

A review of the current Global Pharmacy Support Workforce. How scarcity and need drive the development of a new competent workforce.

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“It is speculated that the number of trained and competent pharmacists may be either unavailable or inadequately distributed to meet population needs. This is a result of varying education and training processes of pharmacists and pharmaceutical scientists around the world. These processes are currently being scrutinized in light of the needs of healthcare systems which are realising the imperative role of the pharmacist through both experience and research evidence.”

FIP’s Vision, Mission and Strategic Plan, 2013

1. Abstract

Keywords: competency framework, accreditation, quality assurance.

Background

Pharmacy educational reform is a strategic goal of the International Pharmaceutical Federation to address the pharmacy component of the global health workforce crisis. The current shortage of pharmacists results in many medicines supply tasks now being undertaken by non-pharmacists. Unfortunately, there is a paucity of documentation on what training is identified and undertaken for these non-professional cadres at a country level. Additionally, there is a lack of clarity on how training is quality assured and accredited.

Aims

To obtain an overview of the pharmaceutical nomenclature, competencies, regulatory systems and education requirements for the global Pharmacy Support Workforce.

Methods

This project adopted an approach using a validated online survey tool, followed by comprehensive phone interviews to identify current practice. Global pharmacy, medicines supply chain and human resources online communities of practice were requested to invite broad participation from professional, academic and government pharmaceutical environments. Descriptive statistics were prepared from the responses and thematic analysis was used to determine the predominant themes.

Results

In excess of 170 respondents provided data. This represented fifty-one individual independent countries and seven World Health Organization regions. Pharmacy technician (n=26) assistant (n=14) and technologist (n=5) were the most commonly used nomenclature for the role, with a variety of expected competency patterns. Themes in work practices identified by the respondents included: less supervision available in rural areas, a variety of regulatory requirements, dissatisfaction with current education offerings and strong growth in the size of the workforce.

Conclusion

These results provide a window into the diverse scope of the global pharmacy support workforce. Significant variation of competencies, regulation and education are evident. This new information provides a baseline from which to begin to improve the training of the global Pharmacy Support Workforce that will allow greater competence, autonomy and accountability, leading to both better systems and patient outcomes.

2. Table of Abbreviations – Table One.

MDG's	Millennium Development Goals
HWFC	Health Workforce Crisis
WHO	World Health Organisation
UN	United Nations
FIP	International Pharmaceutical Federation
HIV	Human Immunodeficiency Virus
CPD	Continuing Professional Development
ART	Anti-Retroviral Treatment
PHC	Primary Health Care
MNCH	Maternal Neonatal Child Health
GHWA	Global Health Workforce Alliance
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund

Chapter One. Introduction and Background

A review of the current Global Pharmacy Support Workforce. How scarcity and need drive the development of a new competent workforce.

3. Introduction

Effective, available medication, along with basic sanitation, and clean water are the cornerstones of efficient public health measures (Singh et al, 2008, and Schmidt, W. 2014). Medications are best made accessible to the population with the support of adequately trained health professionals. These professionals have both the knowledge, and skills, for enabling the medications to be: ordered, transported, stored and supplied to the patient or health facility in a timely manner (Jackson, 2012, and Anderson, et al 2013). This is crucial in all communities but is more challenging to both implement and achieve in developing countries.

This thesis will explore the current understanding of the competencies and training requirements for Pharmacy Assistants/Technicians involved in medicine supply around the world, and seek to identify the gaps in knowledge in this area. In addition it will explore the types of activities undertaken by these workers, and the varieties of competencies required to fulfil their role and training provided to assist them. Importantly the research will articulate the different titles given to the cadres of “Pharmacy Support Workers”¹ internationally as currently there are no universal terms applied to the group and this causes problems when searching for or comparing research and literature. A cadre is defined as a group of people trained for a particular purpose (Brown, A, et al 2011).

This thesis will both identify and articulate the roles of the pharmacy assistant and technician globally, with a focus on developing countries. It will define the area of practice of the

¹ “Pharmacy Technicians are performing a variety of tasks associated with dispensing medicinal products under the guidance of a pharmacist OR, unsupervised if a pharmacist is not available. A pharmacy assistant is defined as performing a variety of tasks associated with dispensing medicinal products under the guidance of a pharmacy technician” (Brown, A, et al 2011)

Pharmacy Support Workers and the skills, attributes, responsibilities and basic competencies required to function in the position. From this research it will be possible to identify with some clarity what training is required to produce an effective pharmacy support workforce in a sustainable way. The rural and metropolitan differences apparent for scope of practice and type and quality of training will be considered across countries. The regulation and accreditation, as well as the methods of effective practical enforcement of these concepts, and skills, will be considered in order to allow a broad evaluation of training standards.

To enable this investigation to occur, key stakeholders who have an understanding of the role and activities undertaken by this workforce will be consulted and any pertinent documents that currently exist in this space will be audited and collated. Communication with these pivotal bodies will also provide some opportunity for interviews to explore in more depth the understanding of the role and how best training and education can be developed to assist in developing a tool which can be used by individual countries to help with professionalising this invaluable workforce.

To enable this research to be undertaken, methodology will need to be developed and adapted to recognise the limited research currently available in this space. A literature review, stakeholder narrative, audit of current practices and organisation experience will be undertaken. The use of “action research methods” and unpublished literature, will also be employed to capture this as yet unpublished knowledge, resulting in a search with the distinguishing features of a realist review (Pawson, et al. 2005). A global online survey will be developed and implemented to collate practices and processes. This initial data will then will be followed-up with more comprehensive interviews when themes, and salient issues, have emerged from the Online Survey analysis.

The new knowledge to be generated from this research, concerning the competences and training requirements for Pharmacy Support Workers involved in supplying medicines globally, will inform key international organisations in their planning, training and development of an essential workforce for the poorest communities on the planet.

3.1 The historical context for global health

In 1978 an International Conference on Global Health was held at Alma Ata in Kazakhstan. Significantly, and somewhat ideologically it was here that the idea of “health for all” was first promoted on a global agenda (WHO, 1978). This revolutionary concept aspires to achieve social justice, equity and health for everyone and recognises the need for highly developed countries to assist lower and middle income countries in aspiring to achieve these targets. It was recognised that strategies to achieve these goals are strongly linked to community participation, health promotion, appropriate use of resources and international collaborative action. In addition, it requires parity of stakeholders including governments, international organisations, as well as multilateral and bilateral agencies, non-governmental organisations, funding agencies, all health workers and the whole world community (Lawn, J.E, et al 2008, and Gunn, J.M. et al 2008). The concept of solidarity is integral in an approach to healthcare that is based on social justice. This means that healthcare should be available according to need and not according to the ability to pay (Santoso, B, et al 2008).

The World Health Organisation (WHO) defined health in its broader sense in 1946 as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (Callahan, D. 1973). Primary Health Care (PHC), is essential health care structured on

“[P]ractical, evidence based and socially acceptable methods and technologies that are universally accessible to individuals and families in their own communities through consumer’s full participation and at a cost that the local and national level can afford to maintain at every stage of their development in the spirit of self-determination”

(Sharp, W, 1947).

These concepts, with medicines supply critical to primary health care, are the globally accepted foundations of health care, though sadly they have not yet been universally achieved.

The PHC model of health care product and service delivery was adopted at the 56th World Health Assembly held in Alma Ata and became a core concept for the WHO serving as the basis for the WHO's goal of “health for all”. The Alma Ata favoured a decentralised approach to primary health care that was evidence based and led to improved quality of life, particularly for the world’s poor (TO, A. 2003). It was at the WHO’s Alma Ata convention that the title

“community health worker” (CHW) was first defined along with the scope of practice for these personnel internationally (Lewin, S, et al, 2010; WHO, 1978). There are criticisms that the role was not articulated clearly enough and that this failure has led to difficulty in practical implementation of the declaration (Gillam, S, 2008; Gunn, J.M, et al 2008). CHW are individuals who have undertaken limited training to become health professionals and are employed to promote health and provide health care services. It may be noted that this definition covers all personnel from lay health workers employed to roll out specific interventions such as a vaccination program, to a surgeon or a senior government health administrator. CHW is currently a common universal term that encompasses pharmacy assistants and technicians but is non-specific as it covers so many other professions and cadres. The roles of the CHW are strongly delineated by what is required in a specific time and/or place to address important health issues: for example mental health workers in India, or HIV/AIDS workers in Africa (Van Rensburg, D et al 2008; Lewin, S.A, et al 2005).

More than thirty years have passed since the Alma Ata declaration and "Health for all" by the year 2000 has not yet been achieved. While there have been some significant improvements in health care over this time period the benefits are not equally spread between or within countries (World Health Organization 2008, and Walley, J, et al 2008). Unfortunately women and children are faring the worst in health indicators (Bhutta, Z.A, et al 2008). Research which strengthens the evidence base for what works in health care service and delivery, needs to be developed urgently. Research on the Global Pharmacy Support Workforce, is required to identify the issues and then develop tested interventions to improve the functionality of systems and practices for all medicines supply. This research will attempt to identify the current issues and solutions. Essentially the core challenge is to develop evidence based methods of investigation, that are clearly defined and easily replicable, and easily interpretable findings so it will be possible for others to synthesise the results into practical applications for both policy and practice. The objective would particularly benefit people who have been excluded from the health care advances of recent decades (Lewin, S, et al 2008).

3.2 The contemporary global health domain

Debates on decentralised community versus key facility-based health care are starting to shift towards building integrated health systems (Schull, M, et al 2010; Clements, C.J, et al 2008). Decentralised community health care may involve greater coverage of a population as basic services are offered in regional and remote areas, facility-based health care may have a greater capacity for complex care as funds are directed at equipment and resourcing in centralised locations, though these may not be as accessible to all individuals. Integration of health services brings together common functions within and between organizations to solve common problems leading to a commitment for shared visions and goals. Integration has been a frustrated change to achieve for Primary Health Care since its inception. In some middle and low income countries, services have been and continue to be, fragmented by a lack of integration and co-ordination caused by separate vertical programmes established to ensure delivery of particular treatments or technologies which are often disease specific, for example HIV or tuberculosis. These programs are not integrated within a system but are provided independently. The effectiveness of integration strategies, particularly training, at the point of delivery can be examined by comparing the patient satisfaction levels, to the financial expenditure as well as general population health data. It is important to consider all the factors in an evaluation, as alone they may provide a biased picture (Lawn, J.E, et al 2008; and Briggs, C.J, et al 2006).

Strategies to integrate primary health care aim to bring together funding entities, equipment, resources and the organisation, management and the delivery of particular service functions to make health care more efficient, and accessible to the service user (Clements, C.J, et al 2008). These goals are achieved by using common technologies, shared training programs and resources. For primary health care, the debate of the past two decades focused on selective (or vertical) versus comprehensive (horizontal) delivery reflects the juggling act caused by having limited funds and trying to reach people in rural areas and the greater costs involved in spreading out resources, for example purchasing duplicate premises or equipment (Lawn, J.E, et al 2008). Decentralisation may be particularly beneficial for minority ethnic groups, women and children and others who may be disadvantaged for accessing health care but may not be useful for other groups. Many global initiatives identify and support the objectives to help

improve health care, and particularly access to medications, for those who are less able to defend their own basic human rights.

3.3 The Millennium Development Goals

The Millennium Development Goals were formulated at the United Nations Millennium Development Summit in the year 2000. The goals' overall aims seek to reduce poverty and ill health, and to improve people's quality of life. There are 48 quantifiable indicators to measure progress in the various goals (Anyangwe, S.C, et al 2006). The goals are consistent with, and a means of operationalising human rights standards and principles (Nelson, P. J. 2007). Four of the goals directly relate to health. Sustainable healthcare is dependent on both medicines and adequate human resources for service and product delivery (Anderson, C, Bates, I, and Brock, T 2011).

Table 2 – Millennium Development Goals

Selected Millennium Development Goals – Relevant to both healthcare and this project.	
Goal Four	Target 4A seeks to reduce by two thirds, between 1990 and 2015, the under-five mortality rate.
Goal Five	Target 5A seeks to cut the Maternal Mortality Ratio by 75%. Target 5B seeks to achieve universal access to reproductive health, Target 6A to have halted by 2015 and begun to reverse the spread of HIV/AIDS.
Goal Six	Target 6A to have halted by 2015 and begun to reverse the spread of HIV/AIDS. 6B Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it. 6C Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases.
Goal Eight	8E In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries.

(Hogan, M.C, et al 2010; Anderson, C, Bates I, and Brock T 2011; Appendix 1. UN MDG's for Health).

The Millennium Development Goals (MDGs) also seek to foster the partnerships between developed and developing countries. Developing countries is a term used to refer to countries identified by patterns of child and adult mortality within specified WHO epidemiological regions (Mutie, M 2011). The MDG 8E to provide access to affordable, essential drugs in developing countries holds direct relevance for medicines supply staff because of the unique relationship between accessibility and availability (Allen, T, and Parker 2011; Clements, C.J. et al 2008). An adequately trained and accessible medicines supply workforce is required to increase the proportion of population who can access essential drugs, affordably and on a sustainable basis (Chong, Y.S, and Tan 2011).

Many countries, especially in the developing world, do not have adequate capacity to train health workers. Poor working conditions, unattractive wages, limited professional development opportunities and inadequate infrastructure for effective performance create a barrier to building a workforce capable of achieving the MDGs (Heller, R.F, et al 2007; Waage, J et al 2010; Nelson, P J. 2007). Barriers to attracting staff to work in health care include pay, working conditions, job security and continuity, health risks, comparative conditions, security and pay in other geographical locations, poor infrastructure and not enough medical supplies. In Sub-Saharan Africa nurses earn half as much as teachers and doctors much less than engineers and as a consequence the professions may not attract the most highly scoring students due to the prognosis of poorer financial opportunities (Conway, M.D, et al 2008). Effective incentives to address these issues vary between localities but it has been shown extensively that it is productive to develop incentive schemes in conjunction with participants, and that this can include the provision of training or transferable qualifications (Henderson, L, and Tulloch 2008; Ranson, M.K, et al 2010).

Prevalent diseases of the third world include well-known existing, emerging and re-emerging diseases. Prominently featured diseases include tuberculosis (TB), cholera, meningitis, hepatitis, malaria, dengue, yellow fever, HIV AIDS, Ebola, Severe Acute Respiratory Syndrome (SARS) and others. This collection of diseases results in suffering and death to a wide portion of the population in developing countries. Due to factors including clean water, access to medicines, public health initiatives and high individual health literacy these diseases pose a reduced risk to developed countries but may still be present. However, antibiotic resistance is

a growing problem and may alter this situation in the future (World Health Organization 2008). Non communicable diseases are also becoming prevalent in the developing country context. Heart disease, cancer, diabetes, chronic pulmonary and mental disease are a growing problem for all countries worldwide (Boutayeb, A. 2006). Holistic health care appropriate to the WHO definition of health should encompass mental health as it is a significant issue for third world countries where prevalence may be higher because of its association with war and disaster (Lawn, J.E, et al 2008). Malaria, tuberculosis, pneumonia and maternal illness are all causes of death that are treatable with pharmaceuticals while others may be preventable particularly through vaccination programs and health promotion (Green, L.W, 1986; Santoso, B, et al 2008). There is an explicit link between medicines supply and achieving the Millennium Development Goals.

Healthcare provision is significantly dependent on access to medicines. Modern medicines are effective and specific in action, but unlike other therapeutic treatments they are primarily self-administered. The implications of this autonomy are that the person taking the prescribed medication needs sufficient information from a health care provider to ensure compliance (Bugnon, O, et al 2012). Medicines must be both effective and available, and the workforce must be adequately trained and present in sufficient enough in numbers, to ensure a well-functioning system. One of the major barriers to strengthening health systems and achieving global health equality in services is the “Global Health Work Force Crisis” first articulated in the publishing of the World Health Report in 2006 (Guilbert, J.J. 2006). Pharmacists are the best cadre to execute safe and effective use of medicines but the importance of the pharmacy support workforce is even greater where pharmacists are not present. For pharmacists who are currently supervising large numbers of non-pharmacists: or in other circumstances where support staff have increased the breadth of responsibilities (even on a temporary basis such as when there is no one to supervise for a pharmacist when they take a lunch break or holiday) scenarios emerge for which the issues of having no pharmacists present are mirrored. Technically proficient pharmacy support staff can improve either the efficiency, or the effectiveness, of a pharmacist to be able to do more clinical work. Support staff can work where pharmacists are unwilling to work or where there is insufficient funding to pay for pharmacists. Support staff can only work where the qualifications of a pharmacist are not required by

regulation. Pharmacists have high levels of training which enable them to undertake complex clinical roles, it is unnecessary for a pharmacist to undertake all the technical roles required in medicines supply, for example: manually rotating the stock in a dispensary (John, D, 2013; Azhar, S, et al 2009; Raehl, C.L, et al 1992).

Misuse of medicines is common and exacerbated by a lack of access to informed staff and information. Misuse may materialise as: the use of unnecessary multiple drugs in one patient, inappropriate use of antimicrobials, incorrect selection of formulations, failure to adhere to clinical guidelines for prescribing: especially for antibiotics, and inappropriate supply and self-medication often of prescription only medicines. Proficient staff trained appropriately can address and overcome these issues and improve the quality use and access to medications. Where a pharmacist is responsible for clinical and technical tasks a situation may arise where errors are missed or medicines are used inappropriately. Investments in training empower lower level of staff to apply standards that are developed and maintained by pharmacists without requiring their direct involvement (Santoso, B, et al 2008; Guilbert, J.J. 2006).

3.4 Essential Medicines and human rights

“Essential medicines” are those deemed by the World Health Organisation to be most appropriate to satisfy the priority health care needs of the population. They not only save lives and promote health, but prevent epidemics and diseases (Kar, S.S, and Montana, 2010). They are selected with due regard to public health relevance, evidence based around efficacy and safety, and comparative cost-effectiveness. Essential medicines are intended to be available within the context of a functioning health system (including staff) at all times. Medicines must be present in adequate amounts, in the appropriate dosage forms, with assured quality and adequate information, and at a price the individual and the community can afford (Greene, J,A 2008; Hogerzeil, H.V. 2006). The WHO Essential Medicine list is updated every two years (Mutie, M.K. 2011).



Image 1. List of factors considered when selecting essential medicines. (Robertson, J, and Hill, 2007)

Inventories of essential medicines show variation between countries (Hill, S, and Bero, L, 2012). The selection of medications for inclusion on an essential medicines list is a national responsibility through the development of national medicines policies. Country specific lists of essential medicines are usually heavily influenced by the WHO list, many are not altered at all as it takes considerable infrastructure to be able to evaluate and develop a list of which medicines are important and effective. Where adjustments do occur it may be because of local differences in the prevalence of disease states, sometimes attributed to differing climates but many factors affect this phenomena (Kar, S.S, and Montana, 2010). The WHO has a four part framework for improving access to essential medicines this relies on affordable pricing, a reliable supply system, sustainable financing and improving the rational selection and use of essential medicines (Santoso, B, et al 2008). Training the pharmacy workforce, including support workers, addresses three of these four components; irrational prescribing, supply system functioning and medicine wastage. Improving access to current medicines and vaccines has been estimated to have the potential to save 10 million lives per year (Santoso, B, et al 2008). Many developing countries lack an effective drug regulatory system and this leads to a greater responsibility for the quality of pharmaceutical products to be placed on the pharmacy staff (Berenguer, B. 2004).

International organisations including WHO, UNICEF and UNHCR, as well as both private and not-for-profit NGOs, are reported to adopt the “essential medicines” concept in strategic planning. These organisations deliver their medicine supply and training activities by utilising the WHO Model list of essential medicines, in consultation with national governments

(Hogerzeil 2003; Mutie, M.K 2011). Considerable effort has been made by international organisations to help nations develop National Medicines Policies or to adopt a generic international version based on the World Health Organisations list of essential medicines. Unfortunately, regulatory enforcement of rules surrounding the supply of medicines is a challenge in developing countries. Developing a skilled and accountable workforce is a strategic necessity for progress in this area (Pariyo, G, et al 2011).

“Medicines are now the major weapon for successful prevention and treatment of many illnesses. Access to effective medicines should, therefore, be considered to be a basic human right.”

FIP Statement of Policy: Improving Access to Medicines in Developing Countries.

World leaders are increasingly receptive to embracing the concept of human rights for all citizens; this can be seen by the adaptation of conventions and treaties by a growing number of countries, although notable exceptions do remain. Some of this adoption is voluntary and some driven by access to technical and financial support (von Benda-Beckmann, F. 2009). The practical implementation of human rights principles is a deeper challenge than identifying what they are, Amartya Sen the Nobel Prize winning economist and philosopher said "the richness of practice is also critically relevant for understanding the concept and reach of human rights" (Sen, A. 2004). Aid and philanthropy has achieved great success in recent years to address availability of drugs without a delineated effect on accessibility. This is particularly apparent for anti-retroviral drugs in developing countries (Klug, H. 2008). Access to essential medicines has implications that transcend the fields of medicine, law and ethics. The WHO Essential Medicines Programme has a directly consistent focus with practical relevance to executing the ideal of universal access. Coupled with the development of national medicines policy the human rights principles of non-discrimination, and care of the poor and disadvantaged are fostered in practice by the implementation of essential medicines programs (Popper, K, 1902; Kar, S.S, et al 2010; Kesselheim, A, 2008).

Good governance also promotes the central dogma of human rights in health care access and quality. For example, the careful selection of essential medicines, good quality assurance, procurement and supply management and rational use, all serve to maximise efficient spending

of limited government financial resources, and thereby empower and support governments in extending basic services to all individuals (Reidenberg, MM 2009). Other aspects of good governance work towards the same goal, such as standardized procedures for monitoring inequities in the pharmaceutical situation, and management tools to assess and reduce vulnerability to corruption and diversion. Adequate training and education in all aspects of the pharmaceutical domain are integral to the human rights doctrine and will ensure maximised and measureable efficiencies. In healthcare financial savings ultimately equate to saving lives where the right to life is at the core of human rights (Qureshi, A, 2010; Chen, L.C. 2010; Hogerzeil, H.V. 2006)

In 2008, 1500 Global Health leaders convened at Kampala in Uganda. This meeting was an inaugural global forum on the issue of human resources for health. The meeting was hosted by the multilateral Global Health Workforce Alliance (GHWA). The Kampala Declaration has an ethos "to assure adequate incentives and an enabling and safe environment for effective retention and equitable distribution of the health workforce" (Chen, L.C. 2010; Møgedal, S. and Sheikh 2009). With this aspiration in mind the need to articulate the roles and training requirements for the workforce who deliver and manage medication for health is essential. This thesis will identify those roles and training requirements and in so doing enrich the body of knowledge in this important field of research.

3.5 The Global Health Workforce Crisis

Fifty-seven countries, thirty six of which are in Sub-Saharan Africa, are experiencing a health workforce crisis. For these African nations the problem is exacerbated as it is estimated that they have 11 per cent of the world's population, 24 per cent of the world's disease burden and only 3 per cent of the world's health workers (Hawthorne, N., and Anderson 2009; Guilbert, J.J. 2006; Conway, M.D, et al 2008). Many countries that do not experience a clear workforce shortage of health professionals overall still identify with shortages caused by distribution imbalances between urban and rural areas within countries. Other countries have further issues such as attracting staff where the public and private sectors compete. There are also issues with the skill mix and competencies of those health staff who are employed (Rao, K, et

al 2009; Conway, M.D. 2008; Ahmed, S.M. 2011). The severity of the world health workforce shortage varies amongst regions and has different causes depending on the particular health profession and country. This research will examine the pharmacy support workforce with only brief characterisation of the general health workforce to provide context and illustrate what may be occurring where there is no pharmacists or specific pharmacy support staff (Anderson, C, Bates, I, and Beck et al, 2009; Doloresco, F, and Vermuelen 2009).

In some instances, the skill mix imbalance of health and pharmacy support workers is a greater problem than the absolute number of workers. The phenomena can be both a symptom and a cause of the type of workers trained and their location. Most countries show juxtaposition between rural vacancies and urban employment, the reasons for which are multifactorial. Severe maldistribution has implications for both the disadvantaged and high-income populations depending on locality. The excessive concentration of overly specialised professionals or, “bought in labour” in the form of well-meaning volunteers, can inflate expenditure due to factors such as prescribing unnecessary tests, procedures and/or prescription of drugs. Wastage costs can be higher in these circumstances as well as the occurrence and implications of iatrogenic diseases affecting the entire cross section of populations (Chen, L.C. 2010).

Maldistribution of the workforce is a generic phenomenon seen in all countries (Anderson, C, Bates, I, and Whitmarsh 2012). Professionals in labour markets exercise occupational mobility and trends show congregation in areas where conditions, pay or security is better. There is a minimal number of countries under authoritarian regimes that currently dictate where health workers must live or practise. Most professionals and paraprofessionals are shown to seek urban based, middle class professional experiences and personal lifestyles (Chen, L.C. 2010). This is a significant problem sometimes coined as “brain drain” in the literature, meaning trained workers and professionals migrate. The workforce is “program driven”, for example, geared specifically to HIV, TB, or Birth Control and not developed for an established, long term, broadly trained workforce (Pang, T 2002; Martineau, T, et al 2004; Saravia, N. G and Miranda, 2004).

Addressing the workforce capacity shortage to improve pharmaceutical services in each country is supported by having a quality assured, competent workforce as well as an integrated

academic workforce to train support staff at lower and enhanced levels. Capacity building will build resources, information and expertise (Chopra, M, et al 2008; Anderson, C. 2008). Research and ongoing review, needs to be extended to identify if training is in an acute status and requires improvement. Some of the difficulties which limit training are that not all workers have information accessible to them, they may not be literate, there could be the geographical tyrannies of distance or they may not be able to access the internet (Rigotti, N.A, et al 2009).

The consequences of under-investment in building pharmaceutical human resource capacity, particularly in countries experiencing distinct health workforce crisis are ill afforded. There is increasing consensus by global stakeholders that the failure to address severe workforce shortages has the potential to undermine attempts to improve access to and rational use of medicines. Medicines must be available and equally importantly health care workers need training and proficiency in their supply (Harford, J, et al 2008; Hongoro, C, and McPake, R 2004; Dowling, P. 2011).

It is estimated that half of all medicines globally are inappropriately prescribed, dispensed or sold to patients. Some 80% of the world's population live in developing countries but these countries account for only 20% of the global pharmaceutical market (King, R.C, and Formundan H 2010). Medicines mismanagement due to workforce shortages translates into gaps in the management of both the pharmaceutical system and the supply chain and this has serious implications for patients. Healthcare cannot be provided without both medicines and a competent workforce to supply them (Qayad, GM 2007) Patients need to receive the right medicines for their clinical needs in the right doses and for an adequate period of time, and at the lowest cost. These are the challenges for pharmacists, pharmacy support and medicines supply workforces.

There are extensive data from a wide body of research illustrating the strong correlation between the number of people with access to health services and the numbers of health service providers (Mills, E.J, and Schabas et al 2008; Huicho, L, et al 2008; Anand, S, et al 2008; World Health Organization 2008). Similarly it has been shown globally that pharmacists and pharmacy support staff are cost effective (Anderson, C. 2009). Strong systems depend on having enough people with the right range of skills in the rights place. The quality of health workers in general is another determinant of the health status of a population. Higher numbers of health workers

are positively correlated to immunisation coverage, outreach of primary care, and infant, child and maternal survival, higher rates of institutional deliveries and greater receipt of antenatal care. The availability of the health workforce is rated as being as important as its composition. Where staff are available, both different professions and different cadres are found to have a different impact on health outcomes (Chokshi, D.A. 2006; Anderson, C, and Rouse, et al 2012).

3.6 The Global HIV/Aids Epidemic

A very important issue standing in the way of meeting the MDG's is the Global HIV AIDs crisis that is currently affecting approximately 33 million infected people worldwide. In low-income countries, only about a third of Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS) patients eligible for anti-retroviral treatment currently receive it (UNAIDS Report, 2009; Banighausen, T, et al 2010). Providing decentralized treatment close to where patients live is crucial to a faster scale up, however a key obstacle is limited health system capacity due to a shortage of trained health-care workers and challenges of integrating HIV/AIDS care with other primary care services (e.g. tuberculosis, malaria, respiratory conditions). It has been estimated that Sub-Saharan Africa would require twice its current human resources to be added every year for the next 10 years to reach universal coverage for HIV/AIDS. Many health workers themselves contract AIDS or have AIDS before training and this reduces the workforce through the death rate (King, R.C, Formundan, H 2010; Case, A and Parson. 2011; Embrey, M, et al 2009).

Most people receiving antiretroviral therapy in sub-Saharan Africa start treatment late (Embrey, M, et al 2009), which limits the overall impact of HIV treatment programmes. The infrastructure, systems, and staff required to properly monitor treatment are not present. Retention and loss of the workforce are becoming increasing problems as inadequate programmes are scaled up. As HIV testing expands, systems are strengthened to monitor the health status of people living with HIV, and access to treatment is provided at the appropriate time, AIDS-related mortality is likely to further reduce (King, R.C, and Formundan, H 2010; UNAIDS 2009).

There are reports that the AIDS crisis has resulted in strengthening the health system through further roll outs and up scaling of various other health treatment and prevention programs.

The AIDS crisis has also driven a shift towards vertical systems in some countries. This has occurred by providing a framework for other delivery systems to be integrated with, drug development and pricing, policy and regulations, procurement, information technology, distribution and human resources (Embrey, M, et al 2009; UNAIDS Report, 2009; Campbell, C, and Scott 2011).

3.7 Limitations to expansion of the current Global Health Workforce

“Training” a new doctor or nurse takes four to six years, expanding pre or in service training gives an opportunity to address the crisis in a shorter space of time. Graduating as a professional through a conventional pathway delays the provision of services. “Task shifting” is the name given to the process where specific tasks are delegated to health care workers with less training and fewer qualifications, sometimes known as paraprofessionals. This may provide an opportunity to ease bottlenecks in service delivery by giving some clearly delineated tasks to new cadres of health workers who receive specific competency based training. Obstacles to conducting task shifting include difficulties with implementing training, such as availability of suitable trainers, facilities for training and recruitment of suitable participants (Chong, Y.S, and Tan 2011; Campbell, C, and Scott 2011).

Using a public health or decentralised, standardised health service delivery model that exhibits simplified treatment protocols and clinical monitoring has been shown to be effective at reaching the world’s poor and dealing with epidemics. This model should be accompanied by standardised training, supportive supervision and a strong referral system. By taking these measures it is possible to utilise health workers with less training and qualifications (Schuch, S. and Koch, 2003). There are strong criticisms of using lower level cadres in healthcare provision, such as it is providing substandard care, it happens in lower income or remote areas where people’s health literacy or literacy may be low and they may be unable to evaluate the quality of care and that governments do this as a cost cutting measure (Cash, R. 2005; Mitchell, D.A. and Cassiter 2006).

Developing the pharmacy support workforce on a global scale encounters a multitude of challenges and is something which would benefit from more comprehensive monitoring and modelling. Extensive differences both between and within countries exist for what training is already present. What parameters are important regarding training in these scenarios also varies due to cultural, societal and financial implications. All healthcare workers are, however, now increasingly faced with problems that require an understanding of global health trends and practices. There seem to be trends in the medicines supply workforce for increased feminization, clinical governance measures, complexity of medication therapy and increased prescriptions (Hawthorne, N, and Anderson 2009; Anderson, C, and Marriott et al 2011;

Anderson, C, and Whitmarsh et al 2012). Knowing what constitutes appropriate global pharmacy support training will assist the process of improving service and delivery (Battat, R, et al 2010; Møgedal, S, and Shiekh 2009). Given medicines are at the centre of health care there is a significant need to attain greater visibility on the human resources, including the Pharmacy Support Workforce, who are involved in supply for improving the global health agenda (Anderson, C. 2008).

In many countries, particularly in Africa, there is a lack of awareness either for the number of health care workers they have, or how the distribution of workers occurs within their nations. There is a need for collaboration between Non-Government Organisations and multilateral organisations and ministries of Health, to document how and where workforce training and practice occurs as an initial step in planning change, concurrently analysing each profession is the most effective strategy to improving the whole health system. This has not yet occurred for a variety of geographically specific reasons but in many cases is related to the availability of funding (Conway, M.D, et al 2008).

4. Current Knowledge of the Global Pharmacy Support Workforce

4.1 The evolving roles of Mid-Level Cadres: “Task Shifting”

Lower level cadres are not a new idea. Between the 1950’s to the 1970’s in China, over four million “barefoot” doctors provided health care to rural populations which resulted in slashing death rates and improving health outcome statistics significantly (Conway, M.D. et al 2008; Brown, A, et al 2011).

“Health care worker” is a generic term and somewhat ambiguous as it could refer to anyone involved in the health profession including surgeons, doctors, nurses, pharmacists, technicians and unskilled or illiterate assisting cadres. The WHO defines three levels though these terms are not always used in practice and do not reflect which professionals are present or performing which roles in a country (Brown, A, et al 2011). There are currently no universal terms for pharmacy assistants or technicians, a plethora of ill-defined titles exist including technician, assistant, technologist and more. This creates a barrier to research and development in the field (Anderson, C, and Bruno et al 2012). The International Labour Organisation defines pharmacy assistants and technicians as “Pharmacy technicians and assistants perform a variety of tasks associated with dispensing medicinal products under the guidance of a pharmacist, or other health professional” (Education, P, and Brown 2011; Brown, A, et al 2011).

Figure One: The Global Health Workforce

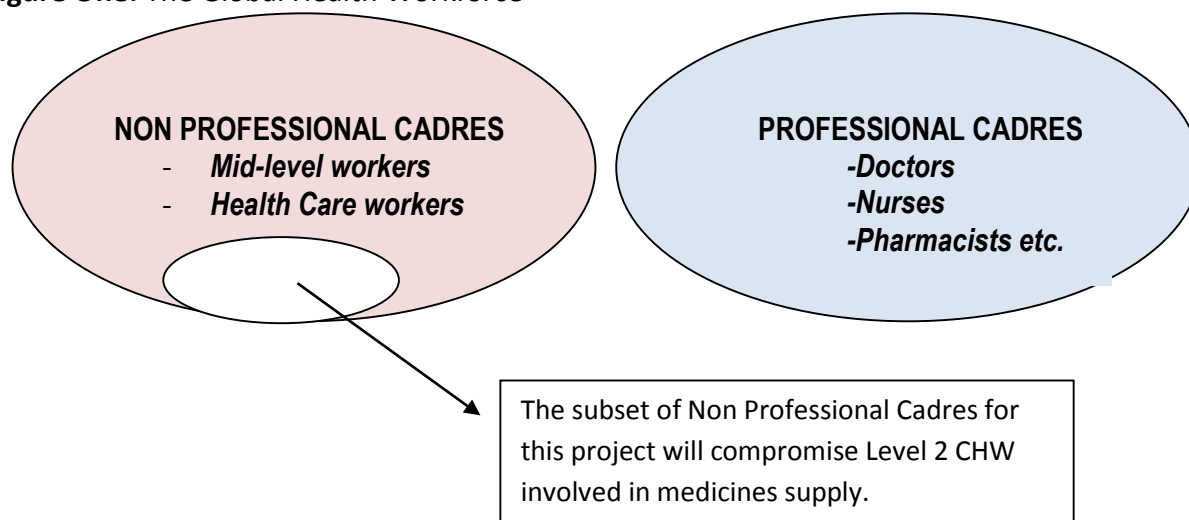


Table 3. Levels of Health Care Workers Involved in Medicines Supply (Brown, A, et al 2011).

Level 1 HCW	These are nurses, primary health care workers and nurse aids who work in clinics, area health centres and aid posts.
Level 2 HCW	These are pharmacy assistants, stores personnel and other mid-level cadres that work in hospitals or at the provincial stores level.
Level 3 HCW	These are pharmacists and stores personnel who work at the national or country level.

Task shifting refers to the rational redistribution of tasks among health workforce teams. Examples of divisions are given in Figure one, and Table 3. Workers with fewer qualifications, or shorter duration of role specific training, are delegated specific tasks traditionally done by others. The advantage of task-shifting is its immediate capability to ease service delivery bottlenecks by efficiently utilising current human resources. An extension of task shifting is the creation of new cadres of health workers, this is done by utilising specific, and competency framework based training (Campbell, C, and Scott 2011; Chong, Y.S, and Tan 2011).

Creating a new cadre or shifting tasks between existing cadres has financial implications and costs that need to be considered to ensure sustainability. Costs will be both onetime and recurrent. Resources such as training, supervision, referral systems, retention measures and adequate wages for new and existing cadres as well as equipment, supplies and infrastructure. Idealistically a rise in the demand for health services should be incorporated with any forecast as the current health care needs of the majority of the world's population are not being met. Where they are met, there is still often room for improvement (Leiserowitz, A, et al 2006; Zeitoun, A. 2011). There may also be political implications of task shifting between professions: often workers may be individually or collectively territorial about specific tasks and roles (Reeves, S, et al 2008).

Financing goals for implementing training programs and workforce expansion will be easier to achieve through the Ministry of Health working with the Ministry of Finance, Ministry of Education, Ministry of Labour, the civil service, donors, international financial institutions, private sector to ensure sustainability. Co-ordinating this range of stakeholders to collaborate for a common objective is complex and requires evidence based and accountable processes (Schuch, S, and Koch 2003; Santoso, B, et al 2008).

Efficient referral systems are needed to support a decentralised health service in the context of lower level cadres. Systems are required to manage patients so that trained and competent staff have assistance and know the correct procedures to follow when patients are too complex. This requires health care workers to have knowledge and training. Integral to utilising both lower level cadres and a competency based framework, is recognising that practitioners will meet patients with needs beyond their capabilities (Lin, V, et al 2009).

Defining the roles and assessing the competencies for new cadres, and for existing cadres, who are extending their scope of practice will allow practice to be safe and efficient. Training will then be required to support the role that will be employed. Defining a role enables a shared understanding of tasks and responsibilities and is the basis of organisation in an institution. This has implications for both recruitment, decision making by authority and referral. Defining competencies is also used to inform required ongoing systems of pre-service curriculum and Continuing Professional Development (CPD) which are oriented to enable lifelong learning for all practitioners and further strengthen health systems.

Continuing Professional Development must, importantly, be coupled with periodic performance appraisals to reinforce accountability and competence in medicines supply.

A strength for developing lower cadres is that the health workforce crisis has been shown to be more critical in rural areas. It has been shown that the lower cadres are willing to be attracted to non-urban positions and once there are more likely to stay there. This has partly been attributed to their qualifications not being recognised in places workers traditionally migrate too (Lewin, S.A, et al 2005; Mills, E, and Bates, I, et al 2008).

4.2 Observed competences

Competencies are the specific skills or items of knowledge required to perform a function (Bruno, A, et al 2010). For an individual to have competence they must be proficient at all competencies required for their role. Developing a competency framework or list of what these competencies are specifically, allows the production of a tool which can be used for evaluation and improvement of services and systems. Allowing direct comparison between roles and outputs enables fairer and more efficient use of resources by stakeholders, as well as a tool for curriculum development. Performance refers to an observable behaviour, indicating what an individual actually does as opposed to what they can do. Effectiveness is the effect of performance on a recipient and is used to measure competence (Battel-Kirk, B, et al 2009; Bruno, A, et al 2010).

A competency based standard allows workers and supervisors a clear understanding of what indicators will be used to measure their job performance. This may also contribute to improving the technical quality of care delivery by individual health workers, teams or facilities. The standards need to be clearly articulated and fully communicated to all stakeholders in order to be effective. Defining a competency framework has been proven to be an effective basis for establishing training, recruitment and evaluation criteria for both new and existing cadres of workers. Uptake and acceptance of competency based systems has been slow and controversial but is growing (Calhoun, J.G, et al 2005). Many countries at both the developed and developing level have embraced a competency framework for particular cadres of health workers (Kapol, N, et al 2008).

Britain is currently the only country with a nationally developed Competency Framework for pharmacy technicians, although it is currently in draft framework and has not yet fully implemented. The first steps in developing that framework included creating robust methods of revalidation such as maintaining learning portfolio's, self-reporting of evidence, self-assessment, continuing professional development and relicensing. Many countries have a competency framework for pharmacists (Bruno, A, et al 2010).

The International Federation of Pharmacists (FIP) has recently produced a generic international competency framework for pharmacists. To achieve this, the working definition of a pharmacist used was a “medicines expert” (Bruno, A, et al 2010). While this tool is useful challenges occur in poorer countries that do not have pharmacists present in sufficient ratios to the population and have other workers performing these roles. The FIP competency framework is based around four domains of core competency required for engaging in effective health promotion and practice these are related to a generic international competency framework for health promotion and education developed by public health specialists and stakeholders. These are detailed in the Figure 2 below (Allegrante, J.P, et al 2009; Bruno, A, et al 2010).

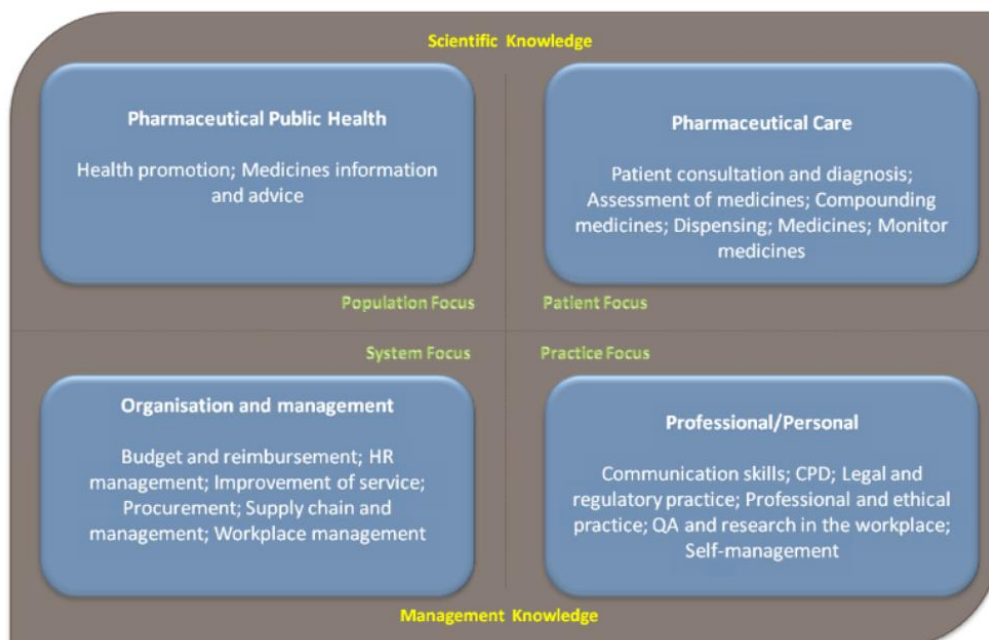


Figure 2. The four domains of Pharmaceutical Public Health, Pharmaceutical Care, Organisation and Management, and Professional/Personal in the FIP Global Competency Framework for Pharmacists www.fip.org/files/fip/PharmacyEducation/GbCF%20booklet.pdf.



Figure 3. Pharmacy Education Taskforce Needs Based Education Model (Whitmarsh, S, et al 2010).

Working under a competency framework has been criticised for limiting innovation, reproducing conventional practices and interfering with inter-professional practice. Drivers for using a competency framework include increasing focus on consumer rights, workforce expansion and risk management (Reeves, S, et al 2009). Other criticisms are that competency frameworks devalue professional judgement and opinion. And that using competency framework's has the potential to develop into behavioural checklists rather than providing a foundation for theoretical knowledge (Battel-Kirk, B, et al 2009). These criticisms can be somewhat invalidated in the developing country context as the process of competency framework based learning streamlines the training process in light of the health work force crisis. Streamlining by this nature would still provide services subject to overall quality assurance particularly if combined with accreditation standards. The FIP PET Model is illustrated above in Figure 3.

Pharmacy is the science and practice of preparing and dispensing medicinal drugs ("pharmacy". Oxford Dictionaries. April 2010. Oxford Dictionaries. April 2010. Oxford University Press. 14 February 2013). Pharmacy is a changing and evolving profession, currently the profession internationally is experiencing a shift from a pharmaceutical science model to a clinical and patient focussed job. This may be in response to the changing economic, political and social environment of the world (Hall et al, 2013; Hassali, M.A, et al 2010). In many countries "pharmacies", or shops or hospital dispensaries where medicinal drugs are prepared or sold ("pharmacies" Oxford Dictionaries. April 2010. Oxford University Press. 14, February 2013), are the main point of primary health care for the community and

the people who supply medicines in these facilities, who may or may not be pharmacists, are the frontline health professionals providing health care to the community (Jungnickel, P.W, et al 2009; Anderson, C, and Brock, et al 2009).

Historically many governments around the world have shown unease at utilising private organisations to provide training in health (Boyne, G, et al 2002). There are widely documented fears that privately provided training would be of a lower quality (Bustreo, F, et al 2003). As the capacity of private training institutions grow in developing countries, a need may arise for Governments to consider financially assisting candidates that may not be able to support themselves personally to attend these alternate institutes, this could take on the appearance of loans or bonded places where the absence of suitable places in public institutions is evident (Conway, M.D, et al 2008).

Quality assurance leads to improved outcomes, reproducibility, accountability and retention of the workforce (Donabedian, A 2002; Nustafa, A and Kawalski, S 2010). Training should be subject to quality assurance because standardisation, evaluation and structuring allows for health workers to be assessed for performance against competency standards. Practically this may mean by observation of performance by mentors or supervisors or by skills based assessment or examination. Training for pharmacy support staff needs to include components on ethical standards such as confidentiality, non-discrimination, stigma and other patient rights (Herrera, H. 2010; Herrera, H, et al 2013; Hawthorne, N, and Anderson 2009; Dumm, M, et al 2010).

Regulation is important to both workforce capacity development, and strengthening health systems. Registration by a licensing or regulatory body legitimises health workers and gives them permission to practice. By tracking training and recording qualifications, the overall responsibility of recruitment can be assumed. This assists in overcoming service delivery bottlenecks because it is possible to predict patterns based on past trends (Schafheutle, E, et al 2013; Dussault, G, and Dubois, 2003).

A professional framework should be decided on at a country level and harmonised across the sector to reflect different scopes of practice and levels of responsibility within the overall health framework. This is necessary because influencing factors including both cultural values

and endemic diseases vary between areas (Kapol, N, et al 2008). Quality assurance or the assessment of performance when completing tasks, competence in practice, is a greater challenge than detailing competencies (Zeitoun, A. 2011). Many countries already have competency frameworks for many health professionals and are now looking to integrate competency frameworks between disciplines to facilitate team work within the capacity of the health work force (Bruno, A, et al 2010).

Developing a competency framework for the health workforce prioritises both retention, and performance indicators. Retention is important since countries, particularly in the developing world should not rely on volunteers for sustainable health service delivery. To rely on volunteers has inherent risks because the numbers of volunteers may fluctuate if the political climate changes or natural disasters occur in their own country or another country. The pharmacy support workforce should be self-reliant and not rely on foreign workers or volunteers (Ranson, M.K, et al 2010). Harmonised training programs leading to career progression contribute to retention and further skills development. Training people closer to their homes can improve retention, many people like to stay close to their family and social networks (Conway, M.D, et al 2008).

4.3 The current training undertaken by the Global Pharmacy Support Workforce

Training involves teaching people new skills or behaviours through regular practice or instruction (Bruno, A, et al 2010). Training medicines supply staff promotes rational, safe, efficacious and financially responsible use of medicines (Anderson, C, and Whitmarsh et al, 2012). Training is one of the vehicles for addressing new knowledge requirements as practice changes and for enhancing human and system based performance (Henriksen, K, and Dayton, 2006). Training programs need regular evaluation so improvements can be made as health challenges are not static and are constantly changing and evolving (Kamiru, HN, et al 2009). It is estimated that if funding was available, it would still take the creation of over 600 new training schools for nurses and doctors to address the health workforce crisis in the African region alone to provide the most basic health services, and the training needed is estimated at taking over 20 years to execute (Conway, M.D, et al 2008).

Training programs are being increased and scaled up in many developing countries. This is particularly evident for individual programs operated privately or publicly, by governments or aid agencies that address a particular issue such as tobacco dependence or HIV prevention or treatment (Embrey, M, et al 2009; King, R.C, and Formunden 2010; Rigotti, N.A, et al 2009). Many of these programs are evidence based, but with the evidence based methods being transported from developed countries there are questions of transferability into the differing environments. However the funding of these programs is a major challenge (Rigotti, N.A, et al 2009). Increasing training has been shown to increase service use by improving the quality of services (Anderson, C. 2008). Training should be quality driven, directed towards local needs and the services required to meet those needs. The competencies needed to provide the services and the education needed to develop those competencies should also be considered (Lin, V, et al 2009).

4.4 Pre-Service and Service Training

In-service training is a prominent strategy used to enhance HCWs technical competence (Ciccio, M et al. 2010). Often this training is delivered in a centralised, intensive, face to face style. The training may be organised at a regional, national or international level. The decision as to what kind of training will be available and the selection of who to train is often driven by the availability of resources and local drivers, financing is particularly limiting. Malaria, Leprosy and Tuberculosis and Family Planning programs all with management centres in Western countries, are all reported to conduct disease specific training programs for health care workers in developing countries. Many of these programs are both sustainable, and locally modified for cultural adaptability (Opiyo and English 2010; Mutie, M.I 2011).

5.4 Quality Assurance of Training

The development of quality assurance (QA) systems for pharmacy education varies greatly among countries. Many countries have their own QA system and standards for pharmacy

education that reflect contemporary pharmacy practice and education and meet the specific needs of the country. However the principles and core elements for QA of pharmacy education are unlikely to differ significantly, if at all, from country to country (Anderson, C. and Brock, T et al 2009). There was broad recognition by stakeholders contributing to the FIP International Forum for Quality Assurance of Pharmacy Education (2001-2008) that countries seeking to establish or improve their QA system would benefit from an internationally developed and adopted QA framework. It is postulated that it would be particularly beneficial for universities and industry to better match research and development efforts to the needs of those not close to high level health care. For example by devising strategies to provide training to workers who can access those in rural and remote areas (Lin, V. 2009; Anderson, C. 2008).

Quality assurance provides a mechanism for accountability, or defining individual responsibility for tasks. Increasing accountability it is possible to both protect the health workers involved in provision and to provide better safety for the service users. Quality Assurance procedures help to identify and prevent problems occurring. A QA Framework allows benchmarking, and the pooling of information leads to more robust data. Regulatory systems such as laws, rules, regulations, policies or guidelines enable Governments to protect the service users from malpractice and to foster trust in relationships between consumers and workers to build a strong health system (Hawthorne, N, and Anderson C, 2009). Most countries have systems for oversight and quality for education, but not specifically for education surrounding the supply of medicines. In some countries quality assurance systems around medicines supply are emerging but in many they are disconnected and only rely on internal or institutional processes (Hawthorne, N. 2009; Shah, M. 2010). Accreditation usually is an external process undertaken to ensure quality. Quality assurance is an internal monitoring of quality that is regarded as less rigorous, but both are similar in effect and their objective. A solid evidence base showing a direct relationship between accreditation and health outcomes is in its infancy, but there is good data showing that accreditation provides a powerful tool for measuring progress in this connection (Joly, B.M, et al 2007; Persaud, D.D, and Nestmann 2006). Where evidence for accreditation of health care does exist, the relationship between conforming to standards and improved outcomes is weak and difficult

to prove (Chuang, S, and Inder 2009). Accreditation is criticised for having costs which may outweigh its benefits, a poor evidence base and a strong focus on functionality of processes rather than educational content (Wholey, D.R. et al 2010).

The AVICENNA directory is a developing project that currently focuses on medical care but is being rolled out to progressively include other health professions. The directory is a quality assurance tool which details names of institutions, admission rules, educational program, titles of degrees or diplomas, accreditation and quality assurance systems. There is also a national level directory incorporated into the Avicenna directory that displays the number of institutions offering training and quality assurance of education. The tool has been developed to create transparency in human resources for health education. The information should be of global interest to registration agencies and licensing authorities. This model should be of value to promote international collaboration as well as providing information for potential students or staff as countries can be easily searched by any criteria such as population or Gross Domestic Product to allow benchmarking and monitor progress. This is particularly relevant for Quality Assurance standards, as these do not vary greatly on a country level (Anderson, C, Rouse, et al 2011). Many of these goals would be transferable to a database of training for the lower cadres that are envisioned in this research, as sharing knowledge can lead to increased understanding and alternate cultural beliefs can generate new perspectives. The FIP have recently developed a Quality Assurance tool for education. The Accreditation Council for Pharmacy Education (ACPE), an organisation under the auspice of the FIP, are in the process of extending this initiative to develop an international framework for accreditation (Anderson, C, Rouse, et al 2012).

4.5 Workforce Planning

Workforce development should be strongly linked to workforce planning in order to strengthen health systems. Measuring the performance at various general through to advanced levels should be the foundation stone of workforce regulation. For this to occur it needs to be recognised that competence is critical for assuring safe and quality performance for individual health workers. A global approach to competence would lead to clear career paths and help to define educational goals. Current limitations to this occurring is the lack of a global competency framework, it is unclear what the magnitude of applicability and

transferability issues would be with this tool if it was developed (Anderson, C. 2008; Barnighausen, T, et al 2011; Battat, R, et al 2010).

Workforce modelling needs to balance both the training output and the utilisation of different cadres to avoid both shortages, as well as oversupply of health care workers. The oversupply of health care workers is a problem because it is a waste of funds and can lead to poorer working conditions, including wages, for the entire cadre. Current barriers to this occurring include the limited exchange of teaching programmes and experiences on an international basis. Additionally many countries have a dispersed management and responsibility for the medicines supply workforce between various stakeholders. Universities, Ministry of Health, Ministry of Education and aid organisations may all assume portions of responsibility for pharmacy support worker education and training on a country level. Where they exist this responsibility is delegated to professional organisations such as country specific institutes. On a world-wide basis the global professional organisation the International Pharmaceutical Federation assumes a leading role (Calhoun, J.G, et al 2005). Workforce planning needs to be informed by reliable workforce data, evidence of factors affecting the workforce, and comprehensive workforce modelling. (Ranson, M.K, et al 2010).

Considerable research has shown that non-monetary incentives are significant in attracting and retaining a health workforce. Drivers such as mobile phones, and public recognition for work have been shown to work as powerful motivation tools (Conway, M.D, et al 2008).

5. Research Questions.

This project will specifically seek to define the current gap in the knowledge surrounding pharmacy support workforce training on a country level;

- Where, and how, is the pharmacy support workforce educated and trained? This will reflect all sectors including both the public and private situations.
- Are the education and training programmes for identified cadres accredited? If yes, how, and by whom?
- How are the workers regulated? Are they licensed or certified? Do they have a legally defined scope of practice and how does this compare to other pharmacy workers?
- Are the cadres required to complete Continuing Professional Development (CPD) or credits?
- What are the titles given to the positions involved in supplying medicines in public and private systems?
- What are the task and responsibility sets assigned by countries to these cadres?

5.1 Scope of the Research

The requirements of registration and training bodies, around registration and training, will be asked and recorded as well the perceived relevance of some basic competencies and roles undertaken by the pharmacy support workers. The information will be obtained from government departments and private and public academic institutions in circumstances where these units have the principle responsibility for education and training standards, or where they are the only respondents available for participation in the research. The same question set is used for all respondents. The definition used in this research for both training and education, is the formal learning that results in a qualification.

This research will not document how many patients a day a pharmacy support worker would see. This has inextricable value for comparing ratios of pharmacy support workers and has extensive implications for resource allocation, but is not easily extracted. Limitations are always present when looking at any project on a global scale if, as in the case of this research,

data and research may only be interpreted in one language, English. Descriptive data on registration and training will only be extracted from English language sources.

As this research is a snap shot the findings will be transient in relevance and need updating as the field progresses. Factors which may force change in medicines supply in developing countries may include the increased availability and affordability of prescription medicines, the worldwide growth and aging of populations, increased use of technology in the medicines supply processes, for example electronic prescriptions, robotic dispensing and automated stock control, the advancement of biotechnology and personalised medicine, changing business models moving towards corporatisation, changing career patterns, changing roles of workers, more women being employed as health care workers who are unlikely to work their entire career span, the attitudes of future generations compared to previous generations, the global economic, environmental and political climates (Affray, C et al, 2009; Anderson, C, Whitmarsh et al 2012; Borowy, I 2012). Beyond the scope of this report is analysis of what incentives would contribute to adherence of a competency framework.

Table 4. Stakeholders involved in medicines supply

<ul style="list-style-type: none">• Government Ministries of Health for Planning and Policy• Regional/provincial levels for policy implementation• Central medical stores for medicines procurement and distribution• Health facilities, both public and private for medicines acquisition, formulation, dispensing and supply.• Private pharmacy establishments (industry, wholesale and retail) who may play a major role in medicines supply but are commonly unregulated.• Medicines councils and professional associations to develop pharmacy practice. This is achieved by methods such as developing both policies and practice standards.• Training and research institutions to train a medicines supply workforce and conduct research. These specifically affect supply by methods such as “cold chain verification.”

6. Rationale and justification of the study

6.1 Stakeholders in this research project

Governments, policy-makers and regulators, the academic community, leaders and practitioners in the pharmacy profession, students, sponsors and funders of education, pharmaceutical companies and the public all have interest in pharmacy education. Stakeholders are further detailed in Table 4, above, and organisations detailed in Table 5.

Many of the following organisations have existed previous to the modern definition of “globalisation” and were originally formed to achieve the concepts of peace and trade between their member nations. These organisations have grown to be the central players in this new concept and have direct interest or indirect influence on this research project (von Benda-Beckmann, F. 2009). While the FIP currently conduct a quadrennial global workforce report encompassing the education and training standards of pharmacists, there are gaps in the knowledge because many countries have insufficient numbers of pharmacists, so the questions arise, namely who is doing a pharmacists work and what education and training do they possess?

The World Health Organisation

The WHO is the peak directing and coordinating authority for health within the United Nations system. The United Nations System includes 193 member states. The WHO are responsible for providing leadership on global health matters, shaping the health research agenda, setting norms and standards, articulating evidence-based policy options, providing technical support to countries and monitoring and assessing health trends. The WHO sees health as a shared responsibility, involving equitable access to essential care and collective defence against transnational threats in the health context. The WHO also engages in partnerships with private companies to promote globalisation and achieve positive outcomes for specific health goals (Kessler, R, et al 2003; Buse, Km and Waxman, 2001; Kickbusch, I. 2003; Sharp W, 1947).

The United Nations

The United Nations is an international organization founded in 1945 after the Second World War by 51 countries committed to maintaining international peace and security, developing friendly relations among nations and promoting social progress, better living standards and human rights. The core aims of the organisation are to help nations work together to improve the lives of poor people, to conquer hunger, disease and illiteracy, and to encourage respect for all people's rights and freedoms (Annan, K.A. 2000; United Nations. Dept. of Economic 2009).

The United Nations Educational, Scientific and Cultural Organisation

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) are the division of the UN whose strategies and activities are focussed on realising the Millennium Development Goals. The organisation has two peak focuses; Africa and gender equality but is involved in the alleviation of poverty and the promotion of human rights principles on a global level through many strategies. UNESCO has a large interest in developing quality education for all and the promotion of lifelong learning, one of its greatest challenges is

working with different cultures to provide relative benefits and opportunities (Jha, A, 2012; Isar, Y.R. 2011; von Benda-Beckmann, F. 2009).

The University of Canberra

The University of Canberra (UC), has a strategic plan intending to develop additional courses to respond to skills shortages and the needs and interests of people in the Australian Capital Territory and surrounding regions. Both the University and the Faculty of Health within the University have a vision for the future, guided by the University's plan which sets out a clear and focused forward direction, promoting excellence in teaching, expanding research capacity, and engaging with the ACT community and its regions. The Pharmacy Department of UC has a significant research base and employs prominent figures in the Global Pharmacy Support Workforce domain.

The International Pharmaceutical Federation

The International Pharmaceutical Federation (FIP) was founded in 1912 as the global federation of national associations of pharmacists and pharmaceutical scientists. The organisation works in official relations with the WHO. The FIP has 214 member organisations and represents over two million scientists and practitioners around the world. Since its inception the FIP has evolved to meet the needs of the pharmacy and pharmaceutical professions, to expand healthcare services and integrate emerging scientific developments. The evolution of pharmacy as being now centred on pharmacy practice has shifted the role of the FIP to become global advocates for health care provision, though they remain very much grounded in pharmaceutical science (Whitmarsh, S, et al 2010; Anderson, C, Brock, T et al 2011).

The Pharmacy Education Taskforce

The Pharmacy Education Taskforce (PET) is a global entity convened by the FIP (as above) to superintend execution of the Global PET Action Plan 2010. The plan was developed to detail competencies and promote quality assurance in order to facilitate educational development

globally but on locally determined needs. The PET is strategically partnered with UNESCO in order to exploit the experience of a transnational agency (Anderson, C, Bates, I et al 2008; Anderson, C, Bates, I, et al 2011).

The goals of the PET, directly in line with this research, are;

1. develop a vision and framework for education development,
2. develop a competency framework,
3. ensure a quality assurance system, and;
4. build academic and institutional capacity.

Competency framework for pharmaceutical services

- Gather and review competency frameworks for pharmaceutical services
- Explore cultural influences on competency
- Develop broad pharmaceutical services competency framework
- Finalise and endorse quality assurance framework for pharmacy education
- Examine accreditation and quality assurance models and systems in country case studies
- Provide guidance for quality assurance system development

People That Deliver

“People That Deliver” is a global initiative of governments and organisations to improve health outcomes through professionalising the management of global health supply chains. This encompasses both medications and other health commodities. People That Deliver seek to improve services and health outcomes by making sure people have formal training in supply chain management and see this as a critical responsibility.

6.2 Evidence for Standardisation and Certification of Pharmacy Support Workers

A global competency framework encompassing single standards for education, training, certification and accreditation may lead to increased accountability through regulatory oversight (Manasse, H.R. 2011). Many studies have shown that increasing training leads to less error and better health care or decreased death rates, better uptake of programs such as ART roll out (King, R.C, and Fomundam 2010; Dumm, M, et al 2010).

Service provision must be of high quality but this should be balanced against the urgency of addressing issues such as the HIV epidemic. Countries should take a simultaneous approach to increasing health professionals training and providing immediate competency based cadres for instant deployment (Naranbhai, V, et al 2012; 210 Mdege, N. D, et al 2012; Ferrinho, P, et al 2012).

7. Definition of Research Purpose, Aims and Objectives

The purpose of this research is to detail the pharmacy support workforce on a country by country level. This will provide evidence to assess both the need for, and the general content required, of a global competency framework for pharmacy support staff. As the focus of the project is global in scope it is anticipated the findings will be somewhat generic.

By systematically comparing countries, suitable directions for further research in this field can be identified. A competency framework will lead to training that is evaluated and designed to be standardised, needs driven and accredited. This will enable proficiency of health workers to be measured for the tasks they perform giving greater control over financial budgeting and workforce planning by governments and organisations. Where training is harmonised there will also be a possibility for ongoing skills development and career progression as skills are transferrable.

The findings of this study will be accessible to researchers, policy makers, planners and stakeholders. Quality assurance systems will not be detailed or formulated but it is noted that these should be formulated to represent the perspectives of pharmacy practice, academia, medicines supply regulators and pharmacy educators. Publication will coincide with the FIP quadrennial global pharmacy workforce report, providing additional information on the non- pharmacist elements of pharmacy.

Details of training will be presented and it will be possible for comparisons to be made reflecting a countries Gross National Income index of the WHO and country lists for human development index. Objectives will be for the information generated to be comprehensive, covering a broad range, reliable and current and easily able to be interpreted.

The need for a statement of Policy on Good Pharmacy Education Practice, which currently exists for pharmacists but not yet for pharmacy support workers will be developed from this work. This would provide a conceptual framework for the design, implementation and assessment of contemporary educational programmes. A tool like this will be useful for pharmacy support worker educators and education policy makers.

8. Pharmacy Education

Against the background of complex pharmacy workforce trends, changes in the roles of pharmacists and growing health challenges, an essential need exists to have a clear and shared vision for professional pharmacy support workforce education.

Competencies are the specific skills or items of knowledge required to perform a function. For an individual to have competence they must be proficient at all competencies required for their job. Developing a competency framework articulating these specific competencies allows the production of a tool that can be used for evaluation and improvement of services and systems. Allowing direct comparison between countries would enable fairer and more direct distribution of resources by multinational stakeholders, such as the UN, FIP and WHO. Local adaptation to the model would be expected to ensure local needs are addressed.

Training involves teaching people new skills or behaviours through regular practice or instruction. Training medicines supply staff has been shown to promote rational, safe efficacious and financially responsible use of medicines.

In Australia there are regulations and guidelines that stipulate the supply, provision and dispensing of pharmaceuticals but in developing countries these are absent. Many different stakeholders have an interest in determining what is occurring in other countries, and whether the training and education of staff is effective (Mak, Vivienne SL 2012; Anderson, C, Whitmarsh et al 2012).

Chapter Two: The Methodological Framework and Methodology

Chapter 2: The Methodological Framework and Methodology

Ethics

The ethics application for this project was submitted to and approved by the University of Canberra Higher Research and Ethics Committee using the National Ethics Approval Form (NEAF).

1. Overview of Methods

Background

Effective and available medications are integral to health care delivery. Adequately trained health professionals are essential to efficiently procure, transport, store and supply medications. The characterisation of the Pharmacy Support Workforce is of great importance, particularly in low income countries where shortages of pharmacists mean other cadres have extended responsibilities but also in developed countries where the strategic use of capable support staff could allow pharmacists more time for non-technical activities. There is significant ambiguity internationally, regarding Pharmacy Support Workforce cadres, their definition, and their range of competences, training and regulation.

Aim

The aim of the research is to obtain an overview of the pharmaceutical nomenclature, competencies, regulatory systems and education requirements for the global Pharmacy Support Workforce

To obtain an overview of the pharmaceutical nomenclature, competencies, regulatory systems and education requirements for the global Pharmacy Support Workforce. This will be achieved via an online questionnaire, and telephone interviews. The various titles and competency sets given to the cadres that fulfil this role will be collated as will the current country expectations regarding cadre regulation. The research will seek to clarify what training is currently available for these cadres with a focus on accreditation and regulation of training as well as where and how it occurs at a country level. The data collected will be synthesized to provide a global picture of the current situation regarding Pharmacy Support Workforce cadres.

Methodology

An online questionnaire was developed using the "Survey Monkey" program, Online Survey (Appendix 5.), which was distributed with the Survey Invitation to Participate (Appendix 8.) Recruitment Email Invitation (Appendix 7), through networks across the globe including: FIP (International Pharmaceutical Federation) –Pharmacy Education Taskforce, World Health Organization, International Association Public Health Logisticians, Global Health Workforce Alliance, the Health Workforce Education and Training branch of the Implementing Best Practices Initiative and the People That Deliver Initiative. The level of access to the internet that the identified participants had to enable them to participate varied widely. Due to differences in infrastructure some countries may have had only a small minority of potential respondents who have access to the internet.

Survey participants included academics, ministry of health officials and key stakeholders as accessed through these networks. The online survey was validated within selected test countries. This process involved analysing the feedback in terms of completed test surveys for systematic or question comprehension type problems and making the adjustments that were needed to the survey format. The data collected by the revised survey, which included modifications resulting from the feedback processes, was subjected to thematic analysis. The identified themes were validated by comprehensive interview, see Comprehensive Interview Document (Appendix 6.) using participants from the initial online survey that nominated themselves for further involvement in the project. Care was taken to ensure geographical representation of a wide range of countries to give a clearer global picture using comparisons between developed, developing, wealthy and poorer (based on Gross National Profit and World Health Index scores (Appendix 3.) Funding opportunities were explored to offer the survey in Spanish and French, the working languages of the World Health Organisation.

Resourcing and Supervision

This project was supervised and resourced by Professor Gabrielle Cooper, Professor of Pharmacy and Assistant Professor Dr Andrew Brown Discipline of Pharmacy, Faculty of Health at the University of Canberra and Domain Lead for the Pharmacy Support Workforce of the Tripartite WHO, UNESCO, the International Pharmaceutical Federation's Pharmacy Education Taskforce.

1.1 Details of researchers and investigators

The role of the principal researcher in this project.

The investigation formed the practical component to the thesis for the principal researcher and author Ms Katie Doherty to complete a Master of Pharmacy by Research.

The principal researcher was responsible for the;

- survey development and design, subject to feedback, guidance and approval by stakeholders and supervisors.
- distribution of the survey including the development of suitable promotional materials under guidance, using networks accessed through supervisors.
- data collection and data analysis.
- formulation of the report and the dissemination of the findings through both the thesis and composition of a journal article (awaiting publication), and the presentation at the centennial International Pharmaceutical Federation preconference in the Netherlands, 2012.

Other relevant personnel: training and accreditation

No other known persons played a specified role in the conduct of this research project.

No relevant certification, accreditation or credentialing requirements were relevant to the conduct of this research. Researchers / investigators or others involved in any aspect of this research project did not require any additional training in order to undertake the research.

1.2 Resourcing: project funding and project support

Name of Grant / Sponsor: Faculty of Health, Research Training Scheme monies

Amount of funding: \$3000

Detail in kind support: The University of Canberra was responsible for travel insurance, public liability and professional indemnity.

The extent to which the scope of this Higher Research Education Contribution application and grant are aligned: The HREC application and grant were 100% aligned.

1.3 Duality of interest

- Development of protected intellectual property did not occur; funding was not dependent on external factors. There was not therefore commercialisation or intellectual property implications of the funding/support arrangement.
- There was no financial interest in the outcome of the research by the funding/support provider as this was provided generically through the University.
- No member of the research team had any affiliation with the provider of funding/support, or a financial interest in the outcome of the research.
- There were no restrictions on the publication of results from this research.
- Though not of a financial nature, there are international professional and non-governmental organisations who had an interest in the outcome of this research;

Table 5. The interested parties, or stakeholders, of this research

Stakeholder
World Health Organization***
Health Workforce Education and Training Branch of the Implementing Best Practices Initiative
United Nations Educational, Scientific and Cultural Organization
The International Pharmaceutical Federation- the Pharmacy Education Taskforce
International Association Public Health Logisticians
Global Health Workforce Alliance
The People That Deliver Initiative
The University of Canberra

****The WHO stipulates that all data sources for information given by respondents must be identified for the results of the project to be utilizable by their organisation.*

The research outcomes may be considered in policy planning or when selecting directions for future research.

1.4 Prior reviews and research.

There is currently no specific research or data collected on the Global Pharmacy Support Workforce. While some data is contained within the FIP affiliated Global Pharmacy Workforce Report, this quadrennial review is in its beginnings and heavily focused on pharmacists (Hawthorne, N, and Anderson, C 2009). There is also a similar albeit much smaller report available on the global hospital pharmacist domain, based on survey data and

briefly examining training and support staff, primarily where pharmacist shortages are exacerbated (Doloresco, F. and Vermeulen F, 2009; Madden, J, et al 2010).

Specific Project Details

The survey was designed to elucidate qualitatively the roles, definitions, competencies, training and regulation of the pharmacy support workforce internationally.

2. Introduction – type of research The overall purpose of the survey was to characterise the current global pharmacy support workforce, taking into consideration the wide variety of nomenclature used to describe this workforce.

2.1 Search strategy; terms, and databases searched

One of the overall aims or objectives of this research project was to define and tabulate the titles or cadres of staff involved in medicines supply as the Pharmacy Support Workforce. In order not to exclude journal articles or research reports in the initial stages of reviewing the literature to provide a background to this research it was necessary to search the collection of terms that were likely to identify pharmacy support staff. These included; pharmacy assistant, pharmacy technician, dispensing technician.

The literature search identified ambiguity in the spelling of the word competences (the United Kingdom favoured spelling) and competencies (United States of America variant spelling). Truncation was unable to overcome this problem for most databases and so either both terms had to be entered or the platforms scanned twice as it was a keyword informing the background to the research.

Stages of the literature review.

1. Phase A: Determine key terms and become familiar with database specific searching.

Conducted with the kind assistance of Ms Pat Tandy, Pharmacy Librarian at the University of Canberra. Databases identified in Table 6 below.

References were managed and the bibliography generated through the online program RefWorks, a subscription for access was available through the University of Canberra.

2. Phase B: Using key terms, over 500 abstracts were scanned.
3. Phase C: A list of highly relevant articles was generated from this search and over 100 references were annotated in the bibliographic software. Background to research formulated with integrated literature review; Key themes; historical context of global health care research, the AIDS epidemic, the global health workforce crisis, competency based learning and regulation.
4. Phase D: Search terms were re-entered on an approximately bi-weekly basis to include new research as it came available.

Table 6. Databases and organisations searched

Table Showing Databases searched.
Google Scholar
CINAHL (Cumulative Index to Nursing and Allied Health Literature on the EBSCO platform)
Highwire
Medline (via EBSCO)
Web of Science
Scopus (Including EMBASE)
PubMed (encompassing PubMed Central)

Online resources including both University of Canberra subscribed and open access databases, online journal collections and online reference materials.

2.2 Parameters for survey based research, definition online questionnaire

The challenge for the development of any questionnaire is that the relevant concepts are clear, and are included using language comprehensible to the respondents. There is a phenomenological step involved that requires designing questions so that results will be quantifiable. In the case of this research, there is a risk language and cultural use of terminology may confound the results.

2.3 Comprehensive interview protocol

The list of competencies from the online questionnaire was removed from the comprehensive interview document. The list was removed as it was time consuming to answer. This is the only explicit difference in the content between the two phases of the project. However, prompts were developed to facilitate further probing on key issues within the original format for the comprehensive questions for points that are identified as:

- 1) Regularly occurring, or
- 2) Inconclusively explained by the phenomena or causal effects; or
- 3) A combination of both these factors.

2.4 Rigour: reliability and validity

Validation is another area that categorises this project in the mixed or quantitative and qualitative paradigm. As the questions have not been altered from the initial questionnaire for the comprehensive interviews this cross-examination technique is typical of quantitative research.

As with all research there are issues with the dependability, credibility and transferability of issues. Convergence of the data when synthesizing the report allowed corroboration of the data and the evolution of rich, deep, broad, complex and rigorous themes (Liamputtong, P. and Ezzy, 2009; Demyttenaere, K, et al 2004). The triangulation is both methodological and theoretical, although only two phases of the project were undertaken this is still referred to as triangulation.

Each strategy in the triangulation of methods exposed different perspectives of reality and showed how the results were convergent in existence. One of the major limitations to

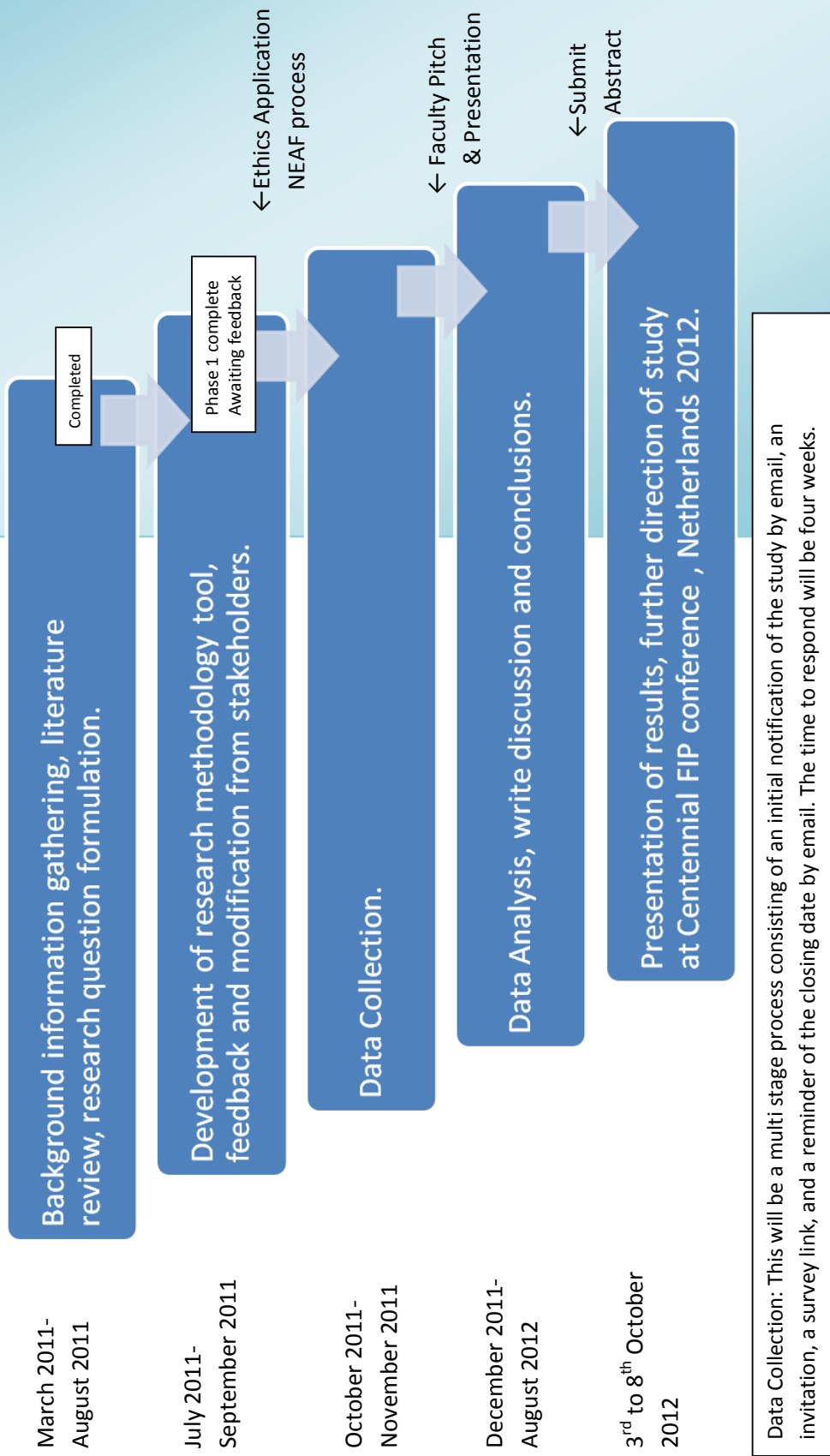
triangulation of data methods in research design is the added cost of multiple methods. This was accounted for in project planning and was minimized due to the online nature of the questionnaire tool. Intra country analysis did not occur, as even where there were multiple respondents from one country the results would not be statistically significant.

Qualitative analysis validation issues including the difficulty with generalising findings, applying findings to other settings and taking responses in context i.e.; looking at an instance within a sequence, this will be discussed in the methodological framework section of this chapter.

Internal and external validity. Internal is that findings are not dependant on mistake within design.

Some countries had multiple respondents, a comparison of results within countries was not presented. This task would have been onerous, and was deemed to detract from the global picture. Because the variation for intra-country results were found to be as prominent as variation in inter-country results for both the pilot survey, as well as the in-depth interviews. Some results for regional vs. metropolitan areas were shown to further support this selection.

Project Timeline



2.5 Research plan

This project explored the current understanding of the competences and training requirements for Pharmacy Assistants/Technicians involved in medicine supply around the world and identified some of the gaps in knowledge surrounding the variety of roles in the workforce, the expected responsibilities, education, training, accreditation and registration for medicines supply workers, including logisticians. In addition it explored what types of activities were undertaken by these workers and how competent staff were to fulfil their roles based on their training. Importantly the research tabulated the different titles given to the cadres of “pharmacy support staff” which assisted the literature search for this project as there are no universal terms applied to the group and this caused challenges for finding information.

This project helped identify and articulate the role of the pharmacy assistant/technician globally, with a focus on developing countries. It attempted to define the area of practice of the pharmacy assistant/technician and the skills, attributes, responsibilities and basic competencies required to function in the position. From this research it was possible to identify with a reasonable amount of clarity what training is required and successful, to produce an effective pharmacy support workforce in a sustainable way. Rural and metropolitan differences in scope of practice and quality of training were considered across countries. The regulation and accreditation, as well as the methods of effective practical enforcement of these concepts, were also considered in order to evaluate training standards.

To enable this investigation to occur, key stakeholders with an understanding of the role and activities undertaken by this workforce were consulted and fundamental documents that existed in the space were audited and collated. Linkages with these pivotal bodies also provided some opportunity for interviews to explore in more depth understanding of the role and how best training and education can be developed to assist in developing a tool which can be used by individual countries to help with professionalising this invaluable workforce.

The list of competences contained in the survey has been adopted from a combination of the only currently available competency framework for Pharmacy Support Staff, originating in the United Kingdom and the supervisor on this project Andrew Brown’s previous work on

competency frameworks for Pharmacy Support staff in the Pacific Islands (Brown, A, et al 2011).

To enable this research to be undertaken, the methodology was developed and adapted to recognize the limited research currently available in the space. The literature review, stakeholder narrative, audit of current practices and organisation experience were sourced. The use of unpublished “action research methods” was employed to capture new knowledge. A global online survey was designed and implemented and this was followed with comprehensive interviews when the most prominent themes were able to be extracted from the survey by analysis and discussion. Further validation occurred through an online discussion forum.

The new knowledge generated from this research, concerning the competencies and training requirements for Pharmacy Assistants/Technicians involved in supplying medicines globally and particularly in developing countries, was freely shared by request of key international organisations, see stakeholder table, who cited value for future planning, training and development of an essential workforce for the poorest communities on the planet.

The Pilot Survey Results

During January 2012, the survey design was trialed within seven countries. These countries were New Zealand, Rwanda, Uganda, Australia, The United States of America, Lao and Papua New Guinea.

Respondents were colleagues of project supervisor Associate Professor Andrew Brown, selected and contacted personally by himself to analyse the survey’s structure and detect any inefficiencies within the design. The respondents to the pilot survey identified themselves from the established networks, and participation was voluntary and not remunerated.

The survey was well received by the eight respondents, and completed within the two-week open period without reminders being sent, the feedback suggested few changes.

No major issues with formatting, accessibility or content were detected in the pilot. The most significant adjustments made were to refine one question aimed at capturing the cadre titles to enhance participant clarification. Additionally, the question seeking to enumerate the workforce was also changed from seeking a delineated and referenced numerical figure to requesting a personal estimation for the direction of growth of the population based on poor initial responses.

2.6 Benefits and risks of research design

Participants are expected to benefit from this research as they are already stakeholders in this field, because of the professional roles which they are involved in the results of this research may be useful for future policy making, quality assurance and training improvement activities. There is currently no centralised reference about what training and composition of the pharmacy support workforce on a global scale. There will not be any commercial benefit for the researcher or stakeholders of the project.

There were no risks to participants as a result of participation in this research. There were also no risks for the research team or organizations that are involved in the research. There are no further risks expected from the dissemination of the results of this project for any individual or organization.

2.7 Monitoring

The researchers and supervisors implemented mechanisms to monitor the conduct and progress of the research project. This was done by the research supervisors meeting regularly to ensure progression of data collection was occurring and any impediments were able to be discussed and a plan to manage them was developed. A timeline with specific research goals was developed to refer to for progression and time mapping (see page. 59). Face to face meetings occurred on a fortnightly basis. Controlling the conduct of the research was a low impact exercise compared to alternative research designs such as training staff for face to face interviewing, as the survey was an online survey whereby all materials had been evaluated by stakeholders and supervisors before the ethics application and therefore well before distribution. Quality, engagement, and support for the participants was ensured by clear directions and instructions in the invitation to participate and introduction to the survey where contact details of the research team were provided.

2.8 Peer review

The research proposal, including design, methodology, survey tool and evaluation underwent a peer review process which involved an initial review by the project supervisors and a further feedback process from stakeholders with an interest in the research.

The research methodology and tool was reviewed by both the project supervisors and external stakeholders to the research. The latter included staff at the International Pharmaceutical Federation involved in the Pharmacy Education Taskforce as well as staff at the Human Resources for Health Organisation. The review provided feedback on the effectiveness of the survey structure as well as strategies to ensure sure the most beneficial topics are covered in the survey as this is a new investigation in an under researched field. Only minimal changes were made to the survey after feedback including changing font size, an internal linking error and the addition of a question to verify information sources in regards to the answers to some questions to enable the results data to be useable by all the organizations.

3. Participant Recruitment

Participants were able to identify and volunteer themselves by email when they were exposed to the presence of the study through its inclusion in various stakeholder websites and newsletters.

The Survey Invitation to Participate (Appendix 8) was the letter that was distributed to moderators at the following organisations; The World Health Organization, The Pharmacy Education Taskforce of the International Pharmaceutical Federation, the People that Deliver Initiative, the International Association of Public Health Logisticians and the Global Health Workforce Alliance. The Individual Email Invitation (Appendix 7) was forwarded to individual participants via these professional networks. Potential participants were not “screened” or assessed by any formal process as to whether they were suitable for participation.

Initial contact was made in an electronic format see Email Invitation (Appendix 7). As participants were recruited through the World Health Organization, the International Federation of Pharmacists- Pharmacy Education Task force, the Health Workforce Education and Training branch of the Implementing Best Practices Initiative, United Nations Education Scientific and Cultural Organization, the People That Deliver, the Global Health Workforce

Alliance and the International Association of Public Health Logisticians networks the inclusion of the proposed study in various newsletters and mailing lists provided by these organisations was the main method of publicising the project. The Email Invitation (Appendix 7) was forwarded to all of email addresses obtained through this method.

The networks listed are routinely used for initiating contact with potential research participants in the field of pharmacy workforce research which is the topic of this project. Any correspondence which is circulated by methods such as email will be subject to moderation by independent moderators from the specific organisations. As participation was completely voluntary it was necessary for stakeholders will come forward by following a hyperlink to give their details and receive a formal invitation for participation.

The Survey Invitation to Participate (Appendix 8) was distributed to the target networks to “point of contacts” who forwarded the information through direct email databases or newsletters. The document was in some cases and was not in other cases, altered by these moderators, for example shortened to meet word limits in newsletters.

Email Invitation (Appendix 7) was distributed through the target network to each individual participant.

3.1 Participant description; Inclusion and exclusion criteria for participants

In the broadest sense, diversity entails respect for the differences represented by individual persons in the workforce, including their varied perspectives, cultures, socio-demographic characteristics, and competencies. Recognizing, appreciating, and cultivating workforce diversity both to achieve a positive work environment and to enhance relationships with participants was critical because both will enhance workforce effectiveness. Diversity in the public health workforce is a concern that must be assessed so that the workforce is prepared to meet the existing and anticipated demands of an ever-diversifying national population.

Participation was voluntary, without tangible incentive and participants were free to withdraw from the project at any stage. The survey was web based and so was conducted in a location that the participant chose.

The survey was hoped to be offered in the working languages of the World Health Organization. This did not eventuate because of difficulties in meeting timelines and so only an English version was circulated. The survey tools were reviewed by the supervisors and various stakeholders for suitability and cultural appropriateness.

The Pharmacy Support Workforce Stakeholders or participants in the survey were subdivided into specific groups for analysis though some answers are grouped for clarity and comparison. The survey was distributed to 156 World Health Organization Member states and responses were obtained from a majority of those countries. The average age of respondents was between 18 and 70 years or normal working age, but the age of participants was not directly asked.

The Pharmacy Support Workforce Stakeholders have an interest in characterising the pharmacy support workforce. They were recruited by invitation from networks formed through the International Pharmaceutical Federations: Pharmacy Education Taskforce, the World Health Organization, the United Nations Educational Science and Cultural Organization, the Health Workforce Education and Training branch of the Implementing Best Practices Initiative, the International Association of Public Health Logisticians, and the Global Health Workforce Alliance. Survey recipients will include academics, ministry of health officials and key stakeholders as accessed through these networks.

These were the participants that were identified as relevant to the project because these networks are global in expanse and allow a world picture to be developed. The people working in these roles and involved with these organisations will hold the relevant knowledge to complete the survey but prior to this research the knowledge had not been centralised or scrutinised by comparison on a country level.

3.2 Participant experience

The online survey took approximately 20 minutes to complete with reliable internet, demonstrated by the researchers and pilot participants. Completing the online survey required access to a computer and the internet, this limited the potential participants to only those with these tools but this was found to be acceptable as the design is often implemented by the WHO (Wright, K, 2005).

The online survey is shown in (Appendix 5). As participants moved through the survey they were asked to evaluate the behaviours, observations and experiences of the Pharmacy Support Workforce in their country. They were asked to choose what they thought was the best answer for each question. Questions consisted of both closed (yes/no) style and open (short answer) type questions.

The results of the initial online questionnaire were subjected to thematic analysis by a coding process where the research team identified prominent, recurrent and interesting themes. Telephone interviews expanded on these themes, see Comprehensive Interview Document (Appendix 6) and also required approximately 20 minutes each to complete. The participants for these extended interviews were those individuals from the online questionnaire who self-nominated for further involvement in the research.

3.3 Relationship of researchers to participants

The relationship was of a professional nature between subjects and the researcher who came from different organisations that shared an interest in development and professionalisation of the pharmacy support workforce. Participants were made aware of the online survey through professional networks; this was by email or inclusion in various newsletters. The content of the Individual Email Invitation (Appendix 7) was approved by the professional network moderators, who were responsible for authorizing the e-mail to the identified population.

Consent to participate was equated to engaging in the survey as involvement was voluntary. Not choosing to participate was equated to not giving consent. A standardised approach and research methodology was used. The researchers were cognisant of maintaining an appropriate professional environment and professional facilitator-participant relationship.

In the event a social relationship was identified between a participant and stakeholder.

Participants could leave the project at any time.

Those who did not wish to participate did not respond to the invitation and were not identifiable. It was not possible to identify a participant who began the survey but decided not to proceed to its completion. Interview transcripts were not shown or made available to participants.

4. Confidentiality and ethical implications of research

4.1 Consent process

All participants were assumed to have the capacity to give their own consent to participate.

No tools or mechanisms were used to assess capacity. Professional health worker, ministry of health employees or similar formed the sample surveyed. Competence in the professional role of the respondent was equated to the required competence to decide whether to participate in the survey. None of the participants were young people or children.

Participants were informed about the project and chose whether or not to participate by the following consent process. A formal e-mail outlined the project, see Survey Invitation to Participate (Appendix 8) as well as the background to the research and expected findings. The letter stated that the research will be anonymous in nature and that participation was voluntary. The survey tool, see Online Survey (Appendix 5) was fully accessible online for those who wished to participate.

There were no specific consequences participants needed to be made aware of prior to making the decision to participate in the project. Individual participants were not identifiable to anyone else; therefore identification was not an issue and will not expose participants to any risk. There were no specific consequences related to choosing to withdraw from the research that a participant needed to be made aware of prior to giving consent to participate.

There was no tangible incentive and no reimbursement to participants for taking part in the research. The only incentive was the contribution to the body of knowledge surrounding the

pharmacy support workforce. As there was no tangible incentive the desire to participate in the research was not be influenced by what has been proposed in the direction of persons wanting only to participate for reward, there was however a slant towards the opinions of those who had a lot at stake. Individual participants gave consent for their transcripts and electronic survey responses to be stored at the University of Canberra under restricted access.

5. Limitations of research methods

As this project involved research conducted overseas there were additional considerations involved in planning. The research was conducted in English and had ethics approval to be translated into the working languages of the World Health Organization including French and Spanish. Translation did not occur because of both budget and time constraints. An interpreter was not present during discussions with the participants about the research project. Participation was web based the ability to read the survey was equated to the required competency for comprehending and completing the survey (Higgs, J, et al 2011). Participants were provided with written information in the language in which the research was conducted, English.

Overseas participants could obtain further information or clarification about the research project by the same procedures as domestic respondents. Complaints and responses were translated on an ad hoc basis as they arose. This project was not of a sensitive or intrusive nature and the number of complaints as expected was minimal. Complaints and information could be directly received from contacting the research supervisor Assistant Professor Andrew Brown, Discipline of Pharmacy, Faculty of Health, University of Canberra, Australia and Domain Lead, Pharmacy Support Workforce WHO, UNESCO, FIP, Pharmacy Education Taskforce, email: Andrew.Brown@canberra.edu.au, ph+61(0)411137625.

This information was provided on all marketing, promotional and correspondence relating to the project. The University had specific processes in place that were required to be followed for problems resolution.

5.1 Cultural variance

Since this was a global project cultural sensitivities were minimised to reduce the intrusive nature of the research. Countries could potentially have the inclination to over or under estimate particular answers because of reasons such as aid funding, this was recognised and negated as much as possible in the research design. Specific questions about funding and budgets have not been asked: cultural challenges that could occur because some cultures do not want to give negative responses as they do not want to insult others (Brown, A. 2009).

5.2 Confidentiality and privacy considerations

Information was collected directly from the participant and de-identified at source. The only identifying or demographic type factors included were country of origin and professional title of respondent. Respondents were not asked their professional or personal opinion on individuals. See Online Survey (Appendix 5) for the full survey.

5.3 Use of participant's information

The information collected about participants in this project was not identifiable in the results. The results were presented in a variety of groupings including geographical, national income and country level basis. Some grouping of countries occurred according to the Gross National Income index of the WHO and country lists for human development index or whether a country is classified according to a developing or developed tier as defined by the World Health Organization. Patterns of answers were not identified based on professional groupings of respondents this may have led to exclusion or consideration of presentation in analysis. Generated responses were password protected by the software program used to collate the data.

Information about participants during and after completion of the project, electronically stored in the software program used to generate and collect the data. This is accessed by subscription and password protected. It would be accessible for 5 years from the date which it is collected and then deleted.

The specific measures taken to ensure the security of information from misuse, loss, or unauthorised access while stored during and after the research project included the information being protected by passwords and guaranteed by the software company which developed the program (www.surveymonkey.com). It is possible for the researchers to monitor when the material is accessed by keeping a log of the use of access dates. The data and program are accessible by paid subscription only supervisors can access. The data would be stored for a period of five years because this is the standard date for research information storage at the University of Canberra.

The arrangements that are in place with regard to the storage of the information collected for, used in, or generated by this project in the event that the principal researcher / investigator ceases to be engaged at the current organization are that the information remains the property of UC as per employment and course guidelines.

5.4 Individual reporting, risk and dissemination of results

No individual data was reported to participants. The research did not produce information that was of a personal significance to individual participants. The research revealed no risk, significant or other, to the health or well-being of persons other than the participant, e.g. family members, or colleagues. The findings of this research will be published in 2014. The confidentiality of participants and their data remained protected during all the dissemination of research results.

Chapter Three. Results

Chapter 3. Results

Results of Global Pharmacy Support Workforce Review

1. Overview

The results of the pilot survey are presented, followed by the Online Survey, and the Comprehensive interview data.

2. Pilot survey results

The pilot study data was collected over four weeks between the 15th December 2011 and 15th January 2012. The survey data was collected over four weeks between 8th March 2012 and 9th April 2012. Seven countries participated in the pilot survey, 66 unique countries were represented in the Online Survey. Of these countries, 4 % completed a version of the survey that was designed for slow internet access. The survey designed for slow internet access was identical in design to the main survey except the questions were arranged on a single page, this meant the respondent had only to wait once for the material to be efficiently accessed online, and once for the answers to be submitted. This significantly shortened the time required for completion in these circumstances. Problems are detailed in Table 5 below.

Table 5. Problems For 7 Pilot Survey countries- New Zealand, USA, Rwanda, Oz, Lao, PNG & Uganda.

Area of Concern	Possible Cause	Possible Solution
Low Completion Rate (57% of survey respondents)	Language problems	-Introduce different versions of survey -Check language with the university's internal Academic Skills Department
Further Low Completion Rate for Competency Section (42%)	Download problems ²	-Shorten survey -Change format -Offer 2 nd link to questions on one page -offer printable/post-able version to overcome IT issues

This table shows the low response, and some of the causal agents identified.

The pilot was a useful tool for identifying errors in the design of the questions. Errors included linguistic problems, and question linking: or the automatic navigation through the survey dependent on answers. The pilot survey also allowed assessment for the content of the survey to make sure the most useful information would be available to the stakeholders at the end.

² Many countries have endemically slow internet access.

3. Online survey

3.1 Completion Rates for Online Survey

Table 6. Completion rates for version types of Online Survey

Version	Responses	Completed Survey	Completion Rate
Pilot	7	4	57.1%
General	157	43	27.4%
Limited access	7	2	28.6%
Facebook	6	1	16.7%
Total	177	50	28.2%

This table shows that the majority of surveys were completed in the original format, and that completion rates were comparable between formats.

Table 7. Respondent Countries

WHO REGION	Countries Who Responded
Africa	Algeria, Botswana, Congo, Ethiopia, Ghana, Kenya, Liberia, Mali, Namibia, Nigeria, Rwanda, South Africa, Uganda, United Republic of Tanzania, Zambia, Zimbabwe
Americas	Brazil, Canada, Guyana, Jamaica, Trinidad and Tobago, United States of America, Uruguay
Eastern Mediterranean	Libyan Arab Jamahiriya, Pakistan, Sudan, Tunisia, United Arab Emirates, Yemen
Europe	Belgium, Croatia, Denmark, France, Germany, Italy, Lithuania, Netherlands, Norway, Portugal, Serbia, Spain, Switzerland, Turkey, Ukraine, United Kingdom
South-East Asia	Bangladesh, India, Indonesia, Nepal, Sri Lanka, Thailand
Western Pacific	Australia, Brunei Darussalam, Cambodia, China, Fiji, Japan, Kiribati, Lao People's Democratic Republic, Malaysia, Micronesia (Federated States of), Nauru, New Zealand, Papua New Guinea, Philippines, Singapore, Solomon Islands, Tonga

This table shows responses represented 66 independent countries from the World Health Organization Member States list of a possible 194 (or 34%). However only 50 countries supplied answers to all the questions in the survey.

3.2 Demographics of the Respondents

A limited number of questions about the respondents demographics were asked. The questions that were chosen were selected as they were deemed to have a potential to influence the interpretation of the results. For example, trends may have been apparent in groups that had been working in their roles for a short time, such as one year, compared with those that had been in their roles for extended time, such as more than ten years. Data on factors such as gender or age were not collated as they were not expected to influence the desired objectives of the study based on the literature search.

Table 8. Self-reported profession of respondents

	Doctor	Nurse	Pharmacist	Pharmacy Assistant/technician	Other
Percentage of Respondents	2.2%	2.2%	70.7%	8.4%	8.4%

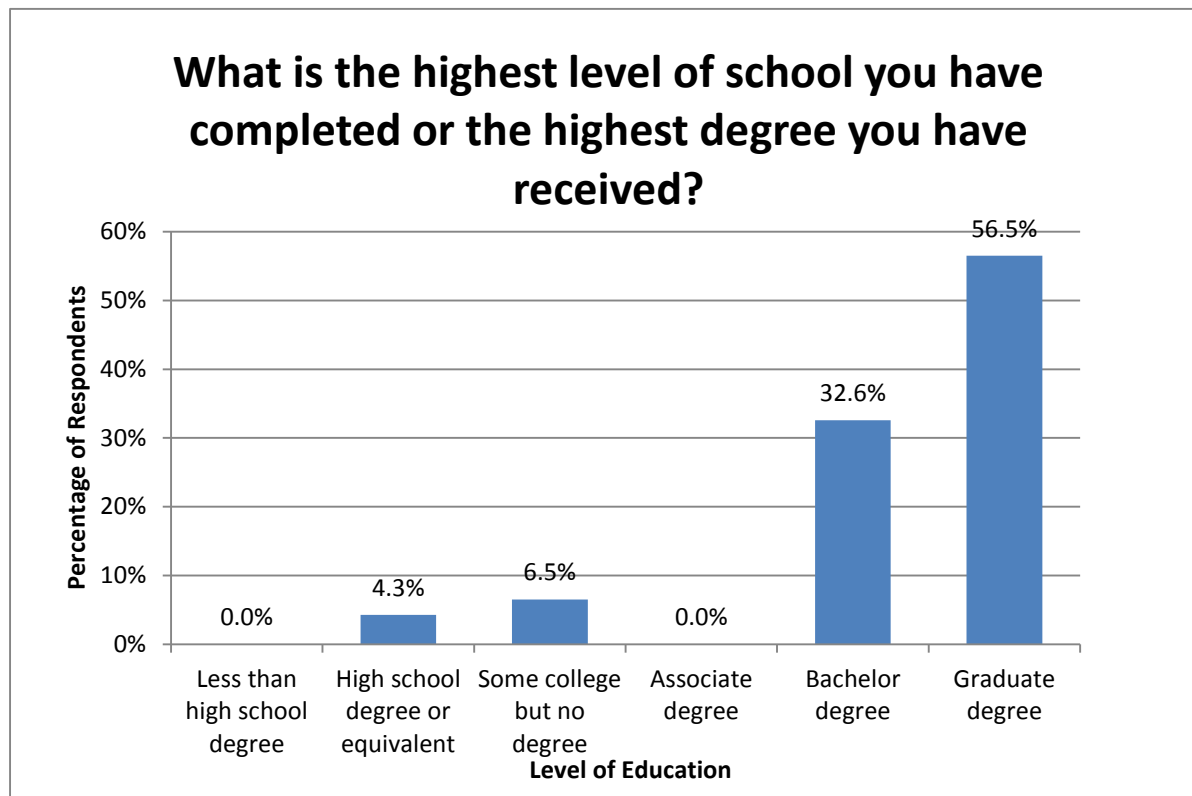
N= 45 for this question. Pharmacists comprised the bulk of the membership for the organisations used to recruit participants.

Table 9. Length of time in present employment

	Less than 1 year	1-2 years	2-5 years	5-10 years	More than 10 years
At your current Facility?	9.1% (4)	11.4% (5)	27.3% (12)	20.5% (9)	31.8% (14)
In your current Professional Role?	8.9% (4)	8.9% (4)	26.7% (12)	13.3% (6)	42.2% (19)

Response count (N=44, N=45) this table shows that many respondents were highly experienced.

Graph One. Levels of Education.



As can be seen the respondents in the sample on average had achieved high levels of education. This may have implications for assuming the levels of comprehension of the survey.

3.3 No Pharmacy Support Workforce in country

Three respondents answered that there was no pharmacy support workforce in their country. Reasons given for this included:

- *“No legal provision for trained support staff”*
- *“Shortage of staff”*
- *“Weakness in clear of job description”* leading to a perception of *“insufficient budget to hire these staffs form government side”* and a scenario where *“storeman, logistics folks or nurses”* may help but *“Most times, you (the pharmacist) are all on your own”*.

3.4 Competency Sets

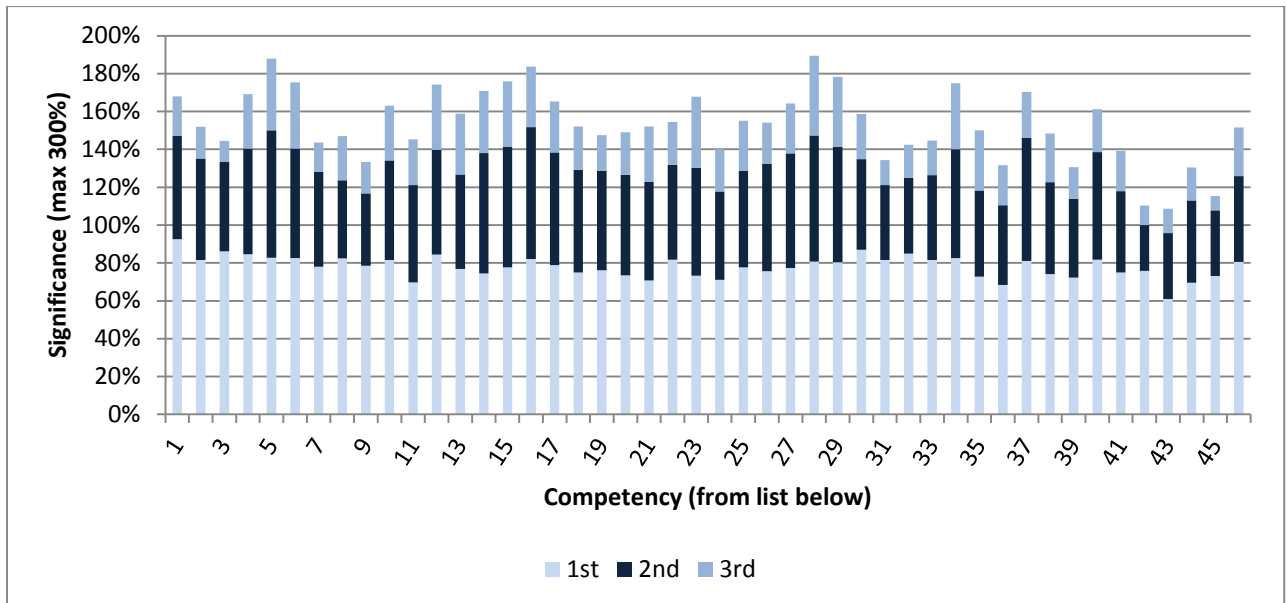
The following set of graphs show respondent opinions for what are the responsibilities of the cadres of pharmacy support staff, in decreasing order of prominence, on a country level for where they are present. They are presented as individual competencies grouped into competency sets arranged in the following four domains:

- 1) Organisation and Management
- 2) Professional/Personal Practice
- 3) Pharmaceutical Public Health
- 4) Patient Care

It is possible to compare between the four graphs as they all have potential maximum values of 300%.

3.4.1 Organisation and Management

This Graph is interpreted by each colour corresponding to the prominent cadres identified by the respondents. The percentage value relates to how many respondents believed that particular competency is the responsibility of the cadre.



Procurement (Stock Ordering)

1. Use the ordering system for obtaining medicines and/or medical sundries from a Central/National Medical Store
2. Use patient and/or facility supply records to determine usage
3. Identify the factors that affect usage patterns of medications and equipment and how this affects ordering (e.g. disease outbreaks), using national policies as a guide and to ensure consistent application.
4. Demonstrate the paperwork and calculations required to order medications
5. Check off orders received
6. Follow up orders not received
7. Use the ordering system for overseas procurement, including a yearly activities schedule
8. Use and monitor the processes for prequalification and tender contracting
9. Demonstrate a detailed knowledge of the national medicines supply information system (Electronic or manual)

Donations

10. Follow the national donations policy referring to national pharmacists for advice
11. Demonstrate the ability to say no to donations that are not consistent with this policy

Storage

12. Layout a medicines/pharmacy store including; the arrangement of medicines according to order form, labelling of medicines, use of stock cards/computerised system
13. Secure the pharmacy store and limit access to appropriate staff
14. Demonstrate appropriate use of, and ability to maintain the cold chain
15. Apply methods of stock rotation (e.g. first in first out or first to expire first out)

16. Store medicines appropriately, including the considerations of temperature, access and cleanliness of the work area
17. Use warehousing skills to organise the supply of medicines and/or medical sundries in large store areas

Distributing to hospital wards and departments

18. Distribute Medicines to Hospital Wards and Departments using a regular system e.g. Imprest system
19. Regularly review Imprest system

Supplying dependent(?) facilities

20. Prepare and use order schedules
21. Order filling priorities in relation to delivery opportunities and urgency
22. Screen orders (Modify order quantities on the basis of available stock, impact on service delivery, distance of facility from hospital.)
23. Assemble, check and pack orders
24. Promote regular, rather than urgent order culture
25. Co-ordinate transport options for order delivery
26. Supply non-government organisations and other individuals who seek assistance for medication supplies

Packing/repacking

27. Safely re/pre-pack pharmaceuticals from large bulk quantities to small patient or facility packs

Record keeping

28. Use appropriate recording systems. (e.g. stock cards, order forms, computer systems (e.g. M-Supply))
29. Demonstrate the appropriate use of computer stock control systems

Disposal

30. Dispose of expired medications and/or medical equipment according to national policy
31. Dispose of specific individual items of greatest risk with appropriate care e.g. oncology medicine
32. Dispose of expired medicines and/or used medical sundries including syringes correctly

Budget and reimbursement

33. Describe the general monetary value of medicines and equipment
34. Manage all resources with care
35. Create and manage budgets as necessary for work (e.g. wages budget, touring budget, stationery budget, project budgets for using NGO funds)
36. Create national budgets for both purchases and organisational costs

Improvement of service

37. Create and use check lists to regularly monitor the activities they are responsible for
38. Plan and conduct supervisory tours of dependant facilities

Human resources management

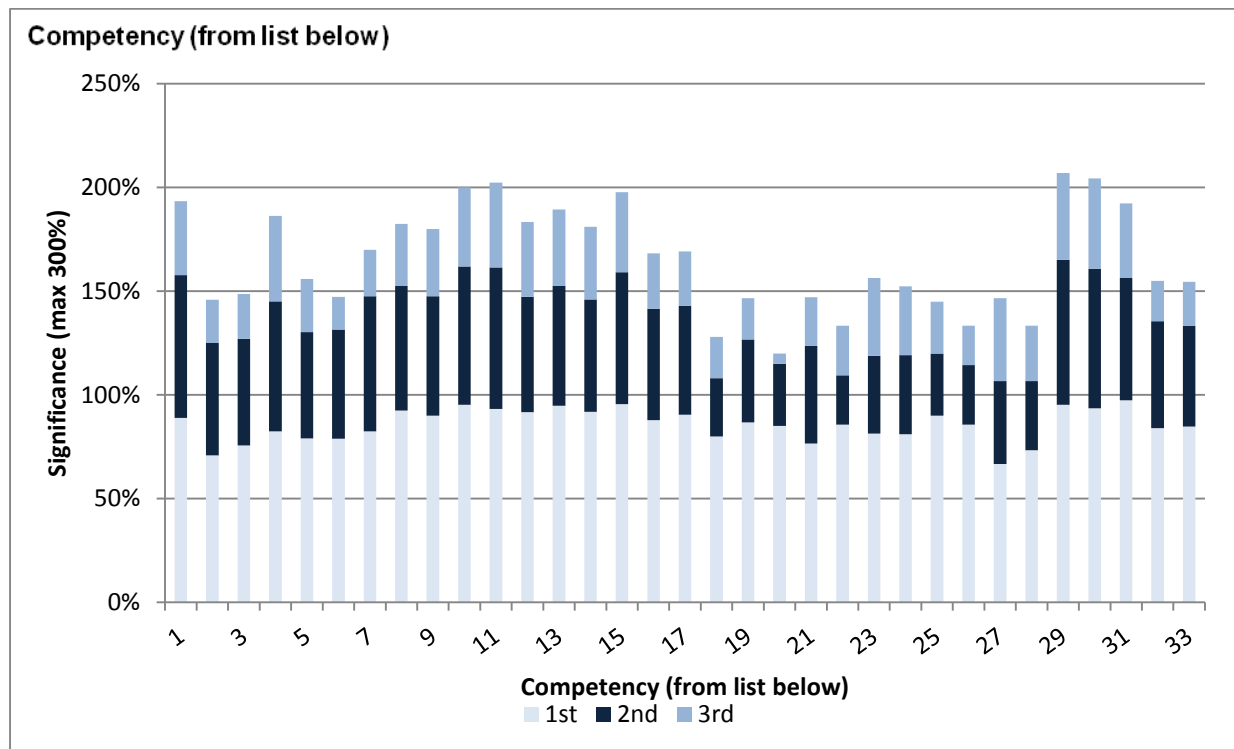
39. Assist in training nurses and other health professionals in the areas of medicines ordering and storage procedures
40. Orientate new staff to the workplace explaining standard operating systems and procedures.
41. Identify and deal with unproductive staff

42. Orientate new doctors to the formulary and the systems and procedures of the medicines supply system
43. Prepare human resource plans to meet the future staffing needs of the organisation
44. Demonstrate the use of a system for staff recruitment, appraisals and monitoring
45. 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

Disaster preparedness

46. Explain the process for dealing with disaster events

3.4.2 Professional/Personal Practice



Communication skills

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

Critical thinking and problem solving

8. Prioritise tasks
9. Work independently to get the necessary work done
10. Use time well to get tasks done
11. Understand the limit of their own skills and abilities (when to try a task and when to refer)
12. Gather information to solve problems
13. Identify problems and consider how to deal with them
14. Follow up problems to ensure they are fixed
15. Ask other people to help with solving problems
16. Take on various responsibilities within the department as the need arises

Continuing professional development

17. Keep up to date in their place of work with input from supervisors

National policy

18. Describe the broad concepts of National Medication Policy, Essential Medicines Lists, Essential Equipment lists, Standard Treatment Guides and “dangerous drug” (DDA) policy
19. Keep up to date with changes in these documents as informed by managers at the national level
20. Use the processes to add and subtract items from the Essential Medicines List and the Essential Equipment list
21. Follow the processes required to alter standard treatment guidelines, dangerous drug policy and national medication policy

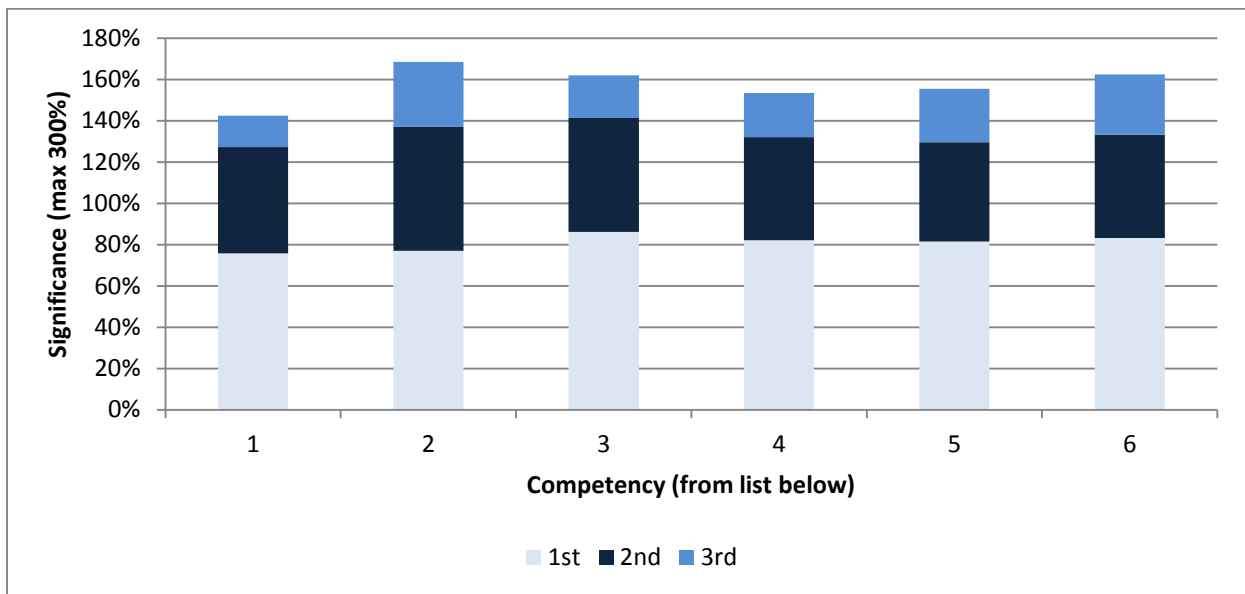
National systems

22. List the legislation that covers the practice of pharmacy and health care and describe its purpose
23. Describe how vertical programs work within the health system
24. Meet the reporting requirements of vertical programs
25. Outline the structure of the health system at a national level and explain this to others
26. Describe the structure of the health system at a provincial/regional level and explain this to others
27. Describe the regulatory requirements and procedures for the importing and exporting of medicines
28. Design and implement national quality assurance processes for all systems to guide improvement

Professional and ethical practice

29. Follow all standard operating procedures
30. Work in a safe and legal way
31. Accept responsibility for their own work tasks and performance
32. Contribute to the professional development of others
33. Practise pharmacy within the cultural framework of the country using both western and local principles

3.4.3 Pharmaceutical Public Health



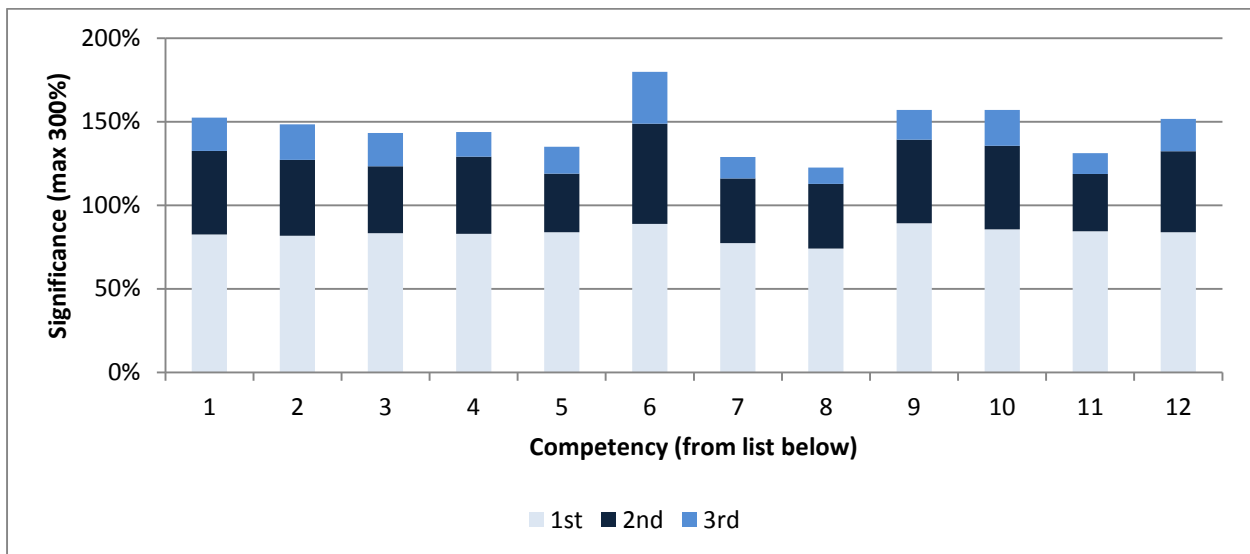
Medicines information and advice

1. Counsel patients when handing out medicines, including explaining the main adverse effects and special considerations for individual medications, including storage and food requirements
2. Supply non-prescription medicines, therapies and diagnostic aids to meet the patient's needs
3. Follow country based treatment guidelines and to ensure the appropriate use of medicines
4. Keep up to date with standard treatment guidelines

Health promotion

5. Assess the primary healthcare needs of patients (taking into account the cultural and social setting of the patient)
6. Communicate lifestyle changes to aid patients in managing various diseases

3.4.4 Patient Care



Patient consultation and diagnosis

1. Identify issues with medicines, dose forms and methods of administration that need to be discussed or referred to a pharmacist
2. 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

Dispensing

3. List which medicines are allowed to be prescribed by different prescribers and how to monitor this
4. Safely supply medication to patients considering packaging, storage and labelling
5. Identify which medicines are especially dangerous and need more care when dispensing

Medicines

6. Identify medicines by their generic name
7. Describe the way medicines work; their use (how much, how often and for how long) and their main adverse effects and cautions
8. 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

Medical equipment and sundries

9. Describe how individual pieces of medical equipment are used, noting personal and patient safety
10. Identify when to dispose of medical equipment or sundries
11. Explain to patients how to use any equipment given to them for their care
12. Maintain equipment supplied by pharmacy and use any existing maintenance support network

4. Terms Used to Describe the Pharmacy Support Workforce

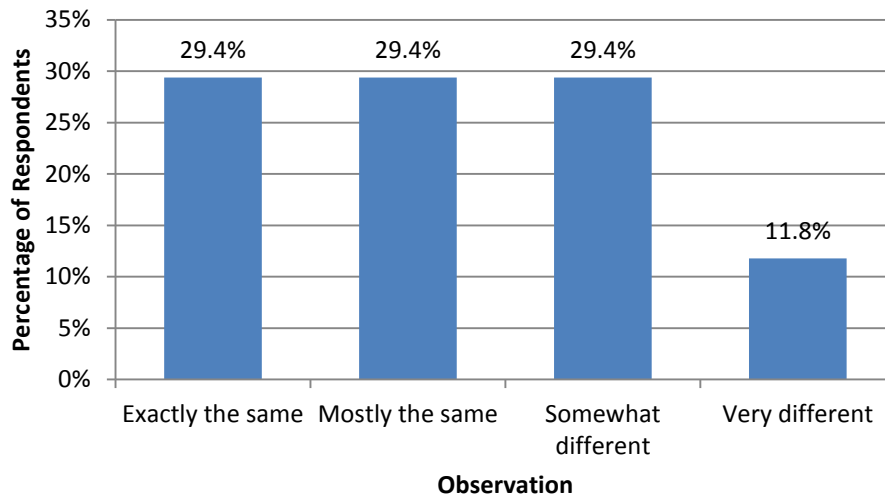


The tool used to create this picture or “cloud”, works by analysing and representing the word frequency of text. The larger and darker words represent those occurring the most often in the results. There are 100 of the 173 terms collated displayed in this graphic. Although some results appear familiar most research databases would require separate search terms to capture all information.

Options set as English language, Maximum number of words shown is 100, minimum frequency of words is 1, and separate graph showing numbers for frequency, similar words are grouped (e.g. learned, learns, learning – learning). The same graph with the numerical frequency displayed is in the appendix (Steinbock, 2012).

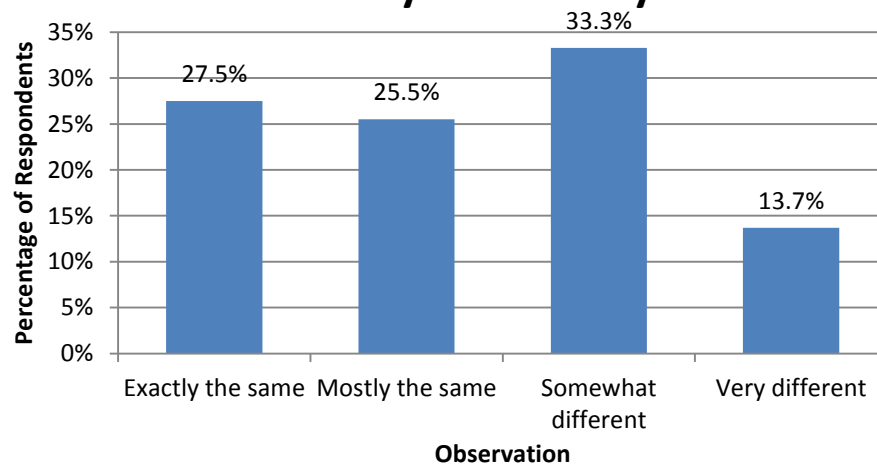
5. Open Style Questions

Is there a difference in the overall EXPECTED COMPETENCIES of Pharmacy Support Workforce cadres in URBAN and RURAL areas in your country?



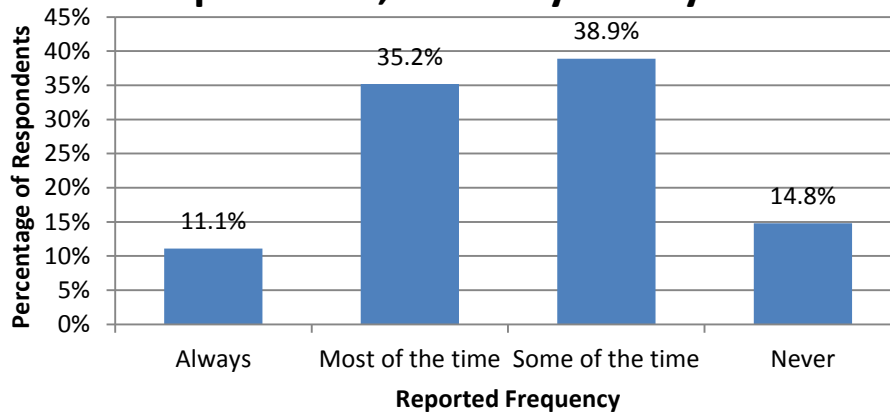
This graph shows a uniformity of expected competencies for Pharmacy Support Workers within countries.

Is there a difference in the overall SUPERVISION LEVELS of Pharmacy Support Workforce cadres in URBAN and RURAL areas in your country?



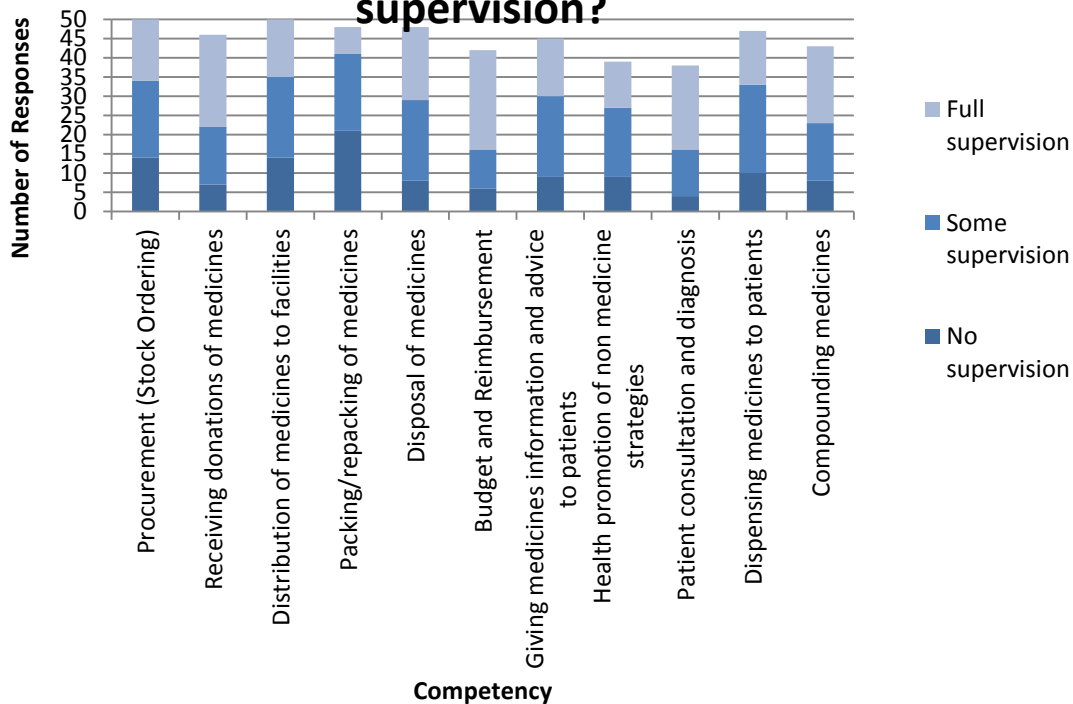
This graph shows some variation in opinions regarding supervision levels of Pharmacy Support Workers between urban and rural areas within countries for approximately half the workers.

Does the pharmacy support worker work independently, without face to face supervision, on a day to day basis?



This shows about One in ten Pharmacy Support Workers work without any face to face supervision, and that most complete some tasks autonomously.

What are the main competencies the Pharmacy Support Worker requires supervision for?



This graph shows a greater level of supervision for 'Budget and Reimbursement', and a lower level for packaging medications.

Who Supervises Pharmacy Support Staff?

[area manager](#) [assistant pharmacist](#) [chief pharmacist](#)
[chief suppliers officer](#) [clinic manager](#) [deputy minister for curative medical sector](#)
[district pharmaceutical facilitator](#) [division of primary health care](#) [farmaceutico](#)
[head of department](#) [health officer](#) [hospital administrators](#) [lead logistics unit manager](#)
[manager of a department](#) [medical director](#) [medical doctor](#) [medical officer](#)

[nurse in charge](#) **pharmacist** [pharmacy technician](#)

[principal pharmacy officer](#) [registered pharmacist](#)
[remote supervision from regional pharmacist](#) [senior officials from the ministry](#)
[senior technician](#) [supervising pharmacy assistant](#)

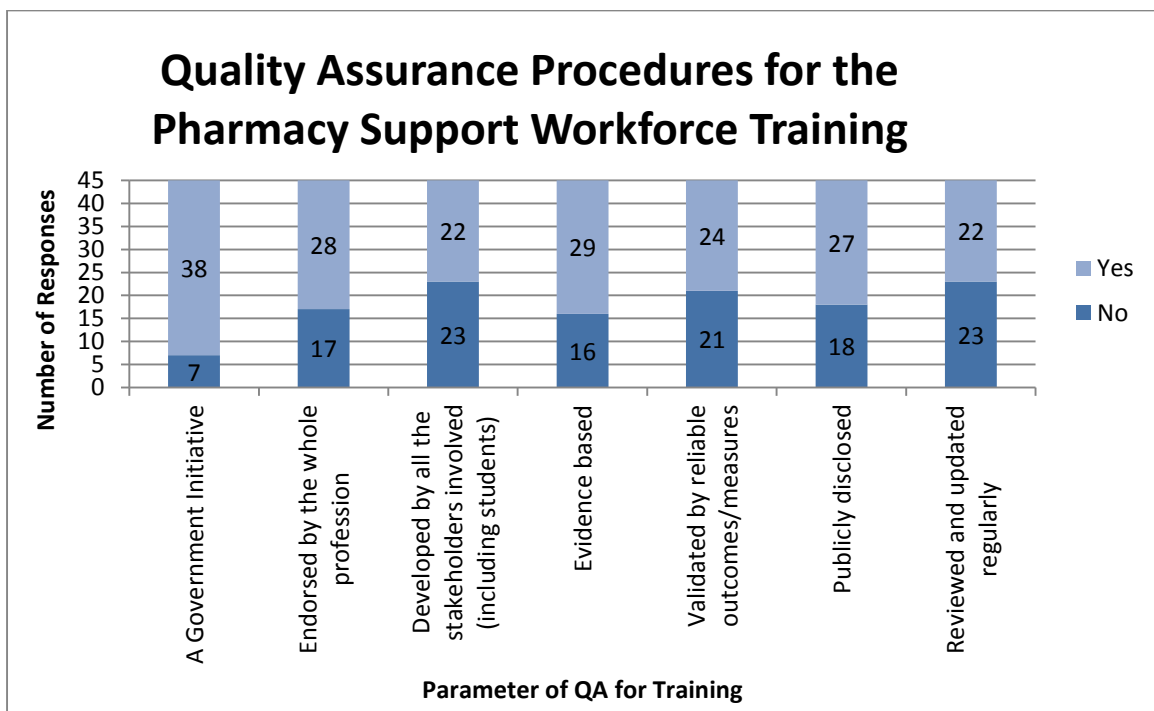
As can be seen, the most prevalent supervising figure for the Pharmacy Support Workers is a pharmacist.



This graph shows a strong trend for growth in the size of the Pharmacy Support Workforce.

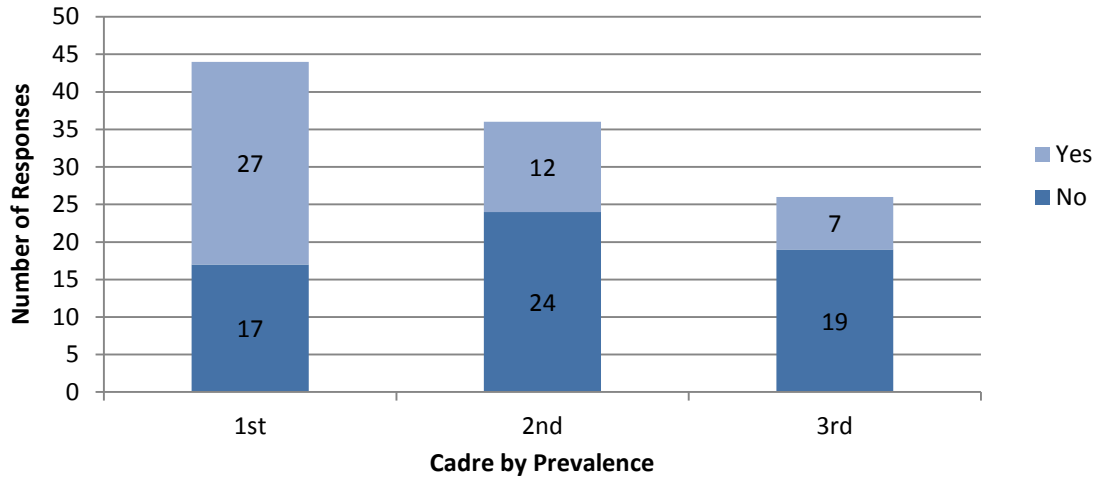


This graph shows around one third of respondents have some level of dissatisfaction with training.



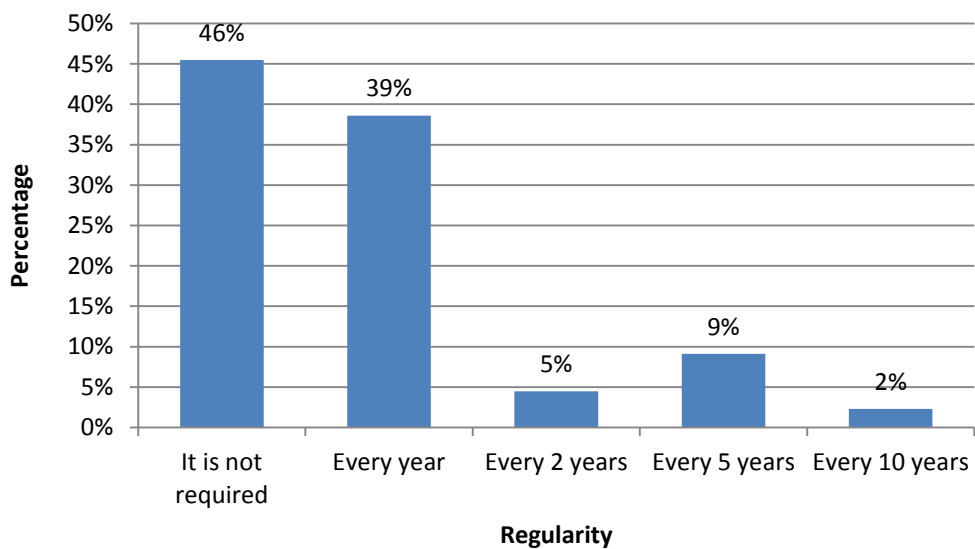
This graph shows that where QA is present, processes are predominantly Government Initiatives, evidence based, and endorsed by a majority of the profession.

Do the cadres identified need to be registered by the government in order to work?



This graph shows that a majority of the predominant Pharmacy Support Workers within countries are required to be registered by their Governments.

How often is re-registration required?



This graph shows a strong trend for re-registration not to be required.

Comprehensive Interview Results

6. Overview

The findings from this phase of the research are presented in the sequential order in which the phenomena were identified. In depth questioning regarding specific competencies was not conducted as this was covered extensively in the online survey and it was not found to be practical to include the subject in a semi-structured, open question style interview.

Following on from the main themes identified in the online survey, the major themes are:

- 1) Training
- 2) Registration/regulation
- 3) Main issues for the pharmacy support workforce in your country.

Eight comprehensive interviews ranging from forty to sixty minutes in length were conducted over land line telephones. These represented seven different countries. Four of these countries were high income countries, one middle income and two low income countries: however three of the responses were for low income countries.

Aside from a major difference in managing and obtaining stock for the low income countries the issues identified in theme 3 were remarkably universal. These were the newness of up-skilling and regulating workers and discovering what this change meant, as well as issues with implementing training particularly in remote areas and in the continuing professional development context.

Quite a simple questioning structure was used with open questions and the interviewer was not required to prompt very often or relay any long or complex questions or examples. Presented now for interpretative validation are the questions as they were asked, with the main response, a short description of how the text has been interpreted, and the number of answers agreeing with the theme (with a maximum of N=8.)

Inductive reasoning was used in the preliminary analysis of the results: this is the initial and unavoidable decision of what to present here. There were not defined preconceived ideas about what would be occurring or particularly how people felt about what is occurring.

6.1 Registration/regulation

Q. Is the pharmacy support workforce registered in your country, please outline the situation?

N= 3 responded that registration is not occurring (all 3 are low income countries)

“We are still building registration. Some pharmacists and pharmacy workers are starting to have registration numbers. The main challenge is finding trained staff to run programs. They are at low levels, there are few graduates.”

“The council hopes to start registering workers in about four years. This would allow us to regulate the numbers, introduce CPD and keep track of workers.”

Where registration was not yet occurring people were still acutely aware of what registration was, and thought the concept of registration was a good thing, and its implementation represented advanced and efficient workforce management. Access to, and availability of, CPD in the future would need to be considered where countries decide to adopt registration.

N = 5 for registration is occurring

“Only technicians are registered but we hope to extend this to assistants soon.”

“Yes anyone working as a health care provider in any capacity must be registered in our country, it does not yet require renewal.”

The occurrence of registration was indicated for all high and middle income countries. People did not willingly offer opinions on why registration would occur but appeared to unquestioningly regard registration as a good thing. Registration of support workers was a new occurrence for all surveyed countries being only a couple of years old at best.

Q. Is re-registration required? How often? What are the requirements for re-registration?

N= 3 for re-registration is occurring (all high income countries)

“Registration is now compulsory since the 1st July 2011. It must be renewed each year. The process is the same as for pharmacists: they must achieve the standards set by the regulator. We check fitness to practice cautions or issues, and Continuing Professional Development within a framework the same as pharmacists.”

Registration was a very new concept for support staff from all those interviewed. Re-registration was an even newer concept. Re-registration was regarded more favourably but with more in trepidation as to what was the best way to implement it.

N= 2 for re-registration does not occur

“Registration does not need renewal, either for pharmacists or pharmacy support staff. My professional association would like to change this.”

The idea of re-registration was favoured by the majority of respondents, even where it was not yet in place. Re-registration was found to be even more popular than registration. Although there were concerns about access to, and implementation of, ongoing education and training. The remaining 3 did not have registration.

Q. Do you think registration is a good thing? Or how could it be improved?

N=3 opinions on registration N=4 registration is good N=1 registration is not good

“I think it is a good idea, we will know how many there are and where they are, so we can move them. Currently only the Ministry of Health knows where they are.”

“I think compared to other countries, I often question what the advantage of registration is for me as a pharmacist and the only answer I can see is the key to a shop. So for ancillary staff, I don’t know that registration is important rather than a peer reviewed system of them taking a position. I don’t really see the point of registration.”

Only one viewpoint strongly questioned the value of registration. There was universal acceptance of registration as a fundamental tool for basic workforce planning. Continuing professional development was highly valued but access and implementation issues were flagged as potentially difficult to implement and maintain.

Findings for Registration

- Registration appears universally to be a fairly new concept for support workers.
- Registration is generally a well-accepted concept.
- Registration is important for managing the workforce and continuing professional development education.
- Registration may be difficult, time consuming and resource heavy to implement initially.

6.2 Training

Q. Please tell me about the minimum levels of training for the pharmacy support workers in your country? (The subtitles in the following table were used as prompts.)

Responsibility for Paying for Training	Length of Training	Pre-requisites for Training
Expected to be Government and NGO's	No pharmacy support staff yet, hope to start soon	NA
Government – funded on an as needed basis	Two days then on the job	Some High School
NGO's	Three to four weeks from NGO	High School
Individual pays for training. There is a tendency for shorter colleges to be privately run and more expensive.	One to two years at college, college programs differ but everyone sits the same exam at end	Shorter courses may have many pre-requisites. All courses are subject to the same national accreditation procedures.
Government funded	8 weeks residential then two years on the job	Some High School
Either the government for hospital situation or the employer for community pharmacy.	Two years Vocational	Minimum skills in literacy and numeracy, no formal qualifications is possible.
Predominantly Government funded with contributions from employer in community pharmacy and small from individual	Two years and one year on the job (training is not compulsory)	High School
Government funded – individual makes a contribution for food and accommodation. This is supposed to be paid upfront but can be deferred. Student then owes 1 year of national service at low pay for their level of training.	Three years at college *please note there is a six month course in this country for assistants to work under the supervision of a pharmacist only in the private community sector.	High School

N=8 HIC MIC LIC

There is considerable variety in the training which occurs for the pharmacy support workers in the countries that were surveyed. Although, there is a trend for the situation to be reasonably consistent across national income groupings with the length of training correlating with availability of resources. A striking consistency exists for recognition of the value of basic literacy and numeracy for work associated with pharmacy.

Some variation exists but governments appear to hold much responsibility for the costs of training in relation to the Pharmacy Support Workforce in most countries regardless of income status.

Q. Are you satisfied with the training that occurs for the pharmacy support workforce in your country?

“The training is good because we have no pharmacists so it helps to manage the commodities.”

“There are many overseas funded programs for immunization, malaria, HIV, leprosy and diabetes. The expectation is that we will be skilful enough to run these: and we need to take this on board developing training.”

“Our pharmacy support staff are highly trained and can do much more than those in other countries without supervision.”

“For Pharmacy Technicians: the minimum expected training is nothing. We have a real problem in pharmacy it is not highly valued and whoever is around is in charge of the pharmacy. If someone said they wanted to be a pharmacy technician everyone would wonder what that is.”

High income country – remote area.

“Our curriculum is strong: we have every aspect of pharmacy being taught. Although, there is not much patient orientated clinical pharmacy.”

“Basic numeracy is fundamental, for pharmacy you can have the best drugs but need to know the dose.”

Although most respondents indicated they were happy with training for the pharmacy support workers in their country many saw room for improvement. This may partially reflect the nature of the respondents having a vested interest in participating in the research project. For developing countries there was a high need to be able to implement overseas sponsored vertical programs. All countries recognised the basic literacy and numeracy skills needed in a dispensary and most felt roles were shifting to a more patient centred responsibilities.

6.3 The Main Challenges for the Pharmacy Support Workforce

The following eight sub themes were identified in all responses. However, two exceptions to this are the first set “Practical Work Issues” which was in all responses from the low income countries. And the second set “Rural and Remote Issues” which pertained to all the low income countries, as well as a response from a remote area of a high income country.

Q. What are the main issues for the pharmacy support workforce in your country?

6.3.1. Practical work issues

“The challenges are stock outs of commodities and sometimes the expiry of products. This can be improved by enhancing health commodity management.”

“Drugs have a use by date so to make these available at the service delivery points and clinics we need strong infrastructure to make this happen. To strengthen the rural issues the pharmacy officers have this responsibility.”

These issues were unique to developing countries.

6.3.2. Rural and remote issues

“The situation for the remote parts of the country is very different to the cities and is on the low side of quality. Quality use of medicines is having the drug there, having a handwritten label and recording supplies. Electronic systems are improving recording. Drugs are always available as community pharmacies are paid on dispensing. So there is no problem with drugs being on the shelf, just once it is dispensed. It is like a third world country when it comes to medicines. I am highly dissatisfied with training.”

“Technicians are the backbone of pharmaceutical services in our country due to the geographical structure of the land. Hospital services are widely spread out and there are not many pharmacists so the departments are looked after by support workers.”

These issues were present for all the geographically large or complex countries surveyed. There were definite perceived inequities in service and development opportunities.

6.3.3. Training issues

“There are challenges with financial means: there is only one university with a training program in the country. It is not formally accredited. We lack pharmacists in the country as they finish the degree and leave to other countries, this means education standards fall across pharmacy.”

“The major issue is up-skilling of our officers, who are trained in drug supply and dispensary work but then have to understand management for vertical programs. These are growing strong, many overseas companies are becoming involved they are looking to us and expecting us to have skills to push the programs through.”

Unique to developing countries were the needs associated with running donor or vertical programs. Universal to all was the perception that pharmacy was changing as a profession to a more patient centred role particularly in regards to enhancing compliance for medications.

6.3.4. Progression

“The technicians biggest issues are professional progression there is no specific career path after a number of years many go back to school to become pharmacists, they don’t see the point of being a technician for life.”

“I think the main issue is that there is a good system here as an established education system but now we have a statement from the government that we are trying to provide lifelong learning as well as assist in increasing the number of individuals moving from secondary school to higher education. I think this is a good thing.”

This was a complex issue and answers may have been partly shaded by the respondent’s decisions to participate. Answers indicated a sympathy for certain but not all workers who

may not have been given opportunity to become pharmacists but who were hard working and dedicated.

6.3.5. What does regulation mean?

“Technicians are a new profession there must be work on what that means for the pharmacy workforce. Pharmacists were traditionally reluctant to delegate tasks and there is now a new and regulated profession. Everyone is trying to figure out what that means and adapt to do more clinical work.”

“I think the challenge is adjusting to regulation what that means why it needs to occur and understanding the difference between being delegated work by the pharmacist and being an independent autonomous worker with their own responsibilities.”

“Regulation will allow us to plan the workforce more efficiently. There is a current challenge because no registration means few statistics.”

This was a dominant theme in the results across all country types, although it was clear initially that regulation meant registration which allowed workforce planning. Issues then arose over how much responsibility and autonomy workers should have.

6.3.6. Implementation

“There were issues when introducing registration. There was a total overload and it took several months to clear the backlog of applications.”

“In order to introduce registration, there are two ways to demonstrate competency during this period we are transitioning. All the folks who were out there working had the chance to come forward and do a bridging program, this allowed them to demonstrate through national exams their skills a pharmacy technicians. The other way, and the new way which will be the only way in the future to demonstrate competency: is to complete a nationally accredited training program, take the national exam and get registered.”

“Many employers are supporting long term staff financially to do training and register in the future when training is compulsory the staff will pay themselves.”

Implementation of registration was seen to be an enormous task, particularly by those where it had already occurred.

6.3.7. Pharmacy is evolving

“Due to the government recession and aging population, policy now dictates that medicines should be used more effectively. There is increasing evidence that medicines are not taken at all or taken improperly, so this agenda will cause a need for education to adapt.”

“We need more data on compliance. Compliance relies on people being educated, and this means more pharmacy workers. The way pharmacy is funded will help shift this priority, by not just rewarding dispensing.”

The notion of pharmacy changing is prominent on the agenda of the FIP and from the results of this survey appears to have filtered into stakeholders opinions on the role of the pharmacy support workforce also. This well documented phenomena alters the needs for training and education and was widely recognized across all countries.

6.3.8. Professional organisations

“A pharmacy specific council overseeing training and accreditation will do a better job than the Ministry of Health and we hope this will begin soon.”

“The professional organization has just purchased a training program to provide training to technicians. We have a lot of hope that this will be a good thing. This will give us a national framework for all workers to do the same thing.”

This sub-theme was unexpected and only identified because of its ubiquity across all responses. Even countries that did not have professional organizations or highly active units were exceptional in their esteem for the value of industry specific bodies in promoting and advocating for all pharmacy education, regulation and training needs. For countries that had efficient entities there was an unquestioning belief that these organizations knew the “best thing to do” and could be relied on unequivocally to act in the best way for pharmacy. Professional organizations were found to be integral to good pharmacy practice, where the expectation in the background was that Governments would be much more influential.

7. Summary of findings

- Registration is very new, it is not clear what its implications will be.
- Inequalities exist between rural and metropolitan areas and lower cadres feature in solutions.
- Regulation allows workforce planning.
- Increasing skills allows greater autonomy, this seems to be fairly well accepted but happening widely.
- Implementation is the biggest challenge when moving to a competency framework.
- Professional organizations are highly valued.
- Pharmacy is evolving.
 - Pharmacy is changing to a more patient centred profession.
 - The main challenge for developing countries continues to be basic issues with stock management. Pharmacy is a procurement and logistics based job where resources are constrained. There is a high need for management training in these countries to deal with vertical programs.

Chapter 4. Discussion

Chapter Four. Discussion

1. Overview of Discussion

This chapter will attempt to analyse the findings presented in the results chapter by making both comparisons, and interpreting the observations with, the research literature described in the Introduction chapter.

Specifically, the issues discussed will include:

- Where and how medicine supply workforce are educated and trained. Rural and remote regional variations in practice for the workforce are detailed, particularly for trends in both the perceived levels of supervision and expected competencies
- Accreditation and regulation of the education and training programmes for this cadre.
- Regulation in terms of licensing, certification and legally defined scope of practice.
- Regulation of the workforce as a tool for workforce planning.
- The obligations of registration including Continuing Professional Development (CPD).
Registration as a novel phenomenon: and the issues that arise in implementation of a registration system.
- The range of 'titles' given to the positions involved in supplying medicines in public, and private, systems: both the effects, and extent, of up-skilling workers will be examined.
- Articulation of each cadre, with roles and responsibilities as well as training identified. This will include contrast and comparison between countries.
- The advantages of Competency Frameworks, including that by design they inherently possess quantifiable indicators for measuring progress in capacity building for a workforce.
- The changing nature of the pharmacy profession globally will be further contextualised for its effects on pharmacy support workforce.

The results also show an issue which was not widely described in the literature and was therefore absent from the Introduction Chapter of this thesis. This was the respect, trust and

value placed on professional organizations for their perceived ability, capability and aptitude for assuming directorship over education and training for the entire pharmacy workforce including support workers. It is noted that one of the major findings from the FIP 2012 Global Workforce Report states the clear importance of professional associations as recognized by stakeholders for advancing the pharmacy workforce.

2. Overview of the Online Survey

The survey methodology appears to have been an effective tool for scoping prospectively the specified parameters of the Global Pharmacy Support Workforce. These parameters consisted of the following core aims:

1. Collecting the terms in use for the pharmacy support workers
2. Identifying the training which occurs on a country level
3. Defining the basic responsibilities for the pharmacy support workforce

Statistical validation of the results was not possible in terms of the response rate as the denominator was unknown. Regardless of this limitation is possible to make some assumptions regarding accuracy and representativeness, as the seven geographical regions of World Health Organization were all represented, as well as a high proportion of WHO member constituent countries. Additionally as is traditionally accepted for a marker of rigor in qualitative research, prominent themes emerged to a point of saturation for most research questions (Morse, J 1994, O'Reilly and Parker et al, 2013, and Meyrick, J 2006). Later, the second phase of the project further validated the Online Survey as a strong correlation for the main findings displayed.

2.1 Perceived effectiveness of the Online Survey

1. The terms for pharmacy support workers were documented and presented.
2. The training which occurs on a country level was collated yielding rich and extensive qualitative data. The general trends have been deducted and presented in the thesis, however a great deal of further analysis of the raw data would have been possible to identify micro-trends, cross reference results and examine trends within different sub groups. This was considered beyond the scope of this project due to time constraints.
3. Defining the basic responsibilities for the pharmacy support workforce was achieved. On reflection, the structure of the question designed to answer this particular aim may have been improved. This is because results had the potential to be accurate but not precise. The findings reflect what individuals define as important responsibilities rather than yielding data for what would be ideal responsibilities. This is confounded further by the potential for responder bias as the demographics of the respondents indicate they are mostly pharmacists, and their voluntary participation shows a potential for bias because of knowledge or interest in education and training issues. The results are less applicable to the question of what is actually occurring for the cadres on national levels than what is desired.

The survey was rigorously developed; peer reviewed, executed effectively within the timeframes and financial budget and appeared to be an effective tool for assessing the pre-specified parameters of the Global Pharmacy Support Workforce. The survey may have been improved by offering it in a greater number of languages and minor changes to the formatting of a small number of questions to give further clarity on the direction of the answer.

2.2 Pilot survey results

The pilot survey was an effective tool for validation, peer review and to incorporate stakeholder feedback. It was possible to evaluate the effectiveness of the survey for breadth of content, question structure and formatting before it was deployed. The pilot also made it possible to have an insight into how the results would look for the online survey phase of the project which helped with general planning and time management for the project.

The pilot was validated within seven countries with selected respondents who were recruited as they had a strong interest in the field of Pharmacy Support Worker education and training. There is a potential for this to have contributed to responder bias, for example there was an elevated motivation to participate. However, the results were found retrospectively to support the main findings. The pilot study led to incorporating changes to address the low completion rate due to both language problems, and technical access problems to improve the main survey.

2.3 Completion Rates for Online Survey

A great number of countries exhibiting a diversity of cultures, from widely ranging income statuses, and geographical locations participated in the online survey. The response rate made a favourable comparison to the International Pharmaceutical Federation Global Pharmacy Workforce Report for 2012 who recorded responses for ninety countries, an increase of fifty six countries since its equivalent project in 2009.

The number of respondents who began the survey that completed the survey averaged at 28%, this is a modest and fairly acceptable number for an online survey of this length with no tangible incentive offered for participation (Sheehan, K.B. 2001; Asch, D.A. et al 1997; Meštrović, A. et al 2011).

2.4 Demographics of Respondents

Pharmacists were highly represented as respondents, 70% of total respondents. This was anticipated as the area of interest was workers who support pharmacists. It was initially postulated that a greater number of nurses would reply but this group formed a negligible component of the survey population. This may reflect the interests of the stakeholders in the issues rather than the situation of daily practice and which workers actually are in contact with the Pharmacy Support Workforce and their education and training scenarios. This may

also reflect the availability of internet access for respondents. An interesting phenomenon observed for the online survey respondents was the length of time spent in both their current role and current facility. This was fairly long averaging at five to ten years. The sample was also highly educated this would correlate with an interest in the subject material being fairly academic or pitched at a managerial level. The FIP 2012 workforce report recruited 120 contributors, representing 90 countries working in pharmacy professional and regulatory bodies, schools of pharmacy, research centres, agencies, and pharmaceutical service providers; they were also offered no incentive to participate. Participation in this survey involved less commitment, as it was not necessary to obtain and validate the data given in responses as stringently.

2.5 No Pharmacy Support Workforce in Country

The background literature review to this research revealed that a number of countries do not have distinct cadres recognisable as a Pharmacy Support Workforce. The reasons for this are multi-factorial and include workforce shortages as well as regulation against lower cadres (Anderson, C. 2008; Dal Poz, M.R. et al 2006). The survey results identified a small number of these nations (N=3); the prevalence was in accordance with instances gleaned from the literature where it was documented there was no Pharmacy Support Workforce (FIP, 2012).

Where there was no Pharmacy Support Workforce, there was a perception that other cadres provided help in some instances with pharmacy work, but this did not occur on a regular or structured basis. Additionally it was flagged that a clear job description for a lower cadre would allow application to funding sources in order to obtain pharmacy support workers: this was framed as a popular scenario and desirable for workforce planning. A competent, supported healthcare workforce is fundamental to developing a robust healthcare system in order for patients to have access to the best possible levels of care (Fulton, B.D, et al 2011).

2.6 Competency Sets

Participants did not fully engage with the Competency Section of the survey. The author believes this was because it was poorly designed. The questions were asked in sets and the respondent was asked to tick a box on a scale in order to value the importance of the task. Completing this section was intensive due to considerable amounts of reading and the use of language that was not plain English. The design of this section was selected as it meant the research could directly be utilised in other research conducted by one of the supervisors of this project. Poor completion was most likely to occur since the overall completion rate fell at the beginning of the section, the response rate partially improved immediately after the section.

Research has found that cadres of health care workers with lower skill sets are most likely to be useful when they have a specific intervention to deliver. Competency sets when collected within Competency Frameworks provide a simple tool to articulate these requirements. Where workers with lower skill sets substitute for professionals by providing care at a level closer to consumers health care system costs may be lowered, however the evidence base to support this claim is currently lacking (Lim, Z. et al 2012; Zachariah, R. et al 2009). Competency frameworks provide effective indicators in order to measure progress for these aims. Many vertical programs for a range of health issues utilise these tools, for example the delivery of home care for people with HIV/AIDS (Loewenson 2004). Research is needed to evaluate the effectiveness of pharmacy support workers in comparison to professional health care providers in delivering interventions for health education, promotion and management of disease (Lewin, S.A, et al 2006).

To further strengthen the evidence base for competency frameworks for pharmacy support staff rigorous design should be used, as well as testing and verification to evaluate the programs. Primary outcomes need to be prospectively specified, the usefulness of measuring a large number of related outcomes should be considered, the training and support strategies should be carefully described and health care organisation and system issues should be identified. Additionally, the opportunity for malfeasance or possible harms from the

interventions should be assessed. Cost effectiveness analysis should always accompany the assessment of interventions to determine economic feasibility. Established competency sets allow benchmarking to ensure the appropriate training activities are conducted within a balanced design incorporating these features (Mills, E. et al 2008; Coombes, I. et al 2010; Bruno, A. et al 2010).

The competency sets were adapted from work by Andrew Brown of the Department of Pharmacy at the University Of Canberra, Australia. The competency sets have been validated in multiple countries particularly in the Pacific Islands where pharmacy support workers make up the bulk of the pharmacy workforce (Brown, A. et al 2011).

2.6.1 Organisation and Management

The five most highly valued competencies in this domain were:

1. **Record Keeping:** Use appropriate recording systems (e.g. stock cards, order forms, computer systems.)
2. **Procurement (Stock Ordering):** Check off orders received
3. **Storage:** Store medicines appropriately, including the considerations of temperature, access and cleanliness of the work area.
4. **Record Keeping:** Demonstrate the appropriate use of computer stock control systems.
5. **Stock Control and Review:** Apply methods of stock rotation (e.g. first in first out or first to expire first out.)

As can be seen the tasks that rated most highly in this domain are components of established systems and do not require significant amounts of autonomous practice. The tasks have accountability systems built in. This group of tasks all aim to increase efficiency and accountability while attempting to reduce costs (Adams, A.J. et al 2011).

The five **least highly valued** competencies in this domain were:

1. **Human Resources Management:** Prepare human resource plans to meet the future staffing needs of the organisation.
2. **Human Resources Management:** Orientate new doctors to the formulary and the systems and procedures of the medicines supply system.
3. **Human Resources Management:** 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.
4. **Human Resources Management:** Demonstrate the use of a system for staff recruitment, appraisals and monitoring.
5. **Human Resources Management:** Assist in training nurses and other health professionals in the areas of medicines ordering and storage procedures.

There is a clear trend for tasks involving the supervision and training of others **not to be valued for the pharmacy support staff**, this contrasts sharply with the top five favoured tasks in this domain that were orientated to stock and practical issues (Anderson, C. 2008; Anderson, C, and Whitmarsh et al 2012). This may reflect hierarchical attitudes implicit in health workforces. Levels of autonomy appear to correlate with levels of training, it is further explored later in the qualitative analysis. Efficient human resources allocation and planning, needs to delineate which tasks require either intuitive, or high level communication skills, and which tasks involve merely following a protocol.

2.6.2. Professional/Personal Practice

The five most highly valued competencies in this domain were:

1. **Professional and Ethical Practice:** Follow all standard operating procedures.
2. **Professional and Ethical Practice:** Work in a safe and legal way.
3. **Critical Thinking and Problem Solving:** Understand the limit of their own skills and abilities (when to try a task and when to refer.)
4. **Critical Thinking and Problem Solving:** Use time well to get tasks done.
5. **Critical Thinking and Problem Solving:** Ask other people to help with solving problems.

A trend is again observed for value placed on tasks that are not highly autonomous, and require following protocols. Higher level reasoning is required only at its most basic level, not particularly requiring complex planning or analytical problem solving (Frenk, J. et al 2011).

The five least highly valued competencies in this domain were:

1. **National Policy:** Use the processes required to alter standard treatment guidelines, dangerous drug policy and national medication policy.
2. **National Policy:** Describe the broad concepts of National Medication Policy, Essential Medicines Lists, Essential Equipment Lists, Standard Treatment Guides and “dangerous drug” (DDA) policy.
3. **National Systems:** List the legislation that covers the practice of pharmacy and health care and describe its purpose.
4. **National Systems:** Describe the structure of the health system at a provincial/regional level and explain this to others.
5. **National Systems:** Design and implement national quality assurance processes for all systems to guide improvement.

These are jobs that require applying knowledge. There appears to be a trend for knowledge to need to be local rather than extensively authentic on a macro level. This reflects the findings in the introduction that health care systems are **needs based**, with national demands being diverse and complex, varying both between and within countries. The trends seen here also illustrate the notion that patients are individual components of the health system and instances of engagement cannot be fully standardised (Myers, C.E. 2011).

2.6.3. Pharmaceutical Public Health

The two most highly valued competencies in this domain were:

- 1. Medicines Information and Advice:** Supply non-prescription medicines, therapies and diagnostic aids to meet the patient's needs.
- 2. Medicines Information and Advice:** Follow country based treatment guidelines and to ensure the appropriate use of medicines.

A distinction between prescription and non-prescription medications is referred to here. Prescription medications may often be more potent, show greater efficacy or have a greater risk of harm or adverse events than over the counter medications. It is logical that more training, education or experience would be required to safely and rationally provide the drugs to patients (Mallet, H, et al 2001; Hertig, J.B, et al 2011). Information was not collected on who makes the decision to supply. It is postulated that this would have greatly varied between countries, for example where lower cadres can give pharmaceuticals in rural areas once they have participated in a training program for endemic diseases. There are risks with all medicines, the greatest responsibility for the risk falls with the health worker in the position of prescribing the medicine. Prescribing requires analysis and evaluation, this should ideally correlate with greater levels of training leading to higher levels of skills.

The two least highly valued competencies in this domain were:

1. **Medicines Information and Advice:** Counsel Patients when handing out medicines, including explaining the main adverse effects and special considerations for individual medications, including storage and food requirements.
2. **Health Promotion:** Communicate lifestyle changes to aid patients in managing various diseases.

These points both reflect the changing nature of pharmacy to become a more clinical and patient centred profession. These tasks are high level functions that require significant skill and knowledge to be applied and efficiently executed. The tasks require training as well as a level of awareness of their importance which is developed through training, and knowing the information regarding what may or may not go wrong. They represent the point in time when a pharmacist may best be able to use their own knowledge to initiate an intervention for the patient, for example the opportunity may come up in conversation to discuss other medications and detect an interaction. It appears to be both safe and logical that these tasks have been chosen as least suitable for Pharmacy Support Staff (Anderson, C., and Rouse et al 2012; Anderson, C, Brock, T, et al 2011).

2.6.4. Patient Care

The three most highly valued competencies in this domain were:

1. **Medicines:** Identify medicines by their generic name.
2. **Medical Equipment and Sundries:** Describe how individual pieces of medical equipment are used, noting personal and patient safety.
3. **Medical Equipment and Sundries:** Identify when to dispose of medical equipment or sundries.

These are basic tasks to operate pharmaceutical services in a safe and efficient manner.

The three least highly valued competencies in this domain were:

1. **Medicines:** Identify that some signs and symptoms shown by a patient may be the result of an adverse effect of medication and these people need to be referred to the nurse or doctor.
2. **Medicines:** Describe the way medicines work; their use (how much, how often and for how long) and their main adverse effects and cautions.
3. **Medical Equipment and Sundries:** Explain to patients how to use any equipment given to them for their care.

Here more complex clinical tasks are included, there is a wide literature base for territorialism by pharmacists for certain tasks in a dispensary to be maintained as a pharmacist's responsibility and not for technicians, these key clinical tasks feature in this phenomena. Further to the trend for support staff to be responsible for objects or goods rather than people, was the low value given to tasks involved with patient contact, although this appears to be evolving (Anderson, C. 2008; Lim, Z. et al 2012).

2.7 Terms used to describe the workforce

This review identified significant methodological problems for conducting research on the global Pharmacy Support Workforce. Poor indexing of the terms used to describe the workers created a substantial issue when first trying to locate literature on the education, training, activities or interventions for the workforce. Major health literature databases showed wide variation in the number and type of terms used to describe the cadres. One hundred and seventy three (173) unique terms were identified in this review for the titles given to the Pharmacy Support Workforce: this creates a huge barrier to sourcing relevant published studies in order to conduct research. Further to this there was no universal, or even widely consistent, definition for what the terms represented. Although this thesis effectively collated and presented many of the terms used in practice internationally, a need for promotion of proper indexing, implementation of a generic term and access to a basic and versatile definition has been clearly demonstrated by this research. Lastly, the background

and training of Pharmacy Support Workers are seldom described in available research, this makes comparison and interpretation of the data that is available difficult (Dal Poz, M.R. 2006).

From this research the top ten responses to the survey were the terms:

1. Pharmacy Technician
2. Pharmacy Assistant
3. Store keeper (and variations: storeman, storeperson, stores officer)
4. Dispenser (and variations: dispensing assistant, dispensing technician)
5. Drivers
6. Pharmaceutical Technologist
7. Medicines Counter Assistants
8. Procurement Officer
9. Health Extension Worker
10. Druggist

Analysis by cross referencing the literature review to these terms showed that these titles exhibited wide variations in the representation of the specific tasks and competencies each was expected to perform. Many nations had more than one cadre making up the Pharmacy Support Workforce that have had different training requirements, responsibilities and remuneration, although sometimes working side by side (Frenk, J, et al 2011; Fulton, B.D, et al 2011).

2.8. Open Style Questions

2.8.1 Urban and Rural Differences

One of the major findings for this research was that large differences occur between both the supervision levels and expected competencies for workers within rural and urban settings. This is a global phenomenon; it would have been possible with the data set to further stratify and omit countries on the basis of their geographical size or levels of urbanization and it is expected this would have magnified the differences observed (Anderson, C, and Brock, T, et al 2011; Anderson, C, and Rouse et al 2012).

2.8.2. Expected Competences

Around forty percent of the respondents highlighted that there are differences in the expected competencies for pharmacy support staff in urban and rural settings. This may highlight differences in the quality of service provision if it means lower cadres are taking on more responsibility, particularly without either higher levels of training, or sufficient access to education (Zachariah, R, et al 2009; Meštrović, A, et al 2011).

2.8.3. Supervision Levels

Almost half the respondents flagged differences in supervision levels of the pharmacy support workforce in their country between rural and urban areas. This trend was expected from the literature and may point to poorer levels of service occurring where there is less supervision (Adams, A.J, et al 2011; Anderson, C, and Brock, T, et al 2011; Bradley, F, et al 2013).

2.8.4. General Supervision For The Pharmacy Support Workforce

This question identified trends for around ten percent (10%) of the total support workforce to work without any face to face supervision on a day to day basis. A further thirty percent (30%) work without supervision most of the time, thirty percent some of the time and around twenty percent identified as never working without supervision. This highlights the need for training. Supervision takes away some of the responsibility for planning and decision making. Where it is not possible for supervision to be provided, in order to achieve best practice skill must be substituted for a system of stringent accountability. This allows for at least retrospective improvements (Brown, A, et al 2011; Coombes, I, et al 2010; Fulton, B.D, et al 2011).

2.8.5. Tasks Requiring Supervision

The five tasks most highly rated as requiring supervision were:

1. Procurement: Stock ordering
2. Distribution of medicines to facilities
3. Packing/repacking of medicines
4. Disposal of medicines
5. Dispensing medicines to patients

There is again a trend to otherwise delegate tasks away from the Pharmacy Support Workforce when patient contact is involved. A trend can be inferred for cost driven supervision, as tasks that have the potential to be expensive if errors are made are at the top of this list. Where only essential medicines are available, particularly where only one brand of essential medicine is available, trends for litigious activity are reduced (Klug, 2008).

2.8.6. Who is Responsible for Supervision of Tasks?

The top three answers for explicit search terms were:

1. Pharmacist
2. Chief Pharmacist
3. Farmaceutico

There is surprisingly little variation in the answers to this question particularly given the range of cadres that has been identified for the Pharmacy Support Workforce. Pharmacists are overwhelmingly responsible for supervising the Pharmacy Support Workforce. Where there are shortages of training staff it has been shown, these can be resolved by increasing remuneration and defining a clear career structure for teacher practitioners. Training is defined as instruction to complete basic tasks, with education relating to instruction to complete more complex tasks with some theoretical knowledge. E-learning can also fill gaps

here for some of the issues for academic capacity. There are internationally developed and validated courses available and it has been shown that donor agencies are willing to sponsor and fund access to these tools (Anderson, C, and Whitmarsh et al 2012; Anderson, C, and Rouse, et al 2012; Anderson, C. 2008; Myers, C.E. 2011).

2.8.7. Growth in the Pharmacy Support Workforce

In the pilot survey respondents were asked to give values for the size of the workforce in their country, and to comment on the trend in which the size was evolving. Due to the complexity of obtaining validated answers, this question was modified to only enquire about the workers perception of the size of the pharmacy workforce and how it was evolving. The responses showed:

15% getting smaller

52% getting bigger

35% staying the same

General inferences can be made from the trends, as the population and requirements should be increasing in most places. It appears the Pharmacy Support Workforce does not always mirror this.

Another major finding of this research is that the Global Pharmacy Support Workforce appears to be growing, according to self-reported measures of stakeholders interviewed in this research. The global population is growing and the expectations for service delivery in health are increasing so this growth should be expected. It is unclear if the growth reflects good practice as the questioned only examined the size of the Pharmacy Support Workforce or the extent of the growth and whether the rate of growth is meeting demand.

Also, not reflected are the numbers of pharmacists, pharmacies or access to effective medicines. Many factors influence the size of the workforce, which globally as discussed previously is experiencing chronic shortages. These include working conditions and job satisfaction. Increasing the number and quality of healthcare workers is for many countries

the greatest constraint on successfully meeting the Millennium Development Goals (Wuliji, T, et al 2009; Rouse, M.J. 2004; Myers, C.E. 2011; Anderson, C, and Brock, T, et al 2011).

2.8.8. Satisfaction with the Training in Your Country

This question may be subject to some responder bias because stakeholders who were motivated to participate in the survey may have concerns about the workforce in their country. Some studies have shown that participants may be more motivated to participate when they have negative or extreme viewpoints on the pre-imagined content of the research (Groves et al, 2000, Morton et al, 2006, and Schleifer S, 1986).

On a 7 point scale (from extremely satisfied to extremely dissatisfied) in terms of evaluating the overall satisfaction level for the Pharmacy Support Workforce training that occurred in the respondents own country the median value was 'slightly satisfied' (3): this corresponded to the third possible highest or most satisfied rating. This is self-reported and may not be informed with evidence, however it was a positive result. However a substantial room for improvement in terms of improving access to training and education for the Pharmacy Support Workforce was identified.

2.8.9. Quality Assurance Procedures for the Pharmacy Support Workforce Training.

This section was well completed (N=45) , the variables that were analysed were developed from the literature and found to be the most effective measures of implementing Quality Assurance. This was in terms of both evidence based evaluation, as well as providing quantifiable indicators for a large area (the survey was not on a micro or local scale.)

As can be seen, most measures were undertaken and required by Governments. This is not surprising as they are principal funders in health care systems either through tax or profit based funding or because of their responsibility with disseminating foreign aid monies therefore accountability is paramount.

Pleasingly, for the reasons of both being the best available tool, and the most effective and easily measureable strategies for improving workforce planning efficiencies, evidence based procedures were in place for 65% (N=29) of the identified healthcare systems that were operating. The FIP recently developed an adaptable quality assurance framework and it is a key objective for the Pharmacy Education Taskforce to encourage quality assurance, particularly through accreditation (Anderson, C, et al 2006; Anderson, C, Brock, T et al 2012; Rouse, M.J. 2004).

Regular review and updating of quality assurance measures was the category with the lowest response rate. This may reflect the fact that systems are new and there has not been time for this to yet occur, that there was no budget for this to occur, that there was no perceived drivers for this to occur, or there were a combination of these reasons amongst local factors which may have introduced complications such as civil unrest or natural disaster interrupting the desired workforce planning initiatives (Anderson, C, Brock, T, et al 2012; Anderson, C. 2008).

Public disclosure of the quality assurance measures surrounding Pharmacy Support Workforce education and training was low. In an emerging system the impact of this may be less significant as processes are developing and too much comment before something has been established may have the potential to hinder its progress before it reaches its actualisation. This is an indicator that would probably improve over time if this research was repeated.

Of potentially more concern is that the processes were not developed by all stakeholders. This may impact negatively upon acceptability, relevance and implementation of change. When feedback is sought and incorporated a sense of ownership may develop which enhances responsibility and camaraderie, strengthening the system internally. Again, this is something that may be found to change over time if a system is new and research was repeated in the future.

Validation by reliable outcomes and measures is both critical and complex. Around half of the interview respondents believed this was being attempted or achieved. Quality Assurance should be specific to Pharmacy as it should be constructed as a framework with feedback from policy makers, regulators, educators and practitioners feeding into a quality improvement cycle (Bruno, A, et al 2010; Coombes, I, et al 2010; Frenk, J. 2011).

2.9.0. Registration

Where more than one cadre was present within a country it became apparent that often large differences for the requirements in skills and training existed between the groups. These occurred for expected competencies, supervision levels, remuneration, prevalence, parameters for training including length and delivery mode. It also became clear from this question that the impetus for registration declined at the lower end of the scale of workers. It is also disappointing to note that registration was not defined for this question and may represent anything from being assigned an individual number to paying an intermittently renewable fee with accompanying ongoing learning or mandatory reporting responsibilities. Even at the most basic level, registration was favourably regarded for allowing Governments to know the size and location of their workforce in order to conduct workforce planning and the allocation of resources. Developed countries such as Australia, and New Zealand do not register Pharmacy Support Workers. Registration could mean the workers would have greater responsibility and receive higher wages, or better conditions. It is unclear if this would be opposed by bodies representing the interests of pharmacy owners.

Re-registration, for which the definition was also unspecified and may have included such diversities as: paying a fee, showing identification or additional activities such as meeting continuing professional development requirements, it was most common (45.5%) for re-registration to not be required. This was followed by the second most common situation of annual registration (38.6%).

3. Summary of Online Survey Results

The online survey was an effective tool for baseline scoping of the educational and training requirements of the Global Pharmacy Support Workforce. This is evidenced by the high response rate, high completion rate and clustered groupings and trends presented as the results.

Collecting the terms for the cadres in the Pharmacy Support Workforce was efficiently executed and presented in a novel and effective format. Although the list may not be exhaustive, it is the only known tool of its kind now in academic literature and provides a useful tool for designing search strategies in databases for future research on the Global Pharmacy Support Workforce.

Defining the basic competencies of the Pharmacy Support Workforce showed strong trends that were widely applicable, skills and responsibilities were universal. The results may provide a background and starting point for further work in order to develop a generic international competency framework that could be used as a tool, particularly in resource poor settings for effective workforce planning.

Another major trend in the findings of this phase of the research is the observed inequalities between rural and urban settings both within countries and around the globe. This occurred for both the expected competencies, with lower cadres in rural settings having perceived levels of greater responsibility than metropolitan contemporaries, as well as the levels of day to day, face to face supervision being different.

By identifying these main themes of the research it was possible to determine what would be the most useful information to further validate and explore in the following phase of the project which consisted of comprehensive interviews carried out with respondents from this online survey who wished to further participate in the research.

Research Question Answers

- The public and private Pharmacy Support Workforce are educated and trained in close proximity to where they are employed, primarily by pharmacists.
- Education and training programmes for identified cadres exhibit trends for increasing accreditation. This is conducted by Governments, Professional Institutions, and NGO's.
- Regulation of workers is increasing, primarily by registration. Re-registration at chronological intervals is also increasing. Many countries are introducing a legally defined scope of practice, which allows for greater responsibility and autonomy in the tasks of the workers. It is suggested this is mirrored in a broadening of the scope of practice for all pharmacy workers.
- Mandatory Continuing Professional Development (CPD) is increasing. Access and availability of CPD continue to be challenges in human resources strategic planning.
- There is a clear trend for the popularity of the cadre titles 'pharmacy assistant' and 'pharmacy technician'. There is a suggestion that these can refer to different roles. Any research in this area needs to use a broad search strategy to accompany the proliferation of titles for similar roles. Stakeholders should seek to define and institutionalise the terms in the future to assist with research and development in the field.
- Tasks and responsibilities of Pharmacy Support Workers show great similarities between countries, with marked differences levels of responsibility and autonomy for rural and metropolitan regions where data was available. Trends for less patient contact, as well as tasks with less costs risks were apparent.

Comprehensive Interview Discussion

4. Overview of Comprehensive Interviews

The questions asked and topics explored in this phase of the research were based on the main themes identified in the online survey component of the research project which was utilized as a scoping tool before undergoing preliminary analysis to formulate the questions for the interviews.

As was expected, the data produced in this phase was of a rich qualitative nature in comparison to the partially quantitative and broader results for the online survey. The extent of the depth and richness of the information was not pre-imagined by the research team and was valuable for adding a whole new dimension to the project. It was surprising how different the answers appeared to be, though not contradictory, for what were essentially the same questions asked in the initial phase of the project. Conducting the second phase was additionally useful to crystallise the process of refining the data. Being able to hear the stresses and inflexions in people's voices assigned influence to, and attached meaning for, phrases that may have not otherwise been transcribed from written text.

4.1 Demographics of respondents

Five of the eight respondents had English as a second language, with English being the interviewer's first and only language. One country identified as being in a middle income band, four into a higher income band, and three countries in the lower income band. Five out of seven of the World Health Organisation regions of the world were represented as seven discrete countries. Four of the eight respondents were male. This information about gender was omitted from the online survey as it was not seen as relevant for the results and it was expected that around half the pharmacy workforce worldwide would be female based on other research which surveyed gender by the membership databases of professional pharmacy organisations globally.

4.2. Training

The small number of countries represented in the collection of eight interviews made it difficult to make generalisations about training from the results. What can be seen is a trend for very short training to occur in resource poor countries and this training is fully funded by the Government. There is also a trend for longer courses in higher income countries to require a financial contribution from the student, though the Government still provided some funding in these cases (Hertig, J.B, et al 2011; Anderson, C, Brock, T et al 2011; Anderson, C, Brock, T, et al 2012).

Basic literacy and numeracy appeared to be pre-requisite for all the Pharmacy Support Worker courses identified, though competency in these areas did not necessarily have to be achieved through formal training, even in the most highly developed countries.

Developing long term sustainable training is more challenging for policy makers than developing isolated interventions that address shortages. Retaining staff is more difficult than attracting staff. Ongoing funding is more difficult to both attract and manage. The range in levels of satisfaction for the training, were as varied as the synopsis given for the types of training. The only consistent trend for the responses about the satisfaction with the Pharmacy Support Workforce training and education is that all the respondents identified room for improvement within the current situation for the country for which they responded (Buchan, J. and Aichen, 2008).

4.3. Registration/regulation

Although registration was not defined within the structure of this question, no respondents asked for clarification or definition of what registration was. As was alluded to in the online survey, registration could mean anything from the assignation of an individual number to an extensive process incorporating ongoing professional development or the payment of a fee, either on a one off, regular or intermittent basis. Additionally, none of the respondents dismissed the concept of registration, and where registration was not occurring the concept was still viewed positively. Registration is not just about meeting supply and demand in workforce planning but it allows a starting point for complex modelling of future human resources needs. Registration is also about holding professional accountability and

protecting the public's safety and interests. Another important distinction for interpreting registration figures is that it may not represent the number of practising health care workers and only the number that are registered, and also does not identify the number of hours worked per person.

Re-registration occurred in fewer countries (registration N=5, re-registration N=3). It was viewed as more challenging to implement but of even higher value than a one off registration for ensuring patient and system based standards. These standards were intended to both reduce harm to patients and raise training and education of the workforce. Ongoing learning allows staff to stay knowledgeable as new technologies or theories emerge once basic training has been completed.

Although it would be possible to retrospectively source the information it may have been interesting to ask here whether re-registration, or mandatory CPD, of pharmacists was required within the country for comparison. The survey showed that in most cases the Pharmacy Support Workforce were supervised by Pharmacists, so in terms of evidence based practice, quantifiable indicators and accountability in a rapidly changing field it would be interesting to consider who is mandated to stay current with changes to best clinical practice and legislation.

4.4. Main issues for the pharmacy support workforce in your country

The following subheadings are the main themes represented by asking the comprehensive interview respondents what they perceived were the main issues for the Pharmacy Support Workforce in their country.

4.4.1. Practical work issues

These issues were unique to developing countries, where they were present in all the interviews in resource poor settings that we encountered. This included such things such as stock outs and accommodating the restrictions imposed for delivery of externally funded vertical programs such as for HIV Aids, or malaria. These were major issues for those who

were involved but they were also accepted as part of practice. No equivalent or similar issues were mentioned by middle or high income countries.

4.4.2. Rural and remote issues

Technicians were found to have an expanded role in rural areas. Unlike the online survey, it was possible to determine which countries were geographically large, isolated, remote, or had poor infrastructure, as the sample size was small. When this was done it was found that all countries that fulfilled one or more of these criteria experienced the same inequalities for service and workforce delivery with urbanisation. As was previously discussed there are challenges balancing service provision for primary health care in terms of the cost effectiveness of centralized facilities versus patient accessibility with decentralization. There are no simple solutions to address the inequalities that were identified. This research highlighted a situation where rural or remote technicians have more responsibility, less supervision and poorer access to education, training and development opportunities.

4.4.3. Training

Training was a main topic for the survey, asking about this topic illustrated what was described in the literature around “brain drain” or the phenomena whereby individuals are up-skilled but then migrate to other areas. Drivers for this include better pay or working conditions. There is much literature examining strategies to counteract the occurrence of this as it leaves health systems under staffed and under resourced. Some of the most effective strategies to counteract professional migration are enhancing both working conditions and job satisfaction. High levels of job satisfaction closely correlate with low staff turnover and better retention of workers. Factors that contribute to job satisfaction include: the intrinsic nature of the job and people’s perception of both their value and contribution, remuneration, good relationships with others in the work team and the opportunity for flexibility in a work schedule (Anderson, C, Brock, T, et al 2008; Anderson, C, et al 2006; Chan, X, and Wuliji, T, 2006).

4.4.4. Progression

A profession ceiling in terms of career progression once a certain level was attained featured as a prominent issue. This issue was previously identified in research undertaken but unpublished by the researchers in Canberra, Australia for hospital and community pharmacies in 2010. During this small Australian project a clear trend emerged for there to be two characteristically distinct archetypes of pharmacy assistants. There were many who usually stayed shorter periods of time and were responsible for shop management or less technical jobs. Many respondents also identified a type of assistant who had usually served for a very long time and could perform complex functions and had excellent knowledge obtained from on the job experience. These two workers in the Australian context were paid the same and given the same conditions. There was a sense of injustice about this situation from the pharmacists who responded to the survey, and this stemmed not only over concerns over money but many pharmacists felt that the workers were no longer able to be intellectually stimulated in their current roles and lacked job satisfaction as a result. It was surprising to hear many of the respondents speak of this on a global scale. Training designed for a carefully structured, and remunerated career path could address this problem and provide opportunity for individuals with a genuine skill or passion for their work.

4.4.5. Implementation

Implementation of a new registration system has additional challenges for resources and skills than an already operating registration system. Tellingly, in nations who responded where implementation of registration had already occurred the process of implementation was viewed as an even more difficult process than in nations where it was being proposed. Registration was found to be important and aligning workforce planning in a multidisciplinary capacity may assist with identification of the skills and roles needed to meet service needs. Aligning the supply of education is cost effective and helps improve day to day matching of staffing with workload.

4.4.6. Pharmacy is evolving

Pharmacists are the most accessible health care workers in many countries and the pharmacy support workers who assist them, or work in their place where they are absent, are integral to the provision of the functions for which pharmacists perform in delivering health care services and in particular medicines. The FIP recently completed a draft competency framework for pharmacists in order to assist human resource planning in pharmacy by providing an evidence based instrument to maximise the expertise of pharmacists. This tool is expected to need local modification to be effective and sustainable in use both because of the inherent differences in the health care needs and expectations of nations, as well as the complex and rapidly changing nature of the role of the pharmacist within healthcare system models.

Due to the evolution of the scope and defined role of the pharmacist, the training needs for the pharmacy support workers are directly influenced. Pharmacy is moving towards a more patient focused service provision (Cliffords et al 2006; Bodenheimer, T 2006; and de Oliveira, D.R, and Shoemaker, S, J, 2005).

4.4.7. Professional Organisations

The overwhelming respect, value and trust placed on professional organisations in order to source, evaluate and provide training for the Pharmacy Support Workforce was not anticipated from our review of the background literature in this thesis. Ubiquitously, and unquestioningly, mentioned by all the interview respondents, the association of pharmacy education and professional organisation was not found to be clearly emphasised in the background research. The only notable reference to the finding is within the opening comments of the FIP Global Pharmacy Workforce Report 2012 “Findings from this report clearly show that professional associations are important stakeholders (professional and financial) in advancing the pharmacy workforce”. This research found that this is something people talk about but it was absent from written responses. It is unclear what the new effect of compulsory Continuing Professional Development will be.

4.5. Summary of Discussion chapter

This project had wide ranging participation, a large number of responses, and was effectively designed. This gave a good overview, and efficiently scoped the situation for pharmacy support workers globally in terms of their titles, responsibilities and training. The design did not allow either accurate enumeration, or quantification, but the results provided a baseline for identifying trends in the global workforce.

These trends are listed in the following:

- The challenge and importance for developing methods for quantifying and qualifying the workforce size and composition;
- The need for research aimed at identifying the right incentives for defining and regulating the profession, including accreditation and credentialing, to ensure that the workforce has a suitable skill and competency mix;
- Registration is a very new process; it is unclear:
 - What the implications of introducing Registration will be.
 - How the process of implementing registration is best carried out.
 - How these proceeding two issues apply to re-registration, and the regularity with which it is required. And;
 - How both cost, and ongoing professional learning requirements, impact upon registration.
- Developing models for assessing existing and future workforce needs and shortfalls in workforce capacity, not just based on supply and demand these need to incorporate complex forecasting (planning) estimates
- Identifying effective strategies to counter severe and ongoing shortages and deficiencies in the global pharmacy support workforce.
- Recognition of the Inequalities that exist between rural and urban areas for the pharmacy support workforce, particularly in terms of supervision and expected responsibilities.
- Increasing training and skills allows workers to practise safely with greater autonomy and accountability.

- Competency frameworks present the biggest challenge during their implementation phase. Familiarisation with the system is not intuitive, and may appear time consuming before useful sets of indicators are generated with time.
- Professional organizations are intrinsically valued and trusted to provide current, evidence based, best practice, accredited and quality assured education for the entire pharmacy workforce. There is a need to recognize the external running of the health system also has influence on the profession i.e. department of Health and Pharmacy Boards. What influence does the profession have and is it listened too by government and medicine who have larger influence.

Table.7. Table Showing Further barriers to progress in Pharmacy Support Workforce planning

Further barriers to progress in Pharmacy Support Workforce planning
Unclear or poor quality policies
Lack of a national plans or, in cases where they do exist, they are poorly executed or not fully implemented
No national professional organization
Planning which is performed independently and in isolation of other disciplines in the health sector
Inadequate resources or capacity to implement plans, short term rather than long term planning
Not considering the impact of social, political, geographical, technological or economic factors
No clear definitions of the functions and scope of practice for the different cadres of workers
Poor communication and coordination between providers, planners, policy makers and employers. (Buchan, J, and Aitken, 2008)

5. Conclusions

There are substantial ethical, economic, public health, and human rights considerations surrounding the manufacture, procurement, distribution, supply and rational use of medicines. Governments and ministries of health have a role to supervise and assist safe and rational use of medicines, but particularly in developing or resource poor countries where health regulation systems may be weak: there is an ultimate and fundamental ethical responsibility for the company who profits from the production and distribution of medicines to ensure they are used safely. Wealthier countries can support poorer countries by dealing with only the most ethical companies.

It is the manufacturers alone who have access to information surrounding how much of a drug is produced and its true cost. It is unlikely global laws around price disclosure, drug patents or copyrights will alter significantly in the not too distant future. Against this background, supplementary goals for improving medicines supply should be postulated.

Development of a global Pharmacy Support Workforce Competency Framework appears to be an achievable and desirable goal for efficient and accountable future workforce planning. Profit driven globalization drives an autonomy at the very core of workforce planning and the development of efficient health systems, though local variations will always remain due to both the nature and prevalence of diseases as well as cultural values. A flexible Competency Framework would provide a tool to be used as a baseline for ensuring cost effective and safe practice is occurring. This project provides a direction for sourcing what might be important to include in such a tool.

There is a wealth of raw data from this project that could be analysed to determine further trends and phenomena within the space. This was deemed beyond the scope of this project.

It is hoped that this research will be useful as basic scoping tool for seeking to build an evidence base for workforce research, discussion, planning and action. The research has shown that while there are great differences in the titles, responsibilities, and the education and training levels of the Pharmacy Support Workforce globally, there are also great similarities.

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Appendices

Appendix 1. Millennium Development Goal's relevant to Pharmacy Support Workforce Education and Training.

Target 4.A:

Reduce by two thirds, between 1990 and 2015, the under-five mortality rate

- Child deaths are falling, but not quickly enough to reach the target
- Revitalizing efforts against pneumonia and diarrhoea, while bolstering nutrition, could save millions of children
- Recent success in controlling measles may be short-lived if funding gaps are not bridged

Target 5.A:

Reduce by three quarters the maternal mortality ratio

- Most maternal deaths could be avoided
- Giving birth is especially risky in Southern Asia and sub-Saharan Africa, where most women deliver without skilled care
- The rural-urban gap in skilled care during childbirth has narrowed

Target 5.B:

Achieve universal access to reproductive health

- More women are receiving antenatal care
- Inequalities in care during pregnancy are striking
- Only one in three rural women in developing regions receive the recommended care during pregnancy
- Progress has stalled in reducing the number of teenage pregnancies, putting more young mothers at risk
- Poverty and lack of education perpetuate high adolescent birth rates
- Progress in expanding the use of contraceptives by women has slowed
- Use of contraception is lowest among the poorest women and those with no education
- Inadequate funding for family planning is a major failure in fulfilling commitments to improving women's reproductive health

Target 6.A:

Have halted by 2015 and begun to reverse the spread of HIV/AIDS

- The spread of HIV appears to have stabilized in most regions, and more people are surviving longer
- Many young people still lack the knowledge to protect themselves against HIV
- Empowering women through AIDS education is indeed possible, as a number of countries have shown
- In sub-Saharan Africa, knowledge of HIV increases with wealth and among those living in urban areas
- Disparities are found in condom use by women and men and among those from the richest and poorest households

- Condom use during high-risk sex is gaining acceptance in some countries and is one facet of effective HIV prevention
- Mounting evidence shows a link between gender-based violence and HIV
- Children orphaned by AIDS suffer more than the loss of parents

Target 6.B:

Achieve, by 2010, universal access to treatment for HIV/AIDS for all those who need it

- The rate of new HIV infections continues to outstrip the expansion of treatment
- Expanded treatment for HIV-positive women also safeguards their newborns

Target 6.C:

Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases

- Production of insecticide-treated mosquito nets soars
- Across Africa, expanded use of insecticide-treated bed nets is protecting communities from malaria
- Poverty continues to limit use of mosquito nets
- Global procurement of more effective antimalarial drugs continues to rise rapidly
- Children from the poorest households are least likely to receive treatment for malaria
- External funding is helping to reduce malaria incidence and deaths, but additional support is needed
- Progress on tuberculosis inches forward
- Tuberculosis prevalence is falling in most regions
- Tuberculosis remains the second leading killer after HIV

Target 8.E:

In cooperation with pharmaceutical companies, provide access to affordable essential drugs in developing countries

Appendix 2.

Raw Data Showing Number of Respondent Countries.

Algeria	2	Namibia	1
Australia	9	Nauru	1
Bangladesh	1	Nepal	1
Belgium	2	Netherlands	1
Botswana	1	New Zealand	5
Brazil	2	Nigeria	13
Brunei Darussalam	1	Norway	1
Cambodia	1	Pakistan	1
Canada	7	Papua New Guinea	6
China	2	Philippines	1
Congo	1	Portugal	6
Croatia	1	Rwanda	6
Denmark	2	Serbia	1
Ethiopia	10	Singapore	1
Fiji	3	Solomon Islands	2
France	1	South Africa	3
Germany	1	Spain	1
Ghana	6	Sri Lanka	1
Guyana	1	Sudan	1
India	5	Switzerland	1
Indonesia	1	Thailand	1
Italy	1	Tonga	2
Jamaica	1	Trinidad and Tobago	2
Japan	1	Turkey	2
Kenya	8	Tunisia	1
Kiribati	1	Uganda	3
Liberia	1	United Kingdom	8
Libyon Arab Jamahirya	1	United Republic of Tanzania	2
Peoples Democratic Republic of Lao	2	United States of America	13
Lithuania	1	Uruguay	1
Malaysia	2	Yemen	3
Mali	1	Zambia	1
Micronesia	1	Zimbabwe	4

Appendix 3.

Definition of region groupings

WHO regions: WHO Member States are grouped into 6 geographical regions: AFRO (Africa), AMRO (Americas), EMRO (Eastern Mediterranean), EURO (Europe), SEARO (South-East Asia) and WPRO (Western Pacific).

WHO subregions: the 6 WHO regions are further divided based on patterns of child and adult mortality in groups ranging from A (lowest) to E (highest): AFRO (D,E); AMRO (A,B,D); EMRO (B,D); EURO (A,B,C); SEARO (B,D); WPRO (A,B).

Low and Middle-Income Countries (LMIC) by WHO region: the 6 WHO regions are used separating out high-income countries within each of these regions into a 7th group: High, AFRO, AMRO, EMRO, EURO, SEARO and WPRO.

WHO regions by income: WHO Member States within each of the 6 WHO regions are divided into high-income or low- and middle-income countries creating 10 groups: AFRO (LMIC); AMRO (High, LMIC); EMRO (High, LMIC); EURO (High, LMIC); SEARO (LMIC); and WPRO (High, LMIC).

World Bank income groups: all Member States are divided in 4 income groups based on 2004 Gross National Income (GNI) per capita: low, lower middle, upper middle, and high.

World Bank regions: countries are separated into 6 World Bank regions, separating out high-income countries as a 7th group: High Income, East Asia and Pacific, Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, South Asia and Sub-Saharan Africa.

UN Millennium Development Goals (MDG) regions: Developed countries, Commonwealth of Independent States, Northern Africa, Sub-Saharan Africa, Latin America and the Caribbean, Eastern Asia, Southern Asia, South-eastern Asia, Western Asia, and Oceania.

GBD 1990 regions: countries are separated into 6 regions as presented in the original GBD 1990 study: Established Market Economies (EME), Formerly Socialist Economies of Europe (FSE), India (IND), China (CHN), Other Asia and Islands (OAI), Sub-Saharan Africa (SSA), Latin America and the Caribbean (LAC), and the Middle Eastern Crescent (MEC).

[Accessed online 11/14/2013]

http://www.who.int/healthinfo/global_burden_disease/definition_regions/en/index.html

Appendix 4. Word Cloud of Cadre Terms with Frequency Displayed



Courtesy of Daniel Steinbock Visiting Professor, Keio University School of Design, Yokohama, Japan, daniel@steinbock.org licensed 2012™ {accessed 20th August, 2012} [online @ <http://tagcrowd.com/>]

Appendix 5. Survey Template

1. Instructions and Overview.

Thank you for taking part in this research. This survey should take approximately 20 minutes to complete.

As you move through this survey you will be asked to indicate the competences expected of the Pharmacy Support Workforce cadres in your country. Think about all staff involved in the procurement, distribution, supply and dispensing of medications.

A "cadre" is a group of people trained for a particular purpose.

"Competences" are the specific skills, behaviours or items of knowledge that are required to perform a role.

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) Patient Care

In this survey each group has sets of competences that Pharmacy Support Workforce cadres could be expected to demonstrate.

Please choose which competences are expected of each cadre in your country.

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.

2. Pharmacy Support Workforce cadres including Medicines Supply and Pharmaceutical Logistics Staff

For the following question;

1. Please take your time and list all the cadres, or position titles, you are aware of.
2. Think about both the private and public sectors.
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.

1.) In the country that YOU work, NOT including pharmacists, nurses and doctors, WHO might work in medicines supply or pharmaceutical logistics?

2.)

3.)

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

3. The Pharmacy Support Workforce in Your Country

1. Which group is the MOST common Pharmacy Support Workforce cadre in your country.

Please choose one.

[Q2]

- [Q3]
- [Q4]
- There is NO Pharmacy Support Workforce in my country

Other (please specify)

4. Organisation and Management

For each cadre you have named a list of possible competences appears below:

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]
Demonstrate the use of the ordering systems for obtaining medicines and medical sundries for provincial pharmacies/medical stores from the Central/National Medical Store	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Describe the importance of patient and facility supply records to determine usage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Describe the factors that affect usage patterns of various medications and equipment and how this affects ordering (e.g. disease outbreaks), using national policies as a guide and to ensure consistent application.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Demonstrate the paperwork and calculations required to order medications

Demonstrate the ability to check off orders received

Demonstrate the ability to follow up orders not received

Do you have any other comments?

2. Donations

[Q2]

[Q3]

[Q4]

Describe and 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]

Demonstrate the ability to layout a medicines/pharmacy store including; the arrangement of medicines according to order form, labeling of medicines, use of stock cards/computerised system

Describe the importance of securing the medicines/pharmacy store and limiting access

Demonstrate appropriate use of, and ability to maintain the cold chain

Demonstrate the ability to apply stock rotation (e.g. First In First Out or First Expired First Out)

Demonstrate the ability to store medicines appropriately, including the considerations of temperature, access and cleanliness of the work area

Do you have any other comments?

4. Distribution

	[Q2]	[Q3]	[Q4]
Distribute Medicines to Hospital Wards and Departments using a regular system e.g. Imprest system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Regularly review imprest quantities

Do you have any other comments?

5. Supply

	[Q2]	[Q3]	[Q4]
Prepare and use order schedules.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Prioritise order processing 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 Non Government Organisation's and other individuals who seek assistance for medication supplies.

Do you have any other comments?

6. Packing/repacking

Safely re/pre-pack pharmaceuticals from large bulk quantities to small patient or facility packs

[Q2] [Q3] [Q4]

Do you have any other comments?

7. Record Keeping

Demonstrate the use of the appropriate recording system. (e.g. stock cards, order forms, computer systems)

[Q2] [Q3] [Q4]

Demonstrate the appropriate use of computer stock control systems

Do you have any other comments?

8. Disposal

	[Q2]	[Q3]	[Q4]
Describe the importance of disposing of expired medications and medical equipment according to national policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Describe how to dispose of specific individual items of greatest risk e.g. oncology medicine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrate the process used to dispose of expired medicines and used medical sundries including syringes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you have any other comments?	<input type="text"/>		

9. Budget and Reimbursement

	[Q2]	[Q3]	[Q4]
Describe the general monetary value of medicines and equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrate the ability to manage all resources with care	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrate the ability to create and manage budgets as necessary for work (e.g. wages budget, touring budget, stationery budget, project budgets for using Non Government Oorganisation funds)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you have any other comments?	<input type="text"/>		

10. Improvement of Service

	[Q2]	[Q3]	[Q4]
Creates and uses check lists to regularly monitor the activities they are responsible for	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Plans and conducts supervisory tours of dependant facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you have any other comments?	<input type="text"/>		

11. Human Resources Management

	[Q2]	[Q3]	[Q4]
Demonstrate the ability to assist in training nurses and other health professionals in the areas of medicines ordering and storage procedures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Orientates new staff to the workplace explaining standard operating systems and procedures.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrate the ability to identify and deal with unproductive staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Orientates new doctors to the formulary and the systems and procedures of the medicines supply system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrate the ability to prepare human resource plans to meet the future staffing needs of the organisation Demonstrate the ability to develop a system for staff recruitment, appraisals and monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrate the ability to 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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Demonstrate the ability to ensure members of staff have the necessary skills and understanding to use appropriate documentation in the event they need to fill a management role due to absence or illness

Do you have any other comments?

12. Disaster Preparedness

Demonstrate an understanding of the process for dealing with disaster events

[Q2]

[Q3]

[Q4]

Do you have any other comments?

5. Professional/Personal practice

For each cadre you have named a list of possible competences appears below:

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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ensure patients are transferred from hospital to clinics with a continuing supply of medicine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Communicate effectively with nurses and doctors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work as part of a team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work as part of the wider healthcare team looking after the patient	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Communicate with patients ensuring confidentiality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Participate in meetings with regard to expressing own opinions and being aware of the needs of others, being appropriately assertive when required	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you have any other comments? (Please specify)	<input type="text"/>		

2. Critical Thinking and Problem Solving

	[Q2]	[Q3]	[Q4]
Prioritise tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work independently to get the necessary work done	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Use time well to get tasks done	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Understand the limit of their own skills and abilities (when to try a task and when to refer)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Gather information to solve problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Identify problems and consider how to deal with them	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Follow up problems to ensure they are fixed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ask other people to help with solving problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrate the ability to take on various responsibilities within the department as the need arises	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you have any other comments? (Please specify)

3. Continuing Professional Development

	[Q2]	[Q3]	[Q4]
Demonstrated commitment to keep up to date in their place of work with input from supervisors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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” policy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Keep up to date with changes in these documents as informed by managers at the national level	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you have any other comments? (Please specify)	<input type="text"/>		

5. National Systems

	[Q2]	[Q3]	[Q4]
List the legislation that covers the medicines supply and health care and describe its purpose	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Describe how vertical programs work within the health system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrate an ability to meet the reporting requirements of vertical programs (for example; tuberculosis, maternal and child health or the extended program on immunisation)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Describe the structure of the health system at a national level and explain this to others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Describe the structure of the health system at a provincial/regional level and the ability to explain this to others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you have any other comments? (Please specify)	<input type="text"/>		

6. Professional and Ethical Practice

	[Q2]	[Q3]	[Q4]
Follow all standard operating procedures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work in a safe and legal way	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Accept responsibility for their own work tasks and performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Contribute to the professional development of others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practise their work within the cultural framework of the country using both western and local principles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you have any other comments? (Please specify)	<input type="text"/>		

6. Pharmaceutical Public Health

For each cadre you have named a list of possible competences appears below:

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, including explaining the main adverse effects and special considerations for individual medications, including storage and food requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Supply non-prescription medicines, therapies and diagnostic aids to meet the patient's needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Follow country based treatment guidelines and to ensure the appropriate use of medicines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Keep up to date with standard treatment guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Communicate lifestyle changes that can be made to aid patients in managing various diseases	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you have any other comments? (Please specify)

7. Patient Care

For each cadre you have named a list of possible competences appears below:

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]
Demonstrate ability to identify any issues with medicines, dose forms and methods of administration that need to be discussed and referred to a nurse, doctor or pharmacist	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrate ability to obtain sufficient information about the presenting requests to determine if the situation can be managed by the staff member or referred to a pharmacist or other health professional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Do you have any other comments? (Please specify)	<input type="text"/>		

2. Dispensing

	[Q2]	[Q3]	[Q4]
List which medicines are allowed to be prescribed by different prescribers and how to monitor this	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Demonstrate ability to safely supply medication to patients considering packaging, storage and labelling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Demonstrate ability to identify which medicines are especially dangerous and need more care when dispensing to patients

Do you have any other comments? (Please specify)

3. Medicines

Demonstrate ability to identify medicines by their generic name

[Q2]

[Q3]

[Q4]

Describe the way medicines work; their use (how much how often and for how long) and their main adverse effects and cautions

Demonstrate ability to identify that some signs and symptoms shown by a patient may be the result of adverse effects 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 Sundries

Describe how individual pieces of medical equipment are used, noting personal and patient safety

[Q2]

[Q3]

[Q4]

Describe how long to use the equipment and when to use a new one

Demonstrate ability to explain to patients how to use any equipment given to them for their care

Demonstrate ability to maintain supplied equipment supplied and use any existing maintenance support network

Do you have any other comments? (Please specify)

5. Compounding Medicines

	[Q2]	[Q3]	[Q4]
Explain the use of compounding techniques and equipment.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Explain the role of non-therapeutic agents such as suspending agents, preservatives, buffers and flavourings.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Explain the factors that can affect medicine stability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recognise when a product needs to be prepared under sterile or special (e.g. cytotoxic) conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prepare the formulation worksheet, calculations and labels.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compound the product using appropriate compounding techniques and principles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comply with legal, workplace and professional requirements when preparing and dispensing compounded products.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pack and label compounded products to optimise safety, stability and patient compliance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clean and maintain compounding equipment and area.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Complete documentation and records.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Do you have any other comments? (Please specify)

8. Supervision of Pharmacy Support Workforce Cadres

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. For what are the main competences, tasks or behaviours, [Q2] require DIRECT supervision?

3. What is the title of the person responsible for supervising the [Q2] for these competences?

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. For what are the main competences, tasks or behaviours, [Q3] require DIRECT supervision?

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

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 what are the main competences, tasks or behaviours, [Q4] require DIRECT supervision?

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

9. Regional/Metropolitan differences.

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

- Exactly the same
- Mostly the same
- Somewhat different
- Very different

Please briefly comment on your response

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

- Exactly the same
- Mostly the same
- Somewhat different
- Very different

Please briefly comment on your response

10. The size of the Pharmacy Support Workforce in your country

1. NOT including nurses, doctors or pharmacists, what do you estimate to be the total size of the Pharmacy Support Workforce in your country?

2. For each cadre you have listed what do you estimate to be the size of that cadre in your country?

[Q2]

[Q3]

[Q4]

3. Where did you get these figures from?

4. Overall, are you confident in the accuracy of this estimate?

- Extremely confident
- Moderately confident
- Slightly confident
- Neither confident nor unconfident
- Slightly unconfident
- Moderately unconfident
- Extremely unconfident

11. Training

1. These questions are about the minimum expected level of training or education that is required for the [Q2] cadre in your country.

Type of training?	Length of training?	Type of institution?	Who has the main responsibility for paying for the training?	Is the training subject to quality assurance processes?
Please choose				

the
best
answer

If you chose other (please specify)

2. Please specify the title of the training which occurs for the [Q2] cadre in your country.

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

4. These questions are about the minimum expected level of training or education that is required for the [Q3] cadre in your country.

Type of training?	Length of training?	Type of institution?	Who has the main responsibility for paying for the training?	Is the training subject to quality assurance processes?
Please choose <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

the
best
answer

If you chose other (please specify)

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

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

7. These questions are about the minimum expected level of training or education that is required for the [Q4] cadre in your country.

Type of training?	Length of training?	Type of institution?	Who has the main responsibility for paying for the training?	Is the training subject to quality assurance processes?
Please choose <input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

the
best
answer

If you chose other (please specify)

8. Please specify the title of the training which occurs for the [Q4] cadre in your country.

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

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

- Extremely satisfied
- Moderately satisfied
- Slightly satisfied
- Neither satisfied nor dissatisfied
- Slightly dissatisfied

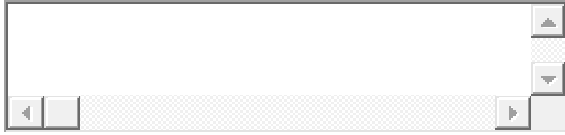
- Moderately dissatisfied
- Extremely dissatisfied

11. Compared to other countries is the quality of Pharmacy Support Workforce training better, worse, or about the same?

- Much better
- Somewhat better
- Slightly better
- About the same
- Slightly worse
- Somewhat worse
- Much worse

12. What do you like most about the training that occurs?

13. What do you like least about the training that occurs?



14. What improvements could be made to training?

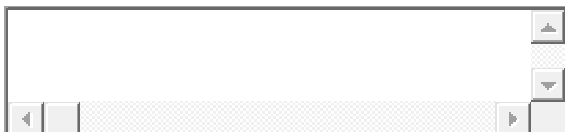


12. Quality Assurance of Training and Education

Quality Assurance is the maintenance of a standard in Pharmacy Support Workforce training. 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 training.

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



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

	Yes	No
A Government Initiative	<input type="radio"/>	<input type="radio"/>
Endorsed by the whole profession	<input type="radio"/>	<input type="radio"/>
Developed by all the stakeholders involved (including students)	<input type="radio"/>	<input type="radio"/>
Evidence based	<input type="radio"/>	<input type="radio"/>
Validated by reliable outcomes/measures	<input type="radio"/>	<input type="radio"/>
Publicly disclosed	<input type="radio"/>	<input type="radio"/>
Reviewed and updated regularly	<input type="radio"/>	<input type="radio"/>

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

- Extremely satisfied
- Moderately satisfied
- Slightly satisfied
- Neither satisfied nor dissatisfied
- Slightly dissatisfied
- Moderately dissatisfied
- Extremely dissatisfied

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



13. Regulation and Registration

Regulation involves the laws and their enforcement surrounding Pharmacy Support Workforce cadre, practice and registration where this exists.

1. Please briefly outline the regulations that support the practice of Pharmacy Support Workforce cadres, where these exist.



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

	Yes	No
[Q2]	<input type="radio"/>	<input type="radio"/>
[Q3]	<input type="radio"/>	<input type="radio"/>
[Q4]	<input type="radio"/>	<input type="radio"/>

3. How often is re-registration required?

- It is not required
- Every year

- Every 2 years
- Every 5 years
- Every 10 years

Other (please specify)

4. What are the requirements for re-registration?

5. Compared to other countries are these regulations better, worse, or about the same?

- Much better
- Somewhat better
- Slightly better
- About the same
- Slightly worse
- Somewhat worse
- Much worse

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

14. Demographics

1. What is your profession?

Please select one.

Other (please specify)

2. How long have you worked;

Time

At your current Facility?	<input type="text"/>
In your current Professional Role?	<input type="text"/>

3. 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
- Graduate degree

4. Please state in 50 words or less, your main day to day duties/responsibilities at work?

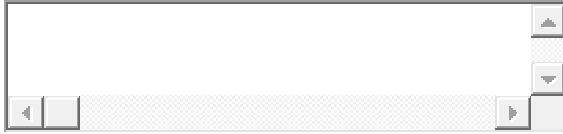


5. This question is OPTIONAL

Many organisations, including the World Health Organisation, are unable to use data unless the contact details of the information sources are provided.

It is unlikely the data will need to be checked for validity and 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 this purpose by the University of Canberra research team if required, and NOT shared with other parties.



15. Thank you

The University of Canberra and the Pharmacy Education Taskforce of the International Pharmaceutical Federation would like to thank you for taking the time to fill in this survey.

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

Assistant Professor Andrew Brown

Andrew.Brown@canberra.edu.au or phone +61(0) 411 137 625.

or Dean of Clinical Engagement, Head of Discipline of Pharmacy, Professor Gabrielle Cooper

Gabrielle.Cooper@canberra.edu.au or phone +61(0) 418 656 003

or Research assistant, Ms. Katie Doherty

katie.doherty@uni.canberra.edu.au or phone +61(0) 403 919 679.

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	<input type="text"/>
Email Address	<input type="text"/>
Phone Number (please include country code)	<input type="text"/>
Is there a convenient time to contact you?	<input type="text"/>

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

Appendix 6. Comprehensive Interview Template

Global Pharmacy Support Workforce Survey.

For academics, Ministry of health and/or education officials and key stakeholders accessed through the following networks;

- FIP (International Pharmaceutical Federation) -Pharmacy Education Taskforce,
- The World Health Organisation
- International Association Public Health Logisticians
- Global Health Workforce Alliance
- The People That Deliver Initiative
- Health workforce education training- Best in Practice
- United Nations Education Science and Cultural Organisation

Interviewer(s)

Date/Time

Location

Opening Remarks

- Introduce yourself to the interviewee
- State the objectives of interview:
 - Establish contact with interviewee
 - Explain the Project
 - Discuss roles and opportunities for the interviewee in this project
 - Gain an understanding of potential solutions/ best practices from interviewee
 - Identify additional sources of information/ data/ reports from interviewee
- Obtain verbal consent to participate in interview and to tape the interview
- Let the interviewee know that they may withdraw from the interview at any time without explanation.
- Let interviewee know that you will be taking lots of notes and taping/not taping the interview to be fed back into the analytical framework
- Let the interviewee know that comments and quotes made will be anonymous
- Commence interview

Background on Project

Effective and available medications are integral to healthcare. Adequately trained professionals are essential to efficiently procure, transport, store and supply medications. The characterisation of the pharmacy support workforce is of great importance, particularly in low income countries where shortages of pharmacists mean other cadres have extended responsibilities but also in developed countries where well trained support staff who allow pharmacists more time for clinical activities which can translate into improved patient health outcomes and savings in health expenditure.

What we hope to identify from this research.

- The titles given to the positions involved in supplying medicines in both public and private systems.
- The task and responsibility sets assigned by countries to these cadres.
- Where, and how, these people are educated and trained.
- Accreditation requirements of the programme? If accredited, how, and by whom?
- What is the numerical size of the workforce?
- Are the workers regulated? Are they licensed or certified? Do they have a legally defined scope of practice?

How will the information be used?

- The findings will be formally published in the Human Resources for Health Journal, an online and open-access periodical.
- The results will be made available for inclusion in significant global pharmacy workforce reports.
- The information will be used by researchers at the University of Canberra for reports that will be given to governments, professional bodies and education institutions.
- In any reports we write we DO NOT give out information that identifies you as a person involved in this research. Respondents are not named in any reports.

Proforma.

Good morning/afternoon, my name is Katie Doherty, I am a research assistant at the University of Canberra in the Department of Pharmacy.

Thank you for taking part in this research. This survey should take approximately 30 minutes to complete.

I am talking to you today as you have participated in our online questionnaire on the Global Pharmacy Support Workforce and have indicated that you would be willing to speak to us further on this topic.

This interview will be similar to the online survey in format, but we would like to ask some questions on topics that arose within the survey that were not clearly understood or that gave us unexpected answers that we would like to find out more about.

Please let me know if there is anything you do not feel comfortable answering and the question can be skipped. Please be aware you may withdraw from the interview at any time without explanation.

A "cadre" is a group of people trained for a particular purpose. "Competences" are the specific skills, behaviours or items of knowledge that are required to perform a role. 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) Patient Care

In this survey each group has sets of competences that Pharmacy Support Workforce cadres could be expected to demonstrate. Please choose which competences are expected of each cadre in your country.

If it is okay with you I would like to record this interview, and I remind you that your answers will be completely confidential and de-identified. Are you happy for me to record this interview?

Have you got any questions before we begin? Are you ready to begin the survey?

A. Questions About Your Workplace:

1. In which country do you currently work?

In answering the following questions, please do so from the perspective of the cadre in which you primarily work.

B. Pharmacy Support Workforce cadres including Medicines Supply and Pharmaceutical Logistics Staff

To help you to answer the following questions:

1. Please take your time and list all the cadres, or position titles, you are aware of.
2. Consider both the private and public workplaces.
3. Give the exact title for the role where possible.
4. Consider staff involved in procurement, distribution, supply and dispensing.
5. Place each title on a new line.

1.) In the country that **YOU** work, **NOT** including pharmacists, nurses and doctors, **WHO** might work in pharmacy related areas including medicines supply or pharmaceutical logistics?

An example might be a pharmacy assistant or technician...

2. What are the main roles and responsibilities of EACH of the cadres you have identified?

C. Supervision of Pharmacy Support Cadres.

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

Yes No Sometimes

2. For what are the main competences, tasks or behaviours, [] require **DIRECT** supervision?

3. What is the title of the person responsible for supervising the [] for these competences?

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

Yes No Sometimes

5. For what are the main competences, tasks or behaviours, [] require **DIRECT** supervision?

6. What is the title of the person responsible for supervising the [] in these competences?

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

Yes No Sometimes

8. For what are the main competences, tasks or behaviours, [] require **DIRECT** supervision?

9. What is the title of the person responsible for supervising the [] in this duty?

D. Regional/ Metropolitan Differences.

1. Is there a **DIFFERENCE** in the overall expected competences of Pharmacy Support Workforce cadres in **URBAN** and **RURAL** areas in your country?
 Yes No Sometimes

Remembering the kind of competences in the online questionnaire do workers have more responsibilities outside cities in your country?

3. Is there a **DIFFERENCE** in the overall supervision levels of Pharmacy Support Workforce cadres in **URBAN** and **RURAL** areas in your country?
 Yes No Sometimes

E. The Size of the Pharmacy Support Workforce in Your Country.

1. **NOT** including nurses, doctors or pharmacists, what do you estimate to be the size of the pharmacy support workforce in your country?

numbers

2. For each Cadre you have listed what do you expect to be the size of that cadre in your country?

3. How did you calculate this figure?

4. How confident are you in the accuracy of this figure?

Not confident
Moderately confident
Very confident

F. Training.

1. Please specify the title of the training which occurs for the [] cadre in your country.

2. Type of training? (please circle)

No training required
Work based training
Certificate level
Diploma level
Degree level
Masters level
PhD
Other

3. Length of training? (please circle)

Less than 2 days
Less than 1 week
Less than 1 month
Less than 6 months
Less than 1 year
Less than 2years
Less than 3yrs
Less than 4yrs
More than 4yrs

4. Type of institution that undertakes the training? (please circle)

Non Government Organisation
Government department
Public technical college
Private technical college
Public university
Private university
Other

5. Who has the main responsible for paying for the training? (please circle)

Student
Government
Non government organisation
Other

6. Is the training subject to quality assurance processes? (please circle)

Yes No Unsure

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

8. Overall, in your experience, are you satisfied with the pharmacy support workforce training which occurs?

- Yes No Sometimes

9. Compared to other countries is the quality of pharmacy support workforce training better, worse, or about the same?

10. What do you like most about the training that occurs?

11.

12. What improvements could be made to training?

G. Quality Assurance of Training and Education.

Quality Assurance is the maintenance of a standard in pharmacy workforce training. 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 training.

1. Please briefly outline the Quality Assurance procedures for the pharmacy support workforce training in your country.

2. Are the Quality Assurance procedures for the pharmacy support workforce training;?
(Please circle all that apply)

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 Training which occurs?

Yes No Sometimes

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

H. Regulation and Registration.

Regulation involves the laws and their enforcement surrounding pharmacy support workforce training.

1. Please briefly outline the regulations surrounding the pharmacy support workforce training in your country, where these exist.

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

Yes No Unsure

3. How often is re-registration required? (Please circle)

Every year
Every 2 years
Every 5 years
Every 10 years
Other (please specify)

4. What are the requirements for re-registration?

5. Compared to other countries are these regulations better, worse, or about the same?

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

I. Demographics.

1. What is your profession? (Please circle)

Senior medical professionals (eg, public healthcare physicians)

Public healthcare practice professional - nurse

Public healthcare practice professional - pharmacist

Public healthcare practice professional - epidemiologists

Community health workers

Science, technology, engineering, and mathematics (STEM) professionals

Technical support and communications occupations (eg, information technology, health communication specialists, and laboratory technicians)

Pharmacy assistant/technician

Nurses aide

Managerial/leadership role

Administrative service professionals (eg, accounting, clerical, and human resources)

Other (*Please specify*)

2. How long have you worked;

At your current facility? _____

In your current position? _____

3. What is the highest level of school you have completed or the highest degree you have received?
(*Please circle*)

Less than high school degree

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

Some college but no degree

Associate degree

Bachelor degree
Graduate degree

4. Briefly, what are your main day to day duties at work?

The University of Canberra and the Pharmacy Education Taskforce of the International Pharmaceutical Federation would like to thank you for taking the time to fill in this survey.

Wrap-up/ Next Steps

- Are there any other comments you would like to make regarding the pharmacy support workforce?
- Closing remarks, opportunity for clarification, listening to the interview etc.
- Thank interviewee for time and contributions

Appendix 7. Recruitment Email

Subject: Global Pharmacy Support Workforce Review for Non-Pharmacist Roles: University of Canberra 2012

Dear e-drugger,

You are invited to participate in the 2012 Global Pharmacy Support Workforce Review for Non-Pharmacist Roles.

This survey provides an opportunity for you to give vital input to inform the future planning requirements needed to ensure an effective international workforce.

As you are aware, efficacious and accessible medications are integral to the health care system. To efficiently procure, transport, store and supply medications it is essential that workers are adequately trained.

In low income countries, the shortage of pharmacists has required other health workers to have extended responsibilities. In developed countries pharmacists working with capable support staff have more time for clinical activities. This survey will examine the size and variety of roles in the Pharmacy Support Workforce, including the expected responsibilities, education/training requirements, accreditation and registration.

The results of this survey will be made freely available through publication, serving as an adjunct to the International Pharmaceutical Federations 2012 Global Pharmacy Workforce Report.

To gain access to the survey, please click on the link below:

<https://www.surveymonkey.com/s/GlobalPharmacySupportWorkforceReviewForNon-PharmacistRoles>

The survey will take around 20 minutes to complete. Your answers will be completely de-identified. The survey will be open from Friday the 8th March to Monday the 9th April 2012

All completed surveys will be electronically submitted directly to the research team at the University of Canberra and individuals' responses will remain totally confidential. The survey design has been approved by the Human Ethics Committee of the University of Canberra.

If you have any questions regarding the survey process or experience any technical difficulties, please contact Assistant Professor Andrew Brown, andrew.brown@canberra.edu.au, Ph +61(0)411 137 625 or +61(0)2620 15033.

Thank you for your time and assistance, yours sincerely,

Andrew Brown
Assistant Professor
Faculty of Health – Discipline of Pharmacy
University of Canberra, Australia
Andrew.Brown@canberra.edu.au
Ph +61(0)411 137 625

Professor Gabrielle Cooper
Associate Dean Clinical Engagement
Faculty of Health – Discipline of Pharmacy
University of Canberra, Australia
Gabrielle.Cooper@canberra.edu.au
Ph +61(0)418 656 003

Appendix 8. Survey Invitation to Participate

Address Block

Dear XXXXX,

Re: The University of Canberra – Global Pharmacy Support Workforce Survey.

Friday the 8th March to Monday the 9th April 2012

We would like to request access to your membership network to invite members to participate in the
Global Pharmacy Support Workforce Survey.

Background.

Effective and available medications are integral to healthcare. Adequately trained professionals are essential to efficiently procure, transport, store and supply medications. The characterisation of the Pharmacy Support Workforce is of great importance, particularly in low income countries where shortages of pharmacists mean other cadres have extended responsibilities but also in developed countries where well trained support staffs allow pharmacists more time for clinical activities which can translate into improved patient health outcomes and savings in health expenditure.

What we hope to identify from this research.

- The titles given to the positions involved in supplying medicines in public and private systems.
- The task and responsibility sets assigned by countries to these cadres.
- Where, and how, the Pharmacy Support Workforce are educated and trained.
- Are these programmes accredited? If yes, how, and by whom?
- What is the size of the workforce?
- Are the workers regulated? Are they licensed or certified? Do they have a legally defined scope of practice?

Who will be surveyed?

The Research population will include academics, ministry of health and/or education officials and key stakeholders accessed through the following networks;

- FIP (International Pharmaceutical Federation) -Pharmacy Education Taskforce,
- The World Health Organisation
- International Association Public Health Logisticians
- Global Health Workforce Alliance
- The People That Deliver Initiative
- United Nations Education Science and Cultural Organisation
- Health Workforce Education and Training- Best in Practice Initiative

Research Format

The research will consist of three components as approved by the Human Ethics Committee of the University of Canberra:

- An online questionnaire to characterise the global pharmacy support workforce that has been designed using the "SurveyMonkey" program.
- A more in depth phone or skype interview, will be used for a random subset of the online questionnaire respondents who indicate they would like to participate further in the project.

How will the information be stored?

- The research records will be kept by the University of Canberra in a locked room until the reports are written and published. This will take approximately 6 to 12 months.
- After this time the interview records will be shredded.
- Any electronic copies of the information collected will be kept for the same period on a password protect computer at the University of Canberra.
- All data collected will be de-identified and viewed only by project team members.
- Data collected will be stored and analysed in computer software that can only be accessed by project team members.
- Participants will be able to view the results in published reports.

How will the information be used?

- The findings will be formally published in the Human Resources for Health Journal, an online and open-access periodical.
- The results will be made available for inclusion in significant global pharmacy workforce reports.
- The information will be used by researchers at the University of Canberra for reports that will be given to governments, professional bodies and education institutions.
- In any reports we write we DO NOT give out information that identifies you as a person involved in this research. Respondents are not named in any reports.

How can you help? What do you need to do?

All academics, government officials and interested stakeholders are invited to participate by completing a survey questionnaire. Respondents may then have the option to participate further in one-on-one interviews and or in an online forum by nominating themselves.

I am seeking your assistance in using your professional network to circulate this survey amongst suitable candidates for the study. I would be most grateful if you could pass on the details of this study to anyone you feel would be an appropriate participant.

Those willing participate in the research survey can access the survey online by using the hyperlink. We will send a suggested email containing the link to the survey for you to forward.

Those who wish to nominate for an individual interview can do so by completing their details in the final section of the survey. I will notify directly those who are randomly select to be part of the interview or focus group cohort.

Do you need more information?

If you would like more information please contact Andrew Brown, Assistant Professor at the University of Canberra email: andrew.brown@canberra.edu.au, Ph +61(0)411 137 625 or +61(0)2620 15033 who is the team leader for this project.

Or Ms. Katie Doherty, Research Assistant at the University of Canberra
katie.doherty@uni.canberra.edu.au

Ph (+61)403 919 679.

Thank you for your time and assistance,

Yours sincerely

Andrew Brown
Assistant Professor
Faculty of Health – Discipline of Pharmacy
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Ph +61(0)411 137 625

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