

FACTORS INFLUENCING HUMAN RESOURCE DEVELOPMENT FOR PHARMACEUTICAL SERVICES

This thesis is submitted in accordance with the requirements of the University of London for the Degree of Doctor of Philosophy by:

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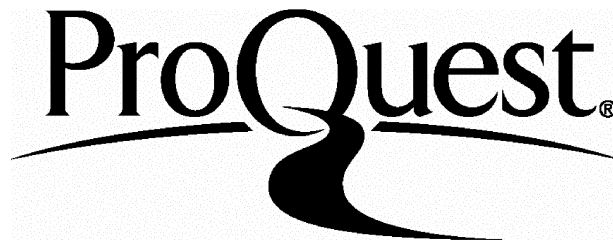
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Plagiarism statement

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8 SEPTEMBER 2010

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Abstract

This thesis sought to explore the migration intentions of pharmacists in nine countries (Australia, Bangladesh, Croatia, Egypt, Portugal, Nepal, Singapore, Slovenia and Zimbabwe) and analyse pharmacy workforce development issues in Zambia, a country with a human resources for health crisis.

Quantitative methodology was employed to study migration intentions through a pilot questionnaire with 791 responses. Data were analysed by means of Principal Components Analysis and two-step cluster analysis to determine the relationships between factors influencing migration and the characteristics of subpopulations most and least likely to migrate. A significant difference was identified in attitudes towards the professional and socio-political environment of the home country and perceptions of opportunities abroad between those that had no intention to migrate and those who intended long-term migration. Those planning long-term migration were observed to hold more negative attitudes towards the home environment and positive attitudes to opportunities. These attitudes together with male gender, knowledge of other migrant pharmacists and past experiences abroad were associated with an increased likelihood of migration.

A grounded theory approach was utilised to undertake an in-depth case study in Zambia. Key pharmacy workforce issues, policy making processes and medicines problems were examined through 19 qualitative interviews with key opinion leaders. Emergent themes were identified and their theoretical relationships refined through open, axial and selective coding and constant comparative analysis. Pharmacy workforce development policies were perceived as a threat to power by the dominant medical profession and were often resisted to the point of inaction. The likely future scenario in Zambia is for slow and incremental shifts in attitudes and recognition of pharmacy workforce needs amongst decision making stakeholders such as the medical profession and donor agencies. Given the influence of the country context and environment on migration intentions, migration should be viewed as a form of workforce attrition rather than a stand-alone phenomenon. Pharmacy workforce development is part of a more complex construct interlinked to the policy making process and is vulnerable to policy neglect.

Table of Contents

Plagiarism statement	2
Abstract.....	3
Acknowledgements.....	11
Part I Introduction	
Chapter 1 General introduction	13
1.1 Human resources for health crisis	14
1.2 Pharmacy workforce description.....	15
1.3 Pharmacy workforce roles	18
1.4 Pharmacy workforce planning.....	22
1.5 Inadequate pharmacy workforce data.....	23
1.6 Pharmacy workforce needs.....	25
1.7 Pharmacy workforce distribution imbalances.....	26
1.8 Pharmacy workforce attrition and retention	29
Part II Migration intentions study	
Chapter 2 Introduction to migration of health workers	34
2.1 Migration of health workers.....	34
2.2 Migration theories	37
2.3 Migration policies	39
2.4 Rationale for migration intentions study	41
Chapter 3 Methods.....	44
3.1 Research questions	44
3.2 Introduction.....	44
3.3 Questionnaire development and content.....	46
3.4 Data collection and entry	48
3.5 Statistical analyses	49
3.5.1 Principal Component Analysis (PCA)	49

3.5.2	Two-step cluster analysis.....	51
3.5.3	Mann-Whitney test	53
3.6	Questionnaire review and finalisation	54
3.7	Bias and limitations.....	57
Chapter 4	Results	58
4.1	Introduction.....	58
4.2	Sample.....	58
4.3	Principle Components Analysis (PCA)	59
4.4	Two-step cluster analysis	65
4.5	Mann-Whitney tests	66
Chapter 5	Discussion.....	67
Part III	Zambia country case study	
Chapter 6	Country case study background	73
6.1	Background.....	73
6.2	Public health sector development.....	74
6.3	Pharmacy workforce development policies in Zambia	76
6.4	Power in the policy making process	78
6.5	Medicines access and use in Zambia	78
Chapter 7	Methods.....	81
7.1	Introduction.....	81
7.1.1	Research questions	81
7.1.2	Selection of methodological approach.....	82
7.2	Case selection	85
7.3	Data collection.....	88
7.3.1	Semi structured interviews.....	88
7.3.2	Sampling	89
7.4	Data analysis.....	90
7.4.1	Coding.....	91
7.4.2	Constant comparative analysis	93

7.5	Reliability, credibility and generalisability.....	94
7.6	Limitations.....	95
Chapter 8 Pharmacy workforce development in Zambia		97
8.1	Literature and context	97
8.1.1	Human resources for health planning.....	97
8.1.2	Pharmacy workforce development and projected needs	101
8.2	Descriptive narrative.....	107
8.2.1	Perceptions of health and pharmacy workforce shortages.....	107
8.2.2	Pharmacists – a small, unclear and substitutable profession.....	111
8.3	Changing perceptions of pharmacy workforce and services	114
8.4	Analysis.....	117
8.4.1	Weak pharmacy institution and powerful medical institution.....	118
8.5	Summary	121
Chapter 9 Pharmaceutical policy development process		122
9.1	Literature and context	122
9.1.1	Medicines policies in Zambia	122
9.1.2	Policy making – power and process	124
9.2	Descriptive narrative.....	126
9.2.1	Policy making and implementation process.....	126
9.2.2	Perceived threat to power.....	133
9.2.3	Evidence	136
9.2.4	Donor pressure	139
9.3	Analysis.....	143
9.3.1	Decision-making and implementation	144
9.3.2	Strategies to influence decision making.....	147
9.4	Summary	150
Chapter 10 Key medicines problems in Zambia		151
10.1	Literature and context	151
10.1.1	Demographics and health.....	152
10.1.2	Healthcare providers.....	153

10.1.3	WHO Access to medicines framework	155
10.1.4	Rational selection and use of medicines	156
10.1.5	Availability of medicines.....	157
10.1.6	Reliable health and supply systems	160
10.1.7	Affordable medicines prices	161
10.2	Descriptive narrative.....	162
10.2.1	Access to medicines	163
10.2.2	Unsafe and irrational use of medicines.....	171
10.2.3	Counterfeit and substandard medicines	175
10.3	Analysis.....	176
10.3.1	Formal, compensatory and illegal flows of medicines	177
10.3.2	Patient improvement versus potential harm - protective roles	179
10.3.3	Determinants of problems of medicines access, unsafe and irrational use, and counterfeits.....	180
10.4	Summary	182
Chapter 11 Discussion.....		184
11.1	Introduction	184
11.2	Pharmacy workforce – the ‘cherry on the top’	184
11.3	Pharmacy – the invisible profession	185
11.4	Threat to power	186
11.5	Pharmacy workforce gaps – loopholes for potential harm.....	188
11.6	Access to medicines framework – contextualising pharmacy workforce issues	188
11.7	Conclusion	192
Part IV Conclusions		
Chapter 12 Conclusions		194
12.1	Introduction.....	194
12.2	Limitations.....	196
12.3	Research methods	197
12.4	Key findings and implications for policy and practice.....	198
12.5	Future research - the policy making environment	201

12.6 Conclusions.....	204
References	206

Appendices

Appendix 1 Abbreviations.....	223
Appendix 2 Glossary	224
Appendix 3 Migration intentions questionnaire	226
Appendix 4 Revised migration intentions questionnaire	229
Appendix 5 Zambia case study interview plan.....	233
Appendix 6 Zambia case study information sheet and consent form.....	235
Appendix 7 Summary of presentations and articles.....	238
Appendix 8 Publications.....	241

List of Figures

Part I Introduction

Figure 1.1 Human resources for health crisis countries	14
Figure 1.2 Pharmacist density and economic development by country	16
Figure 1.3 Pharmacy education capacity per training institution	17
Figure 1.4 Pharmacy workforce composition	18
Figure 1.5 Research articles on health professional education from 1970 to 2004	24
Figure 1.6 Geographical representation of the share of the world's pharmacy workforce ...	27

Part II Migration intentions study

Figure 3.1 Research timeline.....	46
Figure 3.2 Migration intentions questionnaire review process.....	54
Figure 4.1 PCA scree plot	61
Figure 4.2 Mean factor z-scores by migration intention	64

Part III Zambia country case study

Figure 8.1	Monthly public sector salaries and allowances in 2005	100
Figure 8.2	Pharmacist workforce levels in Zambia.....	102
Figure 8.3	Annual training output of pharmacists and pharmacy technologists in Zambia	104
Figure 9.1	Decision making on proposed policy action	146
Figure 9.2	Strategies to influence decision making.....	149
Figure 10.1	Under five child mortality per 1000 live births in Zambia 195-2004	152
Figure 10.2	Sources of medicines used by caregivers in five districts.....	155
Figure 10.3	Access to medicines conceptual framework	156
Figure 10.4	Availability and stock outs of Coartem™ at Medical Stores Limited between May 2004 and April 2007.....	159
Figure 10.5	Proportion of personnel in each cadre by provider type.	161
Figure 10.6	Themes associated with problems in access to medicines	171
Figure 10.7	Themes associated with unsafe and irrational use of medicines	175
Figure 10.8	Access to medicines conceptual framework- determinants and components ...	176
Figure 10.9	Flow of medicines from suppliers to providers	178
Figure 10.10	Patient trajectories through the use of medicines and pharmacist roles	180
Figure 11.1	Access to health technologies framework, Frost and Reich (2008)	189
Figure 11.2	Revised access to health technologies framework	191

List of Tables

Part I Introduction

Table 1.1	Rural pharmacy workforce programs in Australia	32
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Part II Migration intentions study

Table 3.1	Number of participating universities	48
Table 3.2	Comparison of HOMALS and two-step cluster analysis	53
Table 3.3	Expert review panel composition.....	55

Table 3.4	Summary of expert panel comments.....	55
Table 3.5	Major revisions to pilot questionnaire.....	56
Table 4.1	Sample characteristics.....	59
Table 4.2	Linear components within dataset and total variance explained.....	60
Table 4.3	Factor 1 reliability analysis	61
Table 4.4	Factor 2 reliability analysis	62
Table 4.5	Factor 3 reliability analysis	62
Table 4.6	Factor summary	62
Table 4.7	Factor loadings and item composition.....	63
Table 4.8	Cluster characteristics	65

Part III Zambia country case study

Table 7.1	Comparison of methodological approaches.....	83
Table 8.1	Projected health workforce needs and approved establishment	98
Table 8.2	Public sector pharmacists in 2007	106
Table 8.3	Public sector pharmacists by province in 2007	106
Table 8.4	Sub-themes of weak pharmacy profession	118
Table 8.5	Perceived characteristics of medical and pharmacy institutions	120
Table 9.1	Implementation and agreement of proposed action	145
Table 9.2	Major strategies to influence decision making.....	148
Table 10.1	Flows of medicines from suppliers to providers	177
Table 10.2	Determinants of key medicines problems.....	181
Table 11.1	Comparison of thematic components of access to medicines frameworks.....	190

Part IV Conclusions

Table 12.1	Key findings and implications for policy	190
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Part I Introduction

Part I commences with an Introduction chapter that describes key issues and trends in pharmacy workforce development. This serves as a generic introduction to pharmacy workforce concepts and trends to provide background to the specific issues of migration and workforce development in Zambia discussed in Parts II and III.

Parts of this chapter were published in 2009 as part of a literature review on hospital pharmacy human resources and training in the peer reviewed journal American Journal of Health-System Pharmacy and training and as a chapter in the 2009 FIP Global Pharmacy Workforce Report (1;2). It will also be published in a chapter on pharmaceutical human resources in the peer reviewed 2010 World Medicines Situation Report of the WHO that is currently in press.

Chapter 1 General introduction

The purpose of this chapter is to provide a general introduction to pharmacy workforce and health workforce issues in order to contextualise concepts explored in this thesis. It does not aim to serve as an exhaustive literature review on these broad areas, but rather intends to describe key literature on pharmacy workforce issues and trend relevant to the specific research interests of pharmacist migration intentions and processes in pharmacy workforce development. It first seeks to contextualise pharmacy workforce issues within the broader human resources for health situation, before describing the major features of the pharmacist workforce situation, trends, roles and key issues.

Specific literature relating to migration and pharmacy workforce development in Zambia is described in Part II and Part III respectively.

This literature review examined published research and the 'grey' literature in the form of reports, reviews and books relating to human resources for health, pharmacy workforce and migration of health workers from 1970 to 2008. Key words used included pharmac* workforce, pharmacist, pharmac* technician, pharmac* technologist, pharmac* assistant, retention, attrition and recruitment. Electronic databases were used such as Medline, Google, Google Scholar, International Bibliography of Social Sciences, Human Resources for Health Global Resource Center and further references were identified through citations. A total of 5551 articles were identified in the search, of which 75 relevant publications were selected for inclusion after further review. The review focused on literature published in the English language.

There is little published research on pharmacy workforce trends and issues. The literature on human resources in pharmacy is most developed in the United States, followed by the United Kingdom, Canada and Australia. Hence the evidence in this field is dominated by that of Anglophone western countries which may not be applicable to other contexts.

1.1 Human resources for health crisis

Pharmaceutical human resources are part of the health workforce, thus it is important to first consider general human resources for health trends. The crisis described in 2006 by WHO is expressed as a chronic inadequacy of health workers in most countries in sub-Saharan Africa to provide the most basic health services (3).

Investment in human resources, particularly in the public sector has stagnated or declined over recent decades despite increasing demand for health services (3). The consequences of structural adjustment in public funding and recruitment freezes due to fiscal space constraints in many countries, has meant that current employment conditions and workforce levels may be worse than what they were 30 years ago in low income countries.

Fifty-seven countries worldwide, 36 of which are in sub-Saharan Africa, lack the critical level of physicians, nurses and midwives to provide basic health services such as skilled attendance at birth and vaccinations (Figure 1.1) (3).

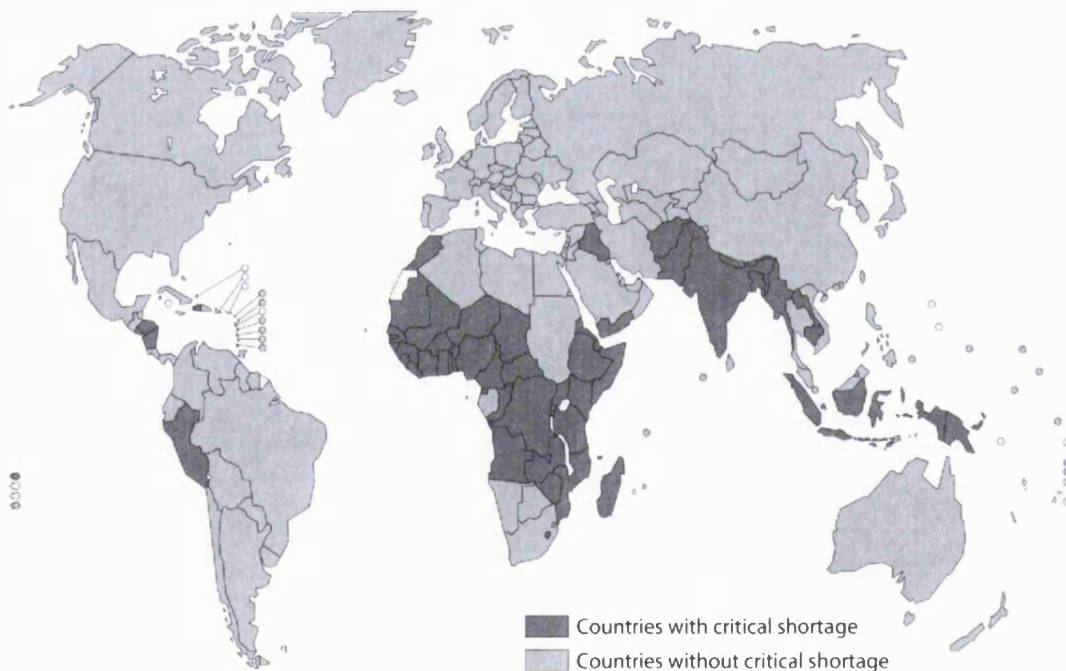


Figure 1.1 Human resources for health crisis countries

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This level necessitates a minimum of 2.5 health workers per 1000 population and has been correlated with a decline in maternal and under five child mortality (3;4). Countries that fall short of this workforce level are defined as 'crisis countries' by the World Health Organization (WHO). It is estimated that an additional 4 million health workers are needed to resolve the crisis. Additionally, health workforce shortages are projected to increase over the next 20 years due to the retirement of the 'baby boomer' generation.

Whilst the level of physicians, nurses and midwives serve as a proxy indicator for the adequacy of the health workforce, there is a lack of reliable data on other health workers. WHO statistics on the health workforce are compiled from national Ministry of Health sources and publicly available on the WHO Global Atlas (5). These data are accessed by researchers and policy advisors in analyses of the health workforce. In this data, statistics on the pharmacy workforce are not up to date and in some cases are inaccurate. For planning and research purposes, this may not provide adequate information and may also misinform. For example, in Zambia, 2004 data from the WHO Global Atlas 2004 records 707 pharmacists whilst according to the Pharmaceutical Society of Zambia records, there were only around 100 pharmacists in 2007 (6).

1.2 Pharmacy workforce description

A survey conducted by the International Pharmaceutical Federation (FIP) in 2009 provides the most accurate and up to date data currently available and includes data from 56 countries (2). The density of the pharmacist workforce to population varies widely between 56 countries surveyed in 2009 from 0.04 (Chad) to 18.88 (Malta) per 10,000 population, or in other words, one pharmacist for every 250,000 people in Chad compared to one for every 250 in Malta (2). Pharmacist workforce density was also found to be correlated with economic development (Gross National Income per capita), with richer countries generally having a higher density of pharmacists than poorer countries (Figure 1.2) (2).

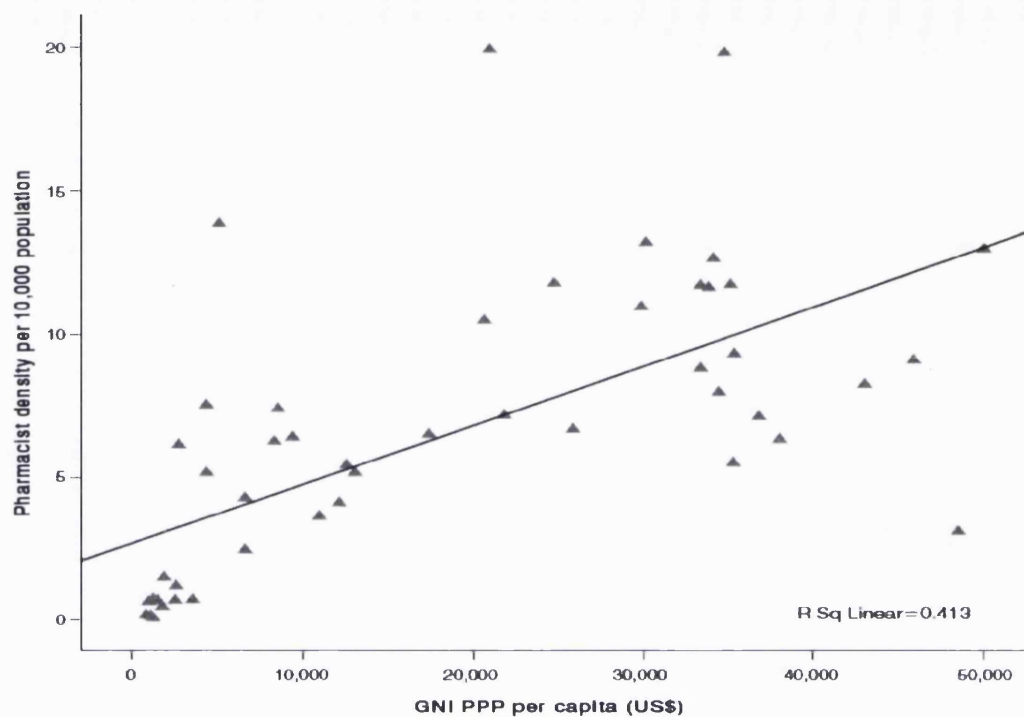


Figure 1.2 Pharmacist density and economic development by country

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The average period of undergraduate training for pharmacists is four years and 8 months with a range from 3.5 (Israel) years to six years (France, Japan) (2). Most countries also require an additional period of experiential learning or internships prior to professional registration of about 8 months although this varies greatly between 1 (India) to 36 (Albania) months in duration (2).

The number of pharmacy graduates (pharmacists) varied considerably between countries depending on the number of schools of pharmacy and education capacity of each training institution (7). Figure 1.3 illustrates the average output of each training institution by country compared to the overall mean (88) (7). Countries ranged from having no training institution to over 500 (India) (7). Anderson et al (2009) report that higher pharmacy workforce densities are associated with a lower proportion of the pharmacy workforce in academia, a finding which flags the important issue of the need to build academic workforce capacity (7). The WHO

UNESCO FIP Global Pharmacy Education Taskforce with its three year action plan is charged with developing evidence and tools with which to develop policy for pharmacy education capacity development (7-9).

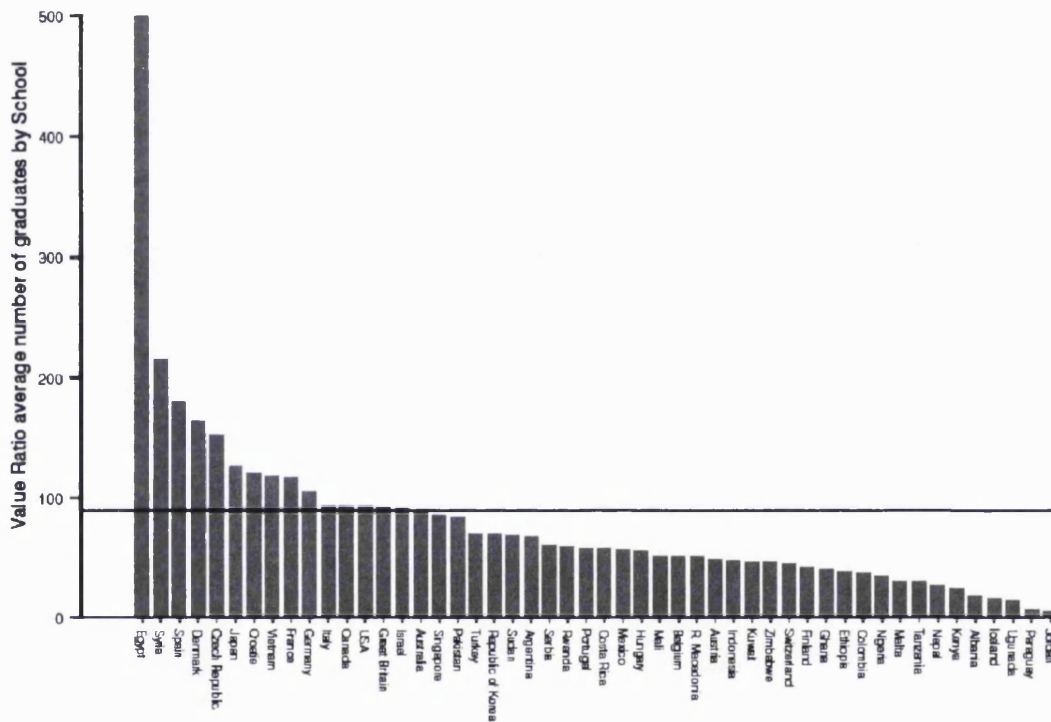


Figure 1.3 Pharmacy education capacity per training institution

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Less is known about the density of pharmacy technicians, however available data from 26 countries indicates that it varies from 0.005 (Chad) to 9.4 (Turkey) per 10,000 (2). The proportion of the workforce comprised of pharmacists and technicians also varies significantly between countries. Some countries report that they do not have any mid or lower level cadres equivalent to pharmacy technicians, such as Japan and the Republic of Korea, whilst pharmacy technicians in other countries such as Pakistan comprise three quarters of the pharmacy workforce (Figure 1.4) (2).

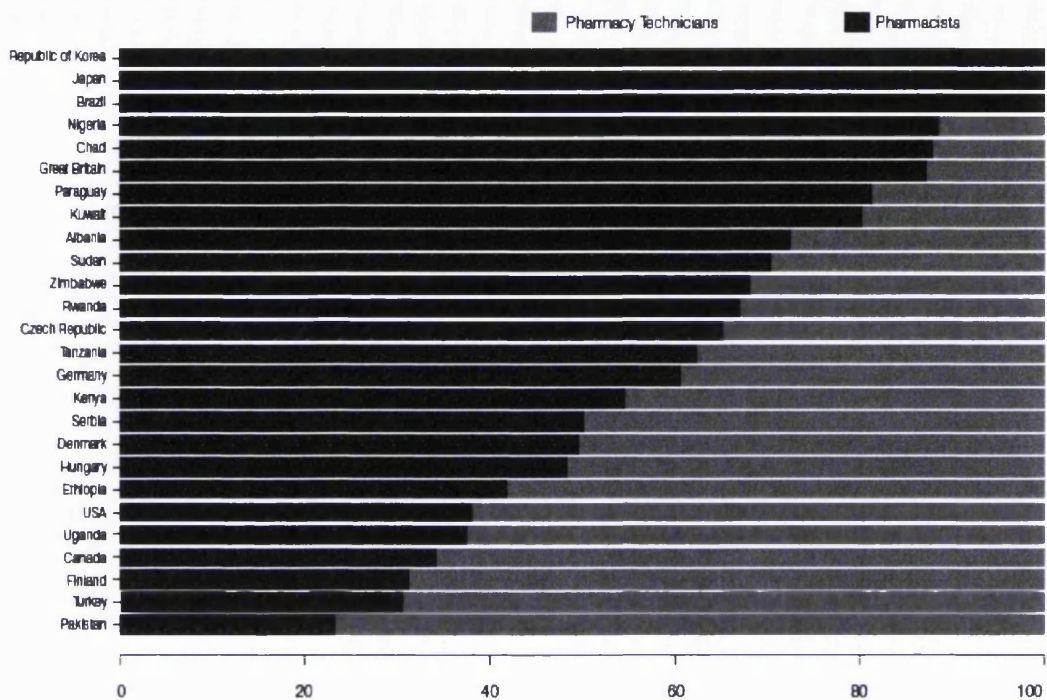


Figure 1.4 Pharmacy workforce composition

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The training of technicians is two years in most countries in a formal training institution though this can take up to four years (Serbia) (2). Pharmacy technicians are not required to do any additional internships in 28 out of 41 countries which provided data, however in some countries they may be required to complete 3 or 6 months (2). Six out of 41 countries did not have any pharmacy technician training institutions, 11 had one or two schools, and the remaining countries varied considerably in the number of schools with USA reporting over 700 (2).

1.3 Pharmacy workforce roles

Pharmaceutical services and the level of competency required to provide these can be ordered across a continuum. The demarcation of roles between pharmacists and technicians and other cadres, varies greatly between countries and can be seen to be a function of multiple

considerations including level of competence of each cadre, workforce shortages and distribution imbalances and workforce composition.

Pharmacists in both community and hospital settings have been described in the literature to improve health, reduce morbidity and mortality, prevent hospital admissions, improve rational use of medicines, and increase access to healthcare and medicines, particularly for underserved populations (10-21).

Evidence supports the extended roles that pharmacists adopt beyond the 'traditional' supply of medicines to deliver population level health promotion services such as health education, HIV and sexually transmitted infection prevention, screening and monitoring for chronic conditions, adherence support for long-term therapies and medicines management services to optimise rational use of medicines. Evidence from USA hospitals associated clinical hospital pharmacy services and clinical pharmacist staffing with reduced adverse drug reactions and mortality rates (22;23).

However there is considerable variance in the roles that pharmacists play between countries. In high income countries such as in Western Europe, North America and Australia where the pharmacist workforce density is greater, direct patient care roles have become established such as clinical pharmacy and ambulatory care (outpatient) services, a trend which is also emerging in parts of Asia. However in low income countries, especially in Africa where pharmacists are significantly fewer in number and perhaps scarce, the roles are centred on supply chain and formulary management.

Whilst it may be tempting to classify pharmacy practice in low income countries as being less advanced as those in high income countries, this simplicity masks the complex workforce dynamics and dimensions in each unique country setting. In the USA, the American Society of Health-System Pharmacists long-range vision anticipates most pharmacists to be focused on direct, interdisciplinary and collaborative clinical care and technicians certified to provide a basic level of services and additionally accredited for specialised and advanced roles (24). In Italy, pharmacists are primarily responsible for the procurement, storage, preparation and dispensing of medicines and medical devices with a few pharmacies serving as medicines information centres (25). In Sweden, hospital pharmacists are beginning to participate in ward rounds and

serve as a member of the health-care team and whilst such services were first piloted almost 20 years ago, the uptake has been limited to temporary projects and has yet to extend into longstanding services (26). In Kenya, pharmacists in the capital Nairobi formed a Hospital Pharmacy Association of Kenya to catalyse advancement in Clinical Pharmacy and introduced the first Masters programme for Clinical Pharmacy in 2006.

Pharmacists in some Spanish, French and Portuguese speaking countries also function as 'clinical biologists'. Clinical biologists usually undergo four years of specialist training and interpret laboratory results and advise on pharmaceutical management. Hospital pharmacists in Kenya provide advanced procurement services, formulary management, technical input for drug policies and guidelines.

Pharmacy technicians are generally responsible for functions that support the preparation and dispensing of medicines and inventory management under the supervision of a pharmacist. In rural areas of countries with severe pharmacist shortages, pharmacy technicians, other mid-level pharmacy cadres and nurses may undertake more advanced roles by independently dispensing and managing dispensaries.

Where technician training is more comprehensive as in UK, technicians may manage inventories, provide advice to patients, compound preparations and in some cases, independently check prescription medicines for dispensing (27). In Hungary, pharmacy technicians may further specialise in 13 areas after two years of practice (27). In some countries such as Italy and Japan, pharmacy technicians do not exist. This scenario seems to be uncommon and only four countries of 84 globally surveyed in 2008 did not have pharmacy technicians and related cadres in their hospital pharmacy departments (28).

In some countries, mid-level cadres exist such as 'associate pharmacists' in China Taiwan, 'Bachelor pharmacists' in some European countries (three year undergraduate bachelor degree), 'pharmacy technologists' in Zambia (three year diploma trained), and 'pharmacoconomists' in Denmark (three year training). These mid-level cadres in the pharmacy workforce may be able to independently dispense and advise on medicines and generally have a formal training programme including a period of experiential learning and assessments.

The status of pharmacy technician role development in the United States has been mixed given the diverse requirements for the training and competence of technicians within the country (29). The American Society for Health-System Pharmacists has raised concerns of patient safety and proposes a model curriculum and developed a pharmacy technician initiative that seeks to work with state regulators and other bodies to move towards uniformity in regulations and training (30;31). Dialogue is underway in Canada for a national pharmacy technician certification process in addition to regulation developments at the provincial level (32). National professional competencies for pharmacy technicians in Canada were established in 2007 and describe the roles, responsibilities and the knowledge, skills, abilities, attitudes and judgements required for competent performance (33).

Newly developed competency standards for pharmacy technicians in Australia will provide new opportunities to technicians to expand their variety of roles and scope for career development (34). The formal training of pharmacy technicians is seen as a fundamental strategy to freeing up the time of pharmacists to take on extended roles in clinical practice (34).

In both the Australian and USA examples, it is anticipated that standardised training and accreditation of technicians will also enable systematic extension of technician roles in the handling and preparation of medicines and thus free up pharmacists to provide clinical services (33;35;36). Seen from this perspective, the competency and workforce development of pharmacy technicians is an integral strategy for the advancement of pharmacist roles and in creating efficiencies in workforce deployment.

There are also other cadres that undertake pharmaceutical service roles. For example, dispensing of antiretrovirals (ARVs) was an activity observed to be provided by physicians, non-physician clinicians, nurses and community health workers in a 2007 WHO report on Task-shifting (37). Hospitals unable to fill pharmacist vacancies in Australia utilised nurses to provide services or supervise pharmacy technicians (38). Nurses specialising in dispensing and administration have also been used to improve efficiency and reduce medication errors on wards in one USA case study, this has also had the effect of enabling pharmacists to expand clinical services (39).

1.4 Pharmacy workforce planning

Pharmacy workforce planning is essential to enable the effective development and implementation of pharmacy services. Traditionally it has been an area which was self determined by the profession based on workforce scenarios as they presented. However, current and emerging drivers external to the profession and largely outside of its influence, such as increasing workforce demands, patient safety, resource constraints, health workforce policy reforms; will pressurise traditional thinking to shift towards sustainable and comprehensive workforce planning. Furthermore, changing demographics in the pharmacy workforce such as increases in the female workforce, increasing part-time employment, and retirement of the 'baby boomer' generation if not appropriately planned for will exacerbate workforce shortages in health systems that are struggling to cope with meeting the needs of an ageing population, increased medicines costs and growing prevalence of chronic diseases (2;27). In Australia, 44% of the current pharmacist workforce is over the age of 45 and the loss from retirement in the near future may be severe according to the 2006 edition of Australia's Health (cited in (34)).

Given growing resource constraints and healthcare demands, knee-jerk workforce planning will no longer be cost effective or efficient as they perpetuate trends of cyclical bouts of workforce oversupply and shortages. There is concern in various countries that knee-jerk reactions to workforce trends or budgetary constraints that spur such trends will lead to long-term adverse effects in quality of care and health outcomes. In 2006, the budget deficits of the UK's publicly funded National Health Service (NHS) had an impact on human resources across the hospital sector including recruitment freezes or abolishment of vacant posts, reduction of locum and temporary workforce and short-term limitations on professional development and career progression in hospital pharmacy (40;41).

A recent Australian study identified adequate and appropriately trained human resources as one of seven key factors necessary to the successful implementation of cognitive pharmacy services in community pharmacy(42). Access to medicines in many African countries is hampered by inadequate capacity to manage the pharmaceutical supply chain and procurement. Sustainable solutions will necessitate African countries to build their own institutional capacity to manage procurement in order to make medicines more affordable and accessible (43).

Despite the significance of pharmacists and the pharmacy workforce in the health care system, very little workforce research or policy analysis exists. Recent reports of the global body representing pharmacists and pharmaceutical scientists, the International Pharmaceutical Federation (FIP), suggests that there are particularly severe pharmacist workforce shortages in low income countries (2;27). There is also a trend of increasing migration of pharmacists, with data from Australia and Canada that indicated a growth in the number of foreign pharmacists registrations over the last 10 years (27). A recent systematic review of the literature on pharmacy workforce highlighted key trends such as growing feminisation of the pharmacy workforce that were increasingly working part-time, inequitable geographic (urban/rural) and work sector (public/private) distribution, expansion of pharmacy education for both pharmacists and pharmacy technicians and concluded that improved recruitment and retention, and minimisation of attrition was necessary to maintain the required expansion of the pharmacy workforce (44).

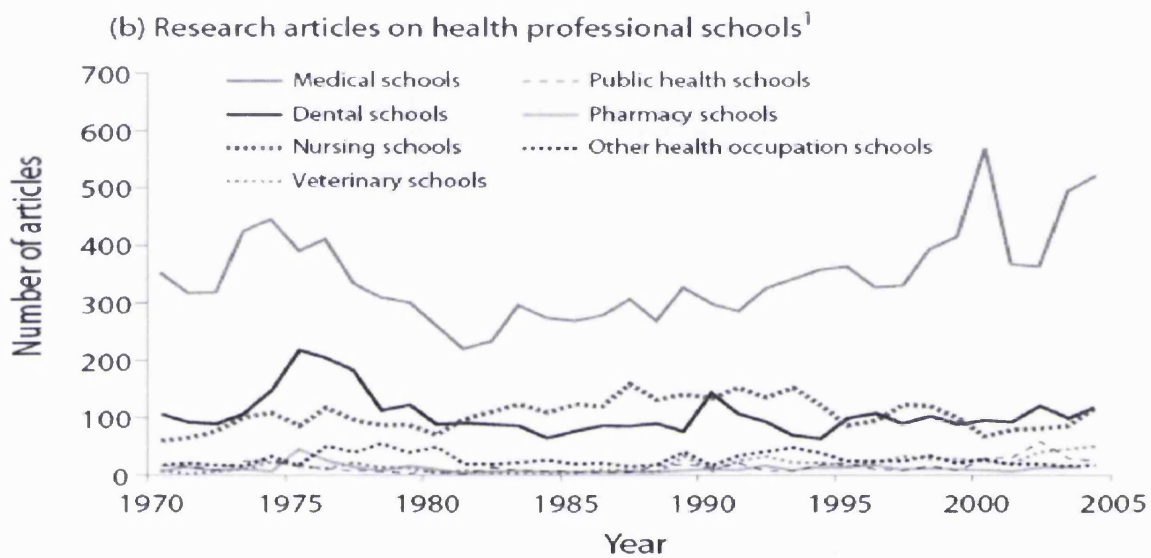
1.5 Inadequate pharmacy workforce data

The documentation of indicators for determining pharmacy workforce needs based on workloads and existing workforce are scant, particularly for workload relating to non-dispensary functions (45). Efforts are currently under way by WHO to develop pharmacy workforce assessment tools to aid workforce planning with pilot assessments conducted in Ghana, Nigeria, Sudan and Tanzania in 2009 (2).

Existing workforce shortages, resource constraints and the lack of appropriate information systems make data collection a challenging exercise. Given the recent impetus in the international health policy making arena signalled by the 2008 Kampala Declaration and Agenda for Global Action on scaling up human resources for health and G8 Leaders declaration on health, this would represent a unique lost opportunity to pharmacy (46).

Lack of data may lead to oversight of the pharmacy workforce in broader national or state level human resource planning and poor understanding by management and policy makers on the role and impact of pharmacy workforce beyond basic dispensary functions in health systems.

Strategically, it is paramount that the profession take leadership to ensure that pharmacy workforce issues are researched and appropriately planned for to capitalise on current policy making momentum and unprecedented attention in this area. In comparison to other professions in the health sector, pharmacy is severely lagging in developing an evidence base relating to its education and workforce development (Fig 2).



¹ As indexed in PubMed, 1970–2004.

Figure 1.5 Research articles on health professional education from 1970 to 2004

Reproduced with permission from (3).

Current policy is creating opportunities for the development of workforce projections, education capacity, working conditions, remuneration packages and career structures. Such opportunities if seized would have important implications for the strengthening of pharmaceutical services and systems and thus healthcare outcomes.

1.6 Pharmacy workforce needs

Pharmacy workforce needs have been estimated in several countries through workforce modelling approaches such as in Australia, UK and USA. Although comprehensive needs assessment and analysis is absent in most countries, many countries report pharmacy workforce shortages. However over recent years, some countries have significantly increased their pharmacy workforce, especially through measures to scale up workforce supply and undergraduate professional education. This strategy has been successful in increasing the pharmacist workforce in the Australia, Kenya, Ghana, Sudan, UK, USA and Vietnam. In many countries, workforce shortages also apply to academia which limits capacity to scale up education (7). Vacancy rates in high income countries are also subsiding such as in Australia, UK and USA over recent years. Twelve percent of hospital pharmacist posts in England and Wales were vacant in 2007 with the highest vacancy rate for junior pharmacist positions at 17%. (47).

The total number of hospital pharmacist and technician posts has increased by 54% and 58% respectively between 2001 and 2006 in the UK (47). Whilst there was an increase in the establishment across all levels of pharmacists and technician practitioners, this was especially marked for mid-level pharmacists and junior technicians (47). The number of pharmacists in Sudan increased from 200 to almost 6000 over the last 40 years mainly due to the scale up of pharmacy education (48). Kenya has also experienced a 40% increase in the public sector pharmacy workforce over the past four years due to increases in pre-service training(49).

New policy developments in extending the role of pharmacists as consultants (advanced level practitioner – equivalent to consultant specialists), supplementary and independent prescribers and pharmacists with special interest in the United Kingdom is expected to increase demand for pharmacists as well as place demands on training (47). Similarly, introduction of remote pharmacist supervision will increase demands for technicians, particularly those who are accredited to check dispensed medicines (47).

In 2002, a conference in the USA suggested that the absolute pharmacist workforce in the USA needed to increase by 75% from 240,000 by 2020 (50). Based on their projection, fewer pharmacists are required for prescription filling services; however, up to five-fold more pharmacists than in 2001 will be required to work in primary, secondary and tertiary care.

There may be difficulties at first in ensuring a sufficient number of registration or residency posts for an increased number of graduates seeking to enter the workforce (41;47). In the case of the USA, this translates into the need to support some 180,000 newly qualified pharmacists through residency training programmes in the next 12 years (51). Should Knapp's projections for the USA's workforce needs for 2020 were to be realised, there would be a need to increase the current number of residency positions from 1600 to over 9000 per year which is unlikely to be feasible (51).

Bond et al argue that focus should be placed towards achieving universal coverage within hospitals of core clinical pharmacy services such as participation on resuscitation (CPR) teams, in-service education, drug information, adverse drug reaction management, drug protocol management, medical rounds and admission drug histories that were most likely to improve health care outcomes such that only a moderate increase in the clinical pharmacist workforce would be required (23;52;53).

1.7 Pharmacy workforce distribution imbalances

In many countries worldwide there is a shortage of pharmacists and inequity in the distribution of the workforce between and within countries (2;54). Figure 1.6 graphically describes the inequalities in the distribution of the pharmacy workforce worldwide and highlights the countries particularly affected by workforce shortages, particularly in sub-Saharan Africa. In this cartogram, the country size is representative of the country's share of the global pharmacy workforce – i.e., countries that have a smaller share of the pharmacy workforce have a smaller geographical representation and vice versa (55).

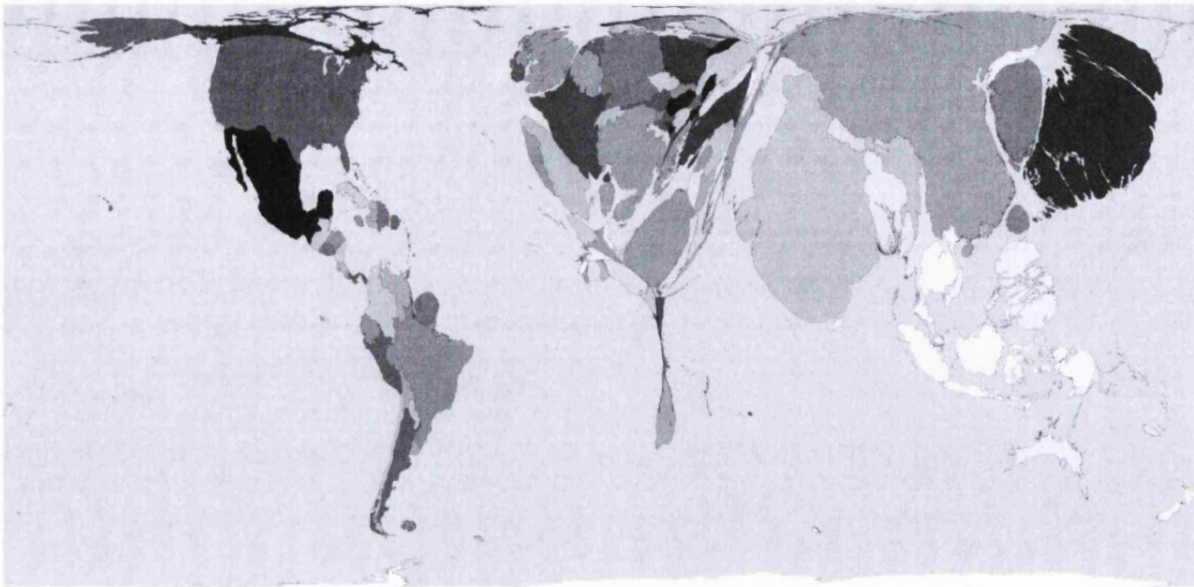


Figure 1.6 Geographical representation of the share of the world's pharmacy workforce*

*Pharmacists, technicians and assistants. Reproduced with permission from WorldMapper (55).

The degree of the shortage and the impact on pharmacy services depends on the roles that pharmacists and other cadres play in each country. These vary from largely distributive functions and supply chain management to patient care roles where a greater workforce density is required.

Planning towards workforce intensive roles may not be workable in areas with extreme workforce shortages, particularly in sub-Saharan African countries. In Ghana and Uganda, the pharmacist workforce is centred in the urban areas and whilst there are some examples of advanced cognitive roles that pharmacists play, in most cases, their roles remain distributive and tied to the procurement, management and dispensing of medicines throughout the supply chain (27). However, the roles of supportive cadres such as pharmacy technologists and technicians tend to be more developed than in high income countries and pharmacists - despite their limited number – may be able to be freed from distributive functions to play more advanced pharmacy service roles to have a greater impact on health outcomes.

In most countries there is an imbalance in the distribution of the pharmacy workforce between rural and urban areas. Whilst these may be less marked in high income countries (such as Australia and Canada) than low income countries, the issue of rural workforce recruitment and

retention requires greater policy focus and strategy development (27). Uganda has just 1 pharmacist per 140,000 population and a workforce availability of 30% of what is required in the public sector across the country, however this is further compounded by 90% of the workforce practicing in one of four regions, leaving the remaining 10% of the workforce to service three quarters of the population (27). In 2005 in Ghana, around 60% of the pharmacist workforce in the public hospital sector were in regions that only serve a third of the population (27).

Pharmacy students from rural areas may be more likely to practice in a rural area. Seventy percent of graduates from one rural pharmacy school in Australia were found to commence their career in rural or remote areas (56). Pharmacists in South Africa from rural areas were more likely to work in rural areas and the public sector hospitals than those from urban areas (57). Pharmacists working in rural areas of Australia also experienced enhanced job satisfaction due to community linkages with patients, interprofessional relationships and undertaking extended roles (58). The negative perception of rural pharmacy practice and rural lifestyle is a barrier to recruitment and further opportunities for exposure to rural practice is recommended (58). Final year medical and nursing students in Ethiopia that were from richer families and with lower motivation to serve the poor were less likely to work in rural areas (59).

Automation has been proposed as a mechanism by which to reduce workload and improve efficiency of services. The evolution of robotics, automated dispensing, point of care dispensing, electronic prescribing and computer systems may improve the efficiency, quality and safety of care and have been utilised in many countries to meet growing service demands despite workforce shortages. The costs associated with such technology may be costly to install and maintain and should be taken into account.

It has been argued that a critical level of workforce is needed to manage such technologies and that technologies cannot supplant the need for pharmacy workforce but rather be used to enhance the performance of the pharmacy services (60). A comparative study of pre- and post-implementation of a robotic prescription-filling system in a hospital pharmacy in the USA indicated that whilst it reduced the overall prescription-filling time, use of the robotic system necessitated a greater proportion of pharmacy technician time and hence effects on skill mix need to be taken into account (61). In one USA report, the oversight and expertise of pharmacists from urban hospital in a rural hospital was utilised via telepharmacy (62). This

functioned via an electronic system including an integrated data network, medication-dispensing machines, order verification and videoconferencing systems.

1.8 Pharmacy workforce attrition and retention

Attrition is the process of an individual leaving their place of employment, sector or labour market. Attrition may take place due to retirement, redundancy, internal and external migration, poor health and death, amongst other reasons.

A small study of pharmacists in Sudan found that the majority of public sector respondents planned to leave for the private sector, predominately for economic reasons, and also cited issues such as lack of recognition in the public sector (63). However almost 80% of private sector pharmacists contemplated moving into the public sector due to the perception of greater job satisfaction (63). Lower salaries in the public sector deterred private pharmacists from moving into the public sector (63).

Insufficient or unqualified staff was cited as a key factor by 72% of USA pharmacists that planned to leave their position within a year, with other common reasons including a desire for change and stress or workload issues (64). Members of the Society of Hospital Pharmacists of Australia (SHPA) in 2007 cited the staffing crisis as the most important issue affecting their ability to provide patient care (34).

Gender differences in workforce attrition trends are also prevalent. In the UK, 12% of the female census respondents reported moving out of the pharmacy sector altogether compared to just 3% of males (65). There is a greater movement within the workforce in the UK towards part-time work, especially for more experienced female pharmacists (65). With the growing feminisation of the pharmacy workforce worldwide, particularly in high income countries, the attrition of a growing demographic out of the pharmacist workforce poses a potential significant loss and emphasises the need to consider gender issues in developing retention strategies.

Retention policies can include financial and non-financial incentives to enhance performance and minimise attrition of health workforce. Financial incentives such as wages, bonuses,

pension, allowances, loans and reimbursements of education costs are the most common approaches.

Pharmacists with fewer years of experience cite low income as more of an issue contributing to attrition than those with more experience, 26% of pharmacists between the ages of 20-30 gave income as their reason for leaving (34). Thus adequate remuneration is necessary to support the recruitment and retention of the younger workforce.

Financial incentives alone do not determine workforce retention as non-financial incentives have an important role to play in increasing the motivation of health workers. Non-financial incentives include enabling a supportive environment for work and professional development, and acknowledging professionalism and career goals (66). These include career development pathways and professional development opportunities.

Where severe workforce shortages exist alongside significant resource constraints, there is preference in Uganda for the allocation of funding towards the retention of the existing workforce through salary top-ups rather than investing in expanding the domestic supply (education) of pharmacists (67).

In pursuit of addressing the addressing shortages in the pharmacy workforce, there is a need to closely examine strategies to encourage workforce retention. In the case of Ghana between 2001 and 2005, there was a 40% increase in the total pharmacist workforce and an 80% increase in the hospital setting (27). This increase was primarily due to the increased number of graduates entering the workforce each year. However workforce levels have since stabilised and have not increased significantly beyond the level in 2005 due to workforce exit (attrition) matching workforce entry (68).

In Australia the reduction of hospital pharmacy vacancy rates in between 2001 and 2003 may be partly due to the entry of an increased number of graduates into the workforce. In one Australian state that had a four-fold increase in the domestic workforce supply, a reduction from 23% to 2% in vacancies was experienced (38). Interestingly, the study notes that pharmacists with two to five years of hospital experience are least represented in the workforce, possibly indicating the lack of retention strategies that keep newly qualified

pharmacists in the sector (38). One state in Australia increased the overall pay scale of pharmacists at all grades and were reporting better retention of younger pharmacists.

Studies suggest that remuneration is not the only factor for retention with other factors such as workforce levels and competency, management support for pharmacy practice, professional development opportunities and access to further training cited as incentives to stay (69).

Organisational climate and culture and conditions of work are important determinants of retention. Half of the USA pharmacists who intended to stay in their positions indicated flexible schedules as a key factor with the most common reasons for retention including good salary and relationships with colleagues (64). Similar reasons were given by pharmacy technicians in the USA who intended to leave their positions citing poor salary, lack of advancement opportunity and insufficient staffing as reasons for their intention to leave (70).

A well staffed department, ability to take leave and support for the pharmacists role within the hospital and professional development opportunities are important retention factors for pharmacists in Australian hospitals (34).

The retention of the rural workforce may be difficult to achieve and a multi-pronged approach is required to better understand the unique workforce challenges in these areas and how best these can be addressed. The Rural Pharmacy Programs in Australia seek to comprehensively address economic, professional, educational and family disincentives to the recruitment and retention of pharmacists in rural areas in order to expand access to community pharmacies and pharmacy services (Table 1.1) (71).

Table 1.1 Rural pharmacy workforce programs in Australia

Examples of strategies	Disincentive addressed			
	Economic	Professional	Educational	Family
Scholarships and allowances	X	X	X	
Emergency locum support	X	X		X
Rural newsletter		X		
Commissioned rural research projects		X	X	

Adapted from Mitchell and Quester, 2009 (71).

Tackling disincentives for rural practice is especially critical given the ageing workforce demographic and the retirement of significant proportions of the rural workforce in the next 5 to 10 years. Almost half of surveyed pharmacists in rural areas in New Zealand planned to leave rural practice (72). The intention of pharmacists in rural practice to leave was greater than that of physicians or nurses with most pharmacists planning to leave within 5 years (72). This included a significant proportion of pharmacists nearing retirement as well as younger pharmacists (72).

Flexible working arrangements such as part-time contracts and shared-staffing between hospitals may be pragmatic solutions against a background of workforce shortages and resource constraints in employing pharmacists and pharmacy technicians in rural hospitals. Many rural hospitals may not have pharmacists or only operate small satellite dispensaries. The majority of the workforce in the regional and remote hospitals in Australia were part-time pharmacists (38). Shared-pharmacist posts between rural hospitals is another strategy to maintain a level of service despite national workforce shortages though may be impractical in the case of remote rural areas (73).

WHO advocates for a 'working life span' approach to systematically developing strategies to develop the health workforce (3). By this it is meant that there is a need for comprehensive policies that support entry (ie – pre-service education), performance (i.e. - remuneration, practitioner development, non-financial incentives) and manage attrition (i.e. – migration, retirement, career change).

Part II Migration intentions study

Part II comprises of chapters relating to the quantitative migration intentions pilot study conducted in nine countries. Research questions are defined together with a discussion of the rationale behind this research enquiry.

Part II commences with an introduction to the relevant pharmacy and health workforce migration literature, followed by a description of the rationale for the research questions, research questions pursued in this aspect of the thesis, methodology, results and a discussion of findings.

Final conclusions and recommendations for future research and policy development drawn from both the migration intentions study and the Zambia country case study are described in Part IV.

Sections of Part II were published in 2009 as part of an original research article in the peer reviewed Human Resources for Health Journal (74).

Chapter 2 Introduction to migration of health workers

This literature review examined published research and the 'grey' literature in the form of reports, reviews and books relating to human resources for health, pharmacy workforce and migration of health workers from 1970 to 2008. Key words used included pharmac* migration, nurs* migration, physician migration, health worker* migration, health professional migration, highly skilled migration, migration intention, migration theory, push-pull theory, pharmac* workforce, pharmacist workforce. Electronic databases were used such as Medline, Google, Google Scholar, International Bibliography of Social Sciences, Human Resources for Health Resource Center and further references were identified through citations. The search strategy yielded a total of 9,546 articles, of which 52 relevant articles were included after further review. Articles presenting empirically derived findings relevant to the issue of pharmacist migration trends and migration intentions were selected for inclusion as well as some major studies on health worker migration intentions. Only a few key opinion and commentary articles have been included, though there is a dominance of such publications in the literature. There is little published research on pharmacy workforce trends and issues. The review focused on literature published in the English language.

2.1 Migration of health workers

Migration has long held the centre stage in discussions concerning the human resources for health crisis. The United Nations defines a migrant as a person who changes their country of usual residence (75). Other forms of migration in the literature describe internal and cross-industry migration (76). Internal migration includes mobility between rural and urban areas and across sub-national territories. Cross-industry movements such as between public and private health sectors or to sectors unrelated to health may also occur. Whilst commonalities between factors influencing mobility between and within countries exist, this research will focus on the context and factors influencing international migration.

In the 1970s, migration of the skilled workforce, particularly that of health workers, from developing to developed countries, became a politically sensitive issue. WHO's first evaluation

in 1978 of the migration of health workers described significant, unpredictable and uncontrolled movement of physicians and nurses that heightened the anxiety of source (origin) and destination (receiving) countries and cast uncertainty in human resource planning (77). A recent revival of interest in migration has spurred a flurry of debate and anecdote though limited research. The international migration of health professionals is thought to reflect the widening of global inequalities (78). It is also seen as the cause of deteriorating health systems, working conditions and workforce shortages in developing countries (79-82).

Data sources are varied and inadequate for effectively monitoring migration patterns and flows and are not systematically comparable (76). In 2000, OECD countries as a proportion of their total health workforce, employed an average of 11% of nurses, 18% of doctors and 16% of other health professionals (including pharmacists) that were foreign born (83).

Half of the foreign born health workforce in OECD countries are in the USA, 40% in Europe and the remainder in Australia and Canada (83). Calculated from census data, this may give an overestimation of foreign health workforce as these individuals were not necessarily foreign trained (83). Data sourced from professional registers in source and receiving countries indicates a growing trend of health worker migration since 2000, including that of pharmacists (27;83;84). However, migration trends are not specific or unique to the workforce in the health sector and emigration rates between tertiary degree holders and physicians are correlated, thus indicating that countries with high emigration rates of tertiary degree holders also have high emigration rates of their health workforce (and vice versa) (85). The share of foreign born PhD holders is also in keeping with the share of physicians in OECD countries, indicating a likelihood of selectivity in migration for higher skills (83).

The 2006 FIP Pharmacy Workforce and Migration Report provides some data on the migration of pharmacists for a few countries, however data on pharmacist migration is scarce due to unavailability of data and poor recognition of pharmacist migration trends in many countries. (27). Only four published studies have empirically examined the migration intentions of pharmacists (63;86-88).

A 2003 United Kingdom pharmacy workforce survey found 9% and 4% of pharmacists planning to work abroad temporarily and permanently, respectively (65). Younger pharmacists who had

been registered for 5 years were found to be significantly more likely to intend to migrate than pharmacists that had been registered for 10 years (65). Males were also significantly more likely to migrate (65).

Migration intentions of pharmacists in Lithuania were found to be higher with over a quarter of surveyed pharmacists expressing their intention to migrate to other countries in the European Union although only 2% had made a final decision (86). The possession of English language skills was found to quadruple the likelihood of migration (86).

Most pharmacy students expressed a desire to migrate in a qualitative study by Owusu-Daaku et al (2008) of Ghanaian pharmacy students and their professional aspirations (88). The main reasons given for migration were further post-graduate study and development of capital for personal development, business and family needs (88). Students also perceived pharmacists abroad to be more respected and to hold more desirable professional and clinical roles than pharmacists in Ghana (88). Interestingly, most of the students interviewed expressed a desire to return back to Ghana (88).

The decimation of the health workforce in developing countries has been attributed to increasing emigration rates (84). Recent evidence disagrees with this perspective and rests the problem of the health workforce crisis with inadequate workforce supply and retention, although it acknowledges that increasing emigration rates can further exacerbate existing health workforce issues. Migration is also a context specific issue which affects countries to varying extents depending on the existing health workforce density (83). Based on the understanding that doctors and nurses who have migrated abroad represent no more than 12 percent of the workforce shortage in Africa, the OECD have suggested that "International migration is neither the main cause nor would its reduction be the solution to the worldwide health human resources crisis." (83). After finding a counter-intuitively negative association across 53 African countries between under 5 child mortality and physicians abroad and a positive association between physician density and proportions of physicians abroad, Clemens (2007) concludes that "Results suggest that Africa's generally low staffing levels and poor public health conditions are the result of factors entirely unrelated to international movements of health professionals." (89). Such correlations have led Clements (2007) to propose that the negative

causal effect of health professional migration on health outcomes and human resource capacity is relatively small in comparison to other factors (89).

The existence of migration prospects has been argued by some to spur investments in education and thus growth in human capital (90). In the modelling of the migration scenarios of 37 developing countries in 2001, Beine et al concluded that a positive effect on human capital can be seen especially where migration prospects play a significant role in education decisions, if the economy is closed and migration probabilities are not high or when the economy has high growth performance and migration is moderate (90). This inductive effect of migration prospects on educational growth may in this particular situation outweigh negative effects of migration.

Expansion of substitute health workers or mid-level cadres have been advocated as a cost effective and long-term achievable strategy to build human resource capacity in the health sector as these workers are not internationally recognised and cannot migrate (80;91;92). Whilst there is evidence to support that mid-level cadres do improve access to healthcare, there is limited and inconclusive evidence to date on their impact on health outcomes (92). In the case of pharmacy, there are some anecdotal reports that mid-level cadres such as pharmacy technicians and pharmacy technologists are mobile between various countries with comparable cadres in sub-Saharan African countries.

2.2 Migration theories

Whilst an array of discussion and policy papers, opinion pieces, theoretical explorations and questions have been published, there is little empirical evidence to better understand why skilled workers, particularly health professionals, migrate (81;93-96).

Economic and sociological theories attempting to explain migration dominate the literature with particular emphasis on 'push-pull' factors, labour demand, income differentials and migrant networks (97).

In the health sector, postulated reasons for migration arising from studies to date include better remuneration, joining or supporting family, political and social instability, poor living conditions, poor working conditions and management, unsafe environment, further training and qualifications and job opportunities and satisfaction (98-102).

Remuneration has been identified in the literature as a key independent influencing factor on migration intentions (78;98;100;103-105). However the limitation of these studies and thus the limitation of this conclusion is in the design of questionnaire tools which analysed the frequency with which remuneration was cited by respondents but failed to analyse the package of reasons provided or relationship between categories. Thus the conclusion that remuneration is a key independent factor was predetermined in some way by study design.

Meija in 1978 concluded that secondary to economic factors, the key determinant for migration was the oversupply of health workforce in a country (source) which leads to migration flows to countries (destination) where workforce shortages exist (77). The relatively more advanced health, education and communication services and industries in developed countries is also proposed to create career opportunities that attract the highly skilled (96). These explanations constitute factors within a theoretical framework known as the 'push-pull' theory.

'Push' factors in source countries influence health workers to leave whilst 'pull' factors attract health workers to destination countries. Differences between factors such as income, job satisfaction, organisational environment/career opportunity, governance, protection/safety and risk, social security and benefits have been proposed to form a gradient in migration decision making by individual health workers (106). Job security, working conditions, economic and political considerations, physical security, quality of life and education were also identified as 'push-pull' factors identified in a Canadian study (102).

Other researchers have cited 'stick' and 'stay' factors in migration research. 'Stick' factors describe those which influence retention despite the 'push' factors in source countries and 'stay' factors describe those which influence return migration decisions of migrants in destination countries (101). Such factors are similar to those described as 'push' and 'pull' factors and include family, professional development and quality of life.

The issue of remuneration in source countries is thought to play a significant role in driving migration and has been identified as a key reason for the international migration of health professionals. From this perspective, source countries are said to be adversely affected by labour market forces from an inevitable 'pull' from richer and higher income countries, thereby depleting human capital (also commonly referred to as 'brain drain'). However, such perspectives may drive policy development towards a narrow set of interventions without full consideration of the 'push' factors and country contexts (107).

Network effects – where potential migrants utilise linkages to existing networks of émigrés in a destination country - have been described to facilitate migration by reducing the associated costs and risks of migration and increasing the potential gains (78;97;108).

Depending on the existence of the 'culture of migration' in country contexts, it is possible that prior knowledge of a migrant pharmacist potentially influences the intention to migrate (79). In countries without an established culture of migration, pharmacists may deliberately seek out migrant contacts abroad.

Smaller countries have also been thought to have higher emigration rates of health professionals due to relatively fewer opportunities in the healthcare labour market, particularly given the large economy of scale required to effectively run a health care system up to the tertiary health care level (89).

2.3 Migration policies

Policies controlling migration in themselves may be ineffective, have unintended effects and possibly lead to diversion of migration flows (109). The 1978 WHO Meija study commented that "to document information on health manpower migration remains nothing more than an interesting but empty academic exercise" provided the findings were utilised for effecting change in development and implementation of effective human resource for health plans and policies. This research concurs with this statement and reinforces the need to address broader human resource policy development that influences the local professional and socio-political environment rather than focus narrowly on migration flows.

There is also an increasing call for compensation or restitution measures from destination countries to correct a 'perverse subsidy' from poor to rich countries especially where governments in low income countries have subsidised education costs (110). In Malawi, it was estimated that investment in the education of one degree nurse-midwife lost through migration ranged between 250,000 USD to 25.6 million USD (111). Similar estimates in Kenya costed the investment lost through the migration of one nurse to be 340,000 USD and physician to be 520,000 USD (112). These estimates were crudely derived by extrapolating the cost of interest at local market rates on an amount that constituted the cost of training over a period that represented an average health professional's working life, in essence the estimates represented the lifetime 'debt' associated with training of each professional. Mutuality of benefit, a mechanism through which source and destination countries mutually benefit from migration, was proposed in the WHO's draft code on the recruitment of international health personnel as a viable solution to mitigate the negative impacts of migration (rather than compensation), however in reality this proves to be a grey area with no empirical evidence to suggest whether such a state has been achieved or can be measured.

Solutions to the 'brain drain' through managing migration flows have mainly focused on the ethical recruitment of health workers in receiving countries though experiences with codes of practice have been poorly documented. One review stated that codes for ethical recruitment have not altered migration flows or minimised the adverse effects of migration on source countries, particularly as they are not legally binding and thus cannot be enforced (113). Major destination countries do not sign on to these voluntary codes rendering them limited in value, for example New Zealand is the only significant destination country that is signatory to the Pacific code. Despite the poor experience with codes thus far, the WHO is currently in the process of proposing a global code at its 2009 Executive Board. However, this new proposed code will also have a focus on addressing underlying issues such as retention strategies and sustainability in domestic workforce supply.

Martineau et al (2004) emphasise the complexity of the migration of health workers and advocate the need for better data on migration flows as well as for source countries to improve retention strategies and destination countries to avoid long-term reliance on migrant labour supply, particularly from low income countries (114). In Canada, improving domestic health

workforce self-sufficiency to reduce 'pull' factors and strengthening health systems in source countries to reduce 'push' factors are seen as the most favourable policy options for managing migration from sub-Saharan Africa (102). Similarly in Norway, the Health, Education and Finance ministries have collaborated on a White Paper due for public release in 2008 to address self-sufficiency in health workforce (115). Norway also published a report in 2007 outlining its responsibilities and policies to minimise adverse impact of the recruitment of migrant health workers on low income countries (116).

Wage differentials in economic migration theories are used to explain migration flows. Vujcic et al suggest that small increases in wages in source countries are unlikely to alter migration flows (117). They found that there was no correlation between the health care worker migration flows and size of the wage differential between source and destination countries (117).

Reliance on international health volunteers to compensate for workforce shortages is not considered a viable option in the sub-Saharan Africa region given the relatively low cost effectiveness and generally poor adaptability of volunteers to local conditions and health priorities (118). International volunteers should thus only play a limited role in gap filling. Approximately 5000 full-time equivalent international health volunteers were working in sub-Saharan Africa in 2005, which also constituted a small proportion of the health workforce (118).

2.4 Rationale for migration intentions study

The migration of skilled labour is a phenomenon that has been the subject of great policy interest and debate, however there is a paucity of empirical evidence on the migration of health professionals to inform human resources policy. Few studies have sought to determine factors driving the intention to migrate and none have explored the relationship between factors influencing intentions.

Previous studies have not adequately examined the associations between factors thought to influence migration intentions nor examined the role of the home environment on migration intentions. Brown and Connell's 2004 study on current migrant, return migrant and non-migrant doctors and nurses from Small Island countries concluded that income is a key reason

for international migration and recognised the country context specific socio-political factors, however, assumed that these socio-political factors were the same for all migrants from the same country (78). In a six country study in 2003 of health professionals, including pharmacists, better remuneration was the most commonly cited reason for the intention to migrate (98). Whilst recognition was also given to other factors, methodology did not permit in depth analysis. These and other studies acknowledge reasons for migration beyond remuneration but do not analyse the relationship between the factors driving migration or develop an understanding of the significance of such factors (78;86;88;102;103;105).

A comprehensive understanding of international migration requires consideration of influences beyond those at the individual and household level (taking into account the influence of the nation state and policies), such as the labour market, private and public sectors and socio-political contexts (107;119).

Various studies have investigated the migration intentions of health professionals and students but few have specifically examined the migration intentions of pharmacy students or pharmacists (78;86;88;98;103;104). No study has sought to examine the relationships between the cited factors driving the intention of health professionals to migrate. Without this understanding, categorical lists of factors may do little to inform comprehensive policy options for building and strengthening the health workforce. There is also an identified need for better understanding of factors that push health workers to leave their home country, especially given lack of data and transparency of data in source countries (76).

Research and policy debates on the migration of health professionals tend to centre on 'push-pull' theories, supportive of mainstream over-simplification of a complex phenomenon. There is a paucity of research on factors which determine migration intentions and potential opportunities for policy intervention to strengthen human resources and health systems in countries, particularly concerning the pharmacy workforce.

This research fills the gap in the literature by developing an understanding of migration intentions and concepts and processes for pharmacy workforce development. The purpose of this research is to explore the factors driving migration and workforce development trends.

This research does not examine actual migration flows, costs and benefits of migration, impact of migration flows on source and destination countries, assume a particular explanatory theory for migration or model future migration trends. Neither does it seek to provide empirical evidence for health workforce planning or workforce modelling. Rather, informed by the literature and empirical findings, it aims to build an understanding of the context in which attrition of the pharmacy workforce takes place and a conceptual framework of the complex factors that should be taken into consideration for pharmacy workforce development.

The research idea was first stimulated in April 2004 while attending a consultation on sustainable development for higher education. Here, 'brain drain' was postulated as the root cause for every conceivable path of failure of higher education to enable sustainable development. The very process of generating a skilled workforce was seen to be threatened by the mobility of such a workforce, particularly from lower income countries to higher income countries. It seemed that policy options were narrowed to strategies that limited mobility and chastised wealthier countries for poaching. Contemporary debate and literature certainly supported such a stance. Unsatisfied by the answers as to what caused the brain drain in the literature and by the largely theoretical and limited empirical research, a research idea was developed that would probe the issue further to identify factors and the relationships between factors that influenced migration intentions. The research was approached with the outlook that such an understanding of migration intentions would bring about a broader conceptualisation of the complex nature of workforce attrition and on the basis of this, provide a more comprehensive base for the development policy options.

Chapter 3 Methods

3.1 Research questions

This exploratory research program was developed to explore the migration intentions and relationship between factors cited in the literature that influence migration. The study does not assume a particular theoretical basis to explain migration nor does it assume that findings are generalisable to other health professions. Whilst this study was conducted with the individual as the basis of analysis, the implications are broader and take into account the influence of contextual factors at national and international levels. The following research questions were pursued in this thesis:

1. What are the factors that influence the migration intentions of final year pharmacy students?
2. What is the relationship between factors influencing migration intentions of final year pharmacy students?
3. How do the attitudes of final year pharmacy students differ between those who plan short-term migration, long-term migration and those who do not plan to migrate?

3.2 Introduction

This chapter describes the methodological processes of the questionnaire development and statistical analyses of this quantitative migration intentions study. Biases and limitations are also described with recommendations for further improvement of the methodology. A quantitative questionnaire methodology was chosen to address the research questions described in Section 3.1.

Final year pharmacy students were surveyed using an original questionnaire tool in nine countries including Australia, Bangladesh, Croatia, Egypt, Nepal, Singapore, Slovenia, Portugal,

and Zimbabwe. Invitations were extended to all IPSF member organisations with nine countries agreeing to participate in the study. At the time of the pilot study in 2006, contacts with the School of Pharmacy in Zambia had not yet been established though Zambia was included in the principal study.

Pharmacy students rather than recently graduated pharmacists were selected as the sample group given their accessibility through the research network established for this study, thus increasing the likelihood of attaining the required sample size to power the study. Final year pharmacy students were selected as the target group for this study for two reasons. Firstly, pharmacy students were accessible via the International Pharmaceutical Students' Federation (IPSF) network. Secondly, final year students are more likely to be certain of their future plans than students in any other year of study.

Agreements between the School of Pharmacy, University of London, IPSF and participating student associations were drawn up and signed prior to commencing data collection. Each participating IPSF member organisation provided their own voluntary capacity to disseminate the questionnaire in English and enter the data into a standardised pro forma spreadsheet.

The questionnaire tool was developed from constructs arising in the literature and in a focus group, reviewed by experts in the field and revised before being distributed to the international research group (comprised of local research teams in each country).

Data from each participant country was collated, cleaned and prepared for analysis in SPSS for Windows, version 14. Principal Component Analysis (PCA) and two-step cluster analysis were used to explore the dataset and determine influencing drivers of migration. Figure provides a summary of the research timeline.

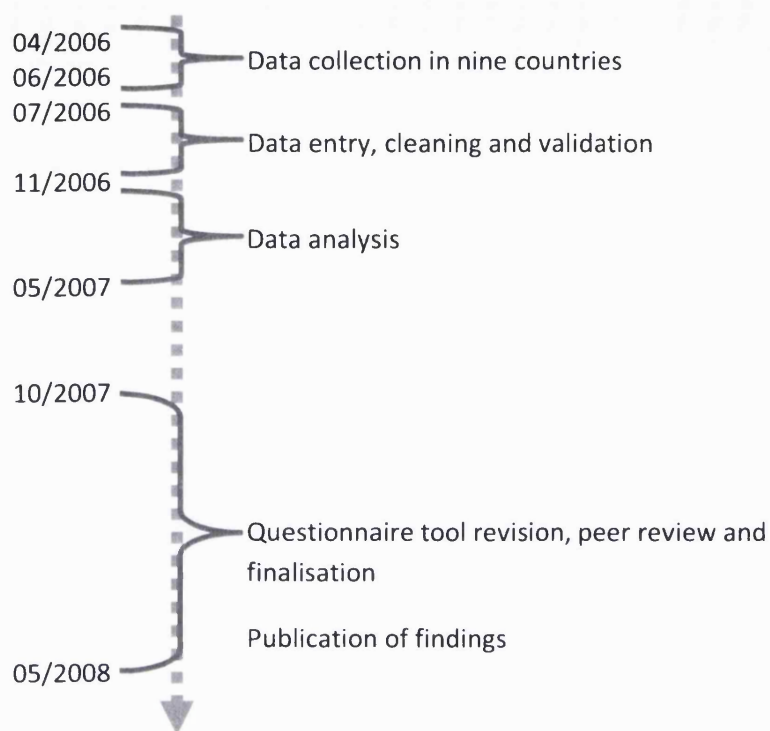


Figure 3.1 Research timeline

3.3 Questionnaire development and content

The questionnaire gathered information from respondents about their intention to migrate, demographics and attitudes towards constructs identified from the literature and a focus group that were thought to influence migration intentions. The questionnaire was revised following assessment of content validity from experts in the field of health workforce migration including representatives of the World Health Organization (WHO) and International Organization for Migration (IOM). The questionnaire was also assessed for face validity by pharmacy students prior to finalisation.

The dependent variable, the intention to migrate within the next five years, was recorded as no intention, or intentions on a short-term (< 2 years) or long-term basis (>2 years). This allowed examination of potential differences in the attitudes towards migration between those who did not plan to migrate, planned short-term or long-term migration.

Independent variables were collected such as gender, country of birth, age, university and country of study. Other variables (unclear causality with the intention to migrate) include knowledge of migrant pharmacists and previous professional experience abroad. The intention to migrate may influence the latter two variables and vice-versa. Further exploration of the cause and effect of these variables was not investigated in this study and should be examined via qualitative methods. As the individual was the focus of this study and the interest was to study the relationship between the individual's intention to migrate and their specific attitudes towards their home socio-economic and professional environment and perceived opportunities abroad, system wide variables such as type of healthcare system and pharmacist roles were not gathered.

A question asking respondents to rank the importance of money, family, experience, stability, lifestyle and ambitions from 1 (most important) to 6 (least important) was included. The questionnaire also contained 20 statements relating to potential reasons for migration to which participants could indicate their response on a 5-point Likert scale from 1 (strongly agree) to 5 (strongly disagree). These statements were developed from the six thematic constructs identified that described reasons for migration at a focus group of 15 pharmacy students at the IPSF Congress in Bonn, Germany in 2005. These included constructs that described personal status (demographics, prior experience), economics (remuneration, health care resources), training and professional development opportunities (career), cultural issues (religion, language, customs), politics (political system), and perceived professional status (role of pharmacist, impact on healthcare, respect).

In order to validate the findings from the pilot study on migration intentions and better explore factors influencing migration, a follow up study has been initiated using the revised and finalised version of the questionnaire for post-doctoral research. The results from the pilot migration intentions study emphasised the need to address country level 'push' factors in order to encourage workforce retention. Hence an in-depth qualitative country case study was planned to explore pharmacy workforce issues and policy recommendations (Part III – Zambia country case study).

3.4 Data collection and entry

A minimum sample size of 788 was calculated to be required to achieve a power of 0.8 with α of 0.05 to detect a small effect size ($r = 0.2$) using the computer programme GPOWER (120;121). Using the general rule of 10 participants per variable for PCA as a required sample size estimate, a minimum of 200 responses was calculated.

Data were collected over a six week period from April 2006 from 27 participating universities across nine countries (Table 3.1). All 40 member countries of the International Pharmaceutical Students' Federation were invited to take part in the study, of which 9 volunteered to participate. Thus countries were self-selected depending upon their interest and willingness to contribute voluntarily to the research. An international research group (Moving On III research group) with the International Pharmaceutical Students' Federation was established. The team included national research coordinators from each country and local research coordinators from each university participating in the study who volunteered their time to gather and enter data. The national research coordinator was responsible for dissemination of the questionnaire to local participating universities and data entry.

Table 3.1 Number of participating universities

Country	Number of participating universities
Australia	6
Bangladesh	3
Croatia	1
Egypt	11
Nepal	1
Portugal	2
Singapore	1
Slovenia	1
Zimbabwe	1
Total	27

Local research coordinators at each participating University disseminated the questionnaire to final year pharmacy students in hard copy during a lecture and collected the completed

questionnaires. Instructions were contained within a template Windows Excel® sheet for data entry. Responses were entered into the sheet by local and national research coordinators and coded as per instructions. Responses to open ended questions were entered as written in the completed questionnaire.

Data sheets were collated and combined into a single dataset before being cleaned and prepared in SPSS for further analysis. A random 4% sample of responses (33 questionnaires) was checked for coding errors across 66 variables against the original completed questionnaires. The coding error percentage was negligible at 0.05% (1 error) across the collated dataset.

3.5 Statistical analyses

3.5.1 Principal Component Analysis (PCA)

PCA was used to explore the latent variables and relationships between variables. PCA was chosen in preference to factor analysis as it is a well documented analytical tool that produces similar results to factor analysis though is conceptually less complex as it employs a process of breaking down the dataset into linear variates rather than estimating underlying factors though a mathematical model (cited in (122)). In using PCA, a descriptive method, the assumption is made that the findings are not generalisable beyond the dataset.

A scree plot is used to graph Eigenvalues of each factor extracted from PCA and ascertain the relative importance of each. The point of inflexion in the scree plot can reliably serve as a criterion for determining the number of factors within the dataset with a sample greater than 200 (123). Kaiser's criterion suggests that factors with an Eigenvalue of greater than one be retained (124).

Each of the 20 statements or variables load to varying extents on each factor. PCA on the 20 statements yielded three factors. Factor rotation maximises the loadings onto one factor and minimises the loading on the remaining factors. Direct oblimin oblique factor rotation was selected to calculate the extent to which variables within the dataset load onto the factors and thus define the set of variables describing each factor. Direct oblique rotation allows

correlation between factors and is the most appropriate method of factor rotation as it is assumed that the factors in the dataset are related, as opposed to orthogonal rotation which holds each factor independent prior to rotation and assumes no correlation between factors (122). Interpretation of loading scores of variables on each factor lead to the determination of the variable composition of each factor.

The statistical significance of a variable loading on a factor is determined to be greater than 0.21 for a sample size over 600 at α level of 0.01 (123). However, statistical significance does not immediately translate into the importance of the variable to the factor. Squaring the variable loading gives an indication of the variance explained and a threshold factor loading of above 0.4 (explains 16% variance) should be interpreted (123).

To identify the items which comprise each factor and describe the factor, a series of steps were used. Firstly, as oblique rotation was used in the PCA, a pattern matrix was generated with the factor loading values. The structure matrix was used to confirm the factor loadings and was found to be consistent with the pattern matrix. Items with loadings of greater than 0.4 were used as the basis for assignment to factors. One item was excluded from the factors due to poor loading.

Secondly, the factors were tested for reliability and inter-item correlation. Reliability within each factor was tested by calculating Cronbach's alpha (α). Items were then reassigned to optimise Cronbach's α and fit thematically with each factor. Cronbach's α indicates the level of commonality or reliability within each factor. It represents the average correlation coefficient of the dataset when split in two in every way (split-half reliability) (122). Whilst there are no firm criteria for what constitutes an acceptable Cronbach's α , levels of between 0.6 - 0.8 indicate good reliability within each factor. Values below this may indicate an unreliable scale and values above this range show a lack of depth and too much commonality within the factor.

Items were recoded to ensure same direction of scores (positive or negative), then grouped accordingly for each factor with scores converted into z-scores for further analysis.

Differences between groups were analysed using independent t-tests. Levene's test for equality of variances was used to determine whether to assume equal variances between groups or not. If significant ($p < 0.05$), variances were assumed to be different and corresponding t-values and

degrees of freedom in the SPSS output were used and reported. If Levene's test was not significant, equal variance between groups was assumed.

Whilst a difference between groups may be found to be statistically significant, it cannot be assumed to be important. Effect size (r) was used as an objective measure of importance of statistically significant differences between groups (122). It can describe the size of the effect observed and was calculated by using the following equation (Rosenthal, 1991) from t -values (cited in (122)):

$$r = \sqrt{\frac{t^2}{t^2 + df}}$$

Where: r = effect size
 t = t -value
 df = degrees of freedom

According to Cohen (1988, 1992), different effect sizes can be defined by the following thresholds (cited in (122)):

Small effect size: $r = 0.1$ (effect observed explains 1% of total variance)*

Medium effect size: $r = 0.3$ (explains 9% of total variance)

Large effective size: $r = 0.5$ (explains 25% of total variance)

*Variance is the squared value of r

3.5.2 Two-step cluster analysis

Two-step cluster analysis was used as an exploratory tool to determine subpopulations or clusters within the dataset and the defining attributes or characteristics of each group. Possible analytical approaches for determining clusters in the sample included k -means, homogeneity analysis by means of alternating least squares (HOMALS), and two-step cluster analysis.

K -means cluster analysis was excluded as an option given that it could only accept the input of continuous variables and could not handle the size of the dataset. Although categorical data

could be recoded as continuous data, this would also introduce additional error into the analysis.

Homogeneity analysis by means of alternating least squares (HOMALS), a computer algorithm for Multiple Correspondence Analysis (MCA) was another analytical approach which was considered. MCA follows the same principle as PCA and enables the analysis of patterns of relationships between categorical variables that are not dichotomous. HOMALS assigns cases into subgroups (or clusters) and spatially plots variables to generate a graphical output. Clusters can be defined by examining the graphical relationship of variables to each other in the dataset for groups that share interconnected or similar features.

Two-step cluster analysis first pre-clusters the cases into multiple small sub-clusters before then clustering these together (125). The number of clusters was decided by examining auto-clustering statistics such as the Bayesian Information Criterion (BIC) change and ratio of BIC changes. The number of clusters in the sample can be deduced by identifying the lowest BIC, large BIC ratio change and large ratio of distances. Whilst two-step cluster analysis does not generate a visual representation of the results as HOMALS, defining characteristics of each cluster are visually generated for subsequent interpretation (125). Outputs include bar charts of cluster frequencies and variable importance plots. Frequency cross-tables, variable importance plots, and t-statistics and chi-square statistics for continuous and categorical variables were used to ascertain cluster defining characteristics of each sub-population.

The advantage of two-step cluster analysis over k-means and HOMALS is that two-step cluster analysis enables the input of both categorical and continuous data. It is also able to cope with very large datasets whereas k-means is better suited for medium to large size data sets (125).

Table 3.2 compares the data capabilities, advantages and disadvantages of HOMALS and two-step cluster analysis. Two-step cluster analysis was selected given its advantages of allowing the input of both categorical and continuous variables and the more statistically robust method of determining characteristics of clusters through interpretation of statistical outputs.

Table 3.2 Comparison of HOMALS and two-step cluster analysis

	HOMALS	Two-step cluster analysis
Data capability	<ul style="list-style-type: none"> • Categorical data • Large databases 	<ul style="list-style-type: none"> • Categorical and continuous data • Large datasets
Advantages	<ul style="list-style-type: none"> • Graphically demonstrate inter-relatedness of variables through visual output • Can incorporate a large number of variables • Missing data has little impact on analysis 	<ul style="list-style-type: none"> • Identifies the number of clusters using both categorical and continuous data, thus removing the need for recoding • Results indicate characteristics of clusters based on component variables and the frequency of cases with certain attributes • Defining characteristics of each cluster can be identified through the interpretation of significance plots and statistics such as chi-square test statistic (for categorical variables) and t-statistics (for continuous variables) • Does not make assumptions about the weightings of input variables
Disadvantages	<ul style="list-style-type: none"> • Clusters are judged or interpreted visually which can be difficult if the output is crowded • Continuous data must first be recoded as categorical data which may introduce an additional level of error by forcing the data into categories • Analysis assigns equal weighting to each variable 	<ul style="list-style-type: none"> • No single visual display of clusters • Description of clusters is based on the frequency profiles from input variables which may be prone to bias • Missing data leads to cases being excluded which can affect the number of clusters

The categorical variables included gender, intention to migrate, past pharmacy experience abroad and knowledge of a pharmacist who had migrated. The continuous variables included the three factors derived from PCA (Factors 1, 2 and 3).

3.5.3 Mann-Whitney test

The Mann-Whitney test is used to test differences between two different groups with ordinal variables. In this case, the tests were used to compare the ranked importance of money, family, experience, stability, lifestyle and ambitions between males and females, those who did and did not intend to migrate and those who planned temporary and long-term migration. The null hypothesis states that there is no difference between the two populations. If the Mann-

Whitney U statistic is statistically significant ($p < 0.05$), the null hypothesis is rejected and a difference between the two groups can be concluded.

Effect size was calculated using the following equation by Rosenthal (1991) (cited in (122)):

$$r = \frac{Z}{\sqrt{N}}$$

Where: r = effect size
 Z = test statistic z-score
 N = size of the study

3.6 Questionnaire review and finalisation

Informed by the interpretation of the results from the pilot study and further expert panel review (content validity) of the questionnaire, modifications were made to the original questionnaire (summarised in Table 3.5). The questionnaire was reviewed for face validity by pharmacy students in the IPSF executive and education working groups before being finalised and distributed for data collection to form the principal follow up study which was conducted beyond the scope of this thesis. The questionnaire revision process is summarised in Figure 3.2.

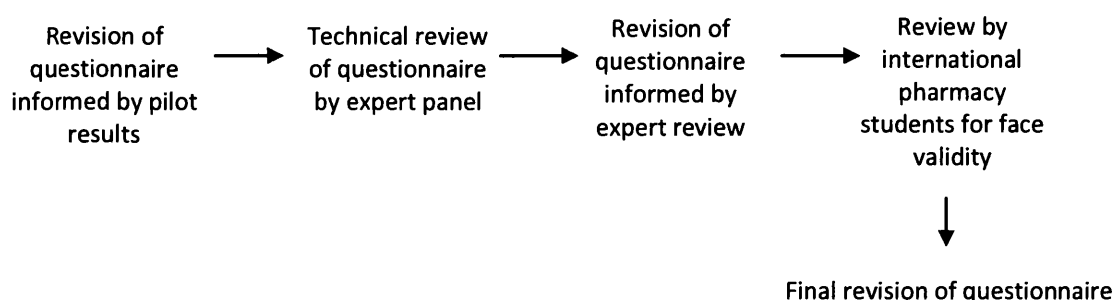


Figure 3.2 Migration intentions questionnaire review process

An international expert panel was assembled for the purposes of technical review and was comprised of recognised experts in the field of health worker migration (described in Table 3.3). The expert panel were asked to specifically review the pilot questionnaire to address the following questions and provide detailed suggestions for improvements:

- Are the key variables and their relevant components that may influence migration intentions captured with the appropriate response options?
- Are the questions and statements clearly expressed?

Table 3.3 Expert review panel composition

Name	Title, Agency
Prof Hugo Mercer	Co-ordinator, Health Workforce Training, Education and Production, Human Resources for Health Department, WHO, Geneva
Dr Pascal Zurn	Economist, Migration and Retention, Human Resources for Health Department, WHO, Geneva
Dr Jean-Marc Braichet	Co-ordinator, Migration and Retention, Human Resources for Health Department, WHO, Geneva
Dr Neeru Gupta	Demographer-Statistician, Human Resources for Health Department, WHO, Geneva
Dr Anita Davies	Public Health Consultant, Migration Health Department, International Organization for Migration, Geneva
Dr Paul de Guchteneire	UNESCO, Paris
Mr Julian Morris	Director, International Policy Network, London
Prof John Connell	Migration expert, School of Geosciences, University of Sydney

The reviewers generally agreed and approved of the content of the questionnaire tool and identified some additional areas for inclusion and improvement. No disagreement was expressed between reviewers on the questionnaire content. Tables 3.4 and 3.5 summarise the reviewers' key recommendations and major revisions to the pilot questionnaire.

Table 3.4 Summary of expert panel comments

Issue	Suggestion
Clarity of background and instructions	To include details on purpose of research, research partners, use of data and data security in the background section, especially as this may improve response rates.
Internal mobility	To include aspects relating to likelihood of working in rural areas.
Stick factors	To include questions that further probe the reasons why respondents do not wish to migrate.
Return migration	To include questions relating to likelihood for return migration

Table 3.3 Major revisions to pilot questionnaire

	Revision	Rationale
1	Change in title of questionnaire	Original title 'Emerging pharmacists and their intention to migrate' was confusing. Replaced with 'Pharmacy students and their intention to migrate'.
2	Insert research partners, purpose, data use, confidentiality and data security information to introduction note.	Suggested by UNESCO through expert panel review process. No information given on these aspects in version 1. Important for respondents to be aware of these points. It may also help to increase the response rate if anonymity is assured and background provided on the purpose of the study.
3	'Country of residence' replaced with 'Country you consider your homeland'	Respondents may be resident in the country of study but may not consider that country as their home country. This is also useful for interpreting the responses of foreign pharmacy students, particularly in statements which make comparisons to their home country. Likewise the questions 'are you a foreign (international) student was inserted for the same reason.
4	Open-ended questions replaced with categorical 'tick box' questions	Categories identified from thematic analysis of responses to open-ended questions in the pilot study. This makes the questions easier and faster to complete as well as making analysis more efficient.
5	Insertion of question 'Was pharmacy your first choice of study?'	Pharmacy is often not the first choice of study for students in many countries. May explain poor attitudes to the practice and professional environment in some cases and thus influence migration.
6	Insertion of question 'Are you planning on working in the pharmaceutical profession in the next five years?'	So as to ascertain the intention for workforce participation in each country.
7	Insertion of question 'In which location would you like to work?'	Suggested by WHO through expert panel review process. With the inclusion of this question, further exploration of internal mobility can be undertaken. Especially given that recruitment and retention of the workforce in rural areas is especially challenging.
8	Insertion of question 'Why do you wish to stay in your country' for those who do not intend to migrate	Suggested by WHO through expert panel review process. To better explore 'stick' factors.
9	Insertion of questions relating to whether the respondent plans to work in the profession and what steps they would be willing to take in order to be professionally licensed abroad	To better understand the intention to migrate and the extent to which respondents would be willing to overcome barriers to professional licensure abroad.
10	Change from dichotomous short term vs. long term migration question to categorical on period planned abroad	To enable more in depth examination of differences between those planning temporary and long-term migration.
11	Insertion of questions on return migration	Suggested by IOM through expert panel review process. To examine intentions for return migration.
12	Deletion of item in Section C 'I am interested in moving to another country in order to experience a different culture'	Found to have low loading on factors in PCA.
13	Deletion of item in Section C 'There is a sufficient range of courses in postgraduate studies to specialise in my area of interest within pharmacy.'	Repetitious item in Factor 1. Deletion of this item from Factor 1 also improves Cronbach's α .

3.7 Bias and limitations

Respondents may be self-selected in that those intending to migrate were possibly more likely to complete the questionnaire. However given the response rate in most countries this is likely to be a small effect though potentially more significant in Portugal and Slovenia where there was a lower response. Data in Egypt was collected at the sample students' forum and hence may not be a representative sample. The response rate for Bangladesh was unknown. Migration intention studies do not necessarily reflect actual migration nor are they reliably predictive of future trends as they are likely to overestimate planned migration (105). However this approach sheds light on the extent to which the intention to migrate exists and key issues influencing these intentions, thereby informing strategies for consideration to facilitate workforce and education policy development that relate to retention.

Chapter 4 Results

4.1 Introduction

This chapter describes the sample and presents the key results of the PCA, two-step cluster analysis and Mann-Whitney test relevant to the research questions. It describes the factors which influence migration intentions and the relationships between them. It also shows the differences between subpopulations least and most likely to migrate, and demonstrates the differences in attitudes between those that don't plan to migrate and those who plan to migrate on a short-term basis and long-term basis.

4.2 Sample

An overall response of 75.5% was achieved in the study with a total of 974 (excluding Bangladesh due to incomplete information) questionnaires disseminated and 801 (743 excluding Bangladesh) responses received from final year pharmacy students from the nine pilot countries. A total of 801 responses were collected, of which 791 validated completed questionnaires were included for analysis, slightly greater than the calculated sample size (N=788) required to detect small effect sizes at a power of 0.8 and with α of 0.5. Ten completed questionnaires were excluded, two of which were excluded due to invalid responses suspected to be hoaxes with the remaining eight excluded as they were not final year pharmacy students.

Table 4.1 summarises the sample characteristics. The mean age of respondents was 22.3 years (SD 2.4). Sixty-one percent of the total sample is female and the proportion of female respondents in each country ranged from 24.1% in Bangladesh to 90.6% in Croatia. The proportion of female students in each country was similar to that reported by an international study of a comprehensive international database of pharmacy students (with the exception of Egypt and Zimbabwe where comparisons were unavailable) (126). Thus, the sample was representative of the final year pharmacy students in the pilot countries.

The intention to migrate varied between countries with 47.5% of respondents overall that have no intention to migrate, 20.2% that intend short-term migration and 32.3% that intend long-term migration. Thus, half of the respondents overall indicated an intention to migrate within the next five years.

Table 4.1 Sample characteristics

Countries	Sample (N = 791)				Gender (N = 783)				Age (N = 784)	Intention to migrate within next 5 years (N = 786)					
	N sampled (N = 974)*	N responses (N = 791)	Response (%)	% of dataset	Female		Male		Mean	No		Short-term migration		Long term migration	
					N (478)	%	N (305)	%		N (373)	%	N (159)	%	N (254)	%
Australia	405	334	82.5	42.2	222	67.3	108	32.7	22.2	157	47.3	95	28.6	80	24.1
Bangladesh	N/A	58	N/A	7.3	14	24.1	44	75.9	22.8	6	10.5	15	26.3	36	63.2
Croatia	110	96	87.3	12.1	87	90.6	9	9.4	22.5	82	86.3	5	5.3	8	8.4
Egypt	117	95	81.2	12.0	31	33.0	63	67.0	20.7	19	20.2	13	13.8	62	66.0
Nepal	33	31	93.9	3.9	12	38.7	19	61.3	23.1	8	25.8	2	6.5	21	67.7
Portugal	118	55	46.6	7.0	35	64.8	19	35.2	23.3	32	58.2	13	23.6	10	18.2
Singapore	81	60	74.1	7.6	50	83.3	10	16.7	23.0	38	63.3	6	10.0	16	26.7
Slovenia	65	25	38.5	3.2	18	72.0	7	28.0	22.4	22	88.0	3	12.0	0	Nil
Zimbabwe	45	37	82.2	4.7	9	25.7	26	74.3	23.3	9	24.3	7	18.9	21	56.8
Sample means			73.3*			61.0	39.0		22.3		47.5		20.2		32.3

*excluding Bangladesh

4.3 Principle Components Analysis (PCA)

PCA on 19 items yielded three factors explaining 46.5% of total variance (Table 4.2). One item (Q29: I am interested to moving to another country to experience a different culture) was excluded from PCA due to poor loading on factors and seemed to be inconsistent in the questionnaire tool. Exclusion of this item from analysis increased the total variance explained by three factors from 44.2% to 46.5%.

Table 4.2 Linear components within dataset and total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings*
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	5.73	30.18	30.18	5.73	30.18	30.18	3.89
2	1.81	9.53	39.71	1.81	9.53	39.71	4.34
3	1.29	6.762	46.47	1.29	6.76	46.47	3.04
4	0.97	5.12	51.59				
5	0.87	4.55	56.14				
6	0.84	4.41	60.55				
7	0.79	4.14	64.69				
8	0.73	3.85	68.54				
9	0.73	3.83	72.38				
10	0.66	3.50	75.87				
11	0.66	3.46	79.33				
12	0.61	3.23	82.56				
13	0.57	3.02	85.58				
14	0.53	2.78	88.367				
15	0.51	2.70	91.07				
16	0.46	2.44	93.51				
17	0.44	2.32	95.83				
18	0.40	2.12	97.94				
19	0.39	2.06	100.00				

Extraction Method: Principal Component Analysis.

*When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

The decision to extract three factors rather than four was supported by interpretation of the total variance explained (Table 4.2) and scree plot (Figure). As shown in Figure 4.1 the inflexion in the scree plot occurs after the third factor and including an additional fourth factor (with borderline Eigenvalue of 0.973) would only explain a further 5% of variance in the dataset, hence the decision to extract three factors.

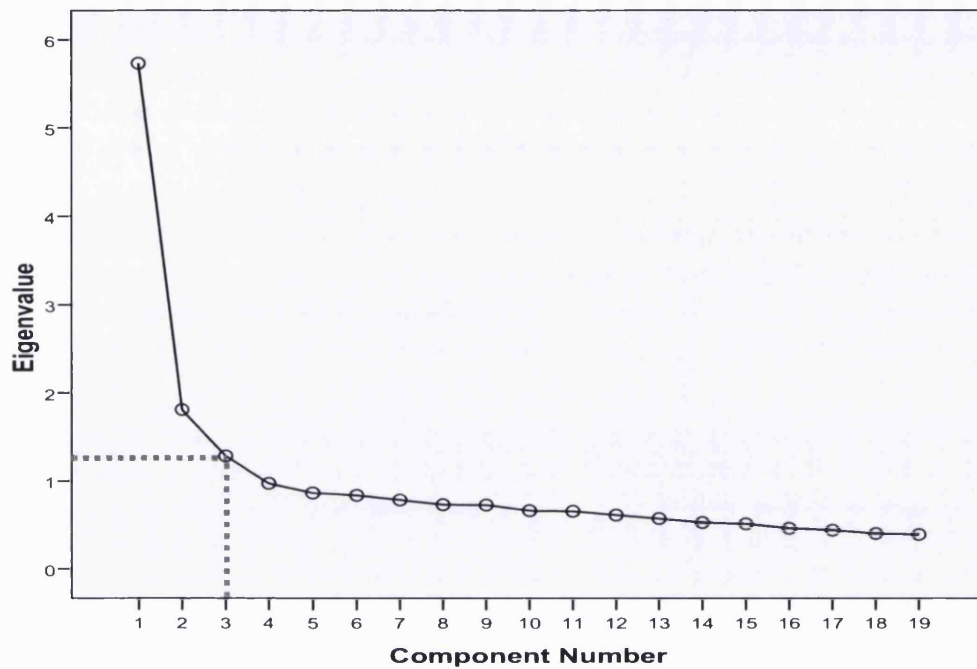


Figure 4.1 PCA scree plot

Table 4.3, Table 4.4 and Table 4.5 summarise the reliability analysis for each factor in its final composition.

Table 4.3 Factor 1 reliability analysis ($\alpha = 0.82$)

Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Pharmacy is a well respected profession in my country	30.86	31.13	0.57	0.36	0.79
Pharmacy has a positive healthcare image in my country	30.82	31.41	0.59	0.41	0.79
There is an active professional pharmacy association in my country	30.72	31.64	0.60	0.39	0.79
In general, patients trust pharmacists	30.63	33.74	0.44	0.24	0.81
There are good opportunities to do research in my country	31.43	32.20	0.47	0.23	0.80
I feel that the practice of pharmacy is supported by health policies in my country	31.17	32.45	0.49	0.26	0.80
There is a sufficient range of courses in post-graduate studies to specialise in my area	31.14	34.28	0.33	0.15	0.82
I feel that there are insufficient opportunities in my country to keep learning	31.30	31.88	0.43	0.22	0.81
Where I live, pharmacists are able to engage in CPD	30.81	31.95	0.55	0.33	0.80
I am satisfied with the standard of pharmacy education I received in the country	30.85	31.45	0.52	0.28	0.80

Table 4.4 Factor 2 reliability analysis ($\alpha = 0.75$)

Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I believe that the healthcare resources are better in other countries	10.67	5.40	0.57	0.36	0.69
I think I would have better career opportunities in other countries	10.56	5.56	0.61	0.39	0.66
I think pharmacists in other countries have a more desirable professional role	10.62	5.43	0.57	0.32	0.69
I think I could earn a better salary in a different country	10.26	6.16	0.46	0.24	0.74

Table 4.5 Factor 3 reliability analysis ($\alpha = 0.67$)

Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
I feel that my religion would be better accepted in another country	11.77	9.31	0.40	0.19	0.63
I feel that the political situation in my country is limiting my practice	11.15	8.54	0.50	0.25	0.58
I feel that the practice of pharmacy is restricted by my culture	11.77	9.22	0.43	0.21	0.62
I feel dissatisfied with the health system in my country	11.00	9.30	0.38	0.17	0.64
There are significant barriers between other health professionals and pharmacists in my country	10.85	9.53	0.40	0.19	0.63

A summary of the reliability, score range and midpoints of each factor is described in

Table 4.6. Factor 1 describes the attitude towards the professional environment and status in their home country (10 items, $\alpha = 0.82$). Factor 2 describes the perception of the opportunity to develop a career and resources abroad (4 items, $\alpha = 0.75$). Factor 3 describes the attitude towards the socio-political environment in their home country (5 items, $\alpha = 0.67$).

Table 4.6 Factor summary

Factor	Number of items	Cronbach's α	Score range	Midpoint
1	10	0.82	10-50	30
2	4	0.75	4-20	12
3	5	0.67	5-25	15

The final composition of items in each factor together with the factor loadings from the pattern matrix are described in Table 4.7. Loading values of 0.05 or less (insignificant) than have been

deleted. As Australia comprised a substantial portion of the dataset, PCA was run excluding Australia's responses from the sample to check for potential bias. A consistent structure matrix was generated with similar loadings to what is presented in Table 4.7. A total of 68 (39%) non-redundant residuals (with values > 0.05) were identified from the reproduced correlation compared to observed correlations, meeting the required criteria of less than 50% non-redundant residuals that is indicative of a good fit of the resultant model.

Table 4.7 Factor loadings and item composition

Factor	Items	Factor loading		
		1	2	3
Factor 1	There are good opportunities to do research in my country	0.45	0.28	
Attitude towards the professional environment and status in home country	Pharmacy is a well respected profession in my country	0.64		-0.16
	I am satisfied with the standard of pharmacy education I received in my country	0.58	0.14	
	I feel that the practice of pharmacy is supported by health policies in my country	0.59	0.07	
	There is a sufficient range of courses in post-graduate studies to specialise in my area	0.58		0.28
	Where I live, pharmacists are able to engage in CPD	0.58	0.18	
	I feel that there are insufficient opportunities in my country to keep learning	0.17*	0.35	-0.42
	There is an active professional pharmacy association in my country	0.61	-0.06	-0.34
	In general, patients trust pharmacists	0.66	-0.18	-0.06
	Pharmacy has a positive healthcare image in my country	0.69		-0.12
Factor 2	I think I could earn a better salary in a different country	-0.06	-0.71	-0.19
Perception of the opportunity to develop a career and resources abroad	I believe that the healthcare resources are better in other countries		-0.70	0.11
	I think I would have better career opportunities in other countries		-0.80	
	I think pharmacists in other countries have a more desirable professional role	-0.08	-0.60	0.27
Factor 3	There are significant barriers between other health professionals and pharmacists in my country	-0.14	-0.40	0.24*
Attitude towards the socio-political environment in their home country	I feel that the practice of pharmacy is restricted by my culture	-0.18	0.11	0.63
	I feel that the political situation in my country is limiting my practice	0.07	-0.19	0.67
	I feel that my religion would be better accepted in another country			0.71
	I feel dissatisfied with the health system in my country		-0.41	0.34*

*These items have a loading of less than 0.4 however were included in these factors as their removal would reduce Cronbach's α for Factors 2 and 3.

In order to explore differences in attitudes between those intending to migrate on a short-term basis, long-term basis and those with no intentions to migrate, mean z-scores for each factor were compared. Those intending to migrate long-term held more negative attitudes towards their home country and a more positive perception of opportunities abroad (Figure).

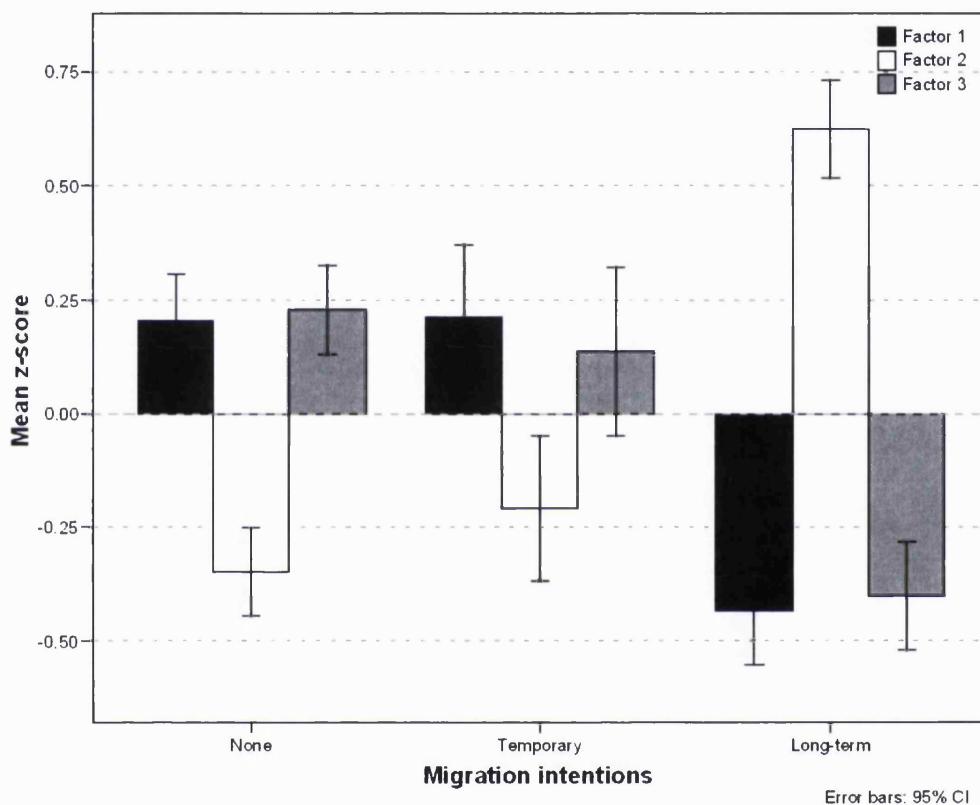


Figure 4.2 Mean factor z-scores by migration intention

There was a significant difference in all factors between respondents who did not intend to migrate compared to those who intended to migrate on a long-term basis, with more negative attitudes towards the home country environment and a more positive perception of opportunities abroad (Factor 1, $t(579) = 7.9, r = 0.31, p < 0.001$; Factor 2, $t(543) = -12.8, r = 0.48, p < 0.001$; Factor 3, $t(601) = 8.2, r = 0.32, p < 0.001$).

It can be seen from Figure that students intending to migrate short-term had a similar profile of attitudes to those who did not plan to migrate (no significant difference) and had significantly

different attitudes to students planning long-term migration (Factor 1, $t(375) = 6.7, r = 0.33, p < 0.001$; Factor 2, $t(284) = -8.3, r = 0.44, p < 0.001$; Factor 3, $t(273) = 5.2, r = 0.30, p < 0.001$). There was no statistically significant difference across all factors between those who did not plan to migrate and those who intended to migrate on a temporary basis.

4.4 Two-step cluster analysis

Analysis revealed four case clusters that represent 86.7% of the dataset (13.3% - 105 cases - were excluded due to a missing value for one or more variables). Table 4.8 describes the significant defining characteristics of each cluster. In Table 4.8, the column describing attitudes towards the home country environment compares scores for both Factor 1 and 3; the column on attitudes towards opportunity abroad represents Factor 2.

Each cluster is distinct in the intention to migrate ranging from predominately long-term migration intention (Cluster 1) to no intended migration (Cluster 4). Cluster 1 describes characteristics of a group that is mostly likely to migrate and Cluster 4 the least likely to migrate. Cluster 3 describes a subpopulation that is most likely to migrate on a short-term basis.

Table 4.8 Cluster characteristics

Clusters (N = 686)	Intention to migrate	Gender	Knowledge of other migrant pharmacist	Past pharmacy experience abroad	Attitudes towards home country environment	Attitudes towards opportunities abroad
1 (N = 111)	Long-term intention	Mostly male	Yes	None	Strongly negative	Strongly positive
2 (N = 165)	Mostly long-term,	Both	Mostly do not know	Yes	Negative	Positive
3 (N = 262)	Mostly short-term	Both	Mostly do know	None	Positive	Negative
4 (N = 148)	None	Female	No	None	Neutral	Neutral

The number of cases in the cluster analysis is less than the total response to the study due to missing values for one or more variables in 105 of the cases.

4.5 Mann-Whitney tests

Males in the sample ranked money as being more important than females ($p < 0.001$, small effect size $r = -0.14$, $U = 57897$). Males also ranked lifestyle as being less important than females ($p = 0.04$, small effect size $r = -.10$, $U = 60707$).

There were also small effect size differences between those who did not plan to migrate and those who planned to migrate long-term. Those who did not intend to migrate ranked the importance of family ($p < 0.001$, $r = -0.14$, $U = 38954$) and lifestyle ($p = 0.001$, $r = -0.11$, $U = 35230$) as being more important, and money ($p = 0.004$, $r = -0.11$, $U = 38753$), experience ($p = 0.005$, $r = -0.11$, $U = 39038$), ambitions ($p = 0.001$, $r = -0.14$, $U = 37714$) as being less important than those who planned to migrate on a long-term basis.

Lifestyle was ranked as being more important by those intending to migrate for less than two years compared to those who wish to remain abroad for more than two years ($p = 0.001$, $r = 0.17$, $U = 15287$).

Chapter 5 Discussion

Results showed a significant and medium-effect size difference in attitudes towards the professional and socio-political environment of the home country and perceptions of opportunities abroad between those who have no intention to migrate or short-term migration intentions and those who intend to migrate long-term. These attitudes, together with gender, knowledge of pharmacist migrant networks and past experiences abroad, are associated with an increased propensity for migration. The finding that attitudes towards the home environment and opportunities abroad may influence the intention to migrate supports previous findings that a broader set of both push and pull factors should be taken into consideration (99;107).

These identified factors provide a deeper understanding of the relationships between variables that influence the intention to migrate. However, factors relating to the country environment and context should not be assumed to be uniform across all respondents. Findings suggest that variance in attitudes is inherent within and between countries and thus cannot be assumed to be standardised.

The results also provide evidence to demonstrate that economic motivation for migration is not an independent, stand-alone factor in itself, but rather a component of a broader factor (as identified here as Factor 2) that takes into consideration the potential to develop both resources and a career abroad. This finding is a departure from previous studies of intention to migrate that all cite remuneration as a key independent influencing factor. This may be partly because their design prevented deeper analysis of relationships between factors (78;98;100;103-105).

Based on a broader framework of understanding derived from the results of this study, a number of inferences can be drawn relating to strategies to encourage retention. Such strategies should frame the issue of migration in context of the wider human resource agenda, thus viewing migration as a form of attrition or workforce exit (rather than a stand-alone phenomenon). To proceed from this rationale, countries experiencing a shortage of health workforce exacerbated by emigration, in addition to other forms of attrition such as change of profession, change to non-practising role, retirement and death, should prioritize interventions that encourage retention and enhance workforce and practitioner development. This is especially important given the current low level of provision of professional development

opportunities, for example, a 2008 survey of global hospital pharmacy practice found that only a fifth of respondent countries (85) necessitated hospitals to be involved in structured post-graduate training programmes for pharmacists, with an equal number of countries stating that this was not within the scope of hospital pharmacy practice (28).

One example of a programme which is seeking to provide post-graduate professional development opportunities through a workplace based approach is the Joint Programme Board (JPB). The JPB was established in 2006 with the support of the UK National Health System to provide a systematic joint post-graduate programme for the development of pharmacists (127). It operationalises the competency frameworks that have been developed in the UK for general pharmacist practice (General Level Framework) and advanced pharmacist practice (Advanced Level Framework). Commencing with the hospital sector, it comprises of a partnership between nine schools of pharmacy, NHS and professional bodies. By providing a structured and supportive learning system facilitated by electronic technology and hands on mentoring, pharmacists are able to remain and develop in their workplace as they undergo formal workplace based training. It also serves as a cost-effective model to develop the competencies of pharmacists, introduce a systematic means of measuring performance and outcomes for human resource management whilst simultaneously retaining pharmacists.

Factor 1 (attitudes towards the professional status and practice environment towards the home country) refers to the need to improve working conditions and the professional interface with other health professionals and society. Planned interventions could employ non-financial incentives and human resource management tools, such as recognition by management, performance review and improving inter-professional working relationships, to uphold and strengthen the professional ethos of health professionals, a key determinant of motivation and retention (66).

Factor 2 (perceptions of the opportunity to develop resources and career prospects abroad) recognizes the influence of the labour market in creating demands and the linkage of issues relating to remuneration and professional development. This supports the rationale for workforce strategies to enhance retention through investment in professional development opportunities in terms of career progression pathways (professional role development) and training, despite the existence of relatively lower salaries compared with those offered abroad

(66;79;117). The results suggest that combined strategies addressing professional development opportunities as well as ensuring appropriate remuneration is warranted, rather than stand-alone efforts in either.

Factor 3 (attitudes towards the socio-political environment in the home country) indicates the influence of factors beyond the individual. It would be important to distinguish here between two sets of factors in the socio-political environment. One set relates to factors within the control of the health and labour sectors, such as health systems, policies and public and private sector dynamics. The other set of factors relates to those likely to be beyond the scope of the health and labour sectors, yet play a significant role in influencing the intention to migrate, such as political stability, human rights (including the right to own and exchange property and the right to operate a business without undue political interference), rule of law (enforced by an independent judiciary), free speech, cultural issues and social development (99).

The negative attitude towards the professional and socio-political environment and positive perception of opportunities abroad were associated with the intention to migrate, particularly on a long-term basis (Table 2). Those intending long-term migration may be a subpopulation of the workforce that will be difficult to retain or to encourage return from abroad. However, there appears to be an opportunity for maximized benefits from migration with those who intend to migrate on a short-term basis, as described by Cluster 3. Results suggest that the intention to migrate should be defined as short-term or long-term in nature, rather than pooled.

Short-term migration intentions are clustered with defining characteristics that are essentially different from those of long-term migration intentions. Those planning short-term migration are more positive towards their home country and more negative towards opportunities abroad. Exploration of the potential for return migration in those who intend short-term migration was not within the scope of this study. However, this will be explored in a follow-up study by examining scenarios in which return migration is more likely. Further study is warranted to build on the limited existing evidence base for understanding return migration and the distinction in characteristics between long-term and short-term migration intentions (78;82).

Gender plays an important role; it is clear that long-term migration is selective towards males. Cluster 4 describes a subpopulation within the sample that is entirely female with no intention to migrate, unaware of other pharmacists who have migrated and hold ambivalent attitudes. By

contrast, Cluster 1 describes a subpopulation that is mostly male, has access to migrant pharmacist networks and holds strong negative attitudes towards their home country and strong positive attitudes towards opportunities abroad. Neither cluster has had any past pharmacy experience abroad. Further research is planned to better understand the gender dynamics. Some evidence that migration is selective towards males exists, though this depends on the country context and demographics within the profession (105).

Knowledge of a pharmacist who has migrated abroad also plays a significant role and alludes to the potential migration network effect (Table 4.8). This tends to facilitate migration by reducing the associated costs and risks of migration and increasing the potential gains (78;97;108). This is closely associated with the intention to migrate, though the direction of causation is unclear.

Those who intend to migrate on a long-term basis tend to know of a migrant pharmacist, while those who do not intend to migrate do not. This could be explained in different ways, depending on the direction of causality. Those who intend to migrate on a long-term basis may actively seek out migrant pharmacists. Or, prior knowledge of a pharmacist who has migrated may determine the choice of training (in this case, pharmacy education) and influence the intention to migrate on a long-term basis.

Should a set of societal values, expectations and perceived behavioural norms relating to an established migration flow exist (also referred to as “culture of migration”) in specific country contexts, as was found to be the case in physician migration from Ghana, it is possible that prior knowledge of a migrant pharmacist potentially influences the intention to migrate (79). The converse may be the case in countries without an established culture of migration. Research and policy debates on the migration of health professionals tend to centre on “push–pull” theories, supportive of mainstream oversimplification of a complex phenomenon. There is a paucity of research on factors influencing migration and potential opportunities for policy intervention to strengthen human resources and health systems in countries, particularly concerning the pharmacy workforce.

A multidimensional understanding of factors influencing the intention to migrate, taking into account the relationships between variables, is proposed. Further research is required to build a theoretical framework that encompasses this approach.

Part III Zambia country case study

Part III comprises of chapters relating to the qualitative country case study conducted in Zambia.

Part III commences with an introduction to provide general background and literature on the public health sector in Zambia and is followed by a methods chapter that defines research questions. Part III is then comprised of three chapters, each focused on one research question, and consists of a more detailed introduction to the literature and specific context, offers a descriptive and interpretive analysis and summarises the key findings. This part concludes with a discussion chapter which identifies and interprets the key findings from the case study.

Final conclusions and recommendations for future research and policy development drawn from both the migration intentions study and the Zambia country case study are described in Part IV.

Chapter 6 Country case study background

The literature review examined published research and the 'grey' literature in the form of reports, reviews and books relating to pharmacy workforce development, policy decision making processes and medicines access and use in Zambia from 1970 to 2008. Key words used included pharmacy workforce, pharmacists, pharmacy technologist, human resources for health, health workforce, retention, power and policy, health policy, health policy process, and Zambia. Electronic databases such as PubMed, Medline, Google, Google Scholar, International Bibliography of Social Sciences, Human Resources for Health Resource Center and Web of Knowledge, were searched and further references were identified through citations. The review focused on literature published in the English language.

This chapter provides a brief overview on the public sector, status of pharmacy workforce development policy, the role of power in the policy decision making process, and medicines access and use in Zambia. This chapter introduces key concepts, and provides context and background to the Zambia case study. Detailed literature and further context is described in the introductory sections of Part III, Chapters 8, 9 and 10.

6.1 Background

Given the lack of evidence in the area of pharmacy workforce issues and development, there was a need to explore the trends, dynamics and issues in a country specific context. One focus of the research is to develop policy recommendations for contexts where the human resources for health need is the greatest, hence a country from sub-Saharan Africa was chosen for this case study. Zambia is one of the 57 'crisis countries' and resource and capacity limitations place constraints on the ability to train sufficient numbers of pharmacists.

Whilst in Zambia in April 2006 for the WHO World Health Day Launch on human resources for health, an expressed need was raised by local stakeholders for greater evidence on and understanding of the pharmacy workforce issues in Zambia. The country case study research plan was thus developed and incorporated into this doctoral thesis programme. The

background and methodology for the case study's development is described in Part III, Chapter 7.

In Zambia, the pharmacist workforce shortages are great and imbalances exist in the distribution of its tiny workforce of approximately 200 pharmacists serving a population of 11, 922, 000 (0.16 pharmacists per 10, 000 population) (6;128). Attrition rates are also high with an increasing trend for overseas migration. However pharmacist workforce levels have doubled since 1995 with the introduction of localised training for a four year Bachelor of Pharmacy degree programme in 2001 (6;129).

The projected pharmacy workforce needs differed significantly between policy papers and reports and have varied over time. At the time of independence in 1964 there were only two pharmacists and the 1968 National Development Plan did not include any pharmacy cadres or the provisions for localised training (6). The first localised pharmacy training was established at the Evelyn Hone College of Applied Arts and Commerce with a six month dispensary assistant course in 1970 (130). This was subsequently dissolved in 1973 to make way for the establishment of a three year diploma course to train pharmacy technologists in 1974 (130). The Ministry of Health sponsored the training of pharmacy technologists until 1996 after which students were self-funded or sponsored by organisations and donors.

In order to understand the pharmacy workforce issues, there was a need to examine the development of the public health sector, pharmacy workforce policies, policy making process and needs relating to medicines access and use.

6.2 Public health sector development

At the time of independence in 1964, Zambia was one of the most prosperous African countries. Economic decline from 1973 and escalating inflation over the 1980s and 1990s prompted major structural adjustment programmes and public sector reforms in an effort to reduce poverty and stimulate sustained economic growth (131). Specific measures adopted in structural adjustment programmes included devaluation of the currency (Kwacha), deregulation of price controls, trade liberalisation and privatisation of state enterprises (132). Healthcare in Zambia was

provided for free from public sector health facilities until user fees were introduced in 1993 with the health reforms as a mechanism through which to recoup the cost of healthcare (133). User fees in all rural areas were later abolished in 2006 amidst concerns of inequitable access to healthcare.

The World Bank and International Monetary Fund played key roles in the structural adjustment programmes with the first implemented in 1978 and the fourth and most significant initiated in 1991. This final structural adjustment programme included public sector reform with an unsuccessful attempt to ensure macroeconomic stability and growth (131).

Over the same period, healthcare decentralisation began with the enactment of the 1985 Medical Services Act which established hospital management boards for hospitals with more than 200 beds (134). The year 1992 ushered in a Sector Wide Approach (SWAp) to health sector reforms and the further decentralisation of healthcare services such as the establishment of District Health Management Teams in 1993 for technical management and District Health Boards in 1994 for oversight and supervision of these teams (135).

In 1993, the Public Sector Reform Programme also aimed to reduce overall public sector employment (personnel emolument) by 25% for what was perceived to be a staffing surplus (131). Despite the government resisting its implementation, severe restraints were placed on maintaining or increasing health workforce levels in the 1990s (131).

With the enactment of the 1995 National Health Service Act, the new Central Board of Health (CBOH) was formed as an autonomous health service delivery mechanism responsible for operational roles such as implementation of policy and management of the various Health Management Boards (135). The Ministry of Health was designated responsibility for leadership, policy making and regulation. After the CBOH was established, plans were drawn to reduce the Ministry of Health headquarters staff from 300 to 60 (136).

The Central Board of Health structure included four main directorates including the Directorate of Clinical Care and Diagnostics which encompassed management of pharmacy, clinical care, oral health and medical imaging services (135). It was at this time of reform that the Directorate of Pharmaceutical Services was removed from the Ministry's structure to be replaced with a

downsized group within the Directorate of Clinical Care and Diagnostics. The Directorate of Planning and Development was expanded from a planning unit within the former structure to take on additional roles to lead health policy, planning, budgeting, monitoring and donor coordination (136).

In 2005, the National Health Service Act 1995 was repealed and the Central Board of Health dissolved so that the Ministry of Health could reassume its former role in both policy making and health service management. The Directorate of Pharmaceutical Services was not reinstated and these four main directorates from the CBOH structure were incorporated back to the Ministry of Health largely unchanged.

In 2000, Zambia was deemed a Highly Indebted Poor Country which entitled it the reduction of its debt by two thirds if conditions described in the Poverty Reduction Strategy Paper were met (Bigsten et al, 2001, cited in (131)). One condition was the reduction of public sector expenditure on personal emoluments to a target of 8.1% of GDP and recruitment freezes were implemented across the public sector (137). This was lifted by the end of 2005 although treasury authority still had to be sought in 2007 to implement the proposed human resource establishment list.

Although public sector spending on health had increased as a proportion of its total expenditure throughout the 1990s, in real terms it had reduced due to high inflation (World Bank 2003, cited in (131)). In 2005 the total Ministry of Health budget was 154 million USD (including 36 million USD of donor support) (138). However external donor support was predominately allocated through disease specific programmes which amounted to 183 million USD in the same year.

6.3 Pharmacy workforce development policies in Zambia

This section introduces the major pharmacy workforce development policies in Zambia which are described in more depth in Chapter 8.

To date, the only specific policy on pharmacy workforce development is the 1997 National Drug Policy which has yet to be implemented (129). The 2006-2010 Human Resources for Health

Strategic Plan (HRH-SP) was developed in 2005 and constituted the first comprehensive human resource for health policy in Zambia (139). Although pharmacy workforce plans were not specified in this plan or in subsequent policy documents, the need for an expanded pharmacy workforce was envisaged in a new establishment list which was approved for implementation in 2007 (140).

The 2006 – 2010 HRH-SP projected a need of only 42 pharmacists and 120 pharmacy technologists in the public sector. The 2005 Draft Master Plan for the Implementation of the National Drug Policy projected an immediate total need for 700 pharmacists and over 700 pharmacy technologists (141). The new establishment list proposes a near doubling of the current health workforce which is to be implemented in a phased approach (140). This marked a significant shift in policy for Zambia which has had a history of recruitment freezes in the public sector.

Remarkably, the total public sector pharmacy workforce needs articulated in the 2007 proposed establishment differed by almost sevenfold to that of the HRH-SP (140). A total required pharmacy workforce of 1238 was expressed and demonstrated a leap in the projections of total pharmacy workforce needs. The desired skill mix by cadre was unclear although the Ministry of Health's 2008 Annual Training and Development Plan stated that whilst annual output from diploma and certificate training programmes for technologists and dispensers needed to be increased by 50% from 40 to 60 graduates each, the output of degree pharmacists was recommended to be reduced by 75% from 40 to 10 (142).

Picazo and Kagulura (2007) found Zambian public sector health workforce salaries to be compressed at the upper and middle levels with uniform salaries for nurses and pharmacy technologists and similar salaries for doctors and nurse-tutors (143). Remuneration for doctors is double that of pharmacist salaries once allowances are included. Pharmacy technologist remuneration is less than a third of pharmacist's.

Numerous retention schemes are in operation, some of which have been initiated by district health offices and others that are supported by donors but none have covered pharmacists or pharmacy technologists.

6.4 Power in the policy making process

This research did not intentionally seek to examine the role of power in the policy making process however this emerged as a key theme in the analysis of the Zambia qualitative case study (Chapter 9). This section provides an overview of key concepts relating to power and the policy process which are further described in Chapter 9.

The two dominant theories of power in policy making are the pluralist and elitist view. The bounded pluralist views is an amalgamation of pluralist and elitist theories of power in policy making and argues that different view apply at different levels of politics; what Hall et al (1975) deemed as high politics and low politics (cited in (144)). The elitist framework is applied to high politics, concerned with systemic or macro level decisions such as economic policy or personnel emolument reforms. The pluralist view is applied to low politics which are largely sectoral and micro level, such as changes in vaccination policy.

According to Ham and Hill (1986), power and dominant perspectives may influence decision makers to ignore issues, prevent decisions from being made or neglect a policy matter if they are contrary to the interests of individuals or groups in power (cited in (144)). In the policy making process, Walt (1994) argues that top level civil servants are unlikely to be neutral actors and tend to play an important role in policy making (144).

6.5 Medicines access and use in Zambia

Very little has been published in the peer review literature regarding medicines access and use in Zambia. Much of the information for this review was derived from the grey literature, reports of non-governmental organisations and the Ministry of Health.

The main points of access in Zambia for healthcare and medicines were the public, private not for profit (mission hospitals and healthcare centres), private sector (clinics, hospitals, pharmacies) and informal sector (drugstores, drug sellers, traditional healers). There are few licensed community pharmacies and most of these are concentrated in the urban areas (145). According to the Pharmaceutical Regulatory Authority in 2008 there were 42 licensed private

community pharmacies in total in Zambia. The informal sector is a common source of medicines access, particularly in rural areas.

The framework defining access to medicines for the purpose of this research was adapted from WHO and incorporated the concepts of rational selection and use, affordable prices, reliable health and supply systems and medicines availability (146).

At the time of the National Drug Policy's development, irrational use of medicines was thought to be widespread in Zambia, particularly for medicines sourced from the informal sector (129). Few studies have since been conducted to provide reliable data on prescribing and medicines use. One example is the documented use of antimalarials despite negative laboratory results which was found to contribute to excessive antimalarial consumption and resource waste in Zambia (147). In a study of 18 public sector health facilities in the urban Lusaka district, only 63% of presentations diagnosed as malaria were prescribed the appropriate course of antimalarials (148).

The lag time between tendering and medicines delivery to Medical Stores Limited (MSL) was six months which required comprehensive and advanced planning to ensure adequate availability. Medicines were frequently observed to stock-out with a 63% monthly average availability of essential medicines at Medical Stores Ltd (MSL) in 2007 (140). However, in a survey of patients in rural districts, only 8% were found to purchase medicines privately due to stock-outs of medicines in public sector health facilities (133).

Supply chain systems in the public sector were seen to be inefficient and ineffective with concerns of integrity, leakage and poor management (145). In a 2003 study across 5 districts, only 11% of workers that dispensed medicines to the public were found to be pharmacists (149). Almost all of the authorised individual dispensers, drug sellers and most of the personnel in drug stores had no training (149). Despite the dominance of untrained drug store, authorised dispenser and drug seller personnel, the level of knowledge demonstrated on the symptoms of malaria, treatment guidelines and advice that should be given on the use of antimalarials was not markedly different to that of licensed dispensing outlets (149).

No price survey had yet been undertaken in Zambia and reliable information on medicines prices and their affordability by the public does not exist. However, it is highly likely given that

two thirds of the Zambian population live below the poverty line that medicines are unaffordable for the majority.

Chapter 7 Methods

This chapter gives an overview of the theoretical underpinnings and assumptions in the methodological approach used to explore the research questions in this qualitative country case study. The reliability, credibility and generalisability of the methodological approaches chosen are also discussed. The chapter concludes with a description of limitations.

7.1 Introduction

The quantitative pharmacy student migration study highlighted the significance of locally determined professional, social and political factors on the intention to migrate and raised the need for further in depth investigation. A qualitative methodology was deemed to be more appropriate to generate an understanding of the conceptual complexities relating to pharmacy workforce development. The intention of this research was not to test theories or ideas *a priori* but rather to understand emergent concepts and their relationships relevant to the investigation of pharmacy workforce issues. This section describes the research questions and the rationale behind the selection of the methodological approach and case employed in this study.

7.1.1 Research questions

Few studies have empirically examined issues relating to pharmacy workforce development and none have focused on countries experiencing a human resource for health crisis such as Zambia. The nature of challenges affecting pharmacy workforce development and policy processes are poorly understood in such contexts. The available literature concentrates on other cadres such as physicians, nurses and midwives but does not explore the policy making processes relating to human resources for health development.

There was a need to understand the decision making processes relating to pharmacy workforce development and perceived implications on outcomes such as medicines access and use. The

following research questions were developed to focus on these research goals whilst iteratively taking emergent themes into account during the course of the research.

1. What are the key pharmacy workforce issues in Zambia and what strategies are needed to build workforce capacity?
2. What are the pharmaceutical and pharmacy workforce policy development and implementation processes and experiences in Zambia and what role does the pharmacy profession play?
3. What if any, are the linkages between medicines problems and the status of pharmacy workforce development?

7.1.2 Selection of methodological approach

A review of methodological approaches appropriate to the research yielded three possible options - grounded theory approach, conversation analysis and ethnomethodology – each with its own advantages, disadvantages and potential to lead to different findings as described in Table 7.1.

According to Strauss (1998), grounded theory is “derived from data, systematically gathered and analysed through the research process” and enables the study of concepts and their relationships through the insights of participants (150). The grounded theory approach is one type of qualitative research which aims to ground the “identification and categorisation of elements, and exploration of their connections” as described by Miles and Huberman (151). It seeks to outline a means by which to generate theory through empirical research (152).

Conversation analysis and ethnomethodology, although related, are distinct from each other in their approach to data analysis. The theoretical underpinnings of conversation analysis assume that talk or interaction is a form of action which is structurally organised and reflective of a subjective reality and thus aims to study how a phenomenon is represented and constructed in talk (153). Ethnomethodology aims to examine social facts through ordinary activities to reveal the local rationality of a phenomenon as it is perceived (154).

Table 7.1 Comparison of theoretical models and methodological approaches

Model	Emotionalist: Participants view provides an insight into the phenomenon.	Constructionist: Participants view provides a perceived construction of the phenomenon.	
Methodology	Grounded theory approach: Study of the conceptual nature of a phenomenon.	Conversation analysis: Study of how a phenomenon is talked about and thus constructed through interaction.	Ethnomethodology: Study of how a social phenomenon is produced and perceived.
Findings	Concepts and their perceived relationships relating to pharmacy workforce issues, development processes and implications on medicines access and use.	Structure and process of decision making on pharmacy workforce issues and development.	Local rationality of pharmacy workforce situation and decisions.
Methods	Focus groups, interviews (audio recorded and/or written transcripts).	Observational studies.	Observational studies.
Data	Interview data. Audio recorded and/or written transcripts.	Naturally occurring conversation data. Audio and/or video recordings of interactions.	Naturally occurring conversation and non-verbal data. Audio and/or video recordings of interactions.
Advantages	Data collection is feasible within time, budget, and accessibility constraints. Allows study of conceptual themes as seen from participant's perspectives. Greater anonymity through interviews given direct interaction with researcher without other participants. Data can also be analysed through a constructionist viewpoint.	Allows study of phenomenon as constructed through naturally occurring discussions. Assumes intersubjective reality.	Allows in depth study of local rationality of a phenomenon through naturally occurring and ordinary actions and verbal accounts. Assumes intersubjective reality.
Disadvantages	Assumes that participants' insights are valid and provides a true representation of the phenomenon. Participant's insights may not be concordant with actual behaviour and conversation in a natural setting.	Observational study unfeasible due to lack of accessibility, availability and consent for recording naturally occurring data (eg - meetings). Anonymity concerns given presence of other participants.	Observational study unfeasible due to lack of accessibility, availability and consent for recording naturally occurring data (eg - meetings). Anonymity concerns given presence of other participants.

A grounded theory approach differs to conversation analysis and ethnomethodology from an epistemological standpoint (155). Interview responses can be interpreted as either insights into real events, experiences and attitudes, as in the emotionalist model, or as social constructions or narratives of events, experiences and attitudes, as in the constructionist model. Rapley (2004) observes these two models to either interpret interviews as a 'resource' where the

“interview data collected is seen as reflecting the interviewees’ reality outside the interview” or as a ‘topic’ where the “interview data collected is seen as reflecting a reality jointly constructed by the interviewee and interviewer” (156). Critics of the ‘interview data as a resource’ approach stated that interviews were the products of interactions between the interviewer and interviewee such that the talk was “locally and collaboratively produced”, rather than being a window into the interviewee’s reality, and that the incorrect assumption was made that the interview was only about the subject of the interview (152). From this perspective, interview data co-produced by the interviewee and interviewer generated versions of the truth as seen from the ‘interview data as a topic’ perspective.

However, as demonstrated through empirical qualitative research, these approaches are not mutually exclusive. In a qualitative study by Glassner and Loughlin (1987) of American adolescents and their use of illicit drugs, the researchers regarded the interviewee’s responses to be both windows into reality as well as culturally defined narratives (cited in (155)). This yielded two interpretations from the data which were equally accepted. Thus while a grounded theory approach could be classified as emotionalist, the data could also be analysed and interpreted from a constructionist viewpoint. Epistemological models were not considered as a criterion for selection although their theoretical assumptions were taken into account when evaluating each option.

The use of naturally occurring data required for conversation analysis and ethnomethodology, whilst desirable and potentially unique for research in the field of human resources for health, was deemed to be unlikely. The form of naturally occurring interaction relating to pharmacy workforce development, such as policy meetings, consultations or private conversations, would be difficult to access, observe and record. The scope of the research questions were also possibly too broad for these constructionist approaches which required a narrower research focus due to their more labour intensive nature of data collection and analysis.

After consideration of the advantages and disadvantages of each methodological option, a grounded theory approach was selected. The dual emotionalist and constructionist interpretation of data through a grounded theory approach as described by Glassner and Loughlin (1987) fitted with the research questions that aimed to develop a descriptive narrative that identified key issues relating to pharmacy workforce development and sought to

understand how pharmacy workforce development was experienced and constructed by participants.

The grounded theory approach was not only more feasible given time, resource and accessibility constraints and concerns of ensuring anonymity, but it would also permit the iterative formation of conceptual models using themes relating to pharmacy workforce issues and development as they emerged in the data. The development of conceptual models using a grounded theory approach was argued by Strauss (1998) to be closer to reality than theories without an empirical basis (150). This methodological approach was also chosen for its advantages in enabling an exploration of conceptual issues that influenced pharmacy workforce development, particularly given the lack of prior empirical research in the field.

Strauss and Corbin (1990) emphasised that the use of a grounded theory approach did not preclude the use of other social theories but rather assigned them towards the end of data analysis once a model from the data had been developed (cited in (157)). In following the approach advocated by Crestwell (1998), relevant social theories were sought and discussed in conjunction with the findings after data analysis had taken place so as to compare the emergent model against points of commonalities and differences (157).

A grounded theory approach to the case study was thus used to undertake an in-depth qualitative exploration of pharmacy workforce issues, pharmacy workforce development processes and medicines access and use. Specific grounded theory approach analytical techniques are described in section 8.4.

7.2 Case selection

This section describes the case selection process and the rationale in selecting a single country, Zambia, as an 'extreme' case in preference to the originally planned collective case study of six countries. Zambia was not included in the pilot migration study (Part II) as contact had not yet been established at the time of data collection in 2006; however Zambia participated in the principal migration intentions study which is outside the scope of this thesis work.

At the outset of the research planning process, the original intention was to select a mixture of high, middle and low income countries from different regions with varying pharmacy workforce scenarios (higher workforce density, lower workforce density), to cover diverse scenarios and contexts and thus maximise the variance in the data. This could be described as a 'collective case study' where the research of a phenomenon involved a series of cases (Stake, 2000, cited in (155)). Six case studies were originally planned with the intention of generating an understanding of the factors influencing the pharmacist workforce, migration and human resource planning across diverse contexts. Countries selected included the United Kingdom, Canada, India, Ghana, Zambia and Malawi. Contacts with all countries had been established due to previous collaboration in a pharmacy workforce study.

The United Kingdom and Canada were selected as high income Anglophone countries with relatively high pharmacy workforce levels but with interesting new changes in the profession and workforce development (such as changes in roles, increasing number of graduates and schools of pharmacy, growing public sector workforce). They were also major destination countries for migrant pharmacists as well as source countries themselves to other countries such as the USA. Given the emphasis of this research on countries where the human resource for health crisis was the greatest, three countries in sub-Saharan Africa were selected – Ghana, Zambia and Malawi. All countries were identified to have severe pharmacy workforce shortages and poor workforce distribution between rural and urban areas, public and private sectors. Interestingly, each country had varying histories of the pharmacy profession, stages in workforce development and workforce levels with the local pharmacy education being most established in Ghana (pharmacy school since the 1960s) and least established in Malawi (first school opened in 2006 with graduates expected in 2009). There were also increasing pharmacist emigration rates in Ghana since 2000 (27). India was chosen as a rapidly developing economy with an established pharmaceutical industry and one of the largest shares of the global pharmacy workforce due to its significant workforce level and large population. Pharmacy workforce development was expanding rapidly with a proliferation of pharmacy training institutions in India, growing workforce demand and high mobility of Indian pharmacists.

Resources were sought and obtained at the end of 2006 to fund this study but as the methodological implications and time requirements of such a study were subsequently evaluated, it became clear after several months of planning that the study would be an undertaking beyond what was feasible within the PhD research programme framework. Thus given the resources, a focused single case study was seen to offer an opportunity for an in depth exploration of a sub-Saharan African context which could have implications across the region.

In the original study design, maximal variance in the data was sought in the form of different country contexts. Maximal variance in a single case study can be achieved through the selection of interviewees who were likely to represent a spectrum of opinions, experiences and beliefs (such as different stakeholder groups) within the same country context.

At the end of February 2007 a decision was made to focus on a single case study which would be selected in order to maximise the opportunity for in depth data analysis whilst the findings could also be generalisable beyond the country of study. Such a case study would be an in-depth 'instrumental case study' as described by Stake (2000) rather than a 'collective case study' which would provide insight into the issues through a single case (cited in (155)). Given the intention to investigate an 'instrumental' and 'extreme' case, it seemed theoretically appropriate to select a country which had either extremely positive and successful developments in its workforce and pharmaceutical services or a country which had very limited development and a scarce pharmacy workforce. The latter target was chosen in line with the intention of this research to explore situations where there was the least evidence yet greatest workforce needs.

Zambia was selected on the basis of theoretical, methodological and practical considerations. Flyvbjerg (2004) proposed that the 'extreme case' could generate more information and provide an opportunity for a richer qualitative exploration of underlying causes of issues beyond a description of the symptoms (158). Zambia was identified through purposive sampling as an 'extreme case', given the extreme pharmacy workforce shortages and poor implementation of pharmaceutical and pharmacy workforce policy. On a practical level, rapport and connections with key stakeholders in Zambia were well established through prior interaction which enabled access to data. Zambia was also the more appropriate choice given their expressed invitation

indicating that the presence of a researcher would be welcome and meaningful to local needs rather than solely satisfying the aims of this study.

7.3 Data collection

This section provides an overview of and rationale for the data collection methods used in the case study. Semi-structured interviews formed the mainstay of the data. Interviewees were purposively selected to maximise variance in perspectives. In order for responses to be accepted as the 'truth', and for the dual interpretation approach to be valid, interviewees and their responses had to be credible which raised the need for robust sampling processes. Interviews were conducted personally with the aid of a digital voice recorder.

7.3.1 Semi structured interviews

Semi-structured interviews were chosen as the method for data collection rather than focus groups. In this case study, issues of anonymity were a key consideration given the sensitivity of the issues discussed. Individual interviews were thought to better establish an environment where greater trust could be fostered between the researcher and the participant, enabling the participant to share information they would otherwise feel uncomfortable to share in the presence of others.

A semi-structured interview plan was designed to serve as prompts to cover each aspect of the topics to be explored and also served as a loose topic guide during the interviews. The interview plan was drafted with questions exploring a wide set of key issues relating to the research questions. It was piloted in March 2007 in Kenya through five interviews with key stakeholders. After the pilot, ambiguous and close-ended questions were further revised and the content adapted to narrow the focus of the interview on the key issues. This was found to be important to not only achieve richness in the data but also to conduct the interview within an acceptable timeframe. The final interview plan used in Zambia is outlined in Appendix 5.

Interviews were mostly one hour in duration and ranged from 20 minutes to two hours. The length of the interview depended on the time constraints of the interviewee and the interview schedule. Access to the broad mix of interviewees required for this research was facilitated by local contacts in Zambia.

Each interviewee received an information sheet describing the study aims, interview process, confidentiality and information security and were asked to complete a consent form if they agreed to be interviewed (Appendix 6). Where consent was given, interviews were recorded with a digital recorder from which transcripts were prepared. In some instances where consent was not given for audio recording, extensive handwritten notes were taken during the interview which were then prepared as transcripts immediately after the interview. Interviewees were assured that their identity or any details which could potentially lead to their identification would not be disclosed in any published material. Pseudonyms have been used in conjunction with quotes in order to preserve the identity of participants. Whilst analysis of the perceptions of different stakeholder groups would be of additional empirical interest, given the small pool of possible interviewees for this research, there was a high risk that this information could be used to identify participants. For this reason, the interviewee's stakeholder group and text which could lead to the potential identification of their stakeholder group has been withheld from quotes presented in this thesis.

7.3.2 Sampling

In order for the data to be interpreted as both valid representations of reality and constructs of reality in the analysis, careful selection of interviewees was necessary. Interviewees needed to be knowledgeable, credible and have had some experience or interaction with pharmacy workforce and its development. At the same time, interviewees were also selected to maximise variance in their attitudes and experiences in order to explore the research questions from a multidimensional perspective.

The initial sampling was purposive with opinion leaders sought out from each potential group that were identified to have an interest in or an influence on pharmacy workforce development such as the government, training institutions, regulatory agencies, professional bodies, donor

agencies, civil society, private sector and public sector. Snowball sampling was subsequently used to identify additional contacts. Nineteen interviews were conducted in June 2007 across the Copperbelt, Lusaka and Livingstone districts in Zambia over a period of three weeks until theoretical saturation at the main thematic levels was reached.

In grounded theory, through the data analysis method of coding data into analytic categories, the concepts relating to the subject matter are conceptually compared and interpreted (150). Data collection ends when no new categories or depth to categories arise, a state known as theoretical saturation. Whilst there is always the possibility of further dimensions or properties of the categories identified in the dataset a set of criteria informed by Strauss (1998) was applied to determine the end point of data collection where theoretical saturation at the thematic level was achieved (150). The conclusion of data collection was thus determined by the following criteria:

- a pragmatic interpretation of theoretical saturation where no new categories or significant properties were detected during the interview process and much of the variation was thought to be captured (i.e. no new significant phenomena or dimensions and properties of the phenomena relevant to the research focus on pharmacy workforce development emerged);
- exhaustive sampling (i.e. almost all opinion leaders from stakeholder groups were interviewed in the study) and
- time constraints (i.e. maximum period of three weeks for data collection).

7.4 Data analysis

This section summarises the methods used within the grounded theory approach for data analysis, the rationale for their selection and their advantages and limitations. The software programme NVivo 7 was used as a computer-assisted qualitative data analysis tool to code, retrieve and compare data throughout the analysis process.

Grounded theory states that there should be a central integrating focus to aspects of the study and that this focus is grounded in the data but is abstracted, integrated and condensed (159). When a core category or theme at the highest level of abstraction has been identified, data analysis is complete.

In order to qualify as a core category, Strauss (1987) proposed that it should be central to the data and linked to the other major categories; appear frequently; emerge logically and consistently rather than being forced; and explain variance in the data and outside the context of study (cited in (150)).

Through data analysis, pharmacy workforce development ceased to be framed in the research as a topical issue but was found to be a complex construct which both influenced and reinforced medicines problems in Zambia.

7.4.1 Coding

Coding techniques such as open and axial coding were used to identify conceptual and descriptive categories and to determine the relationships between them. Categories identified in the coding process were analysed through selective coding and pattern analysis to explore the structure, processes and outcomes of pharmacy workforce development in relation to the research questions.

Open coding was initially used to identify conceptual and descriptive categories and their dimensions in the data. Open coding was defined by Strauss and Corbin (1998) as “the analytical process through which concepts are identified and their properties and dimensions are discovered in data” (150). Properties in this sense refers to the “characteristics of a category, the delineation of which defines and gives it meaning” as distinct from dimensions which relates to “the range along which general properties of a category vary, giving specification to a category and variation to the theory” (150).

Relationships between categories were explored through axial coding around a core category emerging from the analysis. Axial coding was described by Strauss (1998) as the “process of

relating categories to their subcategories, termed axial because coding occurs around the axis of a category, linking categories at the level of properties and dimensions” (150). The nature of relationships between categories was classified by Sayer (1992) as either ‘formal’ to establish conceptual structures, hierarchy and order, or ‘substantive’ to establish causality (160). Formal relationships were readily found in the data, however substantive relationships were difficult to identify unless they were explicitly and repeatedly raised throughout the data, thus assumptions around causality were not made unless this was the case.

Microanalysis, the line by line detailed analysis through open and axial coding, was used on the first ten interview transcripts to generate categories and comprehensively identify both the properties and dimensions of each category. The broader dataset (the remaining nine interviews) were used through comparative techniques to further refine and develop the conceptualisation of categories and the relationships between them.

Although comprehensive, microanalysis was a laborious approach which generated prolific and wide-ranging categories, some of which were not included in the final analysis. As a novice qualitative researcher this approach was useful to gain basic skills in coding but also created complexities given the richness of the data and potential for data overload, hence the progression from open and axial coding to selective coding was slow and required repeated attempts to identify the core theoretical strand in the data. Whilst the data could have been analysed from a number of conceptual angles, the end analysis reflected the focus of the research questions of this study.

Formal relationships were explored and refined through constant comparison. Rather than determining substantive relationships through constant comparison which potentially could lead to flawed conclusions of causality given the lack of basis on which to make comparisons, a strategy proposed by Dey (2004) was employed to analyse and identify the “structure, properties and interactions of those agencies that possess causal powers” (152). This approach shaped the development of the analysis on the decision making process on pharmacy workforce development.

Selective coding was used to further interpret the relationships between categories and establish core categories in the data by analysing the structure, process and outcomes relating

to pharmacy workforce development. In order to achieve this, Strauss (1998) proposed that selective coding should examine processes for changes, sequence and evolution of a phenomenon in relation to the context and conditions (structure) (150). By 'process', Strauss referred to the "sequences of evolving action or interaction" which could be "traced to changes in structural conditions" (150). In taking this analytic selective coding approach to the data, the interplay between structure and process and the identification of related categories, their dimensions and influence on the process, and thus the outcome could be mapped. Processes were broken down into component sub-processes of strategies, actions and tactics (150). In this way a conceptual model was built of the implications of pharmacy workforce on medicines access and use, process of decision making on pharmacy workforce development and the environment and institutions that influence this process.

Patterns defined by Strauss as "groups of properties [that] align themselves along various dimensions", were identified as recurrent themes or combinations of categories and properties and analysed to gain further understanding of the dimensional continuum of categories (150). In practice, this form of analysis was found to be useful after much of the selective coding had taken place to undertake in-depth exploration of sub-processes of decision making experiences described in the data.

7.4.2 Constant comparative analysis

Comparison was seen by Glaser as an integral strategy for analysis in grounded theory (159). Constant comparison is a means to assist theoretical development by seeking variations and contradictions in the data to refine the conceptualisation of relationships between theoretical categories. Contrasting data was sought and used to refine and enrich categories during the process of axial coding. Such contradictory data necessitate the reformulation of the category or may represent an extreme variation or dimension of the category, in this way all the data was accounted for in the analysis (150). Little guidance is offered by grounded theory as to how constant comparison should be undertaken and how such conflicting data and diverse variables can be bound together into a single strand of interpretation or pattern (152).

Comparison of incidents in the data and across the literature is also a technique that can limit bias and stimulate objective thinking during analysis (150). Emerson (2004) suggested using 'key incidents' as an approach to constant comparison. Key incidents were defined by Emerson as "incidents [that] involve particular observations that play a central role in identifying and opening up new analytic issues and broader lines of theoretical development" (161). Key incidents could thus be used as a tool of inquiry where incidents and related observations can be contrasted through the data. Key incidents used for constant comparative analysis were scenarios which described the perceived medical institution's attempts to block pharmacy workforce development. Concepts of institutional strength and weakness were built around such comparisons which formed the basis for understanding the structure (environment and actors) in pharmacy workforce development. At the end of data analysis, systematic comparisons of the properties and dimensions of key concepts emergent in the data were compared to concepts in the literature and social theories, for example, concepts of power in decision making.

7.5 Reliability, credibility and generalisability

There is debate as to whether the case study methodology is valid as a form of scientific enquiry with some experts taking the view that this method tends to perpetuate the researcher's subjective bias (162). In this case study it was important for a grounded theory approach to be used to enable the bottom-up emergence of themes and theories to prevent subjective bias, especially given the lack of prior research in this field. Flyvbjerg (2004) argues that the case study allows the testing of views in real life situations with equal rigour to that of quantitative methods where published experiences have demonstrated a "greater bias towards falsification of pre-conceived notions than towards verification" (158). Objectivity and minimisation of researcher bias was attempted by making constant comparisons between key incidents across the dataset and gathering multiple views on a particular phenomena (150).

Credibility of the findings is linked to the credibility of the data source, the interviewees. Steps were taken to verify the background of interviewees to ensure that they were knowledgeable and had experiences of pharmacy workforce development. In targeting opinion leaders from

each stakeholder group for the first round of interviews followed by snowball sampling using their recommendations, a credible set of participants was ensured.

In the case study methodology, it is commonly believed that generalisations cannot be made on the basis of a single case, however if the case study is carefully and strategically chosen and fully described, generalisations beyond the case can be made (158). Generalisability in quantitative research is contingent on the representativeness of the sample of the population under study. Generalisability in qualitative research according to Gobo, 2004, “concerns general structures rather than single social practices, which are only an example of this structure” meaning that generalisation on the basis of a single case does not seek to infer that the incidents in the case recur broadly but rather that the general structures are recognisable in other instances (163).

Thus from a methodological standpoint, a single well conducted and focused case study may offer meaningful and generalisable findings as it relates to the structures examined, particularly if selected on a theoretical basis. In this case the decisions relating to the methodological approach (grounded theory approach), methods (semi-structured interview), case selection (purposive extreme case) and sampling (maximal variation of attitudes and credibility of interviewees) used in the study were theoretically informed with the deliberate intention to maximise generalisability.

7.6 Limitations

The limitation of this study is mainly due to the country specific nature of this analysis on Zambia, however the findings in this case study could be generalised to other settings, particularly in countries where similar dynamics in the institutions, workforce shortages, socio-political and economic environments and medicines problems are manifest, as in sub-Saharan Africa. Whilst some elements of the conceptual model developed in this study are translatable, they are likely to be quite different to the European, North American, South-East Asian contexts for example where there are significantly different environments, resources, and history of the pharmacy profession’s development and roles.

Another limitation in this study was the lack of formal ethical review and approval as part of the research planning process. Not only does this limit possible future publication of this research in peer-reviewed journals, but no formal assurances could have been given that the ethical issues in the study were accounted for in the study's design. Given the sensitive nature of data and serious concerns of protecting anonymity, particularly in a study outside of the United Kingdom, the lack of a formal process within the School of Pharmacy, University of London to undertake an ethical review of this research proposal posed an ethical problem in itself. Steps such as review by supervisors, advisors and country level collaborators in Zambia were taken though these were informal processes which did not lend an authoritative decision on the ethical issues inherent in this research.

Chapter 8 Pharmacy workforce development in Zambia

This chapter describes the literature and context, data and its analysis in relation to the research question below.

- What are the key pharmacy workforce issues in Zambia and what strategies are needed to build workforce capacity?

The literature described the fiscal constraints of developing adequate human resources in the health sector, challenges in the recruitment and retention of the skilled health workforce and gaps and inconsistencies in the data and policy relating to pharmacy workforce development. Against this background the key themes of pharmacy workforce shortages, changes in the perception towards pharmacists and pharmaceutical services, characteristics of the pharmacy and medical institutions and their relative powers to influence the policy decision making process were identified and explored.

8.1 Literature and context

This section describes the background literature on human resources for health planning to provide context to the issue of pharmacy workforce development in Zambia. Literature and policy documents on broader human resources for health development strategies, remuneration and retention are described as well as explicit policies relating to pharmacy workforce development.

8.1.1 Human resources for health planning

In an effort to establish a reform in thinking and broaden understanding about human resource issues in the Ministry of Health, the Human Resources for Health Strategic Plan (HRH-SP) 2006-2010 was developed in 2005 (139). Whilst it took a comprehensive set of interventions into consideration, it was narrow in its scope of cadres and only focused on physicians, nurses and

clinical officers and relegated all other healthcare cadres to the ambiguous grouping of paramedics. There was no specific strategy for pharmacy workforce development.

The Plan proposed a new establishment which envisaged more than a doubling of the health workforce from 23,000 to 49,000 in order to provide an essential health package. The WHO recommended minimum ratios (workforce to population) were used to make projections of workforce needs for physicians (1:5000) and nurses (1:700) (139). This new establishment necessitated a fourfold increase in the number of doctors and a threefold increase in the number of nurses.

By the end of 2007 a revised establishment list of 51,404 was proposed to Cabinet with 30,883 approved posts (140). A total of 5263 additional positions for the health sector were approved by Cabinet in 2007 to be implemented in phases over several years (140). The approved positions constituted a 16% overall increase in the existing establishment but almost a fourfold total pharmacy workforce increase including pharmacists, pharmacy technologists and dispensers. For 2007, 1300 additional posts on the health sector establishment were approved with 1290 of those positions filled by the end of the year (140).

Table 8.1 describes the projected workforce needs against the 2004/2005 workforce levels in the public sector as expressed in the 2006-2010 Human Resources for Health Plan and the 2007 Proposed Establishment List (139;140).

Table 8.1 Projected health workforce needs and approved establishment

Cadre	Projected establishment	Authorised establishment	2004/2005 public sector workforce levels
Physician	1778	1290	646
Nurse	14053	8165	6096
Midwives	4751	2775	2273
Medical Licentiate	547	79	N/A
Clinical Officer	3737	2657	1161
Environmental Health	2555	1276	803
Pharmacy	1238	693	108*
Laboratory	1403	697	417
Radiography	732	327	142
Paramedical Other	1379	485	527
Teaching staff	422	237	N/A
Administrative	7769	3952	N/A
Support	11040	8250	11003
Total	51404	30883	23176

Adapted from Human Resources for Health Strategic Plan and Joint Annual Review for 2007 Main Report, Ministry of Health (139;140). *Approximately 200 according to Pharmaceutical Society of Zambia data.

Data in the Human Resource Management Information System (HRMIS) was acknowledged in the Ministry of Health's 2007 Joint Annual Review to be inaccurate and unreliable however was still used as the basis for workforce needs projections and training plans (140;142). According to the HRMIS there was a total of 108 pharmacy staff in the public sector whilst the Pharmaceutical Society of Zambia estimated there were 200. Such discrepancies in workforce data were frequently found between various policy documents.

Few studies have examined the issue of health workforce remuneration and retention in Zambia. Picanzo and Kagulura (2007) found Zambian public sector health workforce salaries to be compressed at the upper and middle levels with uniform salaries for nurses and pharmacy technologists and similar salaries for doctors and nurse-tutors (143). Salaries of district level doctors doubled between 1994 and 2004 (when the 16 fold Kwacha increase was adjusted for purchasing power parity in USD) (137). This is much more than the salary of other healthcare cadres but is likely to be considerably less than what doctors earn in than the private sector.

Various salary top ups have been used to create greater differentials between cadre levels including allowances for housing, on-call, retention and overtime, night duty, transport and uniform (Figure 1.61). Remuneration for doctors is double that of pharmacist salaries once allowances are included. Pharmacy technologist remuneration is less than a third of pharmacist's. Salaries of nurses in Zambia were found in one qualitative study to be inadequate for meeting basic costs of living with nurses frequently describing their inability to afford food during a working day (164). This can be presumed to also apply to pharmacy technologists given similarities in the level of remuneration.

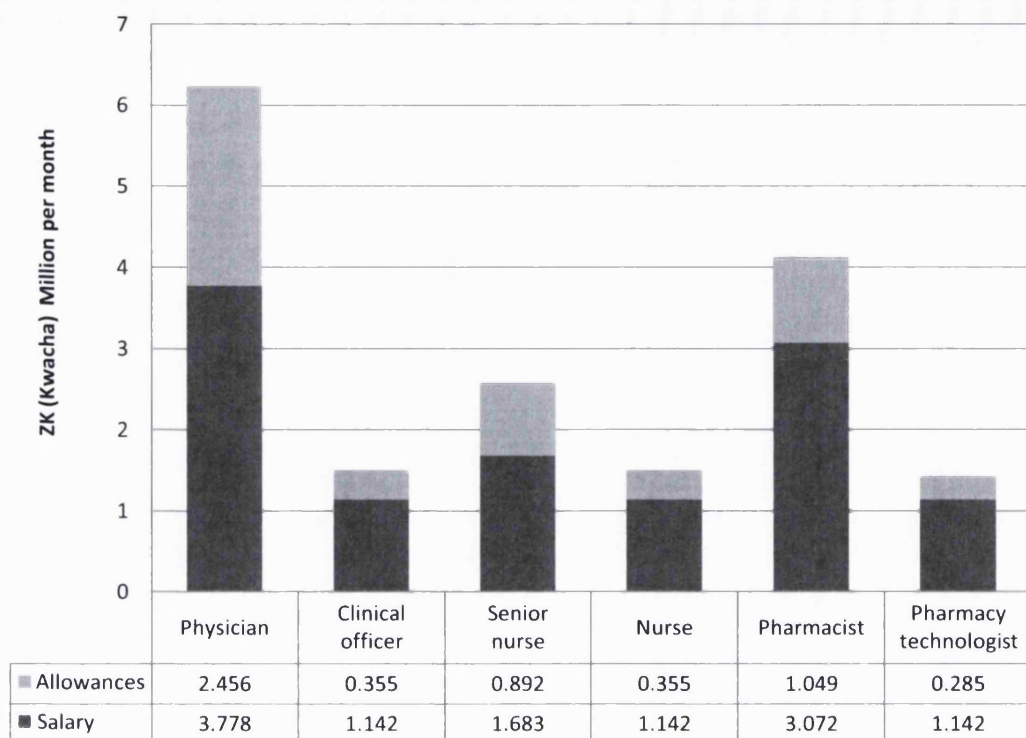


Figure 8.1 Monthly public sector salaries and allowances in 2005

Adapted from Picazo and Kagulura, 2007. (143)

Numerous retention schemes initiated by district health officers and donors are in operation. For example the WHO provided salary top ups to staff at the Medical School at the University of Zambia. The Zambian Health Worker Retention Scheme (ZHWRs) was introduced in 2003 through partnership between the Government of the Republic of Zambia and the Royal Netherlands Government and was the major retention scheme in the public sector (137). Its original purpose was to replace Dutch doctors working in Zambia with local doctors.

The ZHWRs was seen as a viable opportunity to improve the recruitment and retention of public sector doctors working in rural areas given the limited possibilities for expanding the workforce supply at the time. Funded by the Netherlands Government, the scheme provided a hardship allowance, school fees, loans (for cars or house) and assistance for post-graduate training for doctors placed in rural or extremely rural districts for a minimum period of three years. The cost of the scheme per doctor was about 500 Euros (650 USD) per month and was successful in attracting around 50 additional doctors into rural areas which at the time of the scheme's

implementation, only had 15 doctors (137). Most of the doctors enlisting into the scheme were male, inexperienced and had recently completed their internships. By the end of the first phase, 88 doctors had been recruited into the scheme (140).

The mid-term review of the ZHWRS suggested expansion of the scheme to cover more doctor groups, such as educators at the school of medicine, but deemed it unfeasible and unaffordable to expand this program to other cadres such as nurses or clinical officers (137). However it was noted in the report that the attrition and shortage of other cadres remained high which created an environment where the posted doctor found it difficult to perform. The retention scheme was then proposed to be expanded to cadres of critical need in the Human Resources for Health Plan.

In 2007 the scheme was extended to nurse tutors and nurses though targets for 2008 have been set to extend coverage to a total of 150 doctors, 50 medical licentiates, 400 clinical officers, 600 nurses, 250 environmental health technologists and 200 nurse tutors (140). Pharmacists were included in earlier versions of proposal but at the time of the case study in June 2007, it was understood for reasons unknown that this decision had been withdrawn.

8.1.2 Pharmacy workforce development and projected needs

The total pharmacy workforce level in Zambia in 2007 was small with approximately 0.16 pharmacists per 10,000. However it had doubled since 1995 with the introduction of localised pharmacist training in 2001. Figure describes the pharmacist workforce in the public and private sectors in 1995 and 2007 (data sourced from Pharmaceutical Society of Zambia, June 2007). The public sector workforce level increased markedly by 4.5 times whilst overall pharmacist workforce levels doubled over this period.

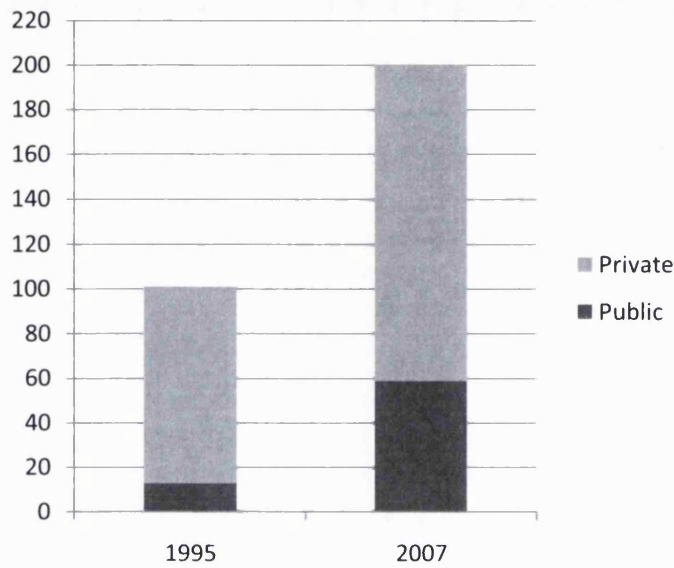


Figure 8.2 Pharmacist workforce levels in Zambia

Data source: Appendix 1, National Drug Policy and Pharmaceutical Society of Zambia(6;129)

Projected pharmacy workforce needs have differed significantly between policy papers and reports and varied over time. At the time of independence in 1964 there were only two pharmacists and the 1968 National Development Plan did not mention any pharmacy cadres or provisions for localised training (6).

The first local pharmacy training programme was established at the Evelyn Hone College of Applied Arts and Commerce with a six month dispensary assistant course in 1970 (130). This was subsequently dissolved in 1973 to make way for the establishment of a three year diploma course to train pharmacy technologists in 1974 (130). The Ministry of Health sponsored the training of pharmacy technologists until 1996, after which students were self-funded or sponsored by organisations and donors.

Between 1977 and 1993 an agreement was in place with Tanzania's Dar es Salaam University to train pharmacists in exchange for the training of Tanzanian mining students at the University of Zambia (130).

In 1979 an agreement was also signed with the UK Government for British Council support to train pharmacy technologists as pharmacists at Robert Gordon University (130). The agreement was terminated in the 1990s due to the poor return of newly trained pharmacists and the inadequate public sector retention of those who did return.

From the 1980s the training of pharmacists in schools abroad depended on donor and some corporate support and Zambian pharmacists were trained in countries with diverse languages, cultures and pharmacy education systems such as the USA, UK, the former USSR, India, and Nigeria. The need for local pharmacist training was thus expressed in policy documents of the Ministry of Health in 1992 at the time of the major health sector reform.

“A school of pharmacy should be opened as a matter of urgency. Pharmacists and pharmacy technologists shall be trained at this school. In the meantime, pharmacy students will continue to be sent for training to relevant African countries.” 1992 National Health Policies and Strategies cited in Nyoni et al., 1996 (130).

The 1997 National Drug Policy also reaffirmed the urgent need for the establishment of localised pharmacist training and scaling up of pharmacy technologist training (129).

“As a matter of urgency, the government shall actively support the development of a pharmacy degree programme at University level with the aim of increasing the output of suitably trained pharmacists. The government shall ensure an increase in output of pharmacy technologists at Evelyn Hone College.” Section 8.3 Policy Statements, Human Resource Development. National Drug Policy (129).

Local pharmacist training finally commenced in 2001 with the establishment of the four year Bachelor of Pharmacy degree programme at the Department of Pharmacy in the School of Medicine, University of Zambia. In 2004, the first graduates emerged to undertake their one year internships in the public sector before becoming registered pharmacists.

The number of pharmacist and pharmacy technologist graduates per year is shown in Figure . The increase in pharmacy technologist graduates in 2008 was due to the addition of a new upgrade course for dispensers to train as technologists. The progression pathway from dispenser to pharmacist is now fully integrated with the possibility for a dispenser to progress with further

training to become a technologist, who in turn can enrol in the degree programme as a second year student to train as a pharmacist. The very first year intake in the Bachelor of Pharmacy degree was mostly comprised of pharmacy technologists. At present no post-graduate programmes or research activity exists in the Pharmacy Department although plans are underway to establish a Masters of Clinical Pharmacy post-graduate degree.

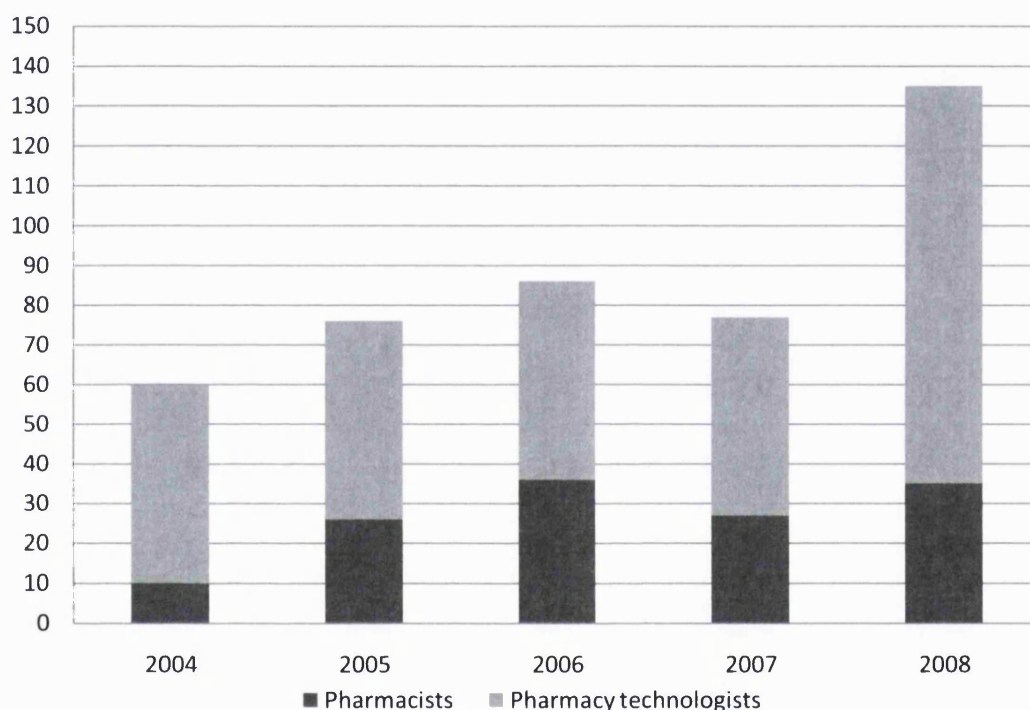


Figure 8.3 Annual training output of pharmacists and pharmacy technologists in Zambia

Data source: Department of Pharmacy, School of Medicine, University of Zambia, 2008.

Several Ministry of Health documents give diverse projections of pharmacy workforce needs. The 2006 – 2010 HRH-SP projected a need of only 42 pharmacists and 120 pharmacy technologists in the public sector. The 2005 Draft Master Plan for the Implementation of the National Drug Policy projected an immediate total need for 700 pharmacists and over 700 pharmacy technologists (141). One-hundred and twenty-six pharmacists were projected to be required just to provide ARV services in order to achieve Global Fund targets by 2008 (165).

Kombe et al.'s projections also envisaged that the required number of pharmacists and lab technicians in a selected group of hospitals exceeded what was available meaning that implementation of planned HIV/AIDS services without pharmacy workforce scale up would compromise baseline health services by diversion to HIV/AIDS services.

Remarkably, the total public sector pharmacy workforce needs articulated in the 2007 proposed establishment differed by almost sevenfold to that of the HRH-SP. A total required pharmacy workforce of 1238 was expressed and whilst the approved establishment was half of this projected need, it nevertheless demonstrated a marked leap in the projections of total pharmacy workforce needs. The composition of this pharmacy workforce projection by cadre could not be found. The Ministry of Health's 2008 Annual Training and Development Plan stated that whilst the annual output from diploma and certificate training programmes for technologists and dispensers needed to increase by 50% from 40 to 60 graduates each, the output of degree pharmacists was recommended to be reduced by 75% from 40 to 10 (142). With the exception of the physiotherapist and pharmacist degree programmes, all other training programmes were proposed to be expanded in the Plan. The rationale for this recommendation is described in the excerpt below.

“There is a current excess of degree-level pharmacists in urban areas who refuse to post in rural health centres. The revised target proposes reducing the number of degree-level candidates due to the current over-supply of degree-level graduates. Instead, the target proposes increases in certificate and diploma level output to meet the most dire vacancy rates in rural areas.” Section 3.1.3.H. Pharmaceutical Studies. Annual Training and Development Plan, p18. (142)

The decision to reduce the annual output of pharmacists was appealed by the Department of Pharmacy and Pharmaceutical Society of Zambia and was subsequently reversed at the end of 2008. At the time of writing in September 2009, the output levels of degree pharmacists were expected to steadily increase. There are also anomalies in the data. The Ministry of Health Human Resource Information Database stated a total of 61 public sector pharmacists in 2003 (cited in (165)) whilst the Human Resources for Health Plan 2006-2010 cites same source but states that there were only 24 pharmacists in 2004 (cited in (139)). The Ministry of Health was unable to provide clarification at the time of writing. Data on pharmacy workforce sourced

from the Pharmaceutical Society of Zambia are likely to be the most reliable. Table 8.2 and Table 8.3 describe the most accurate public sector pharmacist workforce figures available which were obtained from the Pharmaceutical Society of Zambia through a study conducted in June 2007. Data on pharmacy technologists was not available.

Table 8.2 Public sector pharmacists in 2007

Public sector area	Pharmacist numbers	Intern pharmacists	Volunteer pharmacists (Nigeria)	Total
Hospitals	36	35	10	81
Provincial office	4	0	0	4
Headquarters MOH	4	0	0	4
District health management team	4	0	1	5
Total	48	35	11	94

Data source: Pharmaceutical Society of Zambia, June 2007.

Through an agreement with the Nigerian Ministry of Health, around 10 volunteer pharmacists from Nigeria arrive each year to work in the public sector. They constitute a major part of the pharmacist workforce and often work in rural districts where few if any pharmacists are posted. Interns also constitute a significant proportion of the pharmacist workforce with up to 40 entering public service per year.

Table 8.3 Public sector pharmacists by province in 2007

Province	Hospital	Hospital intern	Hospital volunteer	Provincial health office	District health management team	MOH HQ	Total
Central	0	5	1	1	0	0	7
Eastern	2	0	1	0	0	0	3
Northern	5	1		1		0	7
Southern	3	3	2	1	3	0	12
North Western	1	0	0	0	1 (volunteer)	0	2
Western	2	0	1	0	0	0	3
Copperbelt	13	10	4	0	1	0	28
Luapula	0	0	1	0	0	0	1
Lusaka	10	16	0	1	0	4	31
Total	36	35	10	4	5	4	94

Data source: Pharmaceutical Society of Zambia, June 2007.

8.2 Descriptive narrative

This section provides a descriptive narrative of the findings relating to pharmacy workforce development in Zambia. These are described and illustrated by the raw data in the form of excerpts from interviews and policy documents and form a basis for the analysis and interpretation described in sections 8.4 and 8.5.

In the context of broader health workforce shortages, pharmacy workforce issues were perceived to be of lesser priority. The lack of understanding by the Ministry of Health and the medical profession together with resource constraints, ambiguously defined roles and blurred professional boundaries, inadequate workforce data, poor articulation of pharmacy workforce needs and the small workforce size were associated with the slow and inadequate pharmacy workforce development.

8.2.1 Perceptions of health and pharmacy workforce shortages

The health workforce shortage was recognised as a clear impediment to the attainment of improved health and the achievement of health and development goals in Zambia which required priority attention (Extract 8.1).

“I think it’s important to note that number one, human resources is consistently the priority issue, in other words, it is the critical bottle neck in enabling Zambia’s health sector to be able to achieve learning and development goals, universal access, whichever targets you want to talk about. We are not going to be able to achieve anything until we get to grips with the human resources story.” Susan.

Extract 8.1

There was recognition that there was no single quick win to address shortages and that a comprehensive rather than a piecemeal approach was required. In praising the 2006-2010 Human Resources for Health Strategic Plan, Susan emphasises this as the key to sustainable workforce development.

“It [HRH-SP] doesn’t see any individual intervention as the panacea and I think that’s been a failing in the past. Either where people have seen the production of health workers as a core strategy, where people have seen just retention as the core strategy or just the migration as the core strategy.” Susan.

Extract 8.2

Such a comprehensive approach had the backing of the cooperating partners or donors who were willing for the first time to support human resource development in the Zambian public health sector. In order to address the health workforce shortage by increasing workforce supply and expanding the personnel emolument, greater investments by the public sector were also necessary for which treasury authority was sought.

“So, treasury authority is the basis for which we can bring any health worker into the system so that discussion is as important to you as it is to any other health professional because if we haven’t got treasury authority, it means that we can’t bring people into the health system. It is the critical step. We, we have got a, a now an appetite by government to start looking at this and to improve it. It looks like we will be bringing in an extra one thousand nine hundred health workers in the next few months.” Susan.

Extract 8.3

Despite this newfound support by donor agencies and eventual Treasury approval for the proposed health workforce establishment list, there had been no dialogue or planning for the pharmacy workforce. The pharmacy workforce shortage in the public sector from the Ministry of Health’s perspective was thought to be minor given the broader health workforce crisis. Pharmacy workforce development was viewed by some as a mature strategic step and thus assigned a lower priority in a situation where a third of clinics were run by untrained workers.

“You can’t run a health system with only one cadre or without these specialists skills but at the same time it is important we do keep sight of the big picture. And that is that we need to have at least somebody who has some expertise. If we look at many of the clinics, they are being run by what they call the Classified Daily Employees, the CDEs which have no training. And if you’ve got a whole yeah, health system that is being based one third on, on just those [CDEs] you

know, talking about pharmacists is, is kind of a mature discussion that is maybe further down the road.” Susan.

Extract 8.4

Emphasis in the Human Resource for Health Strategic Plan was on doctors and nurses. One interviewee justified this as a strategic approach for phased human resource development where a holistic approach targeting all cadres had the potential to jeopardise the success of the plan’s implementation.

“But I don’t think it’s wrong that there’s been a disproportionate emphasis at this stage on some of the big cadres. The reason I say that is that in any reform programme it is important you have a phased approach. If you try to do everything all at once that’s the... that’s the secret to the whole reform strategy collapsing.” Susan.

Extract 8.5

Stephen describes that whilst pharmacy workforce gaps and needs may be measured against vacant positions, the actual workforce demand as per pharmaceutical service needs, particularly in rural areas, is actually greater (Extract 8.6).

“Here in Zambia the market is not saturated but the jobs may be unavailable. If you go to some provinces here we are struggling, but what about the rural areas?” Stephen.

Extract 8.6

Most interviewees identified a serious and significant shortage of pharmacy workforce in Zambia with some citing it as the problem of priority concern with respect to pharmaceutical services.

“There is a lack of manpower in trained pharmacists in central and general hospitals and no manpower in rural hospitals. [There is] no trained personnel in pharmacy in Rural Health Centres.....It is planned in the new establishment list that there will be one trained pharmacist to district level and then assisted by a pharmacy technologist at Rural Health Centres. There are budget restrictions for employing a greater pharmacy workforce” Adam.

Extract 8.7

Despite the description of pharmacy workforce shortages, Adam goes on to express concerns about potential pharmacist oversupply in the near future.

"There should also be some regulation on the number of pharmacists coming out from the school, at this rate they will fill all positions in ten years and flood the market." Adam.

Extract 8.8

Key informants both within and outside the profession attributed the limited recognition of the scale of the pharmacy workforce shortage not only to budget constraints, but also to a lack of understanding of the pharmacist's role, the ambiguously defined role of pharmacists in healthcare and lack of data.

"For those who say that some hospitals don't need pharmacists is just ignorance. They just don't understand the role of the pharmacist." Stephen.

Extract 8.9

"So I think number one is to have good information because then that is able to inform policy. At the moment... I would not be able to tell you which paramedical profession needs greatest attention. I, we just don't have that information. Both in terms of where the gaps are and in terms of the gaps in terms of production or in terms of the distribution." Susan.

Extract 8.9

Disappointment was expressed by several interviewees who felt that the Ministry of Health's perceived need and thus pharmacy workforce establishment was not founded on actual pharmaceutical service needs. This resonated with Tom's description of the discordance between the projections of workforce needs defined by professional roles and defined by the public sector (Extract 8.10).

"To me even if we scale up twice or even three times what we are producing now, we could not say we had enough pharmacists. It is [in] short, yes according to the national programme we could be ok. No according to what the profession is all about, we are not ok."

Tom.

Extract 8.10

Like Tom, many interviewees felt that there was a significant shortage of pharmacy workforce which had knock on effects on the ability of the health system to effectively regulate and manage the supply chain, thus perpetuating medicines problems.

8.2.2 Pharmacists – a small, unclear and substitutable profession

The roles, development and recognition of the profession were often linked to its workforce size. The increase in the pharmacist workforce over recent years was associated with the reclaim or expansion of professional roles beyond that of dispensing.

“The role of the pharmacist will depend on the number in the country so the actual function of pharmacists has changed. Now that there are more of them they are going back to their old roles and not just dispensing. Pharmacists are there for logistics, clinical advisors, planners, formulations.” Adam.

Extract 8.11

“But we are hoping as we increase the number, that [that] area [of pharmaceutical services] should be you know, reoriented back to the pharmaceutical sector so that pharmacists are now in charge of all of those areas, he goes into the pharmacy with those key roles of procurement, storage, supply and even counselling as that is what a pharmacist should be able to do”. Tom.

Extract 8.12

Clinical pharmacy, a relatively workforce intensive role, was also seen by some to be the next stage of the profession’s progression should the workforce continue to expand. This extension was seen to have a potentially significant impact on the recognition of pharmacists by patients and their medical counterparts.

“Now pharmacists are also participating in ward rounds which is a fairly new component now that there are more numbers. Before there were not many but now they can participate in the ward rounds.” Stephen.

Extract 8.13

“Clinical pharmacy which is something that’s not happening because of the low numbers. Once we start going in there, patients as well as the doctors [will] start to appreciate the role of the pharmacists in that area.” Jackie.

Extract 8.14

In the prevailing situation, pharmacists were frequently described by interviewees to have unclear and substitutable roles and thus, poor visibility as a profession and stakeholder in the policy making process.

“So at that moment I sense that many pharmacists in the Ministry of Health public sector are not really clear what their role is. And consequently there is this sense of not belonging and I suppose not really able to do what you are able to do in this area of work.” David.

Extract 8.15

The lack of clarity on pharmacy workforce needs and demand was perceived to be due to the blurred professional boundaries and the overlapping scope of practice between pharmacists and pharmacy technologists.

“The practice of pharmacists needs to be mapped so that people can see what pharmacists are doing and what pharmacy technologists and others are doing. The shortage of pharmacists is not being appreciated otherwise.” Stephen.

Extract 8.16

One interviewee expressed concerns that pharmacists may be in competition with pharmacy technologists for the same position where the training, roles and competencies of each cadre was not felt to have been clearly defined (Extract 8.17).

“If I am a degree holder, surely I shouldn’t be struggling to get the same job with the technologist yeah? [In] my [professional] line it should be very clear what I am able to do and do best. The technologist shouldn’t come and challenge me that they can do better because the training was not very well planned.” Terry.

Extract 8.17

The perceived blurring of boundaries between pharmacists and pharmacy technologists was explained by one interviewee to be due to the recruitment of technologists for pharmacist roles due to the shortage of pharmacists.

“But I think what has tended to make things unclear is because for some time now the numbers of pharmacists have been fewer and out of a desire to make the best out of a bad situation sometimes especially in the districts you’ll find that pharmacy technicians... have assumed roles which would have been otherwise performed by pharmacists.” Tony.

Extract 8.18

Some felt that there was a clear difference between pharmacists and pharmacy technologists but felt that this was poorly understood by the Ministry of Health, to the extent that even the difference in the provision of pharmaceutical services by trained pharmaceutical workforce (pharmacists and pharmacy technologists) and other healthcare cadres was not seen (Extract 8.19).

“The reason was that they [Ministry of Health] didn’t know what they [pharmacy workforce] were supposed to do. The reason was that they [Ministry of Health] had not actually defined the role of the pharmacist because the role of the pharmacist is quite clear actually, and yet you find that so many of the roles, so much of that aspect has been taken up by a wrong cadre altogether.” Tom.

Extract 8.19

This may also be due to the lack of available pharmacist workforce over time which was thought by Simon to lead to situations in which health care facilities have adapted to cope without pharmacists.

“I feel that there is a danger that in the long run, other cadres feel like there would be no need to have a pharmacist if you look at for more than a decade, a hospital has been running quite well where pharmaceutical services have been run by a nurse or a clinical officer well enough, there would not be any need to have a pharmacist at all.” Simon.

Extract 8.20

8.3 Changing perceptions of pharmacy workforce and services

One major theme in the data was that of the assertion by those both within and outside of the profession of the need to appropriately manage pharmaceuticals across the supply chain and address the lack of understanding of pharmacy services. As early as the point of period of pre-service training, there was a perception of resentment by the medical institution towards the pharmacy profession and a lack of understanding of the profession's purpose.

"These guys who are doing medicine they've not received us in their midst. All they know is that we are trying to take up the space that they are supposed to have and stuff like that."

Peter.

Extract 8.21

The medical academics were also seen to be perpetuating such attitudes amongst the medical students and shaping the pharmacy students impressions of the medical profession.

"I mean even for the introduction of the school of pharmacy at the medical school it was like 'oh, squatters!' from the top! You know? The lecturers themselves 'why do we have to allow pharmacists or biomedical scientists to come into our university?'" Amy.

Extract 8.22

"Most of them are physicians... so most of the decisions that are made [at the Medical School] are biased towards medical students than pharmacy students. So it's... we'll [pharmacy students] feel a bit uncomfortable in school." Peter.

Extract 8.23

Many interviewees based their ideal healthcare approach on the concept of the multidisciplinary health care team and contrasted this against that of the medical profession which they perceived to be doctor-centric.

"I think also healthcare generally is run by doctors and often doctors tend to be narrow minded in thinking that the only thing that Ministry of Health is about is provision of healthcare but even that you do need accountants, you do need people with logistics, you do need people

with other professional bodies because it is the assembly of all of that, the provision of healthcare.” David.

Extract 8.24

Given the dominance of the medical profession in positions of influence in the Ministry of Health, this was seen to reflect in the policy makers’ paradigm of doctor-centric health services where there was inadequate need of other health professions.

“This isn’t just some little microcosm. They’ve [policy makers] got to learn to see it as a holistic health system which needs every one of those cadres.” Julie.

Extract 8.25

Consequently, those in practice felt the effects of a narrow approach to healthcare where healthcare teams were resisted rather than being promoted resulting in what they believed to be more inefficient and poorer quality service.

“Working in an environment for health delivery requires team work and the team work does not just say a medical officer alone or a medical officer with a nurse, everybody is in that team and without a part of the team member, then the service delivery is broken, then there is no efficiency, there’s no quality service given. And so we have problems where pharmacist staff are left out.” Amy.

Extract 8.26

A feeling that is perhaps applicable to other allied health professions is that of exclusion from policy and service development. Most interviewees described experiences where pharmacy stakeholders were inadvertently or deliberately left out. Various themes were associated with this phenomenon such as the unclear nature of the pharmacy profession, small workforce size, weak professional voice and poor alignment within the profession.

Whilst medical students may have resented the presence of pharmacy students during their studies, there seemed to be a development in their understanding of pharmacists after they graduate. Examples of good working relationships between pharmacists and physicians although less commonly referred to were described by some interviewees.

“They are appreciating our presence. People we graduated with, we interact with. Now [that] they are in the field, they [are] appreciating your services you see. So it will take some time to appreciate the pharmacy personnel.” Amy.

Extract 8.27

“They do understand because a lot, I have a lot of the other surgeries that are around, I mean the private clinics, sometimes they phone, they call to consult on one or two issues on drug and stuff like that, so they do understand yes, and they appreciate, they appreciate the role of the pharmacist in the community, quite a lot of them. They call me, we talk you know, and no conflict.” John.

Extract 8.28

A shift in attitudes towards pharmacists and pharmaceutical services was described in one example below. The changes in perceptions were seen to be gradual over time, formed through improving relationships and trust and reinforced by visible outcomes.

“The attitude has been changing. Initially people did not appreciate that the pharmacist can do so much. I’ll talk of that. Right now we have a lot more interaction with the health care providers and they do a lot of consultation, even by phone... So there is a lot more realisation of the role of the pharmacist and we are also now trying to extend it.” Sam.

Extract 8.29

“You see, you can see them asking a lot of questions and all that but slowly, they [patients] do gain... they see the professionalism in you. Then they trust to come to you, they stop going to the illegal outlets.” John.

Extract 8.30

“Well there is some shift. There is some recognition because of the impact we have been putting across over the few years but we still need to make more effort for them to really come to a full scope of understanding.” Amy.

Extract 8.31

In order to effect such a shift, many felt that the profession needed to move away from professional politics but rally together to form a plan through which to strategically convince the Ministry of Health of the need and roles of pharmacists by demonstrating their impact.

“We really need to perhaps strategise and come up with proper ideas on how we can convince or show the Ministry [of Health] that pharmacy, pharmacists can provide a service that will benefit the country economically and benefit the patients and will improve the quality of the service delivery that we are providing. And perhaps move away from professional politics of the same pharmacist get so much and nurse gets so much or a doctor should get so much or who has spent more years in training, but look at what value do you bring to the service that we are all providing as a healthcare team.” Michael.

Extract 8.32

“Then the government will take it up as long as you’ve forwarded convincing ideas to them of really what the profession of pharmacy can do.” Peter.

Extract 8.33

One interviewee described the need to sensitise the medical profession on the role of pharmacists such to address the perceived threat to professional boundaries.

“There is a need to educate other cadres about the role of the pharmacist. When you have a new cadre people don’t always understand and need to be educated. Doctors need to be educated on how to relate to pharmacists. Doctors may feel threatened by pharmacists and pharmacists may be seen to be encroaching on their area as pharmacists may try to correct their prescriptions... It requires more educating and will take time.” Adam.

Extract 8.34

As with the development of the pharmacy workforce, the concept of time was associated with the change in perceptions towards pharmacists and pharmaceutical services.

8.4 Analysis

Using the key themes described in section 8.3, the analysis explored the characteristics of the pharmacy institution as the key actor of concern in this research, and the points of difference with that of the medical institution as the actor who holds power to influence the future development of the pharmacy workforce. Chapter 10 further builds on this analysis to develop

an understanding of the positioning and the relative power of each actor in decision making process and their influence on the key medicines problems in Zambia.

8.4.1 Weak pharmacy institution and powerful medical institution

The pharmacy institution was found to be characterised by poor understanding of the profession by the public, policy makers and other healthcare professionals, weak or lack of a voice in decision making and its small workforce size (Table 8.4).

Table 8.4 Sub-themes of weak pharmacy profession

Sub-themes	Findings and illustrations
Poor understanding	<p>Poor understanding was commonly associated with the medical profession who were also the main decision makers in healthcare. "For those who say that some hospitals don't need pharmacists is just ignorance. They just don't understand the role of the pharmacist." Stephen. Extract 8.35</p>
Lack of external understanding of professional roles and nature of pharmaceutical services.	
No voice	<p>There was a strong perception amongst many interviewees that the voice for the profession was absent "you feel like there is no voice to fight for you" Mary. Extract 8.36</p> <p>Weaknesses were also associated with the small workforce size "with more graduates we will have a bigger voice" (Jackie, Extract 8.37) and poor articulation of needs and issues to the Ministry of Health due to fragmentation "the internal lack of common understanding... have also tended to stifle how the message is received at the top" Tony. Extract 8.38</p> <p>Some perceived that pharmacy technologists were not readily accepted by pharmacists into the professional group which could augment the professional group's size and thus strengthen the voice of the profession "maybe that can improve their [the professional body's] status" Eric. Extract 8.39</p> <p>Some pharmacists in practice felt that their voice was the only one that could legitimately challenge that of doctors as they perceived doctors to be at the same status. "You find a pharmacist who will put up a fight with you [doctor].... But the other cadres, ok medical doctor is so much higher than me I cannot have any say." Amy. Extract 8.40</p>
Weak or absent voice in decision making.	
Small workforce size	
Perceived as a minor professional group.	

The combination of these characteristics formed a profile of a profession that was perceived to be in the early stages of development rather than being well established like doctors or nurses. The profession was also perceived to be a minor player and one which did not hold a significant role in the decision making process relating to healthcare provision or policy.

Comparisons drawn between the pharmacy and medical institutions at thematic points of difference defined the medical institution's dominance and strength and reinforced pharmacy's position of passiveness and weaknesses (Table 8.5).

Policies of the Ministry of Health and management within its structure were perceived to be biased towards the medical profession and were reinforced by the profession's decision making status, unity and visibility which in turn reinforced the sensitisation of the Ministry of Health to the recognition of the need for physicians and an undisputed understanding of their role. The medical profession was perceived to be a relatively strong actor in the decision making processes of the Ministry of Health in contrast to the perceived weakness of the pharmacy profession. One interesting point of difference is the narrow conceptualisation of a healthcare team of a doctor and a nurse which is perceived to be internalised by the medical profession as opposed to the pharmacy profession's view of a wider multidisciplinary team. The exclusion of pharmacy from the decision making ring and health care team in practice reinforces the low visibility of the profession and limited recognition of pharmacist workforce needs, particularly when pharmacists are seen to be substitutable by other cadres.

Table 8.5 Perceived characteristics of medical and pharmacy institutions

Points of difference	Medical institution		Pharmacy institution	
	Description	Illustration	Description	Illustration
Policies and management	Biased	"The system in the Ministry of Health is full of doctors and doctors tend to favour themselves." Stuart. Extract 8.41	Discriminatory	"At the moment some kind of very bad culture where some professions in the ministry would like to dilute the profession of pharmacy." Simon. Extract 8.42
	Policies and management favours medical profession		Policies and management do not favour or support pharmacy profession.	
Power	Influence	"We have sort of the top level dominated by medical doctors." Jackie. Extract 8.43	No influence	"There is no representivity of the department or the directorate so that makes it very difficult for people to take seriously." Julie. Extract 8.44
	Decision makers in healthcare policy and management		No representation at decision making level in healthcare policy or management.	
Healthcare team approach	Doctor-nurse team	"Team work does not just say a medical officer alone or a medical officer with a nurse" Amy. Extract 8.45	Multidisciplinary healthcare team.	"The government should look at the whole sector, not just doctors and nurses. They should realise that there are other support staff who are important.... All those they contribute something to health." Eric. Extract 8.46
	Doctors have a positive top down relationship with nurses in health care and in policy.		Pharmacy profession wish to see emergence of health care team approach to health care and policy (not limited to doctors and nurses).	
Alignment	Unity	"You have a lot of doctors that are trained from one school, so you can always see the way they are united." Jackie. Extract 8.47	Fragmented	"The pharmaceutical body has not been cohesive enough to present that one voice." David. Extract 8.48
	Unity within the professional group.		Lack of unity within the professional group.	
Role	Necessary	"Discussions have focused on the big issues. Making sure you at least have the core health workers [doctors, nurses]" Susan. Extract 8.49	Substitutable	"You find that so many of the roles, so much of that aspect has been taken up by a wrong cadre altogether." Tom. Extract 8.50
	Doctor role cannot be substituted and shortages need to be urgently addressed.		Pharmacist role can be substituted for by other cadres.	
Recognition of workforce need	High	"When you look at the policies and retention schemes, they are all targeted to doctors." Eric. Extract 8.51	Low	"You cannot say there is no work for a pharmacist, there is so much work there." Amy. Extract 8.52
	Ministry of Health highly sensitised to workforce needs and shortages.		Limited or no recognition of workforce needs or shortages by Ministry of Health.	
Visibility	High	"The physicians, all they think is that they do everything on a patient." Peter. Extract 8.53	Low	"You can't miss what you haven't seen... the system is not able to see what they are missing by not having pharmacists in place." Tony. Extract 8.54
	Doctors have high visibility as a profession.		Pharmacy profession has low visibility as well as low visibility of role and outputs.	

8.5 Summary

Poor cohesion, small workforce size, low status and lack of visibility rendered the pharmacy institution a weak player. Consequently pharmacy was not considered a key professional group in the health policy making process. This combination of characteristics formed a profile of a profession that was perceived to be in the early stages of development rather than being well established like doctors or nurses.

By contrast, the medical institution was seen to have the highest status and was not only seen as one of the most important stakeholders but also occupied the key decision making positions in the Ministry of Health. Such positioning reinforced the power of the medical institution and possibly explains the resistance towards policies such as those relating to medicines or pharmacy workforce development which could be perceived as a threat to power. It is unlikely that this resistance is selective or only targeted towards pharmacy. Rather, such resistance is perhaps merely due to the overlap in the wish of both professions to control medicines, an area which the medical profession would see in their personal and professional interest to maintain ownership of. The negligence of and barriers to pharmacy workforce development is thus partly a response to the perceived attempt to encroach on the medical profession's boundaries.

There was an expressed wish of the pharmacy profession to move towards more desirable roles as seen in more developed countries such as clinical pharmacy. However these roles are more labour intensive and are not likely to be well received, given both human and financial resource constraints, especially in an environment where doctors are seen to be protective of professional boundaries and resistant to change.

Chapter 9 Pharmaceutical policy development process

This chapter describes the literature and context, the data and its analysis and interpretation in relation to the research question below.

- What are the pharmaceutical and pharmacy workforce policy development and implementation processes and experiences in Zambia and what role does the pharmacy profession play?

The theme of power was identified as a key theme from the interview data and was also found to be central in the literature on the policy making process. The two key pharmaceutical policies in Zambia were the National Drug Policy 1997 and the Pharmaceutical Act 2004. Whilst both had been adopted, neither had been actively implemented by the Ministry of Health. In order to understand the policy process and related experiences, major pharmaceutical policies were examined, analysed and contrasted with other health policies to determine defining considerations that characterised policy proposals that were or were not acted upon.

9.1 Literature and context

The definition of 'policy' adopted for this research is sourced from Walt, 1994 as a "series of more or less related activities and their intended and unintended consequences for those concerned" (144). This section provides background on medicines policies in Zambia and an introduction to the concept of power in the policy making process. This section does not describe an in depth exploration of theories relating to power in the policy process but rather provides context for the concepts of high and low politics used in the analysis of this case study.

9.1.1 Medicines policies in Zambia

The Pharmacy and Poisons Act, 1940 described the regulation of pharmacies, pharmaceutical industries and wholesalers and led to the establishment of the Pharmacy and Poisons Board.

The Pharmacy and Poisons Board was responsible for medicines regulation however was felt to have inadequate autonomy and powers for this role (166).

The National Drug Policy (NDP) was developed through assistance from the Swedish International Development Cooperation Agency (SIDA) from 1994. The NDP was completed in 1997 and adopted, however to date, no implementation plan had been approved although a draft was prepared with assistance from Management Sciences for Health in 2004 (141). In 2008 a NDP review committee was established to evaluate progress and advise the development of a revised implementation plan.

The vision of the NDP described the government's commitment to the "provision of equity of access for all Zambians to good quality, safe and efficacious drugs (medicines) which are affordable and rationally used as close to the family as possible" (129).

The NDP included vision statements and policy objectives relating to drug legislation and regulation; quality assurance; financing, procurements, storage and distribution; local production of pharmaceuticals; rational drug use and drug selection; human resource development; research and development; traditional medicines; international cooperation; implementation plans; and monitoring and evaluation (129).

The 2004 Pharmaceutical Act arose from the NDP's recommendation in the section on drug legislation and regulation to establish a Pharmaceutical Regulatory Authority (PRA) with the autonomy and responsibility for regulatory control of the pharmaceutical sector. Originally the scope of the PRA was also recommended by the NDP to encompass the regulation of pharmacy practice and pharmacy profession however this was rejected by policy makers and some members of the pharmacy profession at the policy formulation stage. Hence a separate policy was concurrently developed known as the Pharmaceutical Society of Zambia (PSZ) Act, which proposed the professional body to become a legal entity with regulatory powers to self-regulate the profession, a role currently performed by the Medical Council of Zambia. Whilst the PSZ Act was not approved by parliament, in 2004 the Pharmaceutical Act was passed.

With the 2004 Pharmaceutical Act, the PRA was established despite slow progress and a director was finally appointed in 2008. However there is still a perception that the PRA is not as autonomous from the government as it should be in order to effectively perform (145).

In 2004, a review of the procurement process and drug supply budget line funded by the Dutch government proposed the establishment of the drug supply budget line manager, a recommendation which was adopted in 2006.

9.1.2 Policy making – power and process

Various political analyses from predominately high income countries have described the role of power in the health policy process (167). Power in this context is defined by Buse et al as “the ability to influence, and in particular to control, resources” (168). Recognising that power alone does not determine the policy making process and is but one of many influencing factors, this section provides a brief introduction to concepts relating to power in the policy making process to provide context to the analysis in this case study.

Power can be exercised in three ways including overt power (decision making), covert power (non-decision making) and latent power (thought control) (169;170). Overt power describes a form of power exerted over policy decisions when where there is policy debate (Dahl 1961 cited in (170)). Overt power requires actors and interest groups to influence policy issues and decisions, their success being dependent on their political resources including status, financial resources, and control over information (Dahl 1961 cited in (170)). By contrast, covert power controls or restricts the items that are put on the policy agenda (Bachrach and Baratz 1962 cited in (168)). The final category of latent power is subtly expressed to influence perceptions, and may be due to “norms, values and ideologies” that may not be outwardly defined or conceptualised (169).

The two dominant theories of power in policy making are the pluralist and elitist view. The pluralist view argues that power is shared in society such that individuals are politically equal with the right to freedom of speech and vote and self-organise groups for political activity. Plurality is also seen to extend to elites such that no set social group dominates (144). In this perspective, a neutral set of institutions form the state although government power is divested in its alliances to other powerful institutions and lobby groups (144). By contrast the elitist view sees political power monopolised by particular social classes which is reinforced by the state

(144). Interest groups are not thought to be equal with corporations seen to have more power than service providers (144).

The health policy making process may also exhibit complex and mixed modalities expressing a system of central control simultaneously with inclusive decision making processes (167). The bounded pluralist view is an amalgamation of these two theories and argues that different views apply at different levels of politics, what could be deemed high politics and low politics (Hall et al, 1975 cited in (144)). The elitist framework is applied to high politics, concerned with systemic or macro level decisions such as economic policy or personnel emolument reforms. The pluralist view is applied to low politics which are largely sectoral and micro level, such as changes in vaccination policy.

The concepts of high and low politics were used in the analysis of the decision making process relating to medicines policy in Zambia. Thus pharmacy workforce development and access to medicines, the major foci of this research, could both be defined as high politics despite being sectoral in nature, given their significant resource implications and the high status of personnel emoluments and medicines on the government's policy agenda.

The policy agenda is defined by Kingdon 1984, as "the list of subjects or problems to which government officials and people outside of government closely associated with those officials, are paying some serious attention to at any given time" (cited in (144)).

According to the 1975 Hall model, in order to get on the agenda a policy must satisfy the criteria of legitimacy such that the government feels they have a right to be concerned and intervene; feasibility of implementation; and public support for the policy (cited in (144)). Policy on paper rather than practice may also occur if the government feels it important to take a stance on an issue. These criteria seem to be satisfied with respect to the policy issues of pharmacy workforce development and access to medicines in Zambia.

Policy changes may also occur in crisis conditions where a perceived threat of inaction is seen to lead to worsening consequences. Ham and Hill (1986) proposed that power and dominant perspectives may influence decision makers to ignore issues, prevent decisions from being made or neglect a policy matter if they are contrary to the interests of individuals or groups in power (cited in (144)).

In the policy making process, Walt, 1994 argues that top level civil servants are unlikely to be neutral actors and tend to play an important role in policy making (144). The role of donor agencies in countries dependent on foreign aid such as Zambia is evident (144). Donor agencies exert significant influence on programmes and policy leading to highly fragmented and poorly coordinated health initiatives determined by a number of different interest groups due to the poor capacity of government to manage and coordinate these (144).

In terms of policy making, health is relatively lower in status compared to other sectors such as finance and inter-sectoral competition is frequent meaning that a collective government view in reality is unlikely, leading to conflicting views on health issues (144). Health policy is often made incrementally with slight variations on the status quo that are not seen as major reforms and thus more likely to be accepted by key stakeholders.

9.2 Descriptive narrative

This section provides a descriptive narrative of the decision making process and experiences relating to the NDP, Pharmaceutical Act 2004 and Pharmaceutical Society of Zambia Act at the macro level and other policies at a micro (institutional and facility) level. The key emergent themes of perceived threat to power, evidence and donor pressure and their influence on the decision making process were also explored. These findings provided a basis for analysis and interpretation described in sections 9.3 and 9.4.

9.2.1 Policy making and implementation process

In low income countries such as Zambia, policy making is affected by the prevailing environment of inadequate information, values skewed to personal rather than organisational interest, poor accountability and limited resources and capacity (144). This means that the policy making process is slow, bureaucratic and is often perceived to lead to inaction and uncertainty. The

policy implementation process was seen by many to be blocked or suspended at times creating a difficult and demotivating environment within which to effect changes.

“There appears a syndrome somehow (pause) whereby people can be left (pause) open ended with no timeframe. We cannot know what is going to happen, it can be very difficult... You cannot expect quite a lot from the existing staff because there are uncertainties surrounding the whole issue so you get the morale being diminished to varying levels depending on [the] individuals... on.. on (laugh).. the personal capacity to withstand.” Simon.

Extract 9.1

Access to medicines, particularly issues of medicines availability in the public sector was described to be a high level political issue given its strong association with the perceived performance of the health system. Owing to this positioning, issues of medicines were observed by some to hold centre stage in policy dialogues and debate relating to health.

“Everyone talks about drugs. All the politicians whether it is the President or what, every time they talk about health, they are talking about drugs most of the time.” Jackie.

Extract 9.2

Despite the significance of issues such as medicines availability in the political arena, progress in this domain has been piecemeal, largely resisted and slowly implemented. Interviewees recounted the gap in comprehensive health policy relating to medicines until the 1990s during the major health reforms. Aside from the Essential Medicines List policy, there was no explicit policy relating to medicines.

“So in practice, my understanding is that even before this [NDP] policy was in place there was an implicit policy in place for many years on pharmacy generally.... For instance they started the essential drug list with a commitment to ensuring access to medicines.” Tony.

Extract 9.3

The need to develop a medicines policy was described as having been reluctantly agreed to after the issue could not be ignored any longer due to the significant resource implications.

“The health reforms were born and during that time it appeared like the main focus [was] on other areas of health care, the issue of drug control were not taken on board initially until it was recognised after some time that the health reforms would not be effectively

implemented without addressing the issue of medicines. This was arrived at looking at the fact that no less than 70% of the health budget went to the procurement of medicines and the management of drugs. So that area could not just be left like that without being incorporated into the health reform.” Simon.

Extract 9.4

This marked the start of the NDP’s development which was opportunistic in taking advantage of the reform process and by leveraging the influence and resources of donor agencies, background work and consultations, began to establish the country’s first NDP.

“So of course the problem that was noted at the time was that up to that time there hadn’t been a national drug policy in place, so the government was asked to develop a national drug policy to address the drug issues. So funds had to be found from cooperating partners and the Swedish government was a very interested party which actually gave funding through Karolinska Institutet towards the development of the national drug policy. And in 1996 after wide consultation with stakeholders the national drug policy document was finalised and it was approved by cabinet in 1997.” Simon.

Extract 9.5

Even once the NDP had been developed, one person described the Ministry of Health’s reluctance to adopt it and the need to re-establish the case for its existence.

“When we developed the National Drug Policy they looked like they are not interested, but once you make the argument they can see the gain.” Tony.

Extract 9.6

There was a strong perception that the NDP itself was a success and that the policy provided a firm basis upon which to establish regulatory, professional and systems structures to improve access to medicines. Tony described some of the positive outcomes that emerged following the adoption of the NDP such as the establishment of localised pharmacist training and PRA but felt that there was much more that needed to be done, and hesitantly commented on the need for the Ministry of Health to do more.

“So I think the human resource development, drug selection and legislation to support better regulation of medicines, those are some of the positive things that have come out of the

policy but I think there is still a lot of work to be done. There is a draft for implementation there but I think it requires (pause), there's more to be done." Tony.

Extract 9.7

Disappointment at the poor implementation of the NDP was commonly expressed and there was a feeling among some interviewees that the Ministry of Health had intentionally forgotten their commitments described in the policy. This was taken as a display of the lack of understanding by decision makers of the consequences of such inaction. One person benchmarked the status of the NDP against WHO guidelines and described the need for its revival to reclaim its position on the policy agenda.

"Unless someone else again drives the process, reminds them [the Ministry of Health] that we invested money, we cannot stop and have reached the stage where according to WHO recommendations we are supposed to be reviewing the national drug policy [for] the first time as it was almost seven years since it was passed so we need to really refocus." Michael.

Extract 9.8

Others felt that senior decision makers in the Ministry of Health had not forgotten about the NDP but rather had deliberately neglected implementation, much to the detriment of health system functionality.

"But if you look at it, it's been around [the policy makers] and when you look at it, if you go through it you will see areas that have not been implemented in line with it and if all you did was follow what's written there, I think you'd have a good system." Jackie.

Extract 9.9

Jackie further expressed her frustration and puzzlement in the knowledge that no purposive investment in the implementation process was made by the Ministry of Health.

"Yeah, but they [Ministry of Health] have not provided to operationalise what is in the policy. That's why I think people are not really so ignorant. People know what is required. But you just never know why it doesn't happen." Jackie.

Extract 9.10

Poor implementation was also attributed to capacity and management problems.

“We have a very good national drug policy but we don’t have an adequate structure in terms of personnel and management to be able to implement it.” Sam.

Extract 9.11

Changes in leadership in the Ministry of Health shortly after the NDP’s adoption were also thought by one person to contribute to the lack of implementation.

“Unfortunately the implementation plan was not immediately developed because the Minister who was driving the process was changed and also the Permanent Secretary also moved on. So it really took time to do anything.” Michael.

Extract 9.12

Stipulating the need for a regulatory body that was not only responsible for the regulatory control of medicines but also the pharmacy profession, the NDP paved the way for further policy development as was seen with the enactment of the 2004 Pharmaceutical Act, legislature which established the Pharmaceutical Regulatory Authority (PRA).

“That document [NDP] happens to mention within each theme something relating to [the] establishment of [a] regulatory agency which would also be given the mandate to register professionals as pharmacists and pharmacy technologists and be able to promote training opportunities in the area of research and development.” Simon.

Extract 9.13

However the transition to the development and adoption of the Pharmaceutical Act was not automatic and a similar experience of fighting the rejection of the Ministry of Health was described.

“I mean we’ve been fighting for policy for the PRA how many, how many years did it take? Ok? To and fro and ‘no review this’ and ‘no that cannot be done’ and ‘no that has to be redone’ and we employed the legal aid that we needed to help us to you know, write it in the legal language that they accept. To and fro.” Mary.

Extract 9.14

In the process of the Pharmaceutical Act's drafting, the proposed regulatory role of the PRA to cover the profession was rejected, prompting the Pharmaceutical Society of Zambia to draft and propose a separate policy. The Pharmaceutical Society of Zambia Act, was presented at the same time as the Pharmaceutical Act and was subsequently rejected. The two policies were felt by several interviewees to be poorly coordinated and was evidence of the lack of alignment and unity within the profession itself, potentially interpreted by policy makers as a lack of policy coherence.

"But if you have people within yourselves and you want to present something and you are fighting amongst yourselves, how will the others take it? In the end, they just think that they don't know what they want." Mary.

Extract 9.14

"There are people within the pharmaceutical society that didn't buy that [regulation of the profession by a pharmacy board] so two documents were presented to the Minister. One for one. I don't think that is the best way as the Minister had difficulty to see who is what. So the profession should try to do as much internal establishment of common issues as they can." Tony.

Extract 9.15

Once the final draft text for the Pharmaceutical Act was approved by the Ministry of Health it was felt to be inadequate by some as it skewed the balance of power in the proposed PRA to the medical profession rather than the pharmacy profession who were perceived to be the rightful owner of such a role.

"The PRA itself had to have so many doctors coming in, maybe one or two pharmacists. This committee, no pharmacists! This committee within the PRA board. This is our baby, this is our area! So if anything the majority of the members should be pharmacists. There is no committee we are going to allow which is not going to have the pharmacist there right? Otherwise whose interests are they looking at? It's the pharmaceutical issues. So every committee governing that board should have a pharmacist, failure to that there is not a committee at all." Amy.

Extract 9.16

Interestingly, a number of active strategies were taken by the pharmacy students without the knowledge of the professional body to institute the necessary changes at the last moment by

engaging the media, obtaining inside information of the policy process and convincing parliament members to advocate for the changes the students proposed.

“We had to lobby without even the society knowing we were lobbying as students to the parliamentarians. We had a contact who could facilitate our entry into parliament and look at the committee members that were looking at that bill under health.... that day the bill was coming up and it was going into its last stage, the last reading so we really had to fight. And you know we made noise. My friend had a van and in the night we went to the newspaper, we went to the radio stations and we were saying what the Minister is presenting is not adequate.... One night we spent the whole night looking at that same draft. We had to sneak it out and we sat with it at school in the night.... And then I don’t know how many students went, we organised a bus [to parliament,] we were all there.” Amy.

Extract 9.17

Interviewees expressed satisfaction with the enacted version of the Pharmaceutical Act and hoped that the ideals presented within the policy would be followed by changes in current practice where serious gaps existed.

“So we are looking forward to a day when the Pharmaceutical Act will be fully implemented because I think we are having a lot of problems from a lot of drug outlets.” Sam.

Extract 9.18

In contrast to the implementation of the NDP which was felt to be the responsibility of the Ministry of Health, some felt that the Pharmaceutical Act provided the necessary policy space for the realisation of changes in practice which was the responsibility of the pharmacy profession themselves. The pharmacy profession also seemed to take more ownership of the Act and frequently described it as ‘our Act’.

“The passing of the Pharmaceutical Act is very very much welcome. And the roles and duties of pharmacists given in the Pharmaceutical Act are quite enormous. So just now, it will take the pharmacy personnel to make sure they implement the Pharmaceutical Act. By implementing the Pharmaceutical Act, people will appreciate what they’ve [pharmacists] have got to offer, slowly by slowly.” Peter.

Extract 9.19

Only one person felt that the Act needed to be revised as it did not present appropriate solutions for Zambia's disease patterns and stipulated excessive pharmacy human resource requirements. The Pharmaceutical Act states that all dispensing must be done under the direct supervision of pharmacists, however provides an exemption to the Ministry of Health where deemed necessary.

"The Pharmaceutical Act regulation needs to be updated and adapted to current trends. The Pharmaceutical Act needs to be updated for example with HIV/AIDS, many people are suffering in pain and have cancer and now there are too many restrictions on the prescribing of opioids. If only a consultant can prescribe opioids then most patients will just suffer in pain. The Pharmaceutical Act doesn't apply to the disease pattern we have in Zambia and is too ambitious on manpower requirements." Adam.

Extract 9.20

The institutions of the State was not seen to be united with Parliament often being perceived to be segmented from the government or Ministry of Health, using its authority to prescribe policy action which the Ministry of Health would not otherwise approve, such as the Pharmaceutical Act.

"The Pharmaceutical Act was passed because of parliament. No wonder we have PRA at this time.... So even the other policies that can be pushed to be passed by the parliament can help out because even the government would have no choice but to accept it as it would have been passed by parliament and even it would have been law. Exactly. So even the government would not have a second thought about it, they'll just have to take it." Peter.

Extract 9.21

9.2.2 Perceived threat to power

The higher levels of the Ministry of Health was commonly seen by interviewees to be dominated by the medical profession who were characterised as being biased towards their professional group and protective of their professional turf and position of power in decision making. As described in Chapter 8, the medical profession were perceived as an actor with strength, power, unity and influence in the policy decision making process of the Ministry of Health.

"I feel perhaps it [policy action] ends within their own level of understanding and professional politics of protecting whatever they think they have." Michael.

Extract 9.22

"When you look at the Ministry of Health, most of the personnel that are there are physicians, so even the policy that they make are biased to the physicians than the pharmacists. Because even the positions that are there, for physicians they are more influential positions than pharmacists." Peter.

Extract 9.23

Some described these characteristics pervading the management style within the Ministry of Health. One person contemplated whether health managers who were not doctors by background would change the paradigm.

"I tell you they want to oversee everything..... I don't think they will be in a position to appreciate [pharmaceutical services]. I understand in some places they have even developed health managers, I don't know whether that would help." Tony.

Extract 9.24

The perceived threat by doctors at a practice level was felt to transcend to the policy level. Several interviewees commented that the fallibility of doctors was exposed by pharmacists' attempts to improve the use of medicines in practice. This very activity by pharmacists was seen as a threat to the autonomy, authority and professional boundaries of doctors. The need to reframe the perceived threat in order to change the understanding of doctors was described by some as a slow process and one that required further education.

"It's not an attitudinal problem [towards pharmacists] but an issue of reorienting physicians to understand. It's a phobia. A phobia of those who are very protective of their profession." Stephen.

Extract 9.25

"Doctors may feel threatened by pharmacists and pharmacists may be seen to be encroaching on their area as pharmacist may try to correct their prescriptions. Some doctors write the wrong prescription or make mistakes, even senior doctors. It requires more educating and will take time." Adam.

Extract 9.26

The relative parity in status between doctors and pharmacists was seen as a source of threat whereas doctors were not usually challenged in their decisions by other health cadres, often lower in professional status and thus less inclined to do so.

"I mean where you find clinicians that are stubborn, they just want that. And where do you find a pharmacist who will put up a fight with you... but the other cadres, 'OK medical doctor is so much higher than me I cannot have any say'. So whatever they [doctors] say, it's 'yes yes yes'." Amy.

Extract 9.27

The Directorate of Pharmaceutical Services existed in the 1980s and 1990s in the Ministry of Health structure until its disestablishment in 1995 with the formation of the Central Board of Health. Some regarded this to be the medical profession's active pursuit to dilute the pharmacy profession.

"At the moment some kind of very bad culture where some professions in the Ministry would like to dilute the profession of pharmacy and I think that is the reason why it [the Pharmaceutical Directorate] was removed from the structure. But people really see this time that things have gone wrong and without it a lot of things have not been linked proper." Simon.

Extract 9.28

Proposals and recommendations to reinstitute this structure have been made repeatedly by the pharmacy profession and external foreign technical advisors amidst concerns of worsening pharmaceutical management in the public sector.

"That has remained a puzzle because we have had a lot of consultants that have come and have advocated for having that same directorate or department of pharmacy so that everything can be done under one umbrella." Jackie.

Extract 9.29

Given the control of medicines in the current structure by the medical profession, the proposal was thought to be viewed as a threat to power and met with fierce resistance.

"Efforts are being made so that [the] directorate will be restored but a lot of resistance is still being encountered because other professions would not like it to be restored." Simon.

Extract 9.30

“At the end of the day when I think about it and every time I wonder, I am wondering why, why can’t they just let it be stand alone but I think it’s a power thing.” Jackie.

Extract 9.31

One person felt that the reintroduction of the Directorate of Pharmaceutical Services would lead to a fragmented structure rather than greater coordination.

“At the moment the Directorate of Diagnostics and Clinical Care is in charge of this, the set up of a proposed new Directorate of Pharmaceutical Services would just lead to a blotted structure. Then you would have to have a Directorate of Laboratory Services etc etc. The current structure works.” Stephen.

Extract 9.32

9.2.3 Evidence

The lack of evidence for planning and its urgent need to fuel the policy making process was frequently referred to by interviewees and emerged as a key theme to explain the lack of progress in medicines policy and pharmacy workforce development. There was a strong feeling by most interviewees that policy proposals supported by evidence were more likely to be accepted by policy makers than those without.

“Because you can’t go [to policy makers] and you’ll never transform the treasury’s way of thinking unless you’ve got scientific proof.” Julie.

Extract 9.33

The current approach of arguments based on normative values and reasoning were not perceived to hold in an environment where information was unreliable or sorely lacking, the basis for decision making was unclear and the medical profession dominated the ranks. One person also deemed the judgements or conclusions in the Ministry as being untrustworthy unless corroborated by evidence.

The two types of evidence associated with the policy making process were basic statistics and information necessary for health systems and service planning and scientific evidence that evaluated services to stimulate reform. For example, basic information such as health

workforce, health facility utilisation, medicines consumption was seen to be critical for effective human resource planning, without which changes and development in the current pharmacy workforce would not be possible.

“So I think number one is to have good information because then that is able to inform policy. At the moment (pause) I would not be able to tell you which paramedical profession needs greatest attention. I, we just don’t have that information. Both in terms of where the gaps are and in terms of the gaps in terms of production or in terms of the distribution.” Susan.

Extract 9.34

The need for the synthesis of an evidence based pharmacy workforce policy was recommended which not only presented the evidence but also linked it to normative values and implementation strategies.

“Regulatory bodies together with academics need to produce a tangible set of guidelines on pharmaceutical services including facts and figures. This then needs to go to the Ministry of Health with concrete data on key issues and present where the mismatches for pharmacy are and how this goes against regulation, which can then be presented to Treasury with a proposal on how the required workforce can be resourced.” Julie.

Extract 9.35

Both types of evidence were seen to be lacking with respect to medicines and pharmaceutical services, perceived by some to be the cause of the pharmacy profession’s inability to convince policy makers. The lack of evidence or visibility of problems was also seen to perpetuate the Ministry of Health’s complacency and inadequate policy action to address key medicines problems and pharmacy workforce shortages.

“There is no proper information system on where drugs are kept or records on how they are used.” Peter.

Extract 9.36

“They said you can’t list what you can’t see.” Tony.

Extract 9.37

“Because of lack of experience, they [Ministry of Health] think [that] what they are providing is the best [but] I think most of the people don’t know the benefits they would get if they do things differently. And I think to produce that evidence to show that they can benefit more, I think it is still a missing gap that we need to show the policy makers.” Michael.

Extract 9.38

“Then pharmacists might also have some data to justify that those [unqualified personnel] that are there [providing pharmaceutical services] should not be, but I’m afraid that the pharmacists may not even be able to justify that... you see?” Simon.

Extract 9.39

The lack of evidence was also seen to undermine the sustainability of the local school of pharmacy which was recently established and limit the Ministry of Health’s projection of future pharmacy workforce needs.

“So the more reason the school of pharmacy to create the evidence [of] why the training of pharmacists is there.... Because simply to assume that okay because the Ministry has always had pharmacists, we can carry on training pharmacists or carry on having pharmacists is a very dangerous thing to get into (pause) because they are probably just acting on assumptions which cannot be founded.” David.

Extract 9.40

Several interviewees felt that the responsibility for generating both types of evidence lay with the pharmacists themselves in the public and private sectors rather than the Ministry of Health. Some felt that a bottom up drive was needed where pharmacists as the core actors with firsthand experience of problems should proactively gather such evidence in order to effect changes on the status quo. There was no comment on who would coordinate such activities or how the evidence would be harnessed for policy making.

“At the provincial level, even there the pharmacists they need to be able to say and they are the ones at the core and be the ones pushing for changes but they need to bring evidence as why things are not happening.” David.

Extract 9.41

There was a common expectation that any evidence that would be generated would highlight the dangerous and worrying nature of medicines use and access to medicines problems in Zambia due to inadequate pharmaceutical services.

“For a long time there hasn’t been that development and mostly to see how much rational use there is, compliance, whether patients still get the best out of the medicines, one would like to see it how... so I think the patients in these circumstances [are] most likely not getting the best benefit of medicines because of no proper pharmaceutical input.” Tony.

Extract 9.42

Barriers to the development of required evidence were identified as lack of technical, human and resource capacity. Interviewees cited the need for donor support and partnerships with foreign academic institutions to address these. No particular actor or stakeholder group was seen to take responsibility for exploring and developing such partnerships and resource support.

9.2.4 Donor pressure

The role of donors in the policy making process was not seen to be limited to providing resources. In many of the experiences described by interviewees, donors were utilised to influence the policy making process. Due to the significant funding they provided to the Ministry of Health and the perceived dependency created over time, donors were seen to be powerful actors in the policy making process with the ability to enable or block policy development. A stick and carrot mechanism was seen to be the driving force behind much of the progress in improving health in Zambia.

“I know that it is like treating a child and saying if you don’t do this I won’t give you a sweet but it works even in the government sector, it works wherever these kind of [donor funded] programmes are happening. If you specifically say ‘if you don’t do this, we will withdraw our funding’ or ‘if you don’t do this you will not get more [of] this’ or you know, it has to be tied to some kind of bait if you want to call it that. Yeah, yeah, unfortunately so..... WHO [is] doing a wonderful job and yes we are trying to work within the standards and the guidelines [so] that we are known in the world [that] Zambia is doing good. And there have been publications, we are

seeing good progress. But that progress has come because there are donors and there are people on the ground that are working in this way.” Mary.

Extract 9.43

Donors were also known to provide additional funds to assist with elements of the policy making process or even fund policy actions and their role was essential to operationalise some policies.

“Yes the cooperating partners have played quite a tremendous role and maybe without them some of the things we are talking about could not be there.” Simon.

Extract 9.44

Donors enabled the policy making process by lobbying, providing resources and building capacity. In the NDP development process, the Swedish government played a key role in providing both resources and technical assistance. The Human Resources for Health Strategic Plan 2006 – 2010 had the resource and political backing of various donor agencies to obtain Treasury approval for the proposed increase in personnel emolument and for its implementation as well as technical support to manage the implementation process.

“There are a number of different partners that are putting finances behind the plan. European Union, Canadian CIDA, Swedish SIDA, the Netherlands, the World Bank, WHO, US government.” Susan.

Extract 9.45

The HRH-SP also described various initiatives of donors in training and retaining health workers through schemes such as the Zambia Health Workers’ Retention Scheme to promote the rural retention of doctors funding by the Royal Netherlands Government and the training of nurse tutors by SIDA. Donors often brought technical assistance of their own or provided the funding for additional technical assistance to assist overworked Ministry of Health staff.

“I think then we did have support from cooperating partners like CIDA and DFID that actually, they brought staff here that they paid through our system [be]cause it’s just not possible to do everything alone.” Jackie.

Extract 9.46

However there was a feeling by some that donors had gone beyond their acceptable advisory and capacity building role to become decision makers on policy. One interviewee felt strongly that plans needed to be made to phase out donor assistance and that donor funds should be utilised for capacity development rather than operational support.

“I think international cooperation should be accepted as a social responsibility by those that are economically slightly stronger to help. It should be more towards building capacity rather than making decisions for us right? There is a fair amount of sovereignty that you inevitably forfeit by depending with donors but again, the strategy is a vision for our country is to have a programme of phasing out donors. I think where donor input comes, it should be towards capacity building.” Tony.

Extract 9.47

The loss of local autonomy was described in one example where donors bypassed the National Formulary Committee responsible for drug selection to pressure the Minister of Health to phase out previously used antimalarials used in favour of artemether-lumefantrine.

The tension between capacity building and autonomy was referred to by several interviewees. The autonomy of local decision makers was seen to be compromised by the economic fragility and dependence on donors for resources to run the health system. According to several interviewees, donors assumed superiority of knowledge and were inclined to believe that local decision makers were incapable of making the right policy decisions independently.

“Because you are giving aid to people [you think] that they are incapable of making some basic decision about themselves. I think that’s not how it should be.” Tony.

Extract 9.48

Local actors expressed their fear of the possibility of losing aid by countering recommendations or decisions made by donors and their technical assistants. Fear of losing aid was also associated with the potential mismanagement of donor resources and donor funded supplies such as medicines which were not perceived to be appropriately managed in the Ministry of Health. However, donors were not seen to be naïve to these realities and there was a feeling that donors themselves were hesitant to bring such problems to the surface for the sake of diplomatic relations.

“But we actually do appreciate the support we get from partners and it also requires an equal kind of play as we receive it so that they can also be satisfied that the support that they give us is put to good use and is well managed. So the only way they can see things that what they put in the system is properly managed is by looking at the outcome. But they are there, they see and I think that they document these things and perhaps because they are not in hiding, they tend to see exactly where the problem is and most notable is the fact that they are very much diplomatic, perhaps they may not just come out but at least they know well getting around what is there.” Simon.

Extract 9.49

Whilst the previous example indicated the inside knowledge of donors, others felt that donors had an inadequate understanding of the local conditions and context to make valid recommendations.

“We’ve had people arguing with the National Formulary Committee telling them they shouldn’t recommend which drugs but you can’t come from where you are and you don’t know the disease pattern, the skills of the physicians here and tell us that this is the drug you have, what is the basis?” Tony.

Extract 9.50

The limitations in donors’ understanding of pharmaceutical services was also seen by some to reinforce the Ministry of Health’s policies.

“Even the donors, their thought of pharmaceutical services is procurement of medicines and distribution, which in my view that is very shallow and limited.” Tony.

Extract 9.51

In one example relating to the recruitment freeze, donors were seen to exacerbate health workforce shortages and worsen the state of the healthcare system.

“The Ministry of Health is undergoing reorganisation over the last four years and during that period they were not employing anyone. The stupid donors said don’t employ. So over that period, no pharmacists or anyone was employed.” Stephen.

Extract 9.52

With the multiplicity of donors common to many sub-Saharan African countries such as Zambia, the approach to development was felt by some to be fragmented and driven by the interests and expertise of donors themselves rather than the needs in Zambia, the result being a lack of comprehensive development. The UK Department for International Development was one donor which had a policy of giving budgetary support rather than earmarking funding although this by no means was the standard amongst donors.

“Funders don’t always give you what you ask for.... granted because that is their focus of work, what they support and you are restricted and you are obliged to use it for that. And so you have different pots of money and some of them will actually tell you that you can’t use this money for the nation as a whole, use it only for the sites we support.... So that’s the concept of ear marking supplies, ok so you may have areas out in the middle of nowhere but because there is not focus on that site, they miss out.” Mary

Extract 9.53

Fears of sustainability and uncertainty emerged in the discussions with interviewees relating to donors. Donor funds were perceived to be unpredictable in the long term which could threaten the sustainability of health care development currently supported by donors particularly relating to initiatives beyond the resource capacity of the Ministry of Health. This alone was described by one interviewee as grounds for refusal by the Ministry of Health as acceptance could put the health system in a more precarious position by raising expectations and standards which could not be met. Sustainability was seen to be one of the key challenges to aid effectiveness.

“It’s only for the time of the project is able to give that money for that purpose. Thereafter what happens? So that has always been the issue. Well they may be happy to do so and they may have projects and plans to do that [but] it’s the sustainability issue that always comes up.” Mary.

Extract 9.54

9.3 Analysis

The roles of the themes described in section 10.3 were further explored to understand their connection with the policy decision making process in the Ministry of Health. Policies were

compared by agreement level and implementation status to identify key aspects of the decision making process. In order to seek patterns in the data, broader policy examples described in the interviews were used from the health sector beyond that of medicines, pharmaceutical services and pharmacy workforce. Informed by this analysis, a decision making tree centred on the perceived threat to power is proposed. Strategies to overcome a decision not to take up a policy proposal are explored and mapped to the decision making tree.

9.3.1 Decision-making and implementation

Themes associated with the experiences of health policies and their status of agreement and implementation by the Ministry were compared and contrasted to identify patterns or commonalities defined the decision outcomes for each policy (Table 9.1).

Most proposed policy actions were perceived to be a threat to power and only those which had pressure or a mandate from parliament or donors were agreed to. For example, the policy process relating to the NDP and Pharmaceutical Act could be seen to be agreed to due to mounting political pressure exerted by donor agencies, however their ineffective implementation could have been due to inadequate resources and the perceived threat to the dominant medical institution in power.

In order to move from agreement to implementation, proposals needed to source adequate resources, usually from donors. Proposals that were implemented were also policies where active lobbying on the part of donors was observed. Interestingly, there were some examples of policy proposals which were not agreed to by Ministry of Health such as the recruitment freeze and the major health reforms and were perceived as threats but were nevertheless driven by donors.

Table 9.1 Implementation and agreement of proposed action

		Implementation of proposed action	
		Not implemented	Implemented
Agreement of MOH to proposed action	Not agreed	PSZ Act ◊ ○ Pharmaceutical Directorate ◊ ○ National Drug Policy Implementation plan ◊ ○ Retention scheme for pharmacists ◊ ●	Recruitment freeze ◊ ▲ ● Structural adjustment programme health reforms ◊ ▲ ●
	Agreed	Pharmaceutical Act 2004 ◊ ▲ ○ National Drug Policy 1997 ◊ ▲ ○	DSBL ◊ ▲ ● National Drug Policy Development ◊ ▲ ○ Establishment of School of Pharmacy ○ ARV consumption data ▲ ●

Key: ○ Insufficient resources ▲ Donor pressure
 ● Sufficient resources ▲ Parliamentary influence
 ● Cost savings/neutral ◊ Perceived threat to power

A central theme was the perceived threat to power which seemed to be the primary consideration in decisions made on policy proposals. Secondary to this was the existence of parliamentary mandates or external pressure to influence a decision to take policy action and thirdly, the factor of resource sufficiency. This cycle seemed to repeat itself at the implementation phase and thus a decision tree model was developed to describe the considerations involved in making a decision to take policy action such as policy adoption and policy implementation (Figure 9.1). The double headed arrows in this figure denote the dynamic nature of possible pathways through the decision making tree.

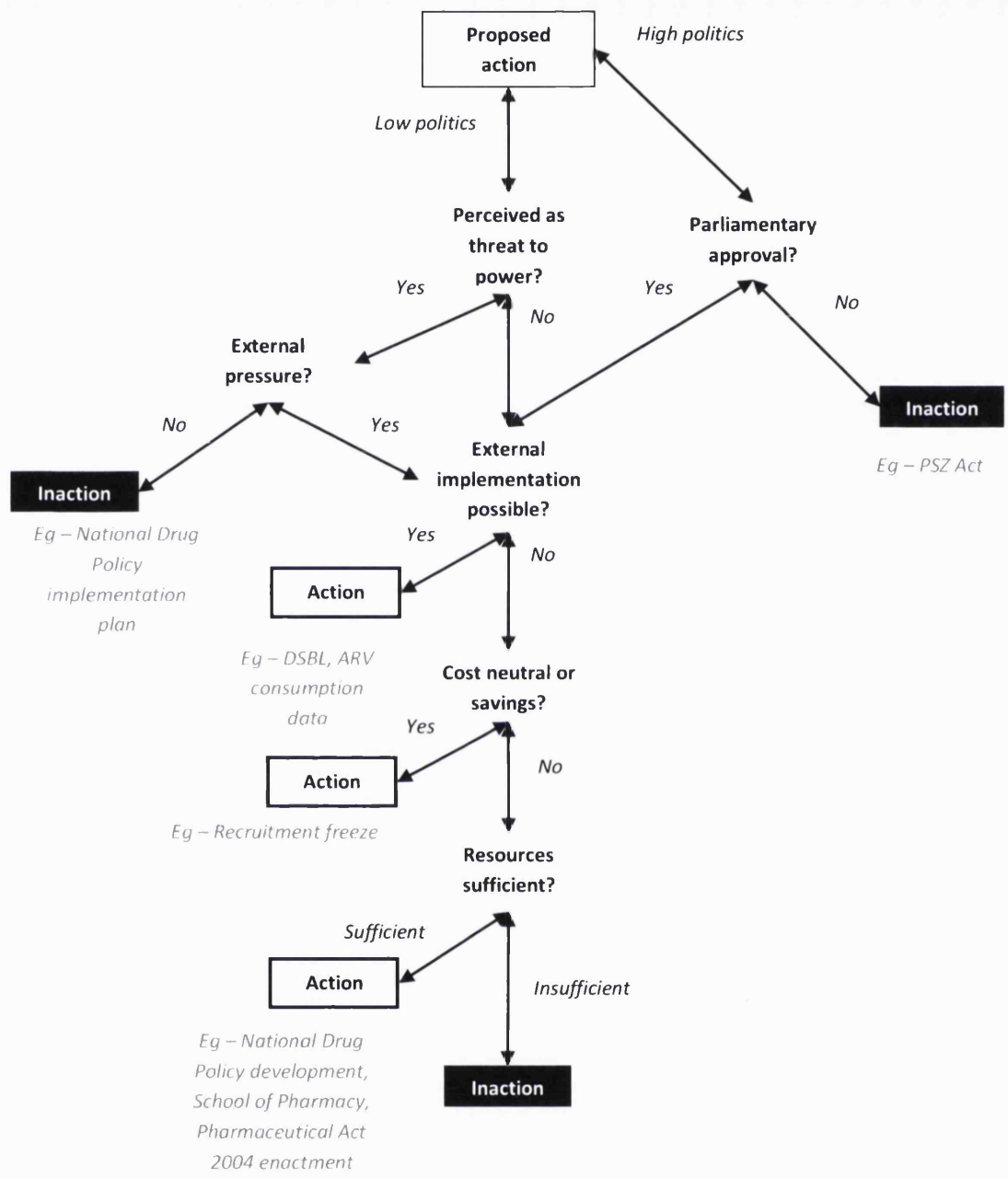


Figure 9.1 Decision making on proposed policy action

Some proposals were differentiated in this model by classification as high or low politics. High politics proposals - such as legislature - necessitated Parliament involvement, as was the case with the Pharmaceutical Act 2004 and Pharmaceutical Society of Zambia Act. All other policy proposals were classified as low politics, including the implementation of high politics policies as

it fell within the main autonomy and remit of the Ministry of Health. The Ministry of Health shared decision making powers with donors upon which they were dependent for resources and capacity. Thus donors had considerable power to lobby and influence the decision making process which is described as 'external pressure' in the model.

Further examination of the trajectories of various pharmaceutical policies through the policy making process gave evidence of the three forms in which power can be executed (as described in Section 9.1.2) – overt power (eg – the Pharmaceutical Act), covert power (National Drug Policy), and latent power (attitudes of medical profession which questions legitimacy of the pharmacy profession's role in the policy environment).

9.3.2 Strategies to influence decision making

In many of the policy proposals described in the data, inaction was the predominant outcome which prompted an exploration of strategies that could influence decision making using the decision tree model. These strategies address key decision making considerations and include reframing the perceived threat to power, shift of the proposed action outside of the decision making body's influence, demonstration of cost savings and convincing influential stakeholders.

Table 9.2 describes how these four main strategies could theoretically influence decision making as illustrated in Figure 9.2.

Table 9.2 Major strategies to influence decision making

Strategy	Explanation
Reframe perceived threat	The perceived threat to power could be changed by reframing or reformulating the proposal to either directly diminish its potential to be perceived as a threat or by changing the understanding of decision makers to allay concerns of potential threats.
Move proposal outside of Ministry of Health influence	Proposals that are outside of the sphere of influence of the Ministry may be implemented if there is strong external support.
Demonstrate cost savings	In the context of resource constraints, a proposal that can demonstrate cost savings is more likely to be adopted or forced by external pressures.
Convince stakeholders	Donors and Parliament are major external groups that have the power to influence the decision making process. By convincing these stakeholders, proposals are more likely to be auctioned due to their lobbying power. Evidence and advocacy serves as key tools with which to convince stakeholders.

Figure 9.2 describes the strategies which could be employed at each level of the decision tree model to influence the outcome of the decision.

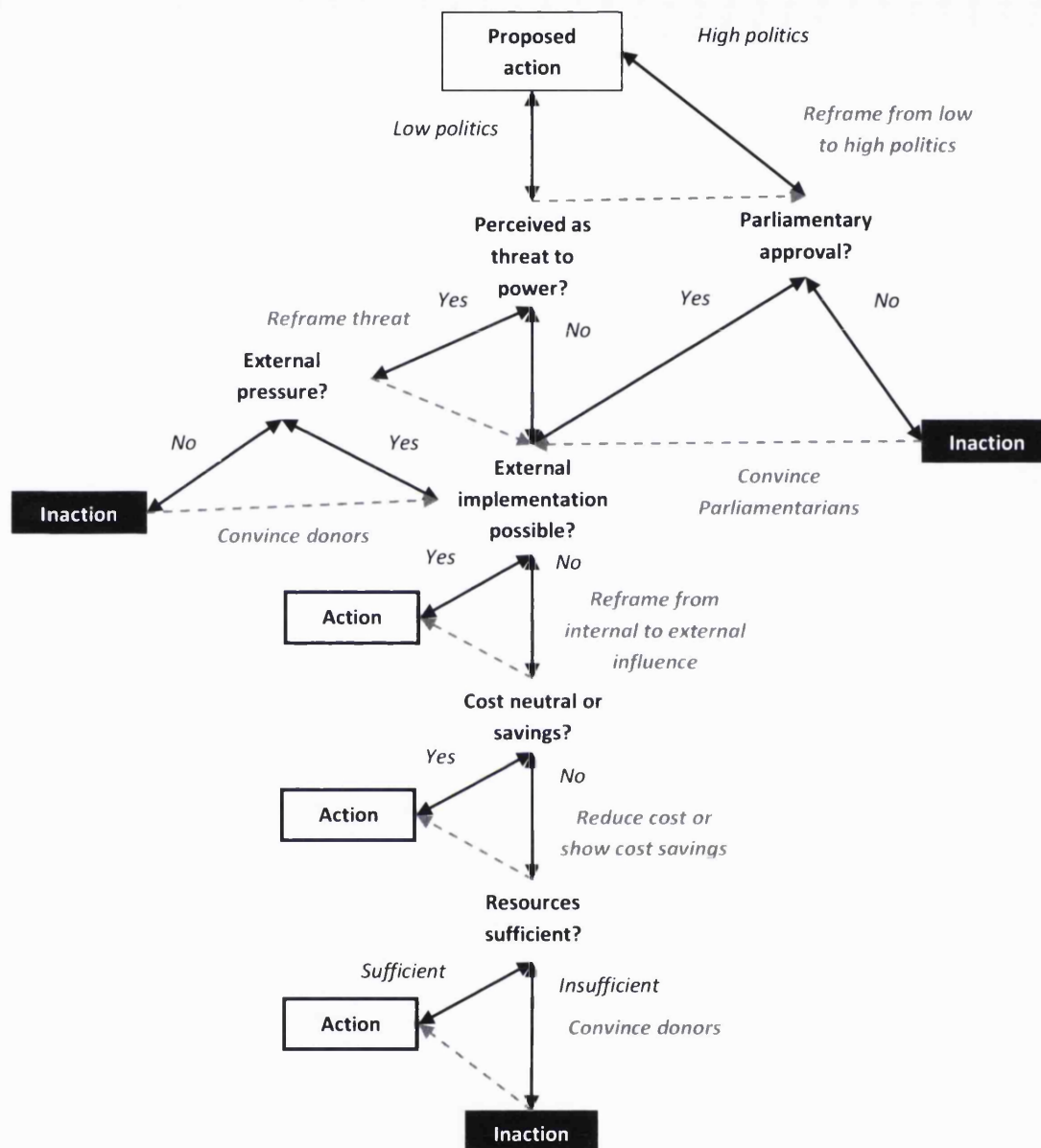


Figure 9.2 Strategies to influence decision making

Depending on the context and nature of the proposed action, a combination of strategies may be required to shift the trajectory of decision making from inaction to inaction. For example, in the instance of a high politics proposed action where external implementation is not possible, demonstrating cost savings and convincing donors to resource may be key strategies. A

proposed action may also commence as a low politics and eventually be reframed as a high politics action in order to bypass a perceived threat to power block in decision making.

This study did not test these theoretical strategies and further research is needed to identify how such strategies may have been used in practice and their features, enablers and barriers to success.

9.4 Summary

The policy making environment was perceived to be difficult and demotivating due to its slow and punctuated progress. Access to medicines was ascribed a high politics issue holding a prominent position in the policy arena. As a result, control of policy developments relating to medicines were seen to be associated with a high level of power and thus attempts to reform or influence this sector were perceived as threats to power, particularly of the medical profession who hold decision making powers.

This scenario was seen remain unchallenged by the lack of evidence to stimulate policy development and implementation. There was a strong feeling by most interviewees that policy proposals supported by evidence were more likely to be accepted by policy makers than those without. Donors were seen to be a major actor in the decision making process with their roles not being limited to the provision of resources. In many of the experiences described by interviewees, donors were utilised to influence the policy making process, seen by some at the expense of a forfeit of sovereign autonomy.

Three key considerations in decision making were found to be perceived threat of a proposed policy action to power, existence of parliamentary mandates or external pressure (eg – donors) and resource sufficiency. Four strategies were identified which could potentially influence the trajectory of policy decisions at each consideration point and included reframing the perceived threat to power, shift of the proposed action outside of the decision making body's influence, demonstration of cost savings and convincing influential stakeholders.

Chapter 10 Key medicines problems in Zambia

This chapter describes the literature and context, data and its analysis in relation to the research question below.

- What if any, are the linkages between medicines problems and the status of pharmacy workforce development?

There was a broad recognition of the major medicines issues that influenced the provision of healthcare in the literature and policy documents, such as access to medicines, unsafe and irrational use of medicines and counterfeits in Zambia. These were also in alignment with the key themes arising from the qualitative data. There was a lack of clarity on the contributing factors of these key issues and this chapter seeks to explore determinants of medicines problems in Zambia and how they interact with the supply chain to perpetuate the existing problems. Pharmacist roles in the access to medicines process were seen to be protective and this perspective is explored by identifying components of this perceived role. Informed by these findings, a revised conceptual framework on the access to medicines is proposed.

This chapter does not seek to generate an explanation for the complex set of medicines related issues raised by interviewees. Rather the intention is to explore problems relating to medicines access and use, perceptions of their causes and construct linkages with the pharmacy workforce scenario in Zambia. This chapter can be seen to delve into the outcomes or consequences of the structures and processes for pharmacy workforce development policy.

10.1 Literature and context

This section provides background information on morbidity and mortality and an overview of the relevant literature and policy documents relating to medicines problems in Zambia.

10.1.1 Demographics and health

The population of Zambia in 2007 was estimated to be 11,922,000 of which 65% lived in rural areas (128). Forty-six percent of the population in 2007 were 14 years of age or under (128). Two thirds of the population in 1999 were thought to live below the poverty line of \$1 USD a day (171). Life expectancy was 42 years for both men and women in 2006 (128). Like many other countries in sub-Saharan Africa, gains in life expectancy over the 70s and 80s were undermined with the advent of HIV/AIDS, its prevalence in 2007 at 15% of adults over the age of 15 (172). Under five child mortality ratio per 1000 live births increased in the 70s, 80s and early 90s during the period of economic recession and high inflation and decreased after 1994 (Figure 10.1)(171). However Zambia still has one of the highest levels of child and maternal mortality with under five child mortality ratio in 2005 at 168 per 1000 live births and maternal mortality ratio of 729 per 100,000 (140).

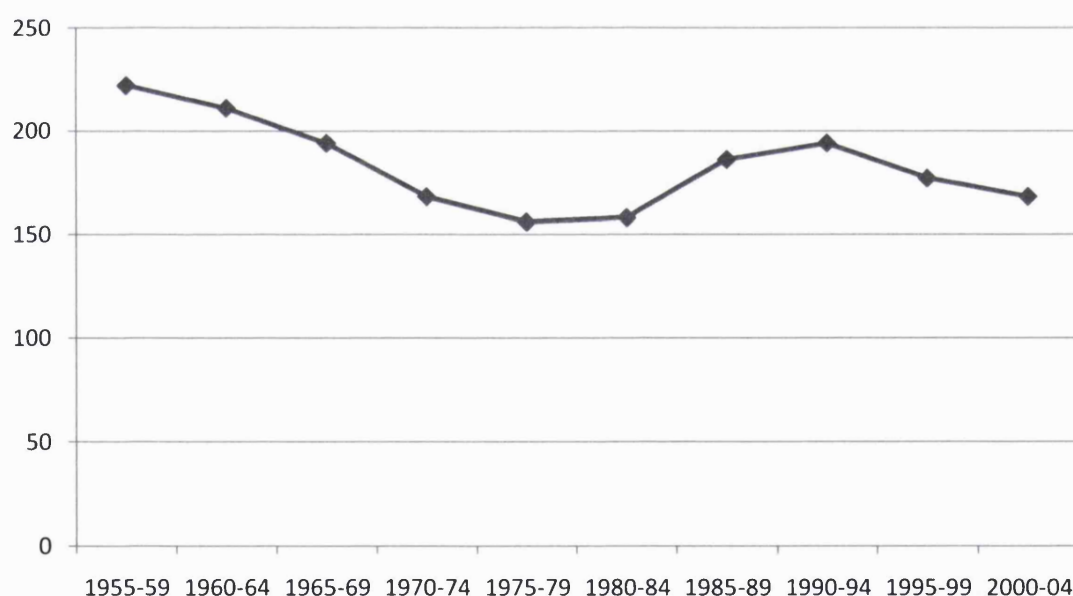


Figure 10.1 Under five child mortality per 1000 live births in Zambia 1995-2004

Data source: WHO (171).

Mortality due to malaria has recently reduced with incidence dropping to 358 per 1000 population in 2007 from 412 in 2006(140). Much of this success is attributed to the successful implementation of prevention strategies such as the dissemination of 3.6 million insecticidal nets between 2006 and 2008, a period over which mortality due to malaria almost halved (173). In April 2009, Zambia was reported by WHO to have achieved the 2010 Roll Back Malaria target with a reduction in the number of malaria cases by 66% since 2000 (173). The number of patients accessing free ART also improved with a doubling of patients from 78,683 in 2006 to 156,783 in 2007 (140). A tuberculosis cure rate of 85% was also achieved in 2007, meeting the MDG target (140).

10.1.2 Healthcare providers

The main providers of healthcare in Zambia were the public, private not for profit (mission hospitals and healthcare centres), private sector (clinics, hospitals, pharmacies) and informal sector (drugstores, drug sellers, traditional healers).

The Churches Health Association of Zambia (CHAZ) is the second largest employer of healthcare workers and estimated to provide up to half of healthcare in rural areas and 30% of all healthcare in Zambia through its non-profit mission hospitals and health centres (174).

The private sector comprises of licensed community pharmacies and licensed paramedical dispensers. There are few licensed community pharmacies and most of these are concentrated in the urban areas (145). According to the Pharmaceutical Regulatory Authority in 2008 there were only 42 licensed private community pharmacies, all of which were located in urban areas.

The informal sector includes legal drug stores which are licensed by the general council in each jurisdiction to sell over the counter (OTC) medicines but often illegally sell pharmacy and prescription only medicines sourced from licensed pharmaceutical wholesalers or pilfered illegally from the public sector. Illegal drug sellers and traditional healers are also part of the informal sector and may operate from their homes, businesses and in the marketplace. Their source of medicines also includes those pilfered from the public sector. Licensed pharmacies

must employ a pharmacist in order to operate though some interviewees reported pharmacies which operated with just a pharmacy technologist.

Figure 10.2 presents data from a 2003 household and provider study of community medicines management for malaria and describes where caregivers of children under five sourced their medicines (149). Public sector facilities (blue) formed the mainstay for most caregivers with drug stores (red) and private or mission (grey) facilities being the next major source. Only a tiny proportion if any sourced their medicines from pharmacies (green) though this was more common in Lusaka where most of the pharmacies in Zambia are located. Interestingly, only a small proportion of those surveyed stated that they obtained their medicines from drug sellers despite widely held beliefs that this is a common practice – it should be noted that this trend may be specific to antimalarials as they are freely available from the public sector.

The study reported that 81% of caregivers sought medicines upon the advice of a Community Health Worker in a health facility, whereas 10% of medicines were sought without any advice and only 5% and 2% of medicines were purchased following the advice given in a drug store and pharmacy respectively (149).

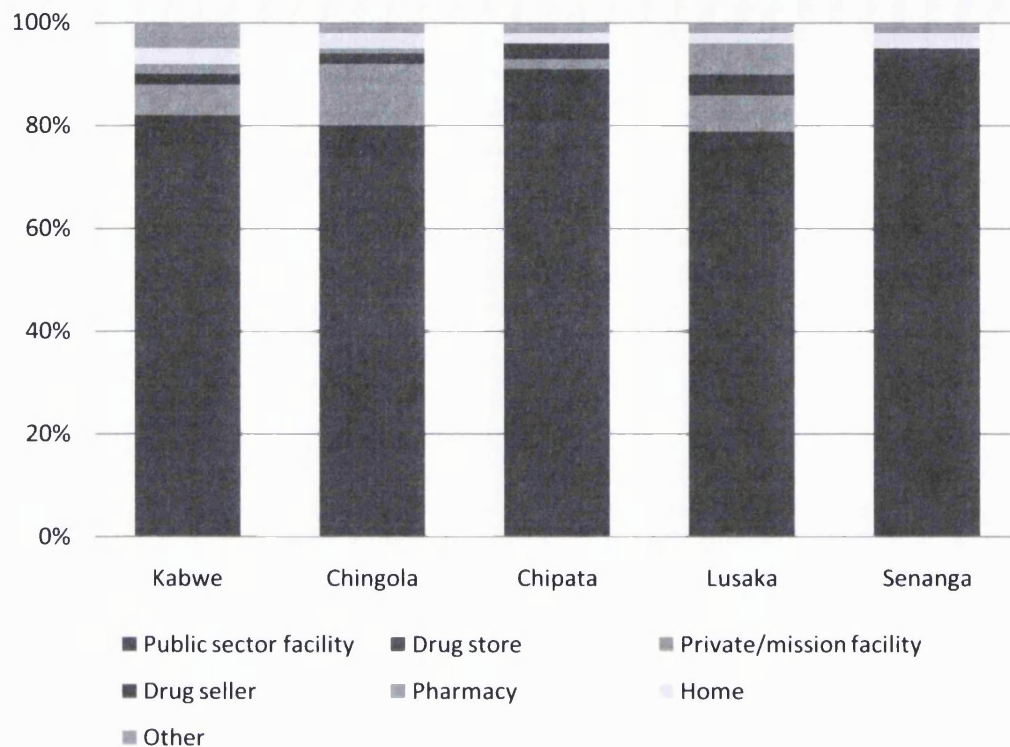


Figure 10.2 Sources of medicines used by caregivers in five districts

Data source: Hazemba et al, 2005, p21 (149).

10.1.3 WHO Access to medicines framework

The Access Framework for collective action to improve access to essential medicines was proposed by WHO in 2004 and included the components of rational selection and use (treatment guidelines, essential medicines list), affordable prices (generics policies, reduced mark-ups), sustainable financing (increase public funding) and reliable health and supply systems (regulatory control, workforce, accessible providers)(146).

Access to medicines for the purposes of this qualitative study was taken from the perspective of the patient and borrowed the concepts of rational selection and use, affordable prices and reliable health and supply systems from the WHO framework. Macro level issues relating to sustainable financing were beyond the scope of this study and instead, the downstream issue of

medicines availability was used to complete the conceptual framework for understanding access to medicines (Figure 10.3).

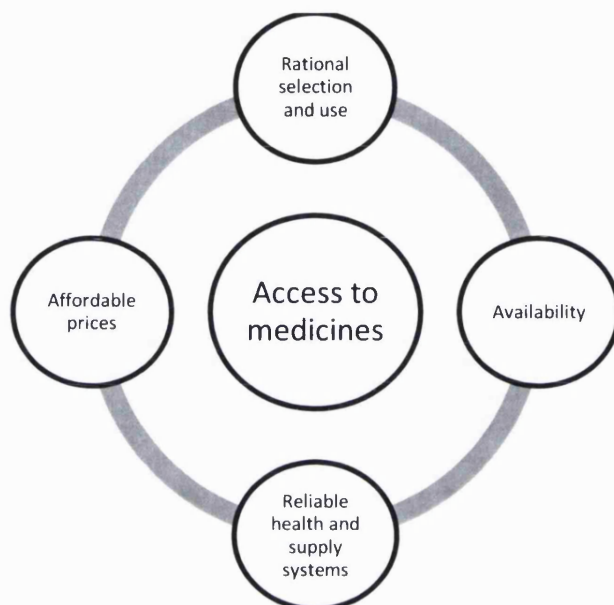


Figure10.3 Access to medicines conceptual framework

Adapted from WHO Framework (146)

Each component of this conceptual framework is further described in section 10.1.4 – 10.1.7.

10.1.4 Rational selection and use of medicines

The Zambia National Formulary (ZNF) was established in 1990 and whilst there was an initial slow uptake and delay in its review rendering it outdated in 1997, it has since been revised and the ZNF is now published in its 2005-2008 version. However few district and hospital level Pharmacy and Therapeutic Committees (PTCs) established by the National Drug Policy were still functional in Zambia to improve rational selection and use (6).

At the time of the National Drug Policy's development, irrational use of medicines was thought to be widespread in Zambia, particularly for medicines sourced from the informal sector and few

studies have since been conducted to provide reliable data on prescribing and medicines use (129).

Use of antimalarials despite negative laboratory results was found to contribute to excessive antimalarial consumption and resource waste in Zambia (147). In a 2006 study of 104 health centres in Zambia, 58% of patients that had negative blood smear results and 35% of those that had a negative rapid diagnostic test (RDT) for malaria were still prescribed antimalarials (147). The cost of a RDT is about \$0.5 USD compared to \$1 USD for each adult treatment course of artemether-lumefantrine, meaning that if a third of all patients that tested negative were to continue to receive treatment, the cost effectiveness of utilising diagnostic tests would be nullified once the costs of training in RDT interpretation was factored in (147).

There was some indication that the prescribing of antibiotics to outpatients by prescribers (clinical officers and nurses) had improved following interventions between 2002-2003 with one study of 18 public sector health facilities noting a drop from an average of 64% of patients prescribed antibiotics to 13% in the urban Lusaka district (capital city) (175). However, irrational prescribing was prevalent and between 2002 and 2004, a fourfold average increase to 67% in the prescribing rates of injections for outpatients was observed (175). In 2004, 75% of patients presenting with non-pneumonia coughs were prescribed antibiotics where it was unwarranted (175). In the management of malaria in 2004, 63% of presentations diagnosed as malaria were prescribed the appropriate course of antimalarials and other inappropriate medicines were also observed to be concurrently prescribed (175). This may have been due to the lack of standard treatment guidelines as only 36% of facilities had access to guidelines on site in 2004 compared to 58% in 2002 (148).

10.1.5 Availability of medicines

The availability of medicines in public sector facilities was deemed to be erratic, unpredictable and characterised by frequent stock outs (145).

Medicines availability was perceived by the Zambian public to be the litmus test of a health care system's performance and thus the lack of medicines was seen as the most significant

impediment to health (176). Anchored upon the availability of medicines in the public sector was the means with which to improve health outcomes, without which, health workers were deemed incapacitated to make a difference.

“Whatever we asked, members of the community brought up the issue of drug availability at the health centre. Whether we talked about decentralization, user fees or quality of care, people linked it immediately to drugs. To them medicines were the *raison d’être* of the health centre and health care in general. A competent and kind nurse or doctor who does not have drugs to dispense becomes useless.” Van der Geest et al, 2000 (176).

The lag time between tendering and medicines delivery to Medical Stores Limited (MSL) was six months which required comprehensive and advanced planning to ensure adequate availability. Prior to 2007, the Procurement Unit in the Ministry of Health could not initiate the procurement process until funds were disbursed to the Ministry of Health as was the policy of the Zambia National Tender Board Act (140). This policy was withdrawn in 2007 and the procurement process can now be initiated when budgets are approved by Parliament rather than waiting for disbursement.

The monthly average availability of essential medicines at Medical Stores Ltd was 63% for 2007, above the set target of 50% (140). In 2007, facility level stock outs of essential medicines such as vaccines and antimalarials were identified as major constraints to health service delivery and were associated with procurement problems, lack of availability at Medical Stores Ltd and poor logistics and management of medicines (140). Medicines availability was also thought to be hampered by delays in the internal processes of the Global Fund and organisations responsible for vertical programmes such as UNICEF and a lack of consumption data on which to base procurement decisions (140). In recent years, the Ministry of Health was also procuring medicines on an emergency basis due to stock outs which resulted in significant gaps in medicines availability and delays in supplies (145).

Figure 10.4 describes the availability of Coartem™, a combination artermether-lumefantrine antimalarial at Medical Stores Limited where public sector medicines are procured and distributed to healthcare facilities in Zambia. Frequent stock outs of all pack sizes (yellow

arrows) can be seen with two complete stock outs in January 2006 and October 2006 which lasted for three months and one month respectively.

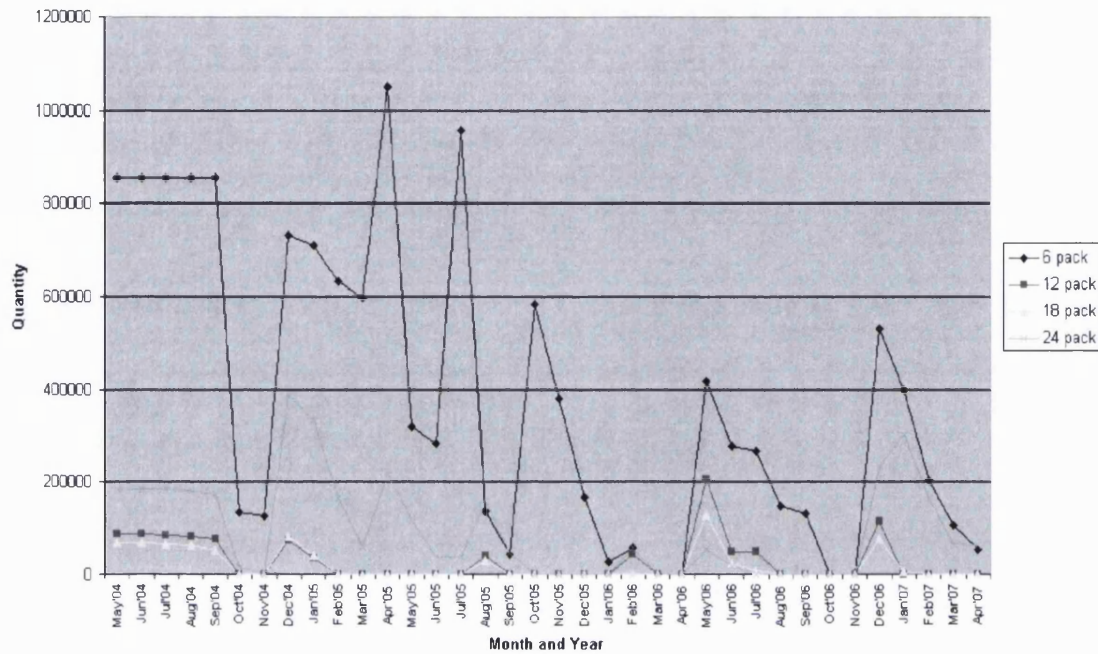


Figure 10.4 Availability and stock outs of Coartem™ at Medical Stores Limited between May 2004 and April 2007.

Reproduced with permission from Hazemba et al, 2007 (175).

Surveys of medicines supply and use in the Lusaka urban district that were conducted in public sector health facilities (12 in 2002 and 18 in 2004) found that the availability of medicines ranged from 28% to 94% with an average availability of only 57% in 2004, a reduction from 70% availability in 2002 (148). In these surveyed facilities, an average of 85% of medicines required for use compared to 76% in 2002, were dispensed on location with lower dispensing rates for facilities that experienced higher stock-out rates (175). One centre had a 25% stock-out rate and thus only dispensed 50% of its prescriptions compared to another centre that had a stock-out rate of 0.4% and dispensed 81% of prescriptions (175). Poor drug management was identified as an unresolved problem which was thought to be due to the lack of competence of staff (175). It is worth noting that health facilities in Zambia did not have pharmacists or

pharmacy technologists on site. Due to the high level of staff turnover in the health facilities, prescribing was also likely undertaken by new and untrained health workers.

Twenty percent of patients surveyed from rural districts felt that the availability of medicines had worsened following the abolishment of user fees though 72% felt that it was the same or had slightly improved (133). Overall, 90% of patients sourced their medicines from the public sector health facility with only 8% having to purchase unavailable medicines privately (133). In an effort to minimise stock outs, emergency and advanced procurement was expedited in cooperation with donor agencies to fund higher levels of stock in preparation for increased consumption (133).

10.1.6 Reliable health and supply systems

Supply chain systems in the public sector were seen to be inefficient and ineffective with concerns of integrity, leakage and poor management (145). The supply of medicines from Medical Stores Limited was frequently less than the order placed and quarterly grants were issued by the Ministry of Health for the compensatory purchase of medicines from the private sector (177).

In a 2003 study across 5 districts surveying 198 public, mission, private and informal providers of medicines, only 11 (6%) of workers were found to be pharmacists, 15 (8%) were pharmacy technologists, and 58% were untrained personnel (149). Figure 10.5 describes the proportion of personnel in each cadre prevalent across the different provider types (149). Almost all of the authorised individual dispensers, drug sellers and most of the personnel in drug stores had no training. Most of the personnel providing access to medicines in public sector health facilities were nurses (purple) with very few pharmacists (green) and pharmacy technologists (red). Pharmacists and pharmacy technologists each comprised 20% of the workforce in licensed dispensing outlets such as pharmacies though untrained personnel still comprised almost half of the workforce.

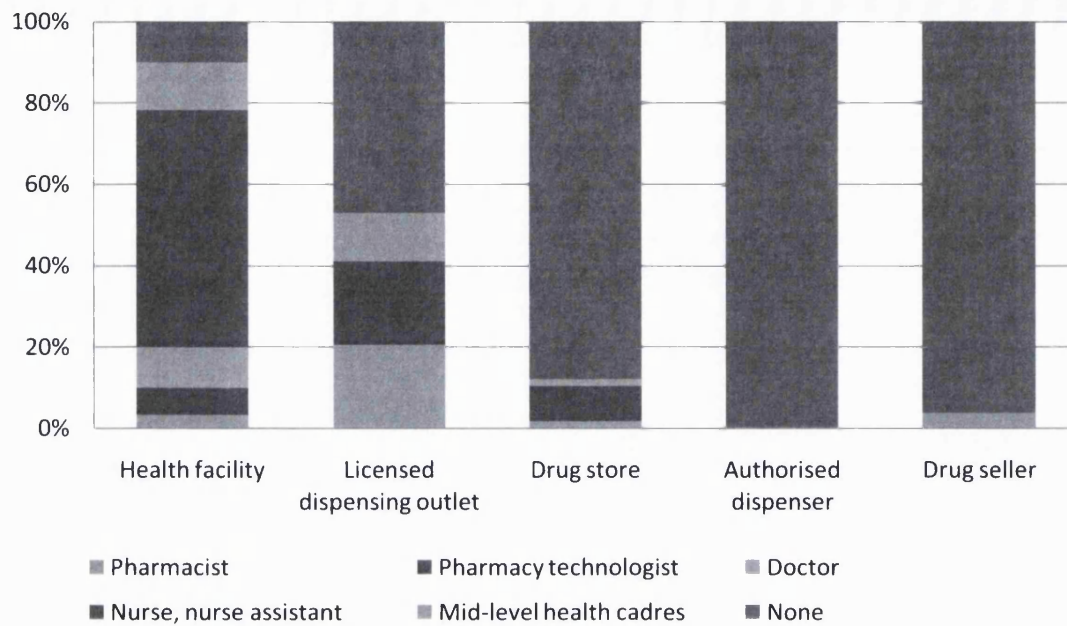


Figure 10.5 Proportion of personnel in each cadre by provider type.

Data source: Hazemba et al, 2005, p16.(149).

Despite the dominance of untrained drug store, authorised dispenser and drug seller personnel, the level of knowledge demonstrated on the symptoms of malaria, treatment guidelines and advice that should be given on the use of antimalarials was not markedly different to that of licensed dispensing outlets (149).

10.1.7 Affordable medicines prices

From Zambia's independence until the implementation of the major health reforms in the early 1990s, health services from public facilities were provided at low or no cost to patients. User fees were introduced in 1993 due to increasing pressures on the government to contain health costs and on the premise that the Zambian public were willing to pay fees to the private sector and thus if quality of service was acceptable in the public sector, the same would apply (176). User fees at primary health care facilities in all 54 rural districts were abolished in 2006 amidst

growing pressure regarding the inequity of access to healthcare. However, household contributions were to be an important source of revenue as user fees constituted almost a third of the public sector health envelope in 2005 (139).

A study of 23 districts measured the impact of the abolishment of user fees in rural areas and estimated a 50% increase over one year in the utilisation of public health facilities by the rural population over the age of five with drug consumption in rural districts increasing by 40% (133). However utilisation did not increase significantly for those under the age of five in rural areas, despite high maternal and child mortality (133).

No price survey had yet been undertaken in Zambia and reliable information on medicines prices and their affordability by the public does not exist. However, it is highly likely given that two thirds of the Zambian population live below the poverty line that medicines are unaffordable for the majority.

High import taxes and duties were thought to contribute to high medicines prices, particularly of patented imported medicines in Zambia. However high import taxes and duties were also applied to raw materials used by local pharmaceutical manufacturers meaning that locally manufactured medicines tended to be more expensive than imports (145). Mark-ups were also applied to base prices by the private sector

In the public sector, the tendering process was seen to be the sole mechanism for reducing prices for medicines procured by Medical Store Ltd whereas other strategies such as joint procurement with neighbouring countries could yield more competitive prices (145). Payment by the Ministry of Health for procured medicines was often delayed and overdue because of poor financial management practices which reduced the likelihood of competitive prices offered by suppliers (145).

10.2 Descriptive narrative

Medicines problems in Zambia described by interviewees were clustered into issues of access to medicines, unsafe and irrational use of medicines and counterfeit and substandard medicines.

This section provides a descriptive narrative of the perceived nature of these problems and their associated causes. They are described and illustrated by the raw data in the form of excerpts from interviews and policy documents and form a basis for the analysis described in section 10.3.

10.2.1 Access to medicines

It was felt that there was inadequate access to medicines in the public sector particularly outside urban areas (Extract 10.1), resulting in potential harm and mortality such as high levels of malaria mortality and poor management of diabetes (Extract 10.1, Extract 10.2). The striking example of insulin stock outs given by Sam is not a rare occurrence and gives a sense of the scale of the consequence of poor supply chain management and the ramifications on patient health.

“There has been this chronic problem in one area of pharmacy which is the drug supply and the sustainable availability of drugs at the district level.” David.

Extract 10.1

“We have a rate of 50% deaths per year from malaria, a treatable disease... where did we fail? Why do we keep on losing? One thing of course, the drugs were not available.”

Michael.

Extract 10.1

“There are times when I think we have run out of critical drugs for a very long time on the national level. Like insulin for instance, I think we ran out for a period of six months.” Sam.

Extract 10.2

Whilst access to medicines used in the major vertical disease programmes such as HIV/AIDS, TB and Malaria may not be entirely adequate, it was felt that there was far better access for these medicines than others on the essential drug list due to the availability of resources (Extract 10.3, Extract 10.4). So much so that efforts relating to healthcare services and medicines were perceived by many to be skewed to these ‘big drives’ and in the process, creating inequities between patients who fall into these priority areas and those who did not.

“In Zambia there are three priority areas in TB, malaria and HIV where the drug supply is good given the level of donor support. However for essential drugs we are spending less than 9 USD per capita, last year it was less than 6 USD per capita which is very low due to the budget constraints we have in this country.” Adam.

Extract 10.3,

“I think we are okay but it seems to be driven towards what the big drive is at the moment in the country. So you find that we are really, really covered for ARVs but we lack drugs for opportunistic infections.” Amy.

Extract 10.4

However medicines for the priority disease programmes supported by donors were not seen to be immune to the systemic problems affecting the medicines supply chain. This was seen as a rationale for a more holistic approach to addressing access issues rather the current vertical paradigm (Extract 10.7). The mismanagement of medicines funded by donors was perceived to be a visible problem that had the potential to affect the likelihood of future foreign aid (Extract 10.5, Extract 10.6).

“Cooperating Partners [donors] support for HIV, TB and malaria drugs face the same distribution problems as for other drugs. There is no proper information system on where drugs are kept or records on how they are used.” Adam.

Extract 10.5

“We should actually find ourselves being able to manage those supplies in a good way, so that we continue to receive support.... because at the end of the day it is not good when they say they’ve given you so much but it just doesn’t feel good when they come and then they find that maybe the drugs have been mismanaged, they’ve been stolen or what. This is just not right.” Jackie.

Extract 10.6

Given the lack of information systems on medicines flows and use in the public sector, there was felt to be inadequate accountability built into the supply chain as well as a lack of understanding of the complexities in medicines use. Poor detection of the early warning signs of low stock levels and poor management of the procurement process and supply chain were associated with the lack of availability of medicines (Extract 10.7, Extract 10.8, Extract 10.9). Infrastructure such

as roads and transport also played a role in efficient distribution of medicines from the district levels to the rural health centres. The lack of understanding and some of the supply chain mismanagement was also partly attributed to the lack of qualified human resources at all levels (Extract 10.9).

“Since we didn’t have drugs we went into this whole issue of procurement and our lead time was very long. So even when we actually awarded for contracts and tenders the time we still had to wait for drugs to come... cause we ran out of kits and run out bulk drugs at the same time.” Jackie.

Extract 10.7

“No one in the ministry really understands what happens down there [at the practice level] from the pharmaceutical point of view. How are they using the medicines?So consumption is confused, no one can really understand and make proper consumption [reports]. So we continued having stock outs.” Michael.

Extract 10.8

“The method of procurement is inefficient for various reasons. One is that the tender procedure is too long as it takes about six months from the time something is ordered to the time it arrives. As these are government procedures, they can’t be changed. The requirement for drugs also changes over time. For example at one moment we may have a pneumonia epidemic which comes up but then goes away. There are distribution problems as the distribution of drugs from the medical stores only goes once a month to the districts. These drugs are left at the district level for further distribution to the rural health centres. In most cases, districts are unable to distribute due to transport problems, roads, inaccessibility such as during the rainy season when there is flooding. There is a lack of manpower in trained pharmacists in central and general hospitals and no manpower in rural hospitals.” Amy.

Extract 10.9

In an attempt to implement better information systems for medicines procured by the Global Fund, a donor programme, the monitoring of consumption (dispensing and adherence) data was instituted to improve the security of ARVs. It was described as a ‘push’ in this example.

“Another push was the logistics management unit, when Global Fund really needed the consumption data..... for the ARVs, it’s working well.” Jackie.

Extract 10.10

Even where medicines were successfully distributed to public sector hospitals and health centres, leakage or pilferage was frequently cited as a common activity which diverted medicines into the informal sector (Extract 10.11, Extract 10.12). Interviewees were unanimous in their view that pilferage was a theft of public property. Pilferage was associated with poor accountability and security of medicines in facilities (Extract 10.12).

“There is also the problem of pilferage... you find that the supplies that reach the hospitals are stolen and that’s what you find on the street.” Mary.

Extract 10.11

“There are issues on security where the drug may be going to the private sector and moves out of the public sector.” Michael,

Extract 10.12

Pharmacists where available, were associated with a protective role of ensuring the security of medicines stocks and preventing pilferage (Extract 10.13). In facilities where there were no pharmacists, there was a perception that pilferage of medicines was more likely (Extract 10.14).

“I have to make sure that [pause] there’s no pilferage and thefts around when I’m working.” Stuart.

Extract 10.13

“There is a lot more institutions like maybe health centres or the districts who are managing drugs and there they don’t have pharmacists and there they could have a problem of maybe taking the drugs to those illegal outlets.” Sam.

Extract 10.14

There was a common perception that pilferage in the public sector decimated stocks of medicines which should be freely available to the public in the rural areas, forcing patients to source medicines from the private and informal sector. Health workers that sold pilfered medicines to the informal sector could sell medicines cheaply to these providers as it was felt that they had none of their own investment to recoup (Extract 10.15).

“So they [health workers who pilfer medicines] can sell it at any, any cost that they like at the market. Because they didn’t, they didn’t buy it.” Mary.

Extract 10.15

It was frequently commented that medicines pilfered from the public sector, illegally sourced from wholesalers together with other illegal sources find their way to drug stores and sellers who served as the mainstay of access to medicines for much of the Zambian public in rural and urban areas. One interviewee classified all medicines supplied from the private sector in rural areas as being from illegal sources given the lack of community pharmacies (Extract 10.16).

“In the rural areas, all the medicines that are being dispensed in the private sector are dispensed I would say illegally, because there are very few if any at all, registered retail pharmacy outlets.” Claire.

Extract 10.16

The growth of the informal sector was attributed by many of the interviewees to the growing demand for medicines, lack of legitimate points of access to medicines in the private sector in rural areas, easy access to pilfered and wholesale medicines and the lack of enforcement of illegal drug sales (Extract 10.17, Extract 10.18, Extract 10.19).

“The reason why these illegal outlets are mushrooming is the fact that they want to provide access to medicines to the people.” Simon.

Extract 10.17

“But there are unfortunately a good number of wholesalers that are selling drugs like they are selling sweets or pumpkins or whatever, to anybody, to anyone. He just walks in, is asking for amoxil. ‘How many do you want?’ They’ll sell it to you.” John.

Extract 10.18

“This [illegal drug sellers] is a real issue because the Pharmaceutical Regulatory Authority does not have the capacity. They lack manpower, they lack viable financial support and they also lack transport. So they rely on part time inspectors and these part time inspectors don’t have much power so to speak. Because they are operating more like on an individual basis. So we need to have infrastructure almost in all towns because without these, we cannot manage.” Sam.

Extract 10.19

Two interviewees described that drug stores were licensed to sell over the counter (OTC) medicines to the public and most interviewees perceived them to often illegally sell pharmacy and prescription only medicines (Extract 10.20). Many drug sellers were not licensed and were described as selling medicines illegally at general stores, marketplaces and on the street (Extract 10.21).

“So you have what is called the drugstore where the guy doesn’t need his license from the Medical Council or from the PRA. He goes to the council, the general council and gets a general sales license to sell and he puts over the counter [OTC] products in there, what is available for everyone to buy. But then everyone knows that under his... yeah, he is selling (laugh) everything else (laugh). So he may not display it but we all know that’s what’s happening OK?” Mary.

Extract 10.20

“You go to the markets, you find you are able to buy antibiotics from the streets or from the you know, the street vendors.” Claire.

Extract 10.21

Given the extent of poverty in Zambia, a major barrier to access to medicines was said to be affordability despite availability of medicines at legitimate sources in the private sector (Extract 10.22).

“But here to get medicines you are simply, you are always dependent on how much liquid cash you have. The medicines may be there in the rural setting in the pharmacy which is situated somewhere at the corner of Zambia, but do the people have the money to go and buy it?” Claire.

Extract 10.22

The cost of medicines from legitimate sources such as licensed community pharmacies was felt to be higher than illegal sources (Extract 10.23). This difference was attributed by some interviewees to legitimate procurement (rather than pilfered), operational costs (rental, lease of premises) and salaries of trained staff (Extract 10.).

“And no matter how much I am an owner of a retail pharmacy and no matter how much I try and put my prices competitive, it will always be higher than what the market boy can sell his drugs at for instance.” Mary.

Extract 10.23

“Well maybe the price might be a bit higher in the legal, in the chemist... because we have to add in a professional fee on top of that and they, of course the rentals are different from say the market fare the illegal ones are just selling small little things... and you have to pay, you know your professional pharmacy technicians.... The pricing will definitely be different.” John.

Extract 10. 25

One respondent described his ethical obligation to make benevolent judgements to make medicines available for patients who could not afford to pay (Extract 10.24). John perceives ethical practice embedded into professional pharmacy practice such that the risks of potential harm caused through lack of access or access through the informal sector should be considered over and above financial return.

“You’ll feel guilty when the person doesn’t have [the money] and you see this is a life threatening you know problem that the person has and you have the medicine and you turn away the patient, it’s not right. You have to lose some you know, you just have to give the drug and let the patient go.” John.

Extract 10.24

Preventing the mismanagement of medicines in the public sector, particularly those funded by donor agencies was also seen as the ethical responsibility of pharmacists.

“So I think even us pharmacist are having that ethical responsibility. We should actually find ourselves being able to manage those supplies in a good way so that we continue to receive support.” Jackie.

Extract 10.25

A similar weighting of risks and benefits was considered by respondents who proposed pragmatic solutions to improve access to medicines without compromising on standards of practice and quality of service, particularly in rural areas where pharmacies and pharmacists were rare (Extract 10.26, Extract 10.27, Extract 10.28). Features of proposed solutions included

the training of personnel in the informal sector, supervisory systems to the informal sector extending from registered pharmacies and limiting informal providers to other health professionals operating in rural areas. One respondent strongly asserted the need to enforce the Pharmaceutical Act which does not permit unqualified personnel to sell medicines (Extract 10.28).

“So we want to move towards that level where we can empower some people [in the informal sector], give them some organised training; training that they should undergo so that they can be in a position to handle medicines without the regulatory authority compromising issues of quality or safety.” Simon.

Extract 10.26

“This is one idea [pharmacy depots] I’d like to encourage for a country like Zambia. Because with that we know that there is going to be adequate supervision by a qualified pharmacist and people will receive quality service and the same can be extended to those [dispensing] surgeries. Where instead of being stand alone they are supposed to be outlets of the registered retail chemist.” Sam.

Extract 10.27

“And maybe I’d understand in remote areas, yes, maybe there we could bend a bit but not break the law. And allow maybe a nurse or a doctor to dispense but not illegal, somebody who doesn’t understand medicines. You can’t end up with someone selling tomatoes today, tomorrow start selling some drugs in a pharmacy. That is [the Pharmaceutical Act] law. That is not in it. We can’t compromise on that one. We should not compromise on that.” John.

Extract 10.28

These proposals suggest the potential openness of pharmacists to workforce paradigms that enabled low and mid-level cadres to take a more active role in improving access to medicines provided that issues of competence and quality were not compromised and supervisory systems were instituted and indicates the limits of the scope of self-interested professional boundaries to urban areas where pharmacists are more prevalent.

Problems in the access to medicines was seen to be a result of the interaction between the poverty of the Zambian public and government coupled with increasingly detrimental provider patterns (Figure 10.6). Such unsafe patterns included the pilferage of medicines from the public

sector and proliferation of the unqualified informal sector in an environment with poor supply chain management and regulatory enforcement, thus increasing the potential to cause patient harm. Pharmacists were perceived to mitigate the potential harm caused to the patient by playing a role in tackling pilferage and inadequate medicines access and improving supply chain management.

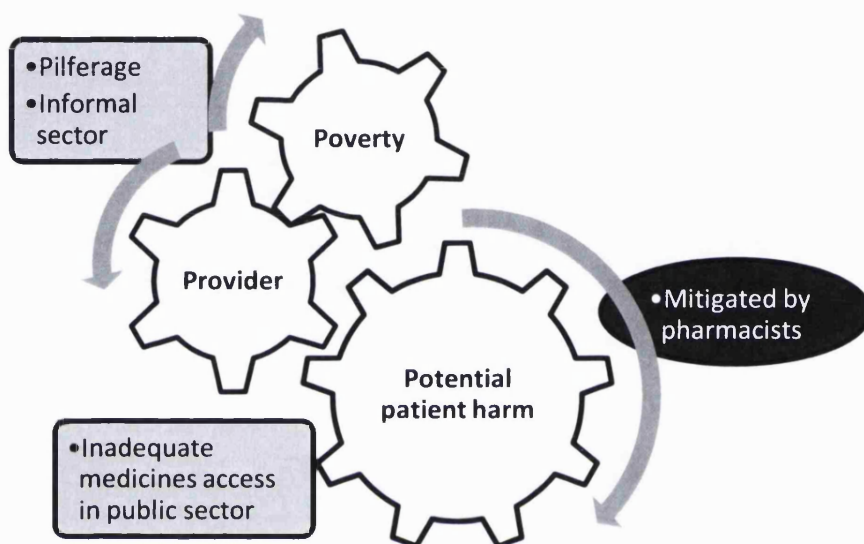


Figure 10.6 Themes associated with problems in access to medicines

10.2.2 Unsafe and irrational use of medicines

Many Interviewees differentiated medicines from other commodities and emphasised the potential of medicines to cause harm, providing the rationale for requiring medicines to be managed by a workforce with basic competencies (Extract 10.29)

“I hope that there will be a time when we will realise that drugs are not ordinary goods and they should be handled by people who understand the basics.” Tony.

Extract 10.29

Incompetence was associated with both illegal drug sellers and untrained personnel in the public sector. These personnel who are the brokers of access to medicines for much of the public were associated with the unsafe and irrational use of medicines and were seen to cause harm to patients. The risk to patients who sought medicines from illegal drug sellers was associated with the lack of competence of the sellers to diagnose, store, dispense and provide professional advice (Extract 10.30, Extract 10.31).

“Mrs so and so in the market knows how to sell fish and tomatoes and onions. She doesn’t know about dosages and the implications about giving someone five capsules of ampicillin every now and again as they need it. There is no knowledge about the resistance issues, there is no knowledge about, you know, what is it doing to his body... you may be dealing with a serious HIV case on your hands and... you don’t see it because you are not qualified to do it. There is nothing you can do about it.” Mary.

Extract 10.30

“And that is the danger if that, the, these medicines are not even stored ideal... under ideal conditions, they are being dispensed by people who don’t understand what these drugs are or what dangers might be in all with dispensing all these drugs.” Claire.

Extract 10.31

The perception of the risks of untrained personnel serving as a point of access to medicines was high with several citing the potential to lead to death (Extract 10. , Extract 10.). Issues of medicines resistance was also common theme associated by most interviewees with irrational medicines use and untrained personnel (Extract 10.).

“A patient like that really needed to be taken straight to [hospital]... she had to be operated on immediately and have the abscess drained and the consequence of that is the patient could have died and the person had been going to see these illegal places for the past you know, 7-14 days and the person is not recovering, that’s really quite a danger.” John.

Extract 10. 34

“I think we are having a lot of problems from a lot of drug outlets... sometimes we are not too sure about the patients who come to us. Either they come to us with complications or worse of all, they may come in as brought in dead.” Sam.

Extract 10. 35

"We need to make sure that qualified people are the ones handling all issues of drugs. And then we don't want that [drug resistance] to happen to the ARVs and other drugs that we have now introduced where issues of resistance could really be deadly, somehow fatal cause we'll run out of options if we don't manage it well." Jackie.

Extract 10.36

A comparable level of risk was associated with untrained personnel providing pharmaceutical services in the public sector and the potential to lead to unnecessarily high drug expenditure (Extract 10.32, Extract 10.333).

"I mean they've got all sorts of people handing out drugs and the danger there is that when you have somebody who is not educated or trained properly, they will go for the most expensive or what they think will be the most effective drug." Julie.

Extract 10.32

"I've known people that look at the drugs that are on the shelf and see them to be completely inappropriate drugs for that level of care, without the specialist skills either to be able to prescribe them or to use them, so yeah, it's an issue." Susan.

Extract 10.333

Poor affordability of medicines may also dictate behaviours that lead to irrational and unsafe use of medicines. An example often cited by interviewees was that of antibiotics where patients can only afford a limited quantity which they purchase from the illegal drug stores and sellers who do not insist that an entire course be purchased and completed, which not only does not effectively treat the infection but also potentially builds antibiotic resistance.

"The driving force says that these, these are dictated more by buying power OK. If the guy can only afford five capsules the woman is gonna sell you five capsules. She's making her money OK? Whereas you know that if you go to a pharmacy they are going to throw to you the whole hoo-hah about having to buy forty capsules and you have to complete the course and don't drink when you are taking this and (laugh) you know. So in our, in our strive to provide the correct regimen, the correct dosages, enough medications with enough information, there's not, not everyone perceives that to be the right thing." Mary.

Extract 10.334

Both illegal drug sellers and licensed community pharmacies, particularly those owned by non-pharmacist owners, were associated with commercially driven and unprofessional practices which did not promote the safe and rational use of medicines. Pharmacists were perceived to lack the autonomy in community pharmacy to practice as ethically and professionally as they would desire, instead being overridden by pressures in the working environment to make profit. In one instance described in Extract 10.37 a pharmacist sold metronidazole to a patient where it may not have been indicated, a behaviour which could be similar to that of illegal drug sellers. John in Extract 10.38 recommended that pharmacists hold shares in the pharmacy business so as to exercise their autonomy.

“People [illegal drug sellers] are just out there to make money. Hence the professional service is not in existence, that area is not yet covered by pharmacists.” Tom.

Extract 10.89

“I think they [pharmacists] have very little influence on their managers to manage their business in a more professional manner unless where a pharmacist owns the pharmacy.”

Michael.

Extract 10.90

“Because yesterday I was in a chemist.... Someone just walked in and said ‘I want metronidazole’ and this boss ‘give metronidazole!’ you see? As a pharmacist or pharmacy technologist you have to stand your ground, you shouldn’t care what your boss thinks, you must practice correctly. The boss is the lay person, his interest is money.” Claire.

Extract 10.37

“You see the pharmacists would like to do the right thing, as in heed the cries of the people. Pharmacists that are working for you know Asian chemists, they want to enforce it you know, work as professionals and then they are told ‘my friend, we have to make money here even if we don’t do this and that’. Yeah a lot of the pharmacists are crying in the private sector. Yes. It’s even, that’s why we need to have a pharmacists have shares or you know, in the business. That way you can see a lot [of] professionalism in that, in the business.” John.

Extract 10.38

There was a reoccurring theme of medicines as potential agents of harm if used inappropriately and if managed by those without the necessary competencies such as illegal drug sellers and

untrained public sector staff. Drivers of unsafe and irrational use of medicines were perceived to be poverty, unethical behaviour, commercial interest and workforce competence (Figure 10.7). Pharmacists were perceived to be associated with preventing unsafe and irrational use of medicines.

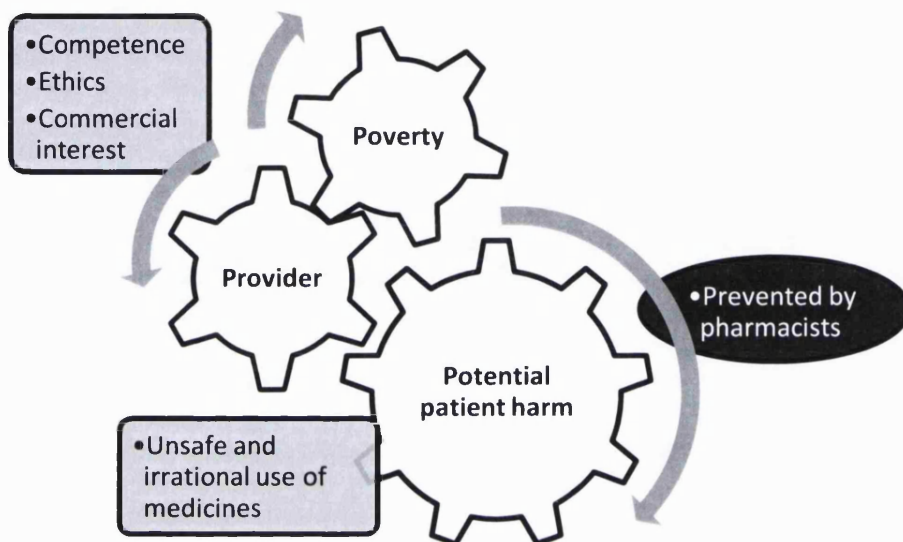


Figure 10.7 Themes associated with unsafe and irrational use of medicines

10.2.3 Counterfeit and substandard medicines

The level of counterfeit medicines and substandard medicines was felt to be high and its prevalence was associated with the lack of regulatory enforcement and limited means through which to appropriately inspect medicines.

“There is too much of fake products, counterfeit medicines, medicines being there without being checked.” Simon.

Extract 10.93

“The other main issue we’d want to be supported in is the establishment of the building for the national control lab. So if we had that it’d be able to assist us maybe handle issues of counterfeit and the like.” Sam.

Extract 10.94

“We also have concerns about drug imports which sometimes can be expired, sub-standard or even counterfeit. We need to have laboratories to inspect these.” Adam.

Extract 10.95

10.3 Analysis

Based on the findings from the descriptive narrative in section 10.2.1, this section explores the formal, illegal and compensatory flows of medicines from suppliers to providers, roles of pharmacists in preventing and mitigating potential harm to patients, and tracks the determinants of key medicines problems in Zambia. Informed by these analyses, a revised conceptual framework for understanding access to medicines is proposed (Figure 10.8).

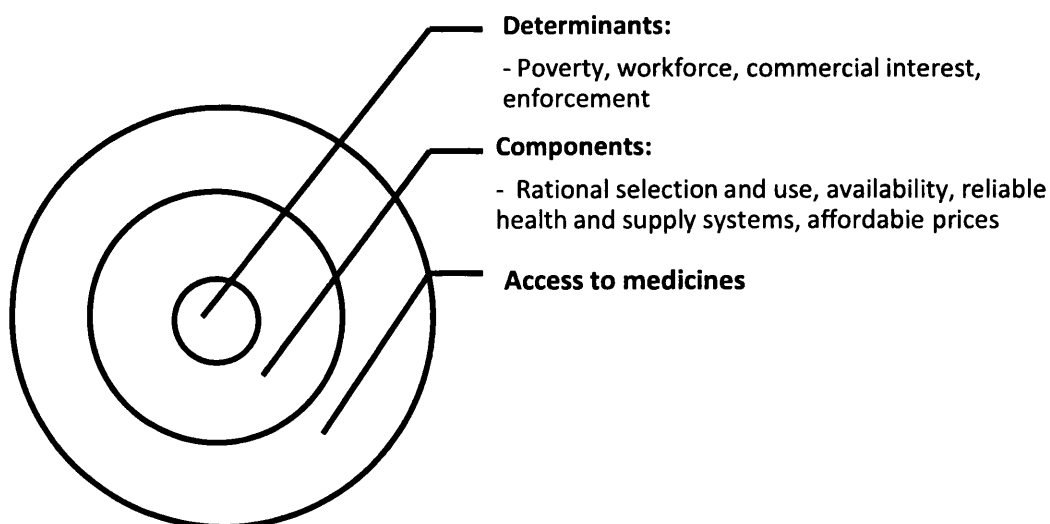


Figure 10.8 Access to medicines conceptual framework - determinants and components

Figure 10.8 incorporates the determinants arising from the analysis into a conceptual framework for access to medicines described in section 10.2.1 (Figure 10.6). Each determinant has the potential to influence one or multiple components in the framework and indicates the need for a holistic rather than piecemeal approach to improve access to medicines.

10.3.1 Formal, compensatory and illegal flows of medicines

The major points of access of medicines (providers) were described in section 10.2.2 and included public sector facilities, private community pharmacies and the informal sector comprising of drug sellers and drug stores. The flows of medicines from suppliers to these providers can be categorised into three types: formal, compensatory and illegal and are described and illustrated with examples in Table 10.1.

Table 10.1 Flows of medicines from suppliers to providers

Description	Examples
Formal Legitimate and planned flows from suppliers to providers.	Procurement from local and multinational drug companies to Medical Stores Ltd and local wholesalers. From local wholesalers to private pharmacies. From Medical Stores Ltd to Provincial facilities.
Compensatory Sourcing of medicines by public providers and patients when medicines are unavailable.	From private pharmacies and drug stores to public facilities. <i>"At times we find ourselves in a situation where you are in a rural area and do require certain medications that you cannot find at a rural health hospital or rural health centre, you find yourself buying from certain illegal outlets."</i> Claire. Extract 10.96
Illegal Illegal flows that are systematic sources of medicines for the informal sector.	Sales of medicines from local wholesalers to drug sellers and drug stores. <i>"But there are unfortunately a good number of wholesalers that are selling drugs like they are selling sweets or pumpkins or whatever, to anybody, to anyone."</i> John. Extract 10.97 Sales of pilfered medicines from public facilities to drug sellers and drug stores. <i>"There is also the problem of pilferage... you find that the supplies that reach the hospitals are stolen and that's what you find on the street."</i> Mary. Extract 10.98

The formal (black arrows), compensatory (red arrows) and illegal (blue dashed arrows) flows of medicines from suppliers to providers are described in Figure .

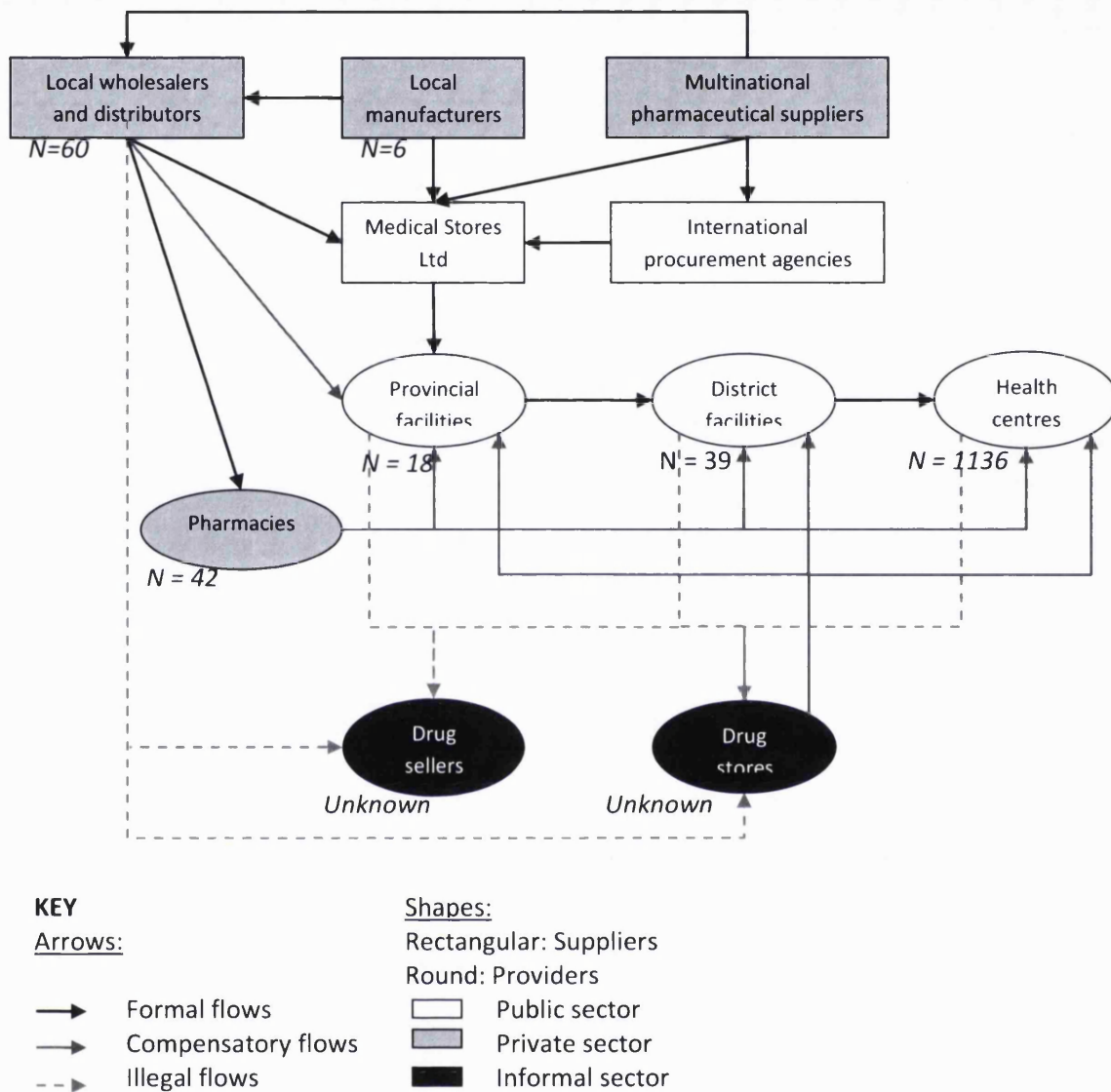


Figure 10.9 Flow of medicines from suppliers to providers

Adapted from Hazemba et al. (6). Data source: Pharmaceutical Regulatory Authority, 2008 and Ministry of Health (178).

The formal flow of medicines in the public sector from procurement to Medical Stores Ltd to healthcare facilities via provincial and district structures was described to be slow, inefficient and poorly managed leading to frequent, unpredictable and prolonged stock outs of medicines

in healthcare facilities. There was no perception of similar problems in the formal flows of medicines from suppliers to providers in the private sector.

Compensatory flows occurred from public sector facilities when dealing with stock outs of medicines where formal flows of medicines from suppliers failed to meet demands. Compensatory flows were also likely to occur when stocks of medicines were depleted through practices such as irrational use of medicines and pilferage. Although medicines from public providers should be free to patients, the common scenario of lack of availability from public providers forces patients to source medicines for use in public facilities such as hospitals through compensatory flows.

The illegal flow of medicines from wholesalers and public sector facilities to the informal sector of drug sellers and drug stores were thought to be recurrent and systematic and formed the mainstay of medicines supply to patients, particularly in rural areas where other options were limited.

10.3.2 Patient improvement versus potential harm - protective roles

The patient trajectory was perceived to be dichotomous with the potential for improvement or harm through the use of medicines. There was a strong perception that potential patient harm was not only one possible trajectory but was the predominant outcome in rural areas where untrained workforce, poor availability of medicines and poverty dominated.

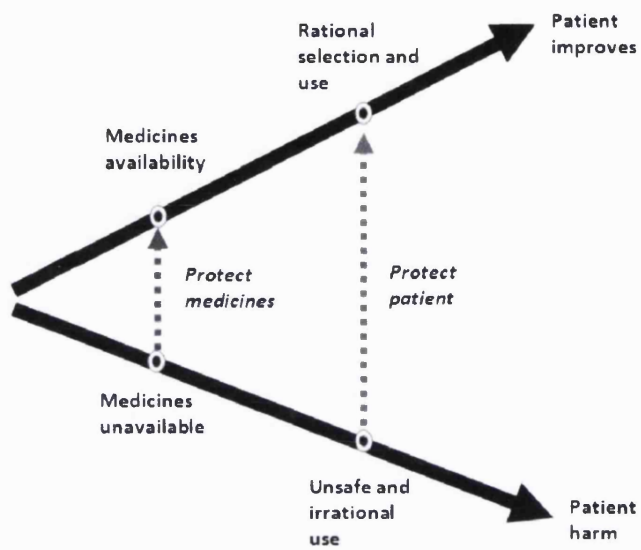


Figure 10.10 Patient trajectories through the use of medicines and pharmacist roles

Figure 10.10 illustrates the protective roles associated with pharmacists and their desire to alter the trajectory to potential patient harm. Their protective roles were directed to the protection of patients (blue arrow) from potential harm arising from medicines use as well as of the medicines themselves (red arrow).

10.3.3 Determinants of problems of medicines access, unsafe and irrational use, and counterfeits.

The underlying causes or determinants of the key medicines problems in Zambia identified in this study could be summarised into the categories of poverty; workforce shortages, competency and ethics; poor enforcement and commercial interest (Table 11.2).

Table 100.2 Determinants of key medicines problems

Determinants	Key medicines problems		
	Poor access	Unsafe and irrational use	Counterfeit and substandard
Poverty	Low purchasing power of patients and government.	Erratic availability of medicines in public sector. Inadequate trained workforce.	Low purchasing power of patients drives sales in informal sector. Demand for medicines in informal sector spurs sales. Inadequate resources for laboratory testing facility.
Workforce shortages	Inadequate workforce to appropriately manage medicines supply chain.	Inadequate workforce to appropriately prescribe and advise on use of medicines.	Inadequate workforce to conduct inspections, assessment and enforcement action.
Workforce competence	Insufficient competence of workforce to procure and manage medicines.	Poor prescribing competencies of trained workers or incompetent and untrained workers prescribing medicines.	Inadequate competence of workforce to undertake enforcement activities.
Workforce ethics	Self-interest of suppliers and providers dominates over responsibility of duty of care to patients.	Unethical sales of medicines dictated by dominant forces such as commercial interest in the work environment.	Principles of non-malevolence and beneficence ignored for potential self-gain.
Commercial interest	Medicines sold to raise revenue.	Sales of medicines dictated by consumer demand and profitability rather than through professional judgement.	Lucrative business given high demand for medicines, lack of enforcement and poor supply chain integrity.
Poor enforcement	Pilferage of medicines in the public sector by health workers leading to depleted stocks.	Poor functionality of Pharmacy and Therapeutics Committees in hospitals, inadequate monitoring of medicines prescribing and use.	No quality control tests or enforcement activities conducted. Unable to control illegal activity.

The poverty of the Zambian public and public sector and thus their low purchasing power, particularly in rural areas was seen to determine an environment (lack of testing equipment and trained human resources), behaviours (sourcing medicines from the informal sector, pilferage) and processes (stop gap procurement) that increased the risk of potential harm and poor access to medicines in the context of growing demand for medicines.

The shortage of trained human resources in each provider group (public, private, informal) was seen as a barrier to improving the access and use of medicines and to effect macro changes in

the processes relating to the medicines supply chain and micro changes in influencing prescribing and medicines taking behaviour.

The protective roles of pharmacists were also seen to be accompanied by their competence, professional incentives and ethics to improve access to medicines and prevent unsafe and irrational use. Deconstructing these workforce characteristics further, it could be seen that those lacking such competency (ie, were not pharmacists) also lacked the professional incentives and ethics to undertake these protective roles. Hence the lack of trained personnel (inadequate competency and workforce shortages) in public sector healthcare facilities was commonly associated with potential harm to patients through unsafe and irrational use of medicines. Given the lack of skilled healthcare workers in rural areas and the dominance of the untrained informal sector, the risk of unsafe and irrational use of medicines was more likely in rural areas. The dominance of the informal sector in rural areas was reinforced by the pilferage of medicines from rural health care centres (unethical behaviour).

An exception to the pharmacist's 'protective role' was described in the private sector, particularly in environments where pharmacists were seen to have limited autonomy to practice as professionally as they would wish to. The ethics of pharmacists in this instance was superseded by the overriding commercial interest of private pharmacies to generate a profit, leading to the behaviours similar to that of the informal sector. Poor regulatory enforcement underpinned poor practices and with illegal activity continuing unchecked, it was presumed that counterfeit medicines had become more common.

10.4 Summary

Zambia has a high disease burden of HIV/AIDS and malaria though recent trends indicate improvement in incidence and mortality. However maternal and child mortality remains high. Providers of healthcare services can be categorised as public, private and informal sectors. The available literature shows that the public sector serves as the main source of antimalarials in contrast with the interview data which extensively described the significance of the informal sector. This was cause of particular concern for interview participants who associated the

informal sector with potential harm due to the perceived lack of provider competence and informal and illegal flows of medicines. Few policies other than the removal of user fees have been implemented in Zambia to improve the access to and rational use of medicines with stock outs and irrational prescribing thought to be common.

Medicines availability was cited to be unpredictable and erratic and was associated with informal and compensatory medicines flows. Potential harm to patients arising from medicines use was perceived to be heightened due to lack of competence of (untrained and/or informal) providers, commercial interest and unethical behaviour. Given the underlying poverty, patients have few choices for treatment but were also faced with practices and advice from medicines providers motivated by commercial interest without adequate regulatory systems for public protection. A reoccurring theme was one which associated pharmacists with a protective role to not only improve the use of medicines but to prevent potential harm. Aside from general issues of availability, there is poor recognition of the public health risk due to the medicines problems of inadequate access, counterfeit and substandard medicines, and irrational use of medicines in Zambia.

Chapter 11 Discussion

11.1 Introduction

The last three decades of healthcare policy making in Zambia have been characterised by public sector reforms, restructuring, diminishing expenditure and increasing constraints on human resource development. With these changes, the Directorate for Pharmaceutical services, referred to by interviewees as the sole authoritative body in the Ministry of Health that exercised its responsibility to ensure access to and rational use of medicines, was disestablished and was restructured as part of the Directorate of Clinical Care and Diagnostics. There was a strong association between this change and the fragmentation of pharmaceutical services and the pharmacy profession.

The literature described the resource constraints and challenges in the recruitment and retention of public sector human resources for health amidst a series of structural adjustment programmes and continuous reform.

This case study sought to explore the key themes of pharmacy workforce shortages, changes in the perception towards pharmacists and pharmaceutical services, characteristics of the pharmacy and medical institutions and their relative powers to influence the policy decision making process against this background. This chapter discusses the findings through key themes that emerged from the analysis and offers a conclusion in answer to the research questions relating to pharmacy workforce issues, pharmacy workforce policy processes and medicines problems.

11.2 Pharmacy workforce – the ‘cherry on the top’

The Human Resources for Health Strategic Plan 2006 – 2010 took a comprehensive set of interventions into consideration, but was narrow in its scope of cadres and did not include a specific strategy for pharmacy workforce development (139). Based on WHO recommended

ratios of physicians and nurses to population, the Plan proposed a near doubling of the health workforce establishment to 49,000. An estimated need for 1238 pharmacy staff (pharmacists and technologists) was stated in 2007, part of a revised proposal for an establishment of more than 51,000 (140). This was an important signal of the Ministry of Health's recognition of the need for pharmacy workforce. Whilst details of the new proposed pharmacy workforce establishment could not be obtained at the time of writing, it contrasted with the strategy proposed in the 2008 Training and Development Plan to reduce the training output of pharmacists to 10 per year (142). Whilst this was not executed, and indeed the training of pharmacists has since continued to expand, it nevertheless flags the constant struggle in the policy arena to formulate and implement policies relating to the pharmaceutical sector in Zambia.

In the context of broader health workforce shortages, pharmacy workforce issues were perceived to be of lesser priority. The roles, development and recognition of the profession were often linked to its workforce size.

11.3 Pharmacy – the invisible profession

Pharmacy workforce needs were also felt to be poorly expressed in policy dialogues with limited understanding of Ministry of Health and the medical profession. The slow and inadequate process of pharmacy workforce development was associated with resource constraints, ambiguously defined roles and blurred professional boundaries (especially with pharmaceutical technologists) and the lack of reliable workforce data. Despite these constraints, and perceptions of slow progress since Zambia's independence in 1964, there was general agreement that the scenario was starting to change with the establishment of local pharmacist training. The recent increase in pharmacist workforce was seen to be the driving force for the expansion of professional roles beyond dispensing. Some felt that there was a gradual change in the perceptions of pharmacists over time, mainly due to the independent efforts of individuals to improve relationships and trust with other professions and healthcare managers.

In countries where pharmacist workforce levels in hospitals are low and mainly distributive in function, enhanced interaction with other professionals may be key in the adoption of more clinical roles. Hospital medical practitioners in Sudan were reported to be significantly more likely to be comfortable with pharmacists advising patients on prescription medicines and suggesting the use of prescription medicines to physicians if they interacted with pharmacists on a weekly basis than those who had less interaction (179).

However one important aspect which had not changed, was the poor visibility of the pharmacy profession as a stakeholder in the policy making process. This seemed to particularly frustrate recent graduates who were cited in one striking example of their political active stance over the Pharmaceutical Act as students. Most interviewees recounted scenarios in which pharmacy stakeholders were left out – either inadvertently or deliberately. This was associated with the unclear nature of the profession, small workforce size, weak voice and poor alignment within the profession. The pharmacy profession was thus relegated as a minor player in the policy making process, and seen to be a profession which was in the early stages of its development rather than well established cadres such as physicians and nurses.

Strategies to strengthen the pharmacy profession's positioning in the policy making process could also be drawn from this analysis of its institutional weaknesses. Improving cohesion and building alliances within the profession are important strategies to strengthen the profession's voice in the policy making process.

11.4 Threat to power

Despite the medical profession's monopoly on the domestic policy making process and resistance to particular policies, implementation was found to be modulated by donor agencies through the leverage of resources in Chapter 8. Given the lack of clarity around the professional roles of pharmacists and pharmacy technologists and opacity of medicines problems, the Ministry of Health's views on the need for pharmacy workforce is unlikely to change unless reliable evidence is available to convince stakeholders and strong pressure and the necessary resources are applied from donor agencies. Although Zambia has adopted a decentralised

governance schema in the health sector, it still retains a highly centralised form of decision making with donor dependency and frequent changeover in political power that stagnates the policy process - similar to the policy environment observed in Pakistan by Khan and Van den Heuvel (2007),(180). Khan and Van den Heuvel recommended wider participation of civil society, professional organisations and other actors together with the institution of measures that build accountability, approaches which may yield the emergence of more transparent policy making processes in Zambia (180).

Chapter 9 describes the analysis of patterns in the data relating to decision making and implementation on pharmaceutical policies in Zambia. Access to medicines was often seen to be an issue of high politics which frequently held centre stage in the political arena. This was ascribed to groups associated with controlling pharmaceuticals a correspondingly high level of status and power, a position which was seen to be held by the medical profession, a dominant force in policy making. Attempts to reform or influence changes in the pharmaceutical sector were identified to be frequently met with resistance. The negligence of, and barriers towards pharmacy workforce development is thus partly a response to the perceived attempt to encroach on the medical profession's boundaries. In analysing various pharmaceutical policies and their status of implementation, the perceived threat to power was found to be central in the decision making tree (Figure 9.1).

Strategies to address decision making blockages were also identified – such as reframing the perceived threat, shifting proposals outside the sphere of the Ministry of Health's influence, demonstrating cost savings and convincing stakeholders (Section 9.4.2). Whilst the decision making points described in the analysis in Section 9.4.1 have been conceptually derived through the grounded theory approach, they may not be actual decision making points in the policy making process. For example, it is unlikely that the question of whether a particular policy can be implemented outside of the Ministry of Health will arise. Thus the strategies identified in Section 9.4.2 to recourse policy development in favour of implementation, should be seen as strategic elements of a policy development and implementation plan rather than interventions at concrete decision making points in the policy process.

11.5 Pharmacy workforce gaps – loopholes for potential harm

Chapter 10 describes how the significant shortage of pharmacy workforce was perceived to affect the health system's capacity to effectively regulate and manage the supply chain. The consequences of such gaps were cited as the perpetuation of medicines problems such as poor access, unsafe and irrational use, and counterfeit and substandard medicines.

Medicines availability was found to be dependent on the flows of medicines from wholesaler to provider, via formal, compensatory or informal channels. Poverty was also identified to be a core determinant of access to medicines problems, reinforcing trends such as pilferage of medicines from the public sector. Other determinants influencing the access to and rational use of medicines were unethical behaviour, commercial interest and workforce competency of providers. Pharmacists were associated with the mitigation of medicines related harm by adopting protective roles directed towards medicines (preserving drug efficacy and access) and the patient (optimising outcomes and preventing harm).

11.6 Access to medicines framework – contextualising pharmacy workforce issues

An access to medicines conceptual framework should not only take into consideration the components of rational selection and use, availability, reliable health and supply systems and affordable prices, but also the determinants of medicines problems as described in section 11.4.

An access framework proposed by Frost and Reich (2008) suggested four elements or 'four A's' including:

- architecture (organisational structure) to support delivery and coordination of health technologies;
- availability of health technologies through effective logistics to ensure reliable supply;
- affordability of health technologies to the end user and purchasers (such as governments); and

- adoption of health technologies at all levels to generate demand and support appropriate use (181).

Architecture is required to support the latter three across the value chain - from the manufacturer to the suppliers, from government purchasers to the end user and adoption from global to local levels (Figure 11.1). Such organisational structure for availability, affordability and adoption is necessary in order to ensure access to health technologies. It is within this element that the issue of health workforce is located. This is not to say that the other elements are not as equally important, but rather that access to medicines depends on the strength of the architecture, and thus in part, the human resources capacity.

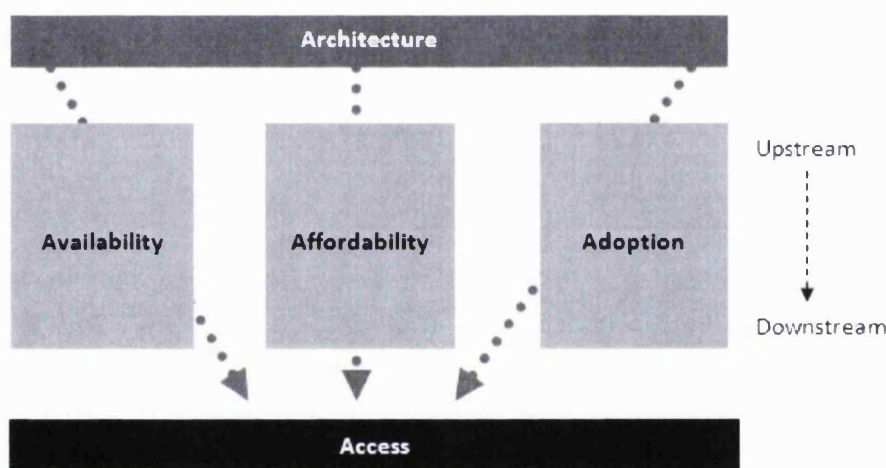


Figure 11.1 Access to health technologies framework, Frost and Reich (2008)

Adapted from Frost and Reich (2008) (181).

These four elements mesh well with the components of the access to medicines framework described in the Zambia case study and seem to validate the components derived from this research through the grounded theory approach (Table 11.1) The component on the rational selection and use of medicines described in Chapter 10 is narrow in comparison to the adoption element. The latter encompasses the notion of generating demand and acceptance at each level. The issue of demand generation and acceptance with respect to access to medicines did

not arise in the Zambia case study, though these are important mechanisms for the diffusion of innovation.

Table 11.1 Comparison of thematic components of access to medicines frameworks

Zambia case study	Frost and Reich (2008)(181)
Reliable health and supply systems	Architecture
Availability	Availability
Affordable prices	Affordability
Rational selection and use	Adoption

Whilst the themes may be similar, the difference is in the intent of the frameworks. Frost and Reich’s framework (2008) seeks to “present an analytical framework for understanding the multiple processes that limit and facilitate access and the particular actors who influence the production of access” (181). The need for deeper understanding of barriers, enablers and key actors involved in these processes is also described by Frost and Reich. Their framework attempts to cater to this by focusing on identifying and making recommendations on processes and “activity streams” which are seen to take place concurrently (181).

The framework proposed in this case study aims to identify key conceptual components of access to medicines and underlying determinants that influence these components. The determinants of medicines problems in Zambia such as poverty, workforce shortages, competence and ethics, commercial interest and enforcement highlight potential barriers to access to medicines.

The classification of workforce themes as a determinant also supports the placement of architecture as an underlying organisational theme in the access framework proposed by Frost and Reich. In juxtaposing the determinants identified in this case study on Frost and Reich’s access framework, a clearer interpretation of barriers and enablers can be synthesised which adds value and is complementary to the process recommendations described by the authors (Figure 11.2)

Figure 11.2 illustrates the way in which the determinants of medicines problems interact with different components of the framework to affect the functionality of activity streams. For

example, the combination of poor enforcement and commercial interest (pale yellow) affects all components within the framework and may particularly serve as a barrier to the effective processes of availability, affordability and adoption. Workforce shortages, ethics and competency (blue) is a constraint to the ability of the organisational structures (architecture) to coordinate and respond to needs in the other activity streams. Poverty curtails the ability of the end user to access and utilise medicines (red).

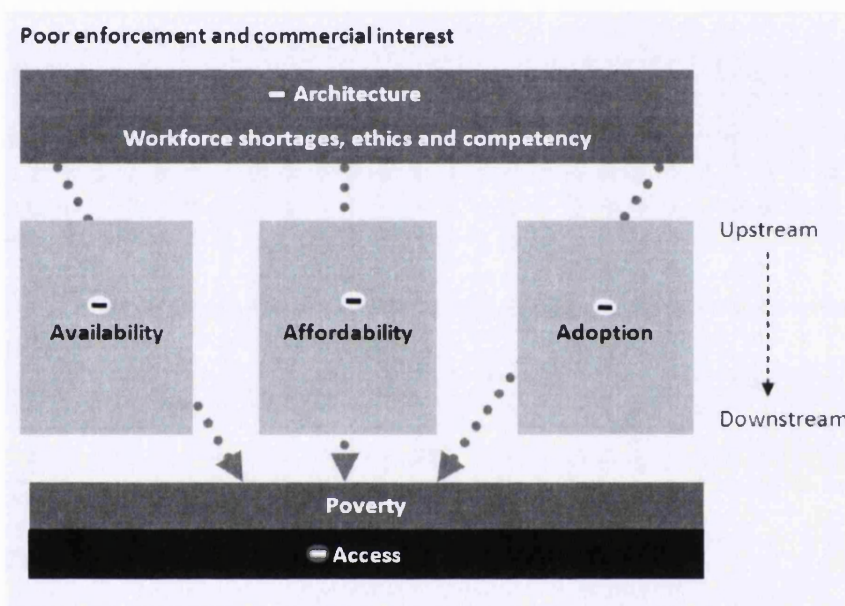


Figure 11.2 Revised access to health technologies framework

This case study can build further on Frost and Reich’s framework on access to health technologies with the addition of barriers to access to medicines, particularly as the underlying components of access to medicines are largely thematically equivalent. The revised framework proposed in Figure 11.2 contextualises pharmacy workforce issues in relation to processes or activity streams and mechanisms required to enable access to medicines.

11.7 Conclusion

Two decades of major structural adjustment programmes accompanied by public sector reforms, reduction in personnel emolument and recruitment freezes have impeded the development of human resources for health in Zambia. Whilst the current policy environment has become more favourable with the adoption of the HRH-SP 2006 – 2010 and approval of the new establishment list for the health sector, the health policy making process has been dominated by institutions such as the medical profession that were able to remain united and maintain their stronghold. The policy making process was described to be biased towards the medical profession's self interest and resistant to policy that in any way curbed the profession's sphere of influence or were perceived to be a threat to their power. Only parliament and donor agencies were seen to be able to influence or override decisions tending to inaction due to perceived threat to power by policy makers.

The likely future scenario in pharmacy workforce development is for slow and incremental shifts in attitudes and recognition of pharmacy workforce needs amongst stakeholders such as the medical profession and donor agencies. Experiences of changes in attitudes towards the pharmacy profession were associated with demonstrated outcomes, and the development of interpersonal relationships and trust.

The pharmacist workforce in Zambia has doubled since 2005 and much of the workforce is young, recently graduated and inexperienced. Although the workforce size is likely to increase the voice of the profession in the decision making process, the status of the profession may only change with the corresponding maturation and retention of the workforce.

This scenario of potential harm resulting from the lack of availability and irrational and unsafe use of medicines is unlikely change unless there is evidence and broad stakeholder awareness of these issues. Pharmacy workforce is not just a human resource development or health systems issue, but is part of a complex construct symptomatic of the collapse of a health system where the power of strong institutions dominate the policy making process, which in turn steered by self-interest.

Part IV Conclusions

This part of the thesis draws together Part II and Part III to discuss limitations, methodological considerations and recommendations for future research work. It summarises the final conclusions of this research and discusses the implications of the findings on pharmacy workforce policy development with respect to the research questions.

Chapter 12 Conclusions

12.1 Introduction

The purpose of this doctoral work was to explore the following research questions:

1. What are the factors that influence the migration intentions of final year pharmacy students?
2. What is the relationship between factors influencing migration intentions of final year pharmacy students?
3. How do the attitudes of final year pharmacy students differ between those who plan short-term migration, long-term migration and those who do not plan to migrate?
4. What are the key pharmacy workforce issues in Zambia and what strategies are needed to build workforce capacity?
5. What are the pharmaceutical and pharmacy workforce policy development and implementation processes and experiences in Zambia and what role does the pharmacy profession play?
6. What if any, are the linkages between medicines problems and the status of pharmacy workforce development?

A two pronged approach was applied to address these questions, firstly by means of an international quantitative study of migration intentions and secondly, through an in-depth qualitative case study of pharmacy workforce development in Zambia.

The first is a quantitative global questionnaire based study that seeks to identify how much and why pharmacy students intend to migrate; whilst the subsequent qualitative case study aimed to explore these underlying factors in greater depth and conceptualise the workforce development process in Zambia.

These two research angles are interconnected by an empirical thread passing through the lens of an individual (migration intentions) to that of a society (Zambia case study), that seeks to explore underlying factors and institutions, and their interaction with decision making processes to shape pharmacy workforce development. It proposes a multidimensional understanding of the intention to migrate which takes into account the relationships between influencing factors and proposes pragmatic policy options to strengthen domestic workforce. Whilst quantitative multi-country studies enabled an analysis of factors and their relationships, there was a need to identify the conceptual components of pharmacy workforce development in more depth. The qualitative component of this research in the form of a case study on Zambia, uncovered the institutions, processes and outcomes of pharmacy workforce development which have not been previously explored in the literature.

The migration intentions study was the first international attempt to identify underlying factors influencing migration and investigate the migratory intentions of pharmacy students (research questions 1 – 3) (74). What began as a journey to understand migration unexpectedly evolved into a foray of socio-political context and attitudes towards professional practice; leading to the identification of largely 'home grown' factors rather than 'pull factors' induced externally as an important determinants of retention. In framing migration as a form of attrition, this research took on a different path, to explore the in depth issues for sustainable workforce development (research questions 4 - 6). This lead to the Zambia country case study and an exploration of issues that nested health workforce development not as a technical issue, but part of a more complex construct of a health system greatly influenced by external actors (such as international donors) and triggered by incentives (such as funding) rather than actual needs. This research offers some technical policy advice but also, more meaningfully, explains why the critical workforce situation is present in Zambia and how the status quo is reinforced through the collective actions of various groups in the policy process at the expense of patients.

12.2 Limitations

Respondents to the migration intentions study may be self-selected in that those intending to migrate were possibly more likely to complete the questionnaire. This effect is likely to be more significant in Portugal and Slovenia given the lower response compared to other countries. Data from Egypt may not be representative as it was collected at a students' forum rather than from specific participating universities as was the case in other countries. Furthermore, the response rate for Bangladesh was unknown. However, the response rate in general was high and the sample size exceeded the minimum requirement in order to achieve the necessary power for the study. Whilst a study of migration intentions is likely to overestimate planned migration, it sheds light on the extent to which the intention to migrate exists and factors influencing these intentions. Future research should recruit specific universities to take part in the study and ensure that the instructions to national research and local research coordinators clearly indicates the need to record the number of questionnaires distributed as well as completed in order to ascertain the response rate. This study was also only conducted in English and future studies should aim to include other major languages in order to expand the study.

The limitation of the Zambia country case study is mainly due its country specific nature, however the findings in this case study could be generalised to other settings, particularly in countries where similar dynamics in the institutions, workforce shortages, socio-political and economic environments and medicines problems exist. Whilst some elements of the conceptual model developed in this study could be generically applied, they are likely to be quite different outside developing country contexts, for example where there are significantly different environments, resources, and history of the pharmacy profession's development and roles.

Another limitation in this study was the lack of formal ethical review and approval as part of the research planning process. Given the sensitive nature of data and serious concerns of protecting anonymity, particularly in a study outside of the United Kingdom, the lack of a formal process within the School of Pharmacy, University of London at the time to undertake an ethical review of this research proposal, posed an ethical problem in itself. Although steps were taken to ensure an ethical research design and approach, such as review by supervisors, advisors and

country level collaborators in Zambia, these were nevertheless informal processes which were not part of a formal ethical review framework.

12.3 Research methods

In the migration intentions study (research questions 1 – 3), responses were gathered from 791 final year pharmacy students from nine countries: Australia, Bangladesh, Croatia, Egypt, Portugal, Nepal, Singapore, Slovenia, and Zimbabwe. Data were analysed using principal components analysis (PCA) and two-step cluster analysis to determine the relationship between factors influencing migration and the characteristics of sub-populations that were the most likely to and least likely to migrate (research questions 1 and 2).

Multiple regression analysis is one potential way in which to identify the extent to which factors influence migration intentions. However in this study, migration intentions were expressed as categorical rather than continuous data. The revised questionnaire design asks for the number of years that the individual wishes to spend abroad. Such continuous data could be used in multiple regression analysis in the future. There is also need for further work to develop a conceptual framework that summarises the factors influencing migration that is informed by migration theories and the findings from the pilot and follow up migration intention study.

As part of post-doctoral research activity, data collection has been completed with the revised questionnaire for the principal study on migration intentions in 12 countries. Data cleaning and validation is currently underway in preparation for analysis. This new study aims to further explore the complex dynamics and relationships between factors, gender, countries of intended migration, linguistic and migrant network ties and return migration. The country-specific policy context will also be examined to explore the association between attitudes of practitioners, the policy environment and policy options to strengthen the workforce.

The methodological approach, methods, case selection and sampling that formed the Zambia country case study were appropriate to the research questions, theoretically informed and lead to the synthesis of a conceptual model of pharmacy workforce development. The development of this conceptual model enabled an understanding of the complex structure, processes and

outcomes related to this central category (research questions 4 – 6). The analytical techniques described were useful in developing skills in qualitative research and enabled a comprehensive analysis of the data which lead to unanticipated insights.

In this study, coding was commenced after interview data had been collected, mainly due to time constraints which did not permit transcribing the audio recordings during the data collection period. However, ideally it would be best to transcribe and code the interviews during the data collection process such that sampling could be further theoretically informed in order to saturate the data by comparing the properties and dimensions of theoretical concepts as described by Straus (1998) (150). This would be particularly useful in exploring data where the properties are not as explicit from the interview itself, and thus could potentially guide further sampling that would assist to uncover latent properties of interest or to clarify properties of emergent themes.

12.4 Key findings and implications for policy and practice

This section describes the key findings of this research and the implications for pharmacy workforce development policy. These are summarised with respect to the relevant research questions in Table 12.1.

Table 12.1 Key findings and implications for policy

Key findings		Implications for policy and practice
1	What are the factors that influence the migration intentions of final year pharmacy students?	
	<ul style="list-style-type: none"> • Attitudes towards home country practice and professional environment (factor 1) • Perception of opportunities to develop career and finances abroad (factor 2) • Attitudes towards home country social and political environment (factor 3) • Gender • Knowledge of other pharmacists from home country that have migrated abroad • Past experience abroad 	<ul style="list-style-type: none"> • Interventions to improve the practice and professional environment, career and salaries, and social and political environment in the home country may have significant influence on the pharmacist intentions to migrate • Migration should be considered a form of attrition • Need for gender sensitive workforce policies to retain female demographic

Key findings		Implications for policy and practice
2	What is the relationship between factors influencing migration intentions of final year pharmacy students?	
<ul style="list-style-type: none"> Factors 1, 2 and 3 are independent factors that influence migration intentions The factors identified in the literature are interlinked and cannot be assumed to be independent, for example the perception of opportunities to develop professionally and finances are interlinked 	<ul style="list-style-type: none"> Retention strategies should incorporate elements that comprehensively address push factors (ie – both professional development and finances), rather than pursuing either in isolation 	
3	How do the attitudes of final year pharmacy students differ between those who plan short-term migration, long-term migration and those who do not plan to migrate?	
<ul style="list-style-type: none"> No difference in attitudes between those planning short-term migration and those who do not intend to migrate Significant difference between those planning long-term migration and those who do not plan to migrate 	<ul style="list-style-type: none"> Retention strategies may have limited impact on those planning long-term migration Retention strategies should be targeted towards those planning short-term migration 	
4	What are the key pharmacy workforce issues in Zambia and what strategies are needed to build workforce capacity?	
<ul style="list-style-type: none"> Poorly expressed and defined pharmacy workforce needs Ambiguous distinction between the roles of pharmacists and other pharmaceutical cadres Pharmacy profession seen as a minor player in the policy making process and were not positioned to advocate for required policies Pharmacy profession needs to be strengthened in order to engage with policy development 	<ul style="list-style-type: none"> Need for improved cohesion within the pharmacy profession Need for robust pharmaceutical workforce human resource planning based on assessed needs (evidence) 	
5	What are the pharmaceutical and pharmacy workforce policy development and implementation processes and experiences in Zambia and what role does the pharmacy profession play?	
<ul style="list-style-type: none"> Decision making in the policy making process centres around the consideration of threat to power Pharmaceutical policies are frequently met with resistance and often only implemented if they are not perceived as a threat to power and there is an absence of financial constraints 	<ul style="list-style-type: none"> Reframing the perceived threat, shifting proposals outside the Ministry of Health's influence, demonstrating cost savings and convincing stakeholders may counter tendency for policy rejection or inaction 	
6	What if any, are the linkages between medicines problems and the status of pharmacy workforce development?	
<ul style="list-style-type: none"> Pharmacy workforce shortages associated with greater perceived harm arising from medicines problems Pharmacists perceived to adopt protective roles directed towards medicines (ensuring efficacy and safety) and patients (improving outcomes and minimising harm) 	<ul style="list-style-type: none"> Pharmacy workforce development may strengthen the architecture through which health technologies are delivered 	

The results of the migration intentions study showed a significant difference in attitudes towards the professional and socio-political environment of the home country and perception of opportunities abroad between those that have no intention to migrate and those who intend to migrate on either a short or long-term basis (research questions 1 - 3). These attitudes, together with gender, knowledge of other migrant pharmacists and past experiences abroad may drive the intention to migrate (research question 1).

Given the influence of the country context and environment on migration intentions, research and policy should frame the issue of migration in the context of the human resource agenda, thus viewing migration as a form of attrition and hence symptomatic of wider professional, economic, pharmacy practice and socio-political challenges. Strategies to retain pharmacists should address professional development and financial incentives rather than stand-alone efforts in either. Retention strategies are unlikely to have any influence over the sub-group that intend to migrate on a long-term basis. Females are least likely to migrate and this is especially important to note in the context of the growing female proportion of the workforce observed in most countries, in order to maximise the opportunity of their stronger intention to stay, human resource policies should be gender sensitive to ensure flexible work arrangements (eg - possibilities of working part-time).

Frameworks used to develop policies and research on access to medicines should ensure that the issue of pharmacy workforce is contextualised rather than ignored. The pharmacy workforce constitutes an important element of the architecture necessary to operate the supply chain from manufacturer to end user.

Whilst pharmacists in Zambia may perceive themselves as a marginalised group in the health sector, this occurs not as a deliberate action but as a symptom of manifested flaws in a decision making process with severe resource constraints, limited options, great responsibility, complacency and learned behaviour that responds only when absolutely necessary. However an increase in the pharmacy workforce is seen to be necessary in order to mitigate medicines problems and optimise rational use of medicines in Zambia. Whilst it seems that recognition of the need to invest in the pharmacy workforce has been recently achieved in the Ministry of Health, it is crucial that the expansion of the pharmacy workforce is also accompanied by a strengthening of the pharmacy profession to address major weaknesses such that it can adopt an influential role in the policy process. The profession should be building greater cohesion, developing a more coherent professional identity and generating public awareness and support; it should also be perceived to be championing developments in the pharmaceutical sector to protect and serve the interests of the public. Strategic approaches may also need to be undertaken to counteract policy inaction by reframing potential threats to power, convincing decision makers and demonstrating cost savings as a result of policy intervention.

12.5 Future research - the policy making environment

Convincing stakeholders who influence decision making was identified in Chapter 10 as one important strategy to shift the policy process in favour of implementation. An important instrument with which to convince stakeholders, such as donors or parliamentarians, is evidence. Evidence for pharmaceutical and workforce policy development was seen by many interviewees in the Zambia case study to be largely absent. Although the critical role of evidence in the policy process cannot be denied, it is not the only factor. In the case of Ghana, power asymmetries in the policy making process created unchallenged imbalances between dominant and weak political actors in the process of the development and implementation of the Ghana National Health Insurance scheme (182). Thus evidence presented by technical analysts from the weaker side had limited political leverage to effect policy shifts (182).

Daniels and Sabin (2002) describe four conditions required of a fair priority setting process (cited in (183)). These include relevance (decisions based on relevant reasons), publicity (to promote transparency and accessibility of decisions and rationale behind them), revision and appeals (in order to provide opportunities to review and resolve disagreements), and enforcement (a regulatory framework to ensure all conditions are met in the process) (Daniels and Sabin, 2002, cited in (183)). Gibson et al (2005) after observing institutional power differences in the priority setting process of a Toronto hospital, defined this as when "some individuals and groups are better positioned than others to influence priority setting outcome", concluded that empowerment be an additional condition of fair priority setting (183). Empowerment is necessary in order to reduce power differences between actors and improve the participation of weaker actors in the priority setting process (183). Empowerment of the pharmacy profession to engage in the priority setting process of human resources for health policy requires greater understanding of the policy making process in order to inform strategic approaches.

Whilst evidence on pharmacy workforce was identified by opinion leaders in the Zambia case study as a key factor to policy development, a comprehensive understanding of the policy processes and its political context of reform is also warranted in order to develop strategies to

facilitate policy development and strengthen engagement of the pharmacy profession or its positioning in the policy process.

One potentially valuable analytical approach for future research is the identification and analysis of veto points, a concept proposed by Pressman and Wildavsky (1973) (184). It describes critical points in the policy process where certain actors can influence policy. Future research on pharmacy workforce development may find that the construction of a research inquiry and analysis specifically on veto points in the policy process to be of particular value to inform future strategic policy development. Atkinson (1997) in her analysis of the implementation of health reforms in Lusaka, Zambia, proposes that veto points can provide a useful investigative angle for comparative analysis of the policy process between countries (185). Using veto points combined with the three forms of power as described in Section 9.2.2 – overt, covert and latent - Atkinson constructed a framework with which to explore the influence and perceptions of different stakeholders in the reform process (185).

Veto points in health policy has also been described by Immergut (1990) in an analysis of medical association lobby groups in Switzerland, France and Sweden (186). This concept has not been applied to human resources for health policy development but provides a valuable analytical framework, particularly for comparative work. Patterns in the decision making process could be explored in a more targeted way to what has been applied in this thesis in applying the grounded theory approach, to specifically analyse such key decision making points. It may also be of interest to compare findings to what has been presented in the Zambia case to ascertain similarities and differences in the decision making points or veto points, and thus develop better understanding of the political influences on pharmacy workforce development.

In reviewing the literature on incremental policy development to draw parallels with the Zambia case study in this thesis, path dependency theory emerged as a potentially useful framework with which to further explore issues relating to pharmacy workforce development. Path dependency theory has its roots in the field of economic history where it is described by Wilsford (1994) as “the interaction of state-dependent individual decision making in a decentralised decision making network that leads to a path-dependent collective decision outcomes” (187). The instrumental work of David (1985, 1989 cited in (187)) showed that this does not presume a deterministic sequence of development but can instead establish new paths

under a particular set of conditions. Such conditions may include technological advancements, political reform, and crisis situations (187). In applying the path dependency model to explaining healthcare reform, Wilsford (1994), states that “It is the combination of path-dependent limits along with occasional windows of exceptional opportunity, or conjectures, that determine the ways small or big that a political system responds to policy imperatives” (187).

The purpose of this conclusion is not to apply path dependency theory to the findings but rather to identify path dependency as a potential theoretical avenue for future pharmacy workforce research. A crude attempt at this for illustrative purposes might interpret the Zambia case study in a similar way to what has been described in Part III, however path dependency theory may assist to identify institutions, policies and processes which have been shaped or locked into a particular direction by past decisions. The analysis presented in Part III lead to the conclusion that future pharmacy workforce development was likely to be incremental with little change to the status quo – an estimation which has not held true over more recent times where the pharmacy workforce situation has changed dramatically. News from Zambia was received at the time of writing of a scandal involving various senior Ministry of Health officials for money laundering from the public sector to the tune of millions of US dollars and the reversal of the decision to reduce the output of pharmacists and to substantially increase the number of pharmacists in the public sector over the next few years – significant developments which may be more than coincidence. This scandal (a political crisis) may have formed a unique set of circumstances and pressures which challenged the authority of the dominating forces influencing policy decisions at the Ministry of Health.

Path dependency may afford future research an explanatory perspective with which to understand the mechanisms and events which have defined current and will likely define future trajectories in workforce development (188). Such an exploratory approach should be aware of certain caveats inherent in path dependency theory such as the tendency for reductionist and simplistic description and emphasis on the status quo rather than change (188). It may provide valuable insights into possible conjectures or combinations of factors, interests and pressures which could provide an opportunity establish new pathways.

12.6 Conclusions

There is a significant difference in attitudes towards the professional and socio-political environment of the home country and perceptions of opportunities abroad between those who have no intention to migrate and those who intend to migrate on a long-term basis. The attitudes of students planning short-term migration were not significantly different from those of students who did not intend to migrate. These attitudes, together with gender, knowledge of migrant networks and past experiences abroad, are associated with an increased propensity to migrate. The economic motivation for migration is not an independent factor in itself. This research, together with other emerging evidence and policy papers, suggests that the migration of health professionals is neither the cause nor the solution to the human resource for health crisis (83;89). Given that the country context is crucial in determining these attitudes and thus migration intentions, research and policy should approach migration as a form of workforce attrition, rather than as a stand-alone phenomenon, and view migration as a symptom of other root causes.

In Zambia, the 'invisible profession' of pharmacy lacks influence on the policy process although an increase in the pharmacy workforce is seen to be necessary in order to mitigate medicines problems and optimise rational use of medicines in Zambia. The Zambian health system is a diverse and fragmented collection of actors acting mostly in isolation, making do, occasionally undertaking strategic actions and sometimes succeeding. The future health of the Zambian public rests in the ability of the Ministry of Health to make linkages and restore a systematic structure which responds to the dynamic needs of patients, rather than the pressures of donors.

Further research on migration intentions should seek to validate findings and further explore the factors that influence migration, recruitment and retention in pharmacy roles, particularly with regard to rural and remote areas. Although new evidence on the nature of pharmacy workforce issues would be of value, greater understanding of the policy environment in which decision-making on pharmacy workforce planning and development takes place, would yield valuable insight that could be used to inform policy development strategies.

Pharmaceutical human resources development is contingent upon addressing barriers in the policy making process and influencing the attitudes of practitioners towards their perceived professional practice and status, socio-political environment and opportunities to develop career and resources.

Pharmacy workforce development is part of a complex construct interlinked to the policy making process and is vulnerable to policy neglect unless strategies are otherwise adopted to strengthen pharmacy's positioning in the policy environment.

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Appendices

Appendix 1 Abbreviations

ART	Antiretroviral therapy
ARV	Antiretroviral
CBOH	Central Board of Health (Zambia)
CDE	Classified Daily Employee (Zambia)
FIP	International Pharmaceutical Federation
GHWA	Global Health Workforce Alliance
HRMIS	Human Resources Management Information System (Zambia)
HRH-SP	Human Resources for Health Strategic Plan 2006-2010 (Zambia)
IOM	International Organization for Migration
IPSF	International Pharmaceutical Students' Federation
MSL	Medical Stores Limited Zambia
OECD	Organization for Economic Cooperation and Development
PCA	Principal Components Analysis
PE	Personnel emolument (staff establishment list)
PTC	Pharmacy and Therapeutic Committee
RDT	Rapid Diagnostic Test (for malaria)
SHPA	Society of Hospital Pharmacists of Australia
SWAp	Sector Wide Approach
UK	United Kingdom
USA	United States of America
WHO	World Health Organization
ZHWRS	Zambian Health Worker Retention Scheme
ZNF	Zambian National Formulary

Appendix 2 Glossary

Attrition: The process of an individual leaving their place of study, employment, sector or labour market.

Cadre: Denotes a specific skilled labour group or profession, e.g. pharmacists, pharmacy technicians, nurses, physicians.

Competencies: The knowledge, skills, behaviours and attitudes that an individual accumulates, develops, and acquires through education, training, and work experience.

Destination country: The country which a migrant has changed residence to. Also known as a receiving country.

Emigration: The process of leaving one's country of residence for the purpose of changing residence.

Immigration: The process of arriving in a country for the purpose of taking residence.

Long-term migration: Two years and more.

Migrant: An individual who changes their country of residence.

Performance: Effective and persistent behaviour.

Pull system: Supply chain driven by demand (orders and consumption)

Push system: Supply chain driven by forecasts of demand

Retention: The process of retaining an individual in their place of employment, sector or labour market.

Return migration: Migration of an individual back to their country of origin, home country or former residence.

Source country: The country which a migrant has changed residence from. Also known as the 'sending country'.

Short-term migration: Two years and less.

Appendix 3 Migration intentions questionnaire

Emerging Pharmacists and Their Intention to Migrate

An International Pharmaceutical Students' Federation (IPSF) Collaborative Research Study

Supported by the International Pharmaceutical Federation (FIP)

Instructions:

Thank you for agreeing to complete this questionnaire. Please answer all the questions in full. If you need any more information about the study please feel free to ask your local research coordinator. Please hand the completed questionnaire to the research coordinator when you have finished.

This is an anonymous and confidential questionnaire. You will not be identifiable and individual responses will not be published.

Thank you for your time.

SECTION A

What is your age?

What is your gender?

- Male
 Female

What nationality are you?

.....

What is your country of residence?

.....

What is your country of birth?

.....

Which languages do you speak?

.....

What is your marital status?

.....

What is your spouse/partner's occupation?

.....

How many children or dependants do you have?

At which university are you currently studying?

.....

What year of study are you in?

What motivated you to study pharmacy?

Please state.....

SECTION B

1. Do you plan to work as a pharmacist in another country within the next five years?

- Yes
- No

If 'Yes', please go to Question 2.

If 'No', please go to Question 5.

2. Which country or countries would you most like to move to and why?

Please state

3. How long do you plan to live in a different country for?

- Less than two years
- More than two years

4. Do you have valuable connections or relationships to facilitate your migration to those countries?

- Yes
- No

If yes, tick those which apply:

- Family
- Friends
- Partner/Spouse
- Employer
- Recruitment Agency
- Other (please state).....

5. Do you know of a pharmacist who has moved to a different country?

- Yes
- No

6. Have you had previous pharmacy practice experience in another country?

- Yes
- No

If yes, was it (please tick):

- academic/student experience?
- paid employment?
- unpaid employment?
- other? (Please state).....

7. How much has this experience influenced your future plans?

- Not at all
- A bit
- Quite a lot
- Very much

8. Summarise what would make you want to work in another country:

.....

9. Summarise what would make you want to stay in your country:

.....

10. Rank the following in order of importance in your life (from 1 through to 6, with 1 being the most important and 6 being the least important):

- Family (providing for your family and their needs)
- Money (salary)
- Experience (job and life experience)
- Stability (job security)
- Ambitions (own expectations and needs in career)
- Lifestyle (quality of life and living environment)

SECTION C

	<i>Strongly disagree</i>	<i>Disagree</i>	<i>Neither disagree nor agree</i>	<i>Agree</i>	<i>Strongly agree</i>
I could earn a better salary in a different country.					
There are good opportunities to do research in my country.					
Pharmacy is a well respected profession in my country.					
I am satisfied with the standard of pharmacy education I received in the country where I studied.					
I believe that the healthcare resources are better in other countries.					
I think I would have better career opportunities in other countries.					
I feel that the practice of pharmacy is supported by health policies in my country.					
There are significant barriers between other health professionals and pharmacists in my country.					
I feel that my practice of pharmacy is restricted by my culture.					
There is a sufficient range of courses in postgraduate studies to specialise in my area of interest within pharmacy.					
Where I live, pharmacists are able to engage in continuous professional development.					
I feel that the political situation in my country is limiting my practice.					
I feel that there are insufficient opportunities in my country to keep learning.					
There is an active professional pharmacy association in my country.					
I feel that my religion would be better accepted in another country.					
I feel dissatisfied with the health system in my country.					
I think pharmacists in other countries have a more desirable professional role.					
In general, patients trust pharmacists.					
I am interested in moving to another country in order to experience a different culture.					
Pharmacy has a positive healthcare image in my country.					

*Thank you for taking the time to complete this questionnaire.
Please hand your completed questionnaire to the research coordinator.*

Appendix 4 Revised migration intentions questionnaire

Background:

An International Pharmaceutical Students' Federation (IPSF) Collaborative Research Initiative

Supported by the International Pharmaceutical Federation (FIP) and School of Pharmacy, University of London

The purpose of this questionnaire study is to examine the intentions of final year pharmacy students worldwide to migrate. Data from this study will be collected, held, analysed, used and protected in an anonymous and confidential data archive for academic purposes by IPSF, FIP and the School of Pharmacy, University of London and approved partners, to better understand factors that influence migration intentions.

Instructions:

This is an anonymous and confidential questionnaire. You will not be identifiable and individual responses will not be published.

Thank you for agreeing to complete this questionnaire. Please answer all the questions in full. If you have any questions or comments about this study please contact Tana Wuliji, Moving On III Project Chair at tana.wuliji@pharmacy.ac.uk

Please hand the completed questionnaire to the research coordinator when you have finished.

Thank you for your time.

SECTION A

This section gathers demographic information and examines motivations for studying and working in pharmacy.

1. Country of birth:
2. Country you consider your home country:
3. Nationality (citizenship):
4. University of study:
5. Year of pharmacy study: *Final year* *Other*
6. Are you a foreign (international) university student?
- Yes No
7. Age:
8. Gender: *Male* *Female*
9. Which language(s) do you speak? *Tick all that apply*
 English *French* *Spanish* *Portuguese* *Russian* *Arabic*
 Chinese *Other (please state):*
10. Which of these best describe your current status? *Tick one*
 Single *In a stable relationship (unmarried)* *Married* *Other*
11. Why did you choose to study pharmacy? *Tick your top three reasons*
 Interest in healthcare *Interest in science* *To help people* *Decision influenced by family*
 Money *Job security* *Job opportunities* *To migrate abroad*
 Professional status *Job variety* *Family pharmacy business* *Unsure*
 Decision influenced by others (not family) *Other (please state):*
12. Was pharmacy your first university course choice? Yes No
12a. **IF NO**, what was your first choice? *Tick one*
 Medicine *Dentistry* *Chemistry* *Other (please state):*

13. Do you plan to work as a pharmacist within the next five years? Yes No

13a. IF NO, why not? *Tick one*

Further study Change of profession Other (please state):

14. Which field would you most like to work in? *Tick one*

Community pharmacy Hospital pharmacy Academia & research

Industry/marketing

Other (please state):

15. In which location would you prefer to work? *Rank from 1 to 3 (1 being the most preferred and 3 being the least)*

City/Urban area Rural area Rural and remote area OR No preference

15a. Are you from or have you spent part of your life living in a rural area? Yes No

SECTION B

This section gathers information about the intention to migrate (live in a different country for any period of time).

Home country refers to the country you stated in question 2.

16. Do you know of a pharmacist from your home country who: *Tick all that apply*

has migrated abroad and has not yet returned to live in your home country?

has returned to live in your home country after migrating abroad?

sometimes returns from abroad to your home country to work?

none of the above

17. Have you had any pharmacy experience in a country outside your home country? Yes No

17a. IF YES, what type of experience did you have abroad? *Tick all that apply*

Academic/internship/student experience Paid employment Unpaid employment

Other (Please state):

18. Do you have connections or relationships to facilitate migration to other countries? Yes No

18a. IF YES, tick all that applies:

Family Friends Partner/Spouse Employer

Recruitment Agency Other (please state):

19. Rank the following in order of importance in your life from 1 through to 6 (1 being the most important and 6 being the least important).

Family (being near family, providing for their needs) Money (salary)

Lifestyle (quality of life and living environment) Experience (job and life experience)

Ambitions (own expectations and needs in career) Stability (job security, familiarity)

20. Do you plan to migrate from your home country to a different country within the next five years? Yes No

20a. IF NO, why do you want to stay in your home country? *Tick your top three reasons*

Gain new experiences

Good lifestyle and quality of life

Family

Familiarity

Friends

Relationships

Better security and safety

To better serve my country

Job opportunities

Good pay

Learn how pharmacy is practiced in my country

Better pharmacy practice

Better professional status

Better career pathway

Better professional development and training opportunities

Other (please state):

**IF NO: Go to
Section C**

ALL OTHERS CONTINUE

21. Which country would you most like to migrate to? State your top three countries. Rank 1, 2, 3 (1 being the top).

- 1.
- 2.
- 3.

22. Why do you want to migrate to another country? Tick your top three reasons

- | | |
|---|---|
| <input type="checkbox"/> Gain new experiences | <input type="checkbox"/> Better job opportunities |
| <input type="checkbox"/> Better lifestyle and quality of life | <input type="checkbox"/> Good pay |
| <input type="checkbox"/> Family | <input type="checkbox"/> Learn how pharmacy is practiced abroad |
| <input type="checkbox"/> Familiarity | <input type="checkbox"/> Better pharmacy practice |
| <input type="checkbox"/> Friends | <input type="checkbox"/> Better professional status |
| <input type="checkbox"/> Relationships | <input type="checkbox"/> Better career pathway |
| <input type="checkbox"/> Better security and safety | <input type="checkbox"/> Better professional development and training opportunities |
| <input type="checkbox"/> To better serve that country | <input type="checkbox"/> To better serve my home country when I return |
| <input type="checkbox"/> Other (please state): | |

23. Do you plan to work as a pharmacist abroad? Yes No

24. What steps would you be prepared to take to practice as a pharmacist in another country? Tick all that apply

- | | |
|---|--|
| <input type="checkbox"/> Pay registration fees | <input type="checkbox"/> Complete a language test |
| <input type="checkbox"/> Complete a short internship (6 months or less) | <input type="checkbox"/> Complete a pharmacy law examination |
| <input type="checkbox"/> Complete a long internship (6 months or more) | <input type="checkbox"/> Complete registration examinations |
| <input type="checkbox"/> Repeat the final year of pharmacy degree | <input type="checkbox"/> Complete a two year pharmacy degree |
| <input type="checkbox"/> Repeat the entire pharmacy degree | <input type="checkbox"/> Apply for a work visa/permit |
| <input type="checkbox"/> Other (please state): | |

25. How long do you plan to live abroad? Tick one

- ≤1 year 1-2 years 2-3 years 3-4 years 4-5 years 5-10 years 10+ years

26. Do you eventually plan to return to your home country? Yes No Unsure

26a. IF YES, when you return to your home country, do you plan to work as a pharmacist? Yes No Unsure

27. Which of the following actions will you do in your home country while you are living in another country? Tick all that apply

- | | | | |
|---|--|-----------|-------------------------------|
| <input type="checkbox"/> Send money to family | <input type="checkbox"/> Send money to not-for-profit organisations | <u>OR</u> | <input type="checkbox"/> None |
| <input type="checkbox"/> Send money to government | <input type="checkbox"/> Invest in companies | | |
| <input type="checkbox"/> Provide technical advice | <input type="checkbox"/> Return to do temporary work in home country | | |
| <input type="checkbox"/> Other (please state): | | | |

28. What change(s) would encourage you to return to your home country after migrating abroad?

Such as changes to personal status, finances, social and political environment, policies, education and training, pharmacy practice etc.

Please state:

ALL TO COMPLETE**SECTION C**

This section collects information on attitudes. Please tick one option which most appropriately reflects your response for each statement. Answer from the perspective of your home country.

		Strongly disagree	Disagree	Neither disagree or agree	Agree	Strongly agree
29	I could earn a much better salary in a different country.					
30	There are good opportunities to do research in my country.					
31	Pharmacy is a well respected profession in my country.					
32	I believe that there is a good standard of pharmacy education in my country.					
33	Pharmacy has a positive healthcare image in my country.					
34	I believe that the healthcare resources are better in other countries.					
35	I think I would have better career opportunities in other countries.					
36	I feel that the practice of pharmacy is supported by health policies in my country.					
37	There are significant barriers between other health professionals and pharmacists in my country.					
38	I feel that the culture in my country would restrict my professional practice.					
39	In my country, pharmacists are able to engage in continuous professional development.					
40	I feel that the political situation in my country is limiting my practice.					
41	I feel that there are insufficient opportunities in my country to keep learning.					
42	I feel that there is an active professional pharmacy association in my country.					
43	I feel that my spiritual beliefs would be better accepted in another country.					
44	I feel dissatisfied with the health system in my country.					
45	I think pharmacists in other countries have a more desirable professional role.					
46	In my country, patients trust pharmacists.					

Thank you for taking the time to complete this questionnaire.

Please hand your completed questionnaire to the research coordinator.

Appendix 5 Zambia case study interview plan

Interview question prompts:

Role of the pharmacist

- Please describe the current role of pharmacists working in the public and private health sector. What role should pharmacists in these sectors be undertaking?
- Please describe your attitude towards pharmacists/your own profession in this country
- How could the pharmacists' skills best be utilised?
- Describe your experiences relating to the development and implementation of policies concerning the roles and practice of pharmacists

Role of auxiliary pharmacy workers eg – technicians, assistants

- Describe your perception of role of pharmacy technicians and/or assistants

Practice and professional environment

- Describe the environment that pharmacists in the community private/ public sector face
- Describe the current situation of pharmacy business and issues affecting pharmacy business. What is the implications of these issues on professional practice and patient care?

Workforce issues

- What are the most important human resource for health issues in this country?
- What are the major HRH issues that affect your/the pharmacists' workplace?
- Why do you think pharmacists choose to change jobs or migrate abroad from this country?
- In circumstances where there are insufficient pharmacists, what coping measures are taken?

Workforce Policy

- What is your interpretation of current (and/or proposed) pharmacist workforce policies and planning strategies?
- What workforce policies and planning strategies are needed to improve workforce retention? What is required to implement these?
- What do you believe is the impact of human resources management or mismanagement in this country on the work environment, professional satisfaction and migration abroad?
- Describe your experiences relating to the development and implementation of workforce policies
- Comment on barriers, challenges, solutions.

Education and training of pharmacists

- How does the education and training of pharmacists relate to practice?
- Describe the capacity of training institutions in your country and the possibility of scaling up to meet demand to address shortages. Comment on barriers, challenges, solutions.
- Comment on any existing gaps between skills training and applied skill/utilisation?
- Describe any existing career development pathway pharmacists and support for its structure?

Stakeholders

- Who are the key bodies/organisations/stakeholders involved in the development of pharmacist roles, practice standards, policies?
- What are the influences of these bodies/organisations/stakeholders on the processes of policy development and implementation?
- Comment on the relationship between pharmacists and other healthcare professionals in practice

Sector initiatives

- Please describe any investigations or initiatives that aim to remedy issues relating to the supply, demand and training of pharmacists or technicians/assistants

Appendix 6 Zambia case study information sheet and consent form

Aims:

To identify key policy issues and develop specific recommendations to build pharmacy workforce capacity and optimise the effective utilisation of pharmacists' skills across various economic settings.

To examine country level processes and experiences related to the development and implementation of policies concerning the roles and professional practice of pharmacists and workforce planning.

Interview description:

The interviews with participants will be recorded and will discuss the roles of pharmacists, pharmacy workforce issues affecting in their local setting, and experiences with the development and implementation of policies relating to pharmacy practice and workforce planning. The interview will be approx 60 min but may vary. Interviews could extend beyond this should interviewees wish. The interviewer will be responsible for transcribing interviews from the recording and will check the transcripts with interviewees prior to analysis.

Confidentiality and information security:

Participation in this research is completely voluntary and participants may withdraw at any time without prejudice or negative consequences. All information relating to the identity of participants will be kept secure and confidential. This research is done in collaboration with the International Pharmaceutical Federation (FIP) and the School of Pharmacy, University of London, United Kingdom and will contribute to a PhD thesis and academic publications. The interviewer, principal researcher and research supervisors shall have access to all information. Information which could potentially identify participants will not be published or disclosed outside of the research group consisting of Tana Wuliji, Prof David Taylor, Prof Ian Bates, Dr Sarah Carter, School of Pharmacy, and University of London. Transcripts will be made available to external individuals with the identity of interviewees kept confidential. Our data storage and archives

comply with the Data Protection Act for anonymity and confidentiality. Any queries regarding this project can be directed to the researcher and/or supervisors.

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Department of Practice and Policy

The School of Pharmacy

University of London

Participation Consent Form

Please complete:

- I have been fully informed of and fully understand the purposes of the study
- I have been given an opportunity to ask questions
- I understand I can withdraw at any time without prejudice
- Any information which might potentially identify me will not be used in any materials
- I agree to participate in this study

Signature:

Date:

Name:

Appendix 7 Summary of presentations and articles

Date	Event/Publication	Type	Title	Co-authors
25/11/2006	British Pharmaceutical Students Association Eastern Area Conference, School of Pharmacy, London	Oral - 20 minutes	The global health workforce: brain drain or circulation?	Prof Ian Bates, Prof David Taylor, Dr Sarah Carter
26/02/2007	International Clinical Pharmacy MSc, School of Pharmacy, London	Lecture - 45 minutes	Pharmacy - think global, act local	Prof Ian Bates, Prof David Taylor, Dr Sarah Carter
23/03/2007	A Call to Action: Ensuring Global Human Resources for Health. International Health Workforce Conference. Geneva, Switzerland	Oral - 15 minutes	Root migration drivers: identifying opportunities to strengthen the workforce	Prof Ian Bates, Prof David Taylor, Dr Sarah Carter
24/03/2007	4th Hospital Pharmacists Symposium, Hospital Pharmacists Association of Kenya, Nairobi	Oral - 10 minutes	Root migration drivers: identifying opportunities to strengthen the workforce	Prof Ian Bates, Prof David Taylor, Dr Sarah Carter
27/04/2007	Visualising Issues in Pharmacy, Online collaborative project, Online guest lecture: http://creativewaves.omnium.net.au/vip/outline/	Online lecture	Strengthening the pharmacy workforce	-
26/05/2007	5th European Tropical Medicine and International Health Conference, Amsterdam	Oral - 15 minutes	The pharmacy workforce crisis - stepping up global and national action	Prof Ian Bates, Prof David Taylor, Dr Sarah Carter
15/06/2007	Pharmaceutical Society of Zambia Conference, Lusaka, Zambia	Oral - 10 minutes	Pharmacy workforce - actions and directions	Prof Ian Bates, Prof David Taylor, Dr Sarah Carter
03/09/2007	67 th World Congress of Pharmacy and Pharmaceutical Sciences, FIP Congress, Beijing, China	Oral - 15 minutes	Drivers of migration - impact on the pharmacy workforce	Prof Ian Bates, Prof David Taylor, Dr Sarah Carter
14/09/2007	Third Global Forum on International Quality Assurance, Accreditation and the Recognition of Qualifications in Higher Education, UNESCO, Dar es Salaam, Tanzania	Oral plenary - 10 minutes	Migration intentions of pharmacy students - a global study of root drivers	Prof Ian Bates, Prof David Taylor, Dr Sarah Carter

17/09/2007	Global Health, Justice and the 'Brain Drain', University of Keele, United Kingdom	Oral – 15 minutes	Migration intentions of pharmacy students – a global study of root drivers	Prof Ian Bates, Prof David Taylor, Dr Sarah Carter
13/10/2007	Workforce and Migration, EuroPharm Forum Conference, Bratislava, Slovakia	Oral – 30 minutes	Global pharmacy workforce and migration – drivers, actions and directions	-
03/12/2007	Masters in Pharmacy students, Faculty of Pharmacy, University of Helsinki, Finland	Lecture – 1.5 hours	International pharmaceutical and health policy	-
30/01/2008	MSc in Clinical Pharmacy, International Practice and Policy, School of Pharmacy, University of London, United Kingdom	Lecture – 45 minutes	Pharmacy Workforce, Migration, and international policy	-
02/04/2008	PhD Day, School of Pharmacy, University of London, United Kingdom	Poster	Migration, a form of workforce attrition	Prof Ian Bates, Prof David Taylor, Dr Sarah Carter
30/08/2008	Global Conference on the Future of Hospital Pharmacy, 68 th World Congress of Pharmacy and Pharmaceutical Sciences, FIP Congress, Basel, Switzerland	Oral plenary – 15 minutes	Human resources and training – introduction	-
30/08/2008	Workshop, Global Conference on the Future of Hospital Pharmacy, 68 th World Congress of Pharmacy and Pharmaceutical Sciences, FIP Congress, Basel, Switzerland	Workshop moderator – 3.5 hours	Workshop consultation on human resources and training	-
02/09/2008	Reporting on Global Conference on the Future of Hospital Pharmacy, 68 th World Congress of Pharmacy and Pharmaceutical Sciences, FIP Congress, Basel Switzerland	Oral – 10 minutes	Human resources and training – evidence, consultation and consensus statements	-
03/09/2008	68 th World Congress of Pharmacy and Pharmaceutical Sciences, FIP congress, Basel, Switzerland	Oral plenary – 35 minutes	Global pharmacy workforce and migration – FIP perspective	-
09/2008	UNESCO Expert group meeting. Migration and education: quality assurance and mutual recognition of qualifications	Oral – 15 minutes	Migration and education: perspectives for sustainable development	-

18/02/2009	MSc in Clinical Pharmacy, International Practice and Policy, School of Pharmacy, University of London, United Kingdom	Lecture – 45 minutes	Pharmacy workforce, migration and international policy	-
01/03/2009	American Journal of Health-System Pharmacy	Journal article	Current status of human resources and training in hospital pharmacy	-
09/04/2009	Human Resources for Health Journal	Journal article	Migration - a form of workforce attrition: a nine country study of pharmacists	Prof Ian Bates, Prof David Taylor, Dr Sarah Carter
07/04/2009	PhD Day, School of Pharmacy, University of London, United Kingdom	Oral – 15 minutes	Migration as a form of workforce attrition: a nine country study of pharmacists	Prof Ian Bates, Prof David Taylor, Dr Sarah Carter
08/08/2009	London International Development Seminar (LIDC), London, United Kingdom	Oral – 15 minutes	The health workforce crisis – a case study of pharmacy education, competency and workforce planning	Prof Ian Bates
02/09/2009	2009 FIP Global Pharmacy Workforce Report	Chapter	Global pharmacy workforce description	-
05/09/2009	69 th World Congress of Pharmacy and Pharmaceutical Sciences, FIP congress, Istanbul, Turkey	Oral – 10 minutes	2009 Global pharmacy workforce survey	-
<i>In press</i>	WHO 2010 World Medicines Situation Report	Chapter	Human resources	Bradley H, Taylor O, Crommelin D, Stolk P.

Appendix 8 Publications

1. Wuliji T: Current status of human resources and training in hospital pharmacy. *Am J Health Syst Pharm* 2009, 66: S56-S60. Accessible from:
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2. Wuliji T: Global pharmacy workforce description. In *The 2009 FIP Global Pharmacy Workforce Report*. Edited by Wuliji T. The Hague: International Pharmaceutical Federation (FIP); 2009:7-15. Accessible from:
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3. Wuliji T, Carter S, Bates I: Migration as a form of workforce attrition: a nine-country study of pharmacists. *Human Resources for Health* 2009, 7. Accessible from:
<http://www.human-resources-health.com/content/7/1/32>. Last accessed: 27/10/2009.