council; 2013 May. [cited 2017 Jan 24] Available from: http://www.pharmacyregulation.org/sites/default/files/Registration%20criteria%20for%20pharmacy%20technicians%20May%202013.pdf
10. Skills for Health. National Occupational Standards [Online]. [cited 2016 March]. Available from: http://www.skillsforhealth.org.uk/standards/item/215-national-occupational-standards
11. General Pharmaceutical Council. Policy on the minimum training requirements for dispensing/pharmacy assistants and medicines counter assistants. London: General Pharmaceutical Council; 2011 Sep. [cited 2017 Jan 24] Available from: https://www.pharmacyregulation.org/sites/default/files/minimum_training_requirements_da_mca_sep_2011.pdf
12. Jee S, Willis S, Pritchard A, Shafheutle A. The quality of pharmacy technician education and training – a report to the General Pharmaceutical Council. The University of Manchester; 2014. [cited 2017 Jan 24] Available from: http://www.pharmacyregulation.org/sites/default/files/quality_of_pharmacy_technician_education_and_training.pdf
13. Rosado H, John C, Puaar D, Bates I. An analysis of the initial education and training standards for pharmacy technicians and views on their fitness for purpose – a report to the General Pharmaceutical Council; 2015. Available at: http://www.pharmacyregulation.org/sites/default/files/pharmacy_technician_iet_standards_report.pdf

14. Rosado H, John C, Puaar D, Bates I. An analysis of the initial education and training standards for pharmacy technicians and views on their fitness for purpose A report to the General Pharmaceutical Council. Report. London: General Pharmaceutical Council; 2015 Nov [cited 2017 Jan 24]. Available from: http://www.pharmacyregulation.org/sites/default/files/pharmacy_technician_iet_standards_report.pdf

Appendix 2 — Terms of reference for BPP Pharmacy Support Workforce Technical Working Group

Introduction

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.

As highlighted in the FIP Workforce Report 2012, to achieve this aim, in all 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 relative unavailability of more highly qualified health professionals in many countries.

Well-trained pharmacy support staff allows pharmacists more time for clinical activities, which can translate into improved patient health outcomes and savings in health expenditure. For instance, this concept was strongly supported in the American Society of Health-System Pharmacists (ASHP) Pharmacy Practice Model Initiative (PPMI), with one of the key consensus statements stating: "pharmacy technicians who have appropriate education, training and credentials could be used much more extensively to free pharmacists from drug distribution activities." This was fleshed out further in the PPMI consensus document, which outlined 14 tasks that could be assigned to pharmacy technicians with appropriate education and training.

However, there are significant differences throughout the world in terms of both the terminology used to describe pharmacy support staff, their responsibilities and their distribution. With a growing recognition and demand for pharmacists and pharmacy services in the health care system, there is also a growing need to define the roles for pharmacy technicians and to identify the competencies, education and practice models that will allow them to make the best contribution possible within the pharmacy team.

FIP has already taken a leadership role in this regard. In 2011, the FIP Education Development Team launched a new pharmacy support workforce domain, which aims to apply a needs-based approach to the education of pharmacy support cadres, such as pharmacy technicians and support personnel. Since 2012, FIP has hosted a symposium for pharmacy technicians as a pre-satellite event to its annual congress, consolidating efforts and fostering a holistic approach to bettering patient care worldwide.

However, there is a need to integrate the work that is being developed, as well as to translate this information into practice in all relevant areas of activity.

Objectives

The FIP BPP decided to set up the "FIP working group on pharmacy support workforce" with the following objectives:

- To provide an overview of the different roles and responsibilities of the pharmacy support workforce, as well as their education and legal framework;
- To provide a definition of the different types of pharmacy support workforce (e.g. pharmacy technicians, pharmacy assistant);
- To identify practice models that will allow them to make the best contribution possible within the pharmacy team, thus assisting in ensuring responsible medicines use.

Plan of project and methodology

To achieve these objectives, the working group will:

- Perform an analysis of existing data:
  - Liaise with the pharmacy support workforce domain within FIP*Ed*, in order to collect relevant data as it relates to the roles and responsibilities of pharmacy technicians and assistants in the different fields of practice;
  - Consider the reports and conclusions of the pharmacy technicians symposia organised since 2012;
  - Perform a literature review on this topic;
- If needed, undertake a survey of the pharmacy support workforce (to complete data);

- Prepare a draft report subject to consultation to BPP members;
- Finalise the report for its adoption by the BPP (and eventually FIP Bureau);
- Prepare an article published in the FIP journal (and possibly another peer-reviewed journal) after validation by the FIP Executive committee.

Expected final outcomes

1) The final outcome of this working group will be a report consisting of:

- Rationale for pharmacy support workforce utilisation;
- A description of the roles and responsibilities of pharmacy support workforce throughout the world, and its link to the development of adequate competencies and skills;
- A suggested definition of the different levels of pharmacy support workforce;
- Discussion on issues of supervision and liability.

This report will be made available to all FIP member organisations and will be publicly available on the FIP website.
2) This report will then be summarised into an article published in the IPJ (and if appropriate another peer-reviewed journal).
3) This report can then be used as a reference document to produce an FIP policy statement about this subject.

Project team

To ensure this work, the following profiles for the team members should be considered:

- Diversity of education and professional background (pharmacists, pharmacy technicians, pharmacy assistants);
- Specifically, the CPS, HPS, IPS, MEPS and the SAPS will be asked to nominate a representative each to this WG;
- The pharmacy support workforce domain lead;
- Several systems of regulation and linguistic zones should be represented, and thus it is advised to involve the FIP Forums.

All members should be fluent in English as the work will be done in English but they should also ideally be fluent in at least another language. The project team will be supported by a FIP staff member.

Collaboration expected on this project from other stakeholders

The following potential contributors should be considered when setting up the working group:

- The World Health Organization;
- The Global Health Workforce Alliance;
- People that Deliver.

Publication of the results

1) The final report will be printed and sent out to all FIP member organisations. The pdf version will be available on the FIP website.
2) The article summarising the findings will be published in the IPJ journal and therefore will be made available to all FIP individual members.

If approved by the FIP ExCo, this article could be reproduced in another journal after its publication in the IPJ journal (so that the FIP ownership of the findings is properly preserved).

Appendix 3 — Survey questions

This is the copy of the survey:

FIP 2015 Global survey on Pharmacy Technician & Pharmacy Support Workforce

1. Instructions and Overview.

Dear reader,

Thank you for taking part in this research on Pharmacy Support Workforce.
This survey should take approximately 20 to 30 minutes to complete.

Your answers will help build a global picture of the Pharmacy Technician workforce and the Pharmacy Support Workforce, both involved in pharmaceutical services delivery besides pharmacists. This survey will provide information for us to better understand the situation and needs of the Pharmacy Support Workforce internationally.

As you move through this survey you will be asked a series of questions about:
- The names of cadres (= group of people educated for a particular purpose) of staff who provide pharmaceutical services,
[Think about all staff involved in the procurement (purchase), distribution, supply and dispensing of medications in your country]
- Their training,
- Their regulation

You will then be asked to indicate the expected competences (=specific skills, behaviours or items of knowledge required to perform a role) of the Pharmacy Support Workforce cadres in your country.

The competences for the Pharmacy Support Workforce are organised into four groups:
1) Organisation and Management
2) Professional / Personal Practice
3) Pharmaceutical Public Health
4) Dispensing and Patient Care

In this survey each group has a sub-set of competences that cadres within the Pharmacy Support Workforce could be expected to demonstrate. Please choose which competences are expected of each cadre in your country.

The survey design has been approved by the Human Ethics Committee of the University of Canberra.

* 1. In which country do you currently work?

	Country
Please select one	[▼]

Other (please specify)

[   ]

Please answer all following questions in relation to this answer.

1

FIP 2015 Global survey on Pharmacy Technician & Pharmacy Support Workforce

2. Cadres (=group of people) providing delivery of pharmaceutical services, inc. supply of medicines

For the following question:

1. Please take your time and list all the cadres, or job descriptions you are aware of that provide pharmaceutical services but are NOT pharmacists.
2. Think about both the private & public sectors and community & hospital practice.
3. Give the exact title for the role where possible.
4. Think about all staff involved in the procurement, distribution, supply and dispensing of medications.
5. Place each title on a new line.
6. The titles you choose here will reappear through out the rest of the survey.

* 1.) In the country that YOU work, NOT including pharmacists, nurses and doctors, who are the MAIN CADRES providing pharmaceutical services in your country?

2.)

3.)

4. If there are more than three cadres, please list the additional titles here.

5. If there is NO Pharmacy Support Workforce in your country, please comment on what you think are the reasons for this?

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3. The Pharmacy Support Workforce in Your Country

1. Of the three cadres you previously described (which appear again below), which cadre forms the largest group within the Pharmacy Support Workforce?

◯ *[Q2]*

◯ *[Q3]*

◯ *[Q4]*

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4. Supervision of the different Pharmacy Support Workforce cadres

The questions on "Supervision" will be repeated for the different cadres you described earlier in the questionnaire.

* 1. Does the "[Q2]" work independently, without face to face supervision, on a day to day basis?

- ◯ Always
- ◯ Most of the time
- ◯ Some of the time
- ◯ Never

2. What are the main competences that require supervision for the "[Q2]" you have identified ?

	Full supervision	Some supervision	No supervision	Item not applicable in my country
Procurement (Stock Ordering)	◯	◯	◯	◯
Receiving donations of medicines	◯	◯	◯	◯
Distribution of medicines to facilities	◯	◯	◯	◯
Packing/repacking of medicines	◯	◯	◯	◯
Disposal of medicines	◯	◯	◯	◯
Budget and Reimbursement	◯	◯	◯	◯
Giving medicines information and advice to patients	◯	◯	◯	◯
Health promotion of non medicine strategies	◯	◯	◯	◯
Patient consultation and diagnosis	◯	◯	◯	◯
Taking a medication history of patients, including 'medication reconciliation'	◯	◯	◯	◯
Dispensing medicines to patients	◯	◯	◯	◯
Reconstituting of medicines	◯	◯	◯	◯
Preparation or compounding of medications	◯	◯	◯	◯
Consult with other healthcare professionals	◯	◯	◯	◯
Checking prescriptions	◯	◯	◯	◯

* 3. What is the title of the person responsible for supervising the "[Q2]"?

[   ]

4. Does the "[Q3]" work independently, without face to face supervision, on a day to day basis?

○ Always

○ Most of the time

○ Some of the time

○ Never

5. What are the main competencies that require supervision for the "[Q3]" you have identified?

	Full supervision	Some supervision	No supervision	Item not applicable in my country
Procurement (Stock Ordering)	○	○	○	○
Receiving donations of medicines	○	○	○	○
Distribution of medicines to facilities	○	○	○	○
Packing/repacking of medicines	○	○	○	○
Disposal of medicines	○	○	○	○
Budget and Reimbursement	○	○	○	○
Giving medicines information and advice to patients	○	○	○	○
Health promotion of non medicine strategies	○	○	○	○
Patient consultation and diagnosis	○	○	○	○
Taking a medication history of patients, including 'medication reconciliation'	○	○	○	○
Dispensing medicines to patients	○	○	○	○
Reconstituting of medications	○	○	○	○
Preparing or compounding medications	○	○	○	○
Consult with other healthcare professionals	○	○	○	○
Checking prescriptions	○	○	○	○

6. What is the title of the person responsible for supervising the "[Q3]"?

[   ]

7. Does the "[Q4]" work independently, without face to face supervision, on a day to day basis?

○ Always

○ Most of the time

○ Some of the time

○ Never

8. For the "[Q4]" you have identified what are the main competences that require supervision?

	Full supervision	Some supervision	No supervision	Item not applicable in my country
Procurement (Stock Ordering)	○	○	○	○
Receiving donations of medicines	○	○	○	○
Distribution of medicines to facilities	○	○	○	○
Packing/repacking of medicines	○	○	○	○
Disposal of medicines	○	○	○	○
Budget and Reimbursement	○	○	○	○
Giving medicines information and advice to patients	○	○	○	○
Health promotion of non medicine strategies	○	○	○	○
Patient consultation and diagnosis	○	○	○	○
Taking a medication history of patients, including 'medication reconciliation'	○	○	○	○
Dispensing medicines to patients	○	○	○	○
Reconstituting medications	○	○	○	○
Preparing or compounding of medications	○	○	○	○
Consult with other healthcare professionals	○	○	○	○
Checking prescriptions	○	○	○	○

9. What is the title of the person responsible for supervising the "[Q4]"?

[   ]

10. Briefly describe the circumstances (eg regulations, geographical, health facility type etc) where different cadres within pharmacy support workforce are allowed to work independently in your country.

[   ]

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5. Differences in "Situational Competences" and "Supervision" due to work area and facility.

By "Situational Competencies" we mean that different competencies may be asked of an individual depending on the location of their work or depending on which other staff are available at a particular time.

* 1. Is there a difference in the overall EXPECTED COMPETENCES of cadres within the Pharmacy Support Workforce in URBAN or RURAL areas in your country?

◯ Exactly the same

◯ Mostly the same

◯ Somewhat different

◯ Very different

Please briefly comment on your response

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* 2. Is there a difference in the overall SUPERVISION LEVELS of cadres within the Pharmacy Support Workforce in URBAN or RURAL areas in your country?

◯ Exactly the same

◯ Mostly the same

◯ Somewhat different

◯ Very different

Please briefly comment on your response

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* 3. Is there a difference in the overall EXPECTED COMPETENCES of cadres within the Pharmacy Support Workforce between HOSPITAL, PRIMARY HEALTHCARE FACILITIES or COMMUNITY PHARMACIES in your country?

◯ Exactly the same

◯ Mostly the same

◯ Somewhat different

◯ Very different

Please briefly comment on your response

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7

* 4. Is there a difference in the overall SUPERVISION LEVELS of cadres within the Pharmacy Support
Workforce in HOSPITAL, PRIMARY HEALTHCARE FACILITIES or COMMUNITY PHARMACIES in your
country?

○ Exactly the same

○ Mostly the same

○ Somewhat different

○ Very different

Please briefly comment on your response

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6. Education

The questions on "Education" will be repeated for the different cadres you described earlier in the questionnaire.

1.

What is the minimum expected level of education that is required for the "[Q2]" cadre in your country?

	Type of education?	Length of education?	What type of institution mainly gives this education?	Who has the main responsibility for paying for the education?	Is the education to qu assum proces
Please choose the best answer	⬍	⬍	⬍	⬍	

If you choose other (please specify)

* 2. Please specify the title of the education occurs for the "[Q2]" cadre in your country.

* 3. Please mention any prerequisites, or necessary requirements, a student must have before starting that education?

4. What is the minimum expected level of education that is required for the "[Q3]" cadre in your country?

	Type of education?	Length of education?	What type of institution mainly gives this education?	Who has the main responsibility for paying for the education?	Is the education to qu assum proces
Please choose the best answer	⬍	⬍	⬍	⬍	

If you choose other (please specify)

5. Please specify the title of the education which occurs for the "[Q3]" cadre in your country.

6. Please mention any prerequisites, or necessary requirements, a student must have before starting that education?

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7. What is the minimum expected level of education that is required for the "|Q4|" cadre in your country?

Type of education?	Length of education?	What type of institution mainly gives this education?	Who has the main responsibility for paying for the education?	Is th education to qu assun proces
Please choose the best answer	⬍	⬍	⬍	⬍	

If you choose other (please specify)

[   ]

8. Please specify the title of the education which occurs for the "|Q4|" cadre in your country.

[   ]

9. Please mention any prerequisites, or necessary requirements, a student must have before starting that education?

[   ]

* 10. Overall, are you satisfied with the Pharmacy Support Workforce education which occurs in your country?

○ Satisfied

○ Slightly satisfied

○ Neither satisfied nor dissatisfied

○ Slightly dissatisfied

○ Dissatisfied

* 11. What do you like most about the education that occurs?

[   ]

* 12. What do you like least about the education that occurs?

[   ]

* 13. What improvements could be made to the education?

[   ]

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7. Quality Assurance of Education

Quality Assurance is the maintenance of a standard in Pharmacy Support Workforce education. In some countries this may be done by a specific health professional board for example a Pharmacy Board, in others it may be the responsibility of a Government department such as the Ministry of Health or the Ministry of Education. Some countries don't have any such quality assurance process for education or training.

* 1. Please briefly outline the Quality Assurance procedures for the Pharmacy Support Workforce education in your country.

* 2. Are the Quality Assurance procedures for the pharmacy support workforce education;

	Yes	No	Unsure
A Government initiative	○	○	○
Endorsed by the whole profession	○	○	○
Developed by all the stakeholders involved (including students)	○	○	○
Evidence based	○	○	○
Validated by reliable outcomes/measures	○	○	○
Publicly disclosed	○	○	○
Reviewed and updated regularly	○	○	○

* 3. Overall, are you satisfied with the Quality Assurance of education which occurs?

○ Satisfied

○ Slightly satisfied

○ Neither satisfied nor dissatisfied

○ Slightly dissatisfied

○ Dissatisfied

* 4. What improvements could be made to the Quality Assurance of the pharmacy support workforce education?

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8. Regulation, Registration and Scope of practice

* 1. For each of the cadres you identified within the Pharmacy Support Workforce is there LEGISLATION (national, state or provincial laws) and REGULATIONS (rules) to support their practice?

	Yes	No	Unsure
[Q2]	○	○	○
[Q3]	○	○	○
[Q4]	○	○	○

Please provide 'web links' to any relevant LEGISLATION or REGULATIONS here

* 2. For each of the cadres you have identified, does a defined 'SCOPE of Practice' exist?

	Yes	No	Unsure
[Q2]	○	○	○
[Q3]	○	○	○
[Q4]	○	○	○

Please provide a 'web link' to any available 'SCOPE of Practice' documents here

* 3. For each of the cadres you have identified do they need to be REGISTERED by the government in order to work?

	Yes	No	Unsure
[Q2]	○	○	○
[Q3]	○	○	○
[Q4]	○	○	○

* 4. For each of the cadres you have identified do they need to be RE-registered every few year in order to work?

	Yes	No	Unsure
[Q2]	○	○	○
[Q3]	○	○	○
[Q4]	○	○	○

* 5. What are the requirements for re-registration?

* 6. What improvements could be made to these regulations and their enforcement?

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9. Competence 1; Organisation and Management

The questions on "Competence 1 " are to be filled out for the different cadres you described earlier in the questionnaire.

Please read carefully:
A list of possible competences appears below for each cadre you identified within the
Pharmaceutical Support Workforce.
Please TICK the box if the cadre is expected to perform the competency.
Please leave the box BLANK if the cadre is NOT expected to perform the competency.

1. Procurement (Stock Ordering)

	[Q2]	[Q3]	[Q4]
Use the ordering system for obtaining medicines and/or medical appliances from a Central/National Medical Store	☐	☐	☐
Use patient and/or facility supply records to determine usage	☐	☐	☐
Identify the factors that affect usage patterns of medications and equipment and how this affects ordering (eg disease outbreaks), using national policies as a guide and to ensure consistent application.	☐	☐	☐
Demonstrate the paperwork and calculations required to order medications	☐	☐	☐
Check off orders received	☐	☐	☐
Follow up orders not received	☐	☐	☐
Use the ordering system for overseas procurement (purchase), including a yearly activities schedule	☐	☐	☐
Use and monitor the processes for prequalification and tender contracting	☐	☐	☐
Demonstrate a detailed knowledge of the national medicines supply information system (Electronic or manual)	☐	☐	☐

Do you have any other comments?

2. Donations

	[Q2]	[Q3]	[Q4]
Follow the national donations policy referring to national pharmacists for advice	☐	☐	☐
Demonstrate the ability to say no to donations that are not consistent with this policy	☐	☐	☐

Do you have any other comments?

3. Storage

	[Q2]	[Q3]	[Q4]
Layout a medicines/pharmacy store including; the arrangement of medicines according to order form, labelling of medicines, use of stock cards/computerised system	☐	☐	☐
Secure the pharmacy store and limit access to appropriate staff	☐	☐	☐
Demonstrate appropriate use of, and ability to maintain the cold chain	☐	☐	☐
Apply methods of stock rotation (eg first in first out or first to expire first out)	☐	☐	☐
Store medicines appropriately, including the considerations of temperature, access and cleanliness of the work area	☐	☐	☐
Use warehousing skills to organise the supply of medicines and/or medical sundries in large store areas	☐	☐	☐

Do you have any other comments?

4. Distributing to hospital wards and departments

	[Q2]	[Q3]	[Q4]
Distribute Medicines to Hospital Wards and Departments using a regular system e.g. Imprest system	☐	☐	☐
Regularly review imprest quantities	☐	☐	☐

Do you have any other comments?

5. Supplying dependent facilities eg clinics or other healthworkers

	[Q2]	[Q3]	[Q4]
Prepare and use order schedules	☐	☐	☐
Order filling priorities in relation to delivery opportunities and urgency	☐	☐	☐
Screen orders (Modify order quantities on the basis of available stock, impact on service delivery, distance of facility from hospital.)	☐	☐	☐
Assemble, check and pack orders	☐	☐	☐
Promote regular, rather than urgent order culture	☐	☐	☐
Co-ordinate transport options for order delivery	☐	☐	☐
Supply government health facilities (eg clinics) or other government health workers	☐	☐	☐
Supply non government organisations and other individuals who seek assistance for medication supplies	☐	☐	☐

Do you have any other comments?

6. Packing/repacking

	[Q2]	[Q3]	[Q4]
Safely re/pre-pack pharmaceuticals from large bulk quantities to small patient or facility packs	☐	☐	☐

Do you have any other comments?

7. Compounding of medications

	[Q2]	[Q3]	[Q4]
Prepare componding of medicines and medication orders for final check by a pharmacist for NON STERILE items	☐	☐	☐
Prepare reconstitution of medicines and medication orders for final check by a pharmacist for STERILE items	☐	☐	☐
Supervise or double check the compounding work of other staff members for NON STERILE items	☐	☐	☐
Supervise or double check the reconstitution work of other staff members for STERILE items	☐	☐	☐
Independently complete the final check of medication compounding and release to the patient for NON STERILE items	☐	☐	☐
Independently complete the final check of medication reconstitution and release to the patient of STERILE items	☐	☐	☐

Do you have any other comments? (Please specify)

8. Record keeping

	[Q2]	[Q3]	[Q4]
Use appropriate recording systems. (e.g. stock cards, order forms, computer systems	☐	☐	☐
Demonstrate the appropriate use of computer stock control systems	☐	☐	☐
Update the medical record or patient profile	☐	☐	☐

Do you have any other comments?

9. Disposal

	[Q2]	[Q3]	[Q4]
Dispose of expired medications and/or medical equipment according to national policy	☐	☐	☐
Dispose of specific individual items of greatest risk with appropriate care eg oncology medicine	☐	☐	☐
Dispose of expired medicines and/or used medical sundries including syringes correctly	☐	☐	☐

Do you have any other comments?

10. Budget and reimbursement

	[Q2]	[Q3]	[Q4]
Describe the general monetary value of medicines and equipment	☐	☐	☐
Manage all resources with care	☐	☐	☐
Create and manage budgets as necessary for work (e.g. wages budget, touring budget, stationery budget, project budgets for using NGO funds)	☐	☐	☐
Create national budgets for both purchases and organisational costs	☐	☐	☐
Perform billing and accounting functions for products and services	☐	☐	☐

Do you have any other comments?

11. Improvement of service

	[Q2]	[Q3]	[Q4]
Create and use check lists to regularly monitor the activities they are responsible for	☐	☐	☐
Plan and conduct supervisory tours of dependant facilities	☐	☐	☐
Participate in quality assurance activities	☐	☐	☐
Identify problems for intervention by a pharmacist	☐	☐	☐

Do you have any other comments?

12. Human resources management

	[Q2]	[Q3]	[Q4]
Assist in training nurses and other health professionals in the areas of medicines ordering and storage procedures	☐	☐	☐
Orientate new staff to the workplace explaining standard operating systems and procedures.	☐	☐	☐
Identify and deal with unproductive staff	☐	☐	☐
Orientate new doctors to the formulary and the systems and procedures of the medicines supply system	☐	☐	☐
Prepare human resource plans to meet the future staffing needs of the organisation	☐	☐	☐
Demonstrate the use of a system for staff recruitment, appraisals and monitoring	☐	☐	☐
Ensure members of staff have the necessary skills and understanding for safe practice in the event they need to fill a management role due to absence or illness	☐	☐	☐

Do you have any other comments?

13. Disaster preparedness

	[Q2]	[Q3]	[Q4]
Explain the process for dealing with disaster events	☐	☐	☐

Do you have any other comments?

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FIP 2015 Global survey on Pharmacy Technician & Pharmacy Support Workforce

10. Competence 2; Professional / Personal practice

The questions on "Competence 2 " are to be filled out for the different cadres you described earlier in the questionnaire.
Please read carefully:
A list of possible competences appears below for each cadre you identified within the Pharmaceutical Support Workforce.
Please TICK the box if the cadre is expected to perform the competency.
Please leave the box BLANK if the cadre is NOT expected to perform the competency.

1. Communication skills

	[Q2]	[Q3]	[Q4]
Be truthful and supply accurate information at all times	☐	☐	☐
Ensure patients are transferred from hospital to clinics with a continuing supply of medicine	☐	☐	☐
Communicate effectively with nurses and doctors	☐	☐	☐
Work as part of a pharmacy/medical stores team	☐	☐	☐
Work as part of the wider healthcare team looking after the patient	☐	☐	☐
Communicate with patients ensuring confidentiality	☐	☐	☐
Participate in meetings with regard to expressing own opinions and being aware of the needs of others, being appropriately assertive when required	☐	☐	☐

Do you have any other comments? (Please specify)

2. Critical thinking and problem solving

	[Q2]	[Q3]	[Q4]
Prioritise tasks	☐	☐	☐
Work independently to get the necessary work done	☐	☐	☐
Use time well to get tasks done	☐	☐	☐
Understand the limit of their own skills and abilities (when to try a task and when to refer)	☐	☐	☐
Gather information to solve problems	☐	☐	☐
Identify problems and consider how to deal with them	☐	☐	☐
Follow up problems to ensure they are fixed	☐	☐	☐
Ask other people to help with solving problems	☐	☐	☐
Take on various responsibilities within the workplace as the need arises	☐	☐	☐

Do you have any other comments? (Please specify)

3. Continuing professional development

	[Q2]	[Q3]	[Q4]
Keep up to date in their place of work with input from supervisors	☐	☐	☐

Do you have any other comments? (Please specify)

4. National policy

	[Q2]	[Q3]	[Q4]
Describe the broad concepts of National Medication Policy, Essential Medicines Lists, Essential Equipment lists, Standard Treatment Guides and "dangerous drug" (DDA) policy	☐	☐	☐
Keep up to date with changes in these documents as informed by managers at the national level	☐	☐	☐
Use the processes to add and subtract items from the Essential Medicines List and the Essential Equipment list	☐	☐	☐
Follow the processes required to alter standard treatment guidelines, dangerous drug policy and national medication policy	☐	☐	☐

5. National systems

	[Q2]	[Q3]	[Q4]
List the legislation that covers the practice of pharmacy and health care and describe its purpose	☐	☐	☐
Describe how vertical programs work within the health system	☐	☐	☐
Meet the reporting requirements of vertical programs	☐	☐	☐
Outline the structure of the health system at a national level and explain this to others	☐	☐	☐
Describe the structure of the health system at a provincial/regional level and explain this to others	☐	☐	☐
Describe the regulatory requirements and procedures for the importing and exporting of medicines	☐	☐	☐
Design and implement national quality assurance processes for all systems to guide improvement	☐	☐	☐

Do you have any other comments? (Please specify)

6. Professional and ethical practice

	[Q2]	[Q3]	[Q4]
Follow all standard operating procedures	☐	☐	☐
Work in a safe and legal way	☐	☐	☐
Accept responsibility for their own work tasks and performance	☐	☐	☐
Contribute to the professional development of others	☐	☐	☐
Practise pharmacy within the cultural framework of the country using both western and local principles	☐	☐	☐

Do you have any other comments? (Please specify)

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11. Competence 3; Pharmaceutical Public Health

The questions on "Competence 3 " are to be filled out for the different cadres you described earlier in the questionnaire.
Please read carefully:
A list of possible competences appears below for each cadre you identified within the Pharmaceutical Support Workforce.
Please TICK the box if the cadre is expected to perform the competency.
Please leave the box BLANK if the cadre is NOT expected to perform the competency.

1. Medicines information and advice

	[Q2]	[Q3]	[Q4]
Counsel patients when handing out medicines, improving treatment adherence and explaining main adverse effects and special considerations for individual medications, including storage and food requirements	☐	☐	☐
Supply non-prescription medicines, therapies and diagnostic aids to meet the patient's needs	☐	☐	☐
Follow country based treatment guidelines and to ensure the appropriate use of medicines	☐	☐	☐
Keep up to date with standard treatment guidelines	☐	☐	☐

Do you have any other comments? (Please specify)

2. Health promotion

	[Q2]	[Q3]	[Q4]
Assess the primary healthcare needs of patients (taking into account the cultural and social setting of the patient)	☐	☐	☐
Communicate lifestyle changes to aid patients in managing various diseases	☐	☐	☐

Do you have any other comments? (Please specify)

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12. Competence 4; Dispensing and Patient Care

The questions on "Competence 4 " are to be filled out for the different cadres you described earlier in the questionnaire.

Please read carefully:

A list of possible competences appears below for each cadre you identified within the Pharmaceutical Support Workforce.

Please TICK the box if the cadre is expected to perform the competency.

Please leave the box BLANK if the cadre is NOT expected to perform the competency.

1. Patient consultation and diagnosis

	[Q2]	[Q3]	[Q4]
Identify issues with medicines, dose forms and methods of administration that need to be discussed or referred to a pharmacist	☐	☐	☐
Obtain sufficient information about a patient request to determine if the situation can be managed by the pharmacy staff member or referred to a pharmacist or other health professional	☐	☐	☐
Taking a patient medication history, including 'medication reconciliation'	☐	☐	☐

Do you have any other comments? (Please specify)

2. Dispensing

	[Q2]	[Q3]	[Q4]
List which medicines are allowed to be prescribed by different prescribers and how to monitor this	☐	☐	☐
Prepare prescriptions and medication orders for final check by a pharmacist	☐	☐	☐
Supervise or double check the work of other staff members eg 'Tech check Tech'	☐	☐	☐
Independently complete the final check of medication orders and release to the patient	☐	☐	☐
Identify which medicines are especially dangerous and need more care when dispensing	☐	☐	☐

Do you have any other comments? (Please specify)

3. Medicines

	[Q2]	[Q3]	[Q4]
Identify medicines by their generic name	☐	☐	☐
Describe the way medicines work; their use (how much, how often and for how long) and their main adverse effects and cautions	☐	☐	☐
Identify that some signs and symptoms shown by a patient may be the result of adverse effect of medication and these people need to be referred to the nurse or doctor	☐	☐	☐

Do you have any other comments? (Please specify)

4. Medical equipment and appliances

	[Q2]	[Q3]	[Q4]
Describe how individual pieces of medical equipment are used, noting personal and patient safety	☐	☐	☐
Identify when to dispose of medical equipment or sundries	☐	☐	☐
Explain to patients how to use any equipment given to them for their care	☐	☐	☐
Maintain equipment supplied by pharmacy and use any existing maintenance support network	☐	☐	☐

Do you have any other comments? (Please specify)

[   ]

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13. Demographics

* 1. What is your profession?

Please select one.	

Other (please specify)

* 2. Where is your main place of work?

⬍

3. How long have you worked;

	Time
At your current Facility?	⬍
In your current Professional Role?	⬍

4. What is the highest level of school you have completed or the highest degree you have received?

◯ Less than high school degree

◯ High school degree or equivalent (e.g., GED)

◯ Some college but no degree

◯ Associate degree

◯ Bachelor degree

◯ Post Graduate degree (Certificate, Master, PhD)

* 5. In a few words, please state your main day to day duties/responsibilities at work?

6. This question is OPTIONAL

Many organisations, including the World Health Organisation, are unable to use data, such as the information this survey will generate, unless the contact details of the sources are provided.

Any data that is used will be de-identified.

Please consider providing your contact details in the space below. They will ONLY be used for the purpose of validation by the research team if required, and will NOT be shared with any other parties.

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14. Thank you so MUCH!

The Pharmacy Support Workforce Technical Working Group of the International Pharmaceutical Federation would like to thank you for taking the time to fill in this survey.

If you have any inquires regarding this research please direct them to:

Dr Andrew N Brown
anbrown.hss@gmail.com or skype andrew.brown.uc or phone +61(0) 411 137 625.

1. If you would consider taking part in a telephone interview or online discussion on the findings of this survey, please leave your details below.

You will not be contacted by us except for the stated purpose.
Your name, phone number or email address will not be passed on to any other source.

Name	
Email Address	
Phone Number (please include country code)	
Is there a convenient time to contact you?	

2. Please use this space if you have any further comments

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