Barriers to Effective Policy Implementation and Management of Human Resources for Health in Nepal

1 The Distribution and Skill Mix of Human Resources for Health in Nepal

A Report of Operational Research

MAY 2012

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The Creative Hands (SELF-MOTIVATED, INDEPENDENT & CREATIVE DEAF GROUP)
Chhetrapati, Kathmandu, Nepal

Principal Investigator

Dr Khem Bahadur Karki (MBBS, MPH)

Report Writers

Dr Khakindra Bhandari (BHMS, MPH)
Mr Bhuwan Baral (BPH, MPH)

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Preface

Ministry of Health and Population has committed, through its second Nepal Health Sector Programme Implementation Plan (2010-2015), to improve the health and nutritional status of the people by providing them equal opportunity to receive quality health care services free of charge or at affordable cost thereby contributing to poverty alleviation. The ministry promotes access to and utilisation of essential health care and other health services, emphasising services to women, children, and poor and excluded. The plan and programmes are focused to changing risky life styles and behaviours of most at-risk populations through behaviour change and communication interventions.

The health sector requires competent and motivated health workforce to achieve the stipulated goals and targets of the health plan and the programmes. Nepal health sector is facing critical human resources for health (HRH) crisis for service delivery. Deployment and retention, production of skill mix human resources and their equitable distribution, availability, productivity, performance and accountability of the human resources for health are some of the major issues to be addressed by the health system. On the other hand, non-communicable diseases, accident and injuries and other new emerging diseases will require more epidemiologists and public health experts. A scientific and robust strategic plan for managing HRH both in public and private sectors, maintaining equilibrium in supply and demand, delivering efficient services to people so as to achieve MDGs, is now a prime concern for the Ministry.

The Ministry of Health and Population has prepared a HRH Strategic Plan (2011-2015) aiming to ensure the equitable distribution of appropriately skilled human resources for health to support the achievement of health outcomes in Nepal and in particular the implementation of Nepal Health Sector Progamme-2 (NHSP-2). The HRH Strategic Plan has given main focus to achieve the appropriate supply of the heath workers, equitable distribution of them, improved health workers performance, effective and coordinated HR planning, management and development across the health sectors.

Both the NHSP-2 and HRH Strategic Plan has highlighted the need of operational researches to find out the bottlenecks of health system in terms of policy implementation and HRH management there by to recommend the appropriate actions to strengthen the health system.

This operational research carried out by Society for local Integrated Development Nepal (SOLID Nepal) and Merlin with financial support from the European Commission and Ladham Trust helps to generate empirical evidence highlighting the key gaps and existing challenges in six key areas : a) Distribution and skill mix of HRH, b) Training, recruitment , placement and retention, c) performance and accountability, d) HRH management, e) working conditions and f) Civil Society Organisation's engagement . This will definitely support MoHP for further human resources planning and its effective implementation.

The MoHP would like to thank SOLID Nepal, Merlin, the European Union and Ladham Trust for carrying out this research. There is great appreciation to all research and logistics teams for their efficient work and to the research participants, for their valuable contribution to the research study.

Dr. Praveen Mishra
Secretary

Kupondole - 1, Lalitpur

PO Box 8975, EPC 1641

Kathmandu, Nepal

T (977-1) 5544250

F (977-1) 5544450

E Kathmandu@merlin-nepal.org

Chair **Lord of Ewelme**

Chief Excecutive **Carolyn Miller**

Charity Numbers **113511161016607**

Foreword

It is my great pleasure to introduce this report on the *Barriers to Effective Policy Implementation and Management of Human Resources for Health in Nepal*. This report was the result of a comprehensive piece of nationally representative operational research, conducted by Society for Local Integrated Development (SOLID) Nepal in partnership with Merlin Nepal, which encompassed all Nepal's development regions and ecological belts. That research and, subsequently, this report were made possible with the financial assistance of the European Union and the Ladham Trust.

Every man, woman, youth and child has the right to enjoy the highest attainable standard of physical and mental health. The practical realisation of this right, however, has one significant precondition: To enjoy the highest attainable standard of health, every individual must first have access to suitably qualified and motivated health workers. While fundamental, this requirement remains a major challenge in many countries, particularly those which have significant geographical, economic and/or human resource constraints.

The Nepal Health Sector Programme – Implementation Plan II (NHSP-IP II, 2010-2015) mentions that Nepal has experienced a 35% growth in population since 1991, however the public workforce only increased by 3% during the same period, and approximately 25% of the total health workforce are unskilled. While having an adequate number of qualified health workers physically in place is obviously vital to ensuring access to quality healthcare, so too is the distribution and mix of those health workers, the quality and appropriateness of their training, their workplace performance and accountability, the effectiveness of their management structures and their working conditions. All of these contributing factors were assessed and analysed as part of this operational research.

SOLID and Merlin also recognise the proactive role civil society organisations (CSOs) can play in regard to human resources for health. As such, the current and potential roles of CSOs were considered throughout this research.

It is our hope that this publication will not only provide a holistic picture of the current health worker situation in Nepal, but also present all stakeholders engaged in Nepal's health sector with tangible recommendations which will, in turn, facilitate every Nepali accessing their right to the highest attainable standard of health.

More information on the importance of health workers and the challenges they face can be found on Merlin's Hands Up for Health Workers campaign site: **www.handsupforhealthworkers.org.**

Catherine Whybrow
Country Director
Merlin Nepal

MEDICAL EXPERTS ON THE FRONTLINE

Acknowledgements

Dr. Khem B. Karki,
Executive Director/Principal Investigator
SOLID Nepal
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ACRONYMS

AAW	Acupuncture Auxiliary Worker
AAHW	Ayurvedic Auxiliary Health Worker
AHW	Auxiliary Health Worker
ANM	Auxiliary Nurse Midwife
BAMS	Bachelor in Ayurvedic Medicine and Surgery
BASLP	Bachelor of Audiology and Speech, Language Pathology
BDS	Bachelor of Dental Surgery
BMLT	Bachelor of Medical Laboratory Technology
BN	Bachelor of Nursing
BOptom	Bachelor of Optometry
BPharm	Bachelor of Pharmacy
BPH	Bachelor of Public Health
BPKIHS	B.P. Koirala Institute of Health Sciences
BSc	Bachelor of Science
CBOs	Community-Based Organizations
CDR	Central Development Region
CMA	Community Medical Assistant
CTEVT	Council for Technical Education and Vocational Training
DDC	District Development Committee
DfID	Department of International Development
DHO	District Health Office
DoHS	Department of Health Services
DPHO	District Public Health Office
EC	European Commission
EDPs	External Development Partners
EDR	Eastern Development Region
EHCS	Essential Health Care System
FCHV	Female Community Health Volunteer
FGD	Focus Group Discussion
FPAN	Family Planning Association of Nepal
FWDR	Far-Western Development Region
FY	Fiscal Year
GiZ	Deutsche Gesellschaft fur Internationale Zusammernarbeit GmbH (formally GTZ)
HA	Health Assistant
HF	Health Facility
HFOMC	Health Facility Operation and Management Committee
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome
HP	Health Post
HRD	Human Research Development
HRH	Human Resources for Health
HuRDIS	Human Resources Development Information System
HuRIS	Human Resources Information System
I/NGO	International Non-Governmental Organization
IOM	Institute of Medicine
KII	Key Informant Interview
KU	Kathmandu University

LA	Laboratory Assistant
LT	Laboratory Technician
MBBS	Bachelor of Medicine, Bachelor of Surgery
MCH	Maternal and Child Health
MCHW	Maternal and Child Health Worker
MD/MS	Doctor of Medicine/Master of Surgery
MDS	Master of Dental Surgery
MDGs	Millennium Development Goals
MMLT	Master of Medical Laboratory Technology
MN	Master of Nursing
MoHP	Ministry of Health and Population
MoLD	Ministry of Local Development
MPH	Master of Public Health
MPharm	Master of Pharmacy
MSc	Masters of Science
MWR	Mid-Western Development Region
NCD	Non-Communicable Disease
NAMS	National Academy of Medical Sciences
NDHS	Nepal Demographic and Health Survey
NFHP	Nepal Family Health Programme
NFHS	Nepal Family Health Survey
NGO	Non-Governmental Organization
NHP	National Health Policy
NHSP IP	Nepal Health Sector Programme Implementation Plan
NHSP II	Nepal Health Sector Programme II
NHSSP	Nepal Health Sector Support Plan
NHTC	National Health Training Centre
NSI	Nick Simons Institute
NSU	Nepal Sanskrit University
PAHS	Patan Academy of Health Sciences
PHA	Public Health Administrator
PHC	Primary Healthcare Centre
PHO	Public Health Office
PPICD	Policy, Planning and International Cooperation Division
PPP	Public Private Partnership
PSC	Public Service Commission
PSI	Population Service International
PU	Purbanchal University
RHD	Regional Health Directorate
RTI	Right to Information
SAHW	Senior Auxiliary Health Worker
SBA	Skilled Birth Attendant
SHP	Sub-Health Post
SLTHP	Second Long Term Health Plan
SN	Staff Nurse
TSLC	Technical School Level Certificate
TU	Tribhuvan University
VDC	Village Development Committee
VHW	Village Health Worker
WDR	Western Development Region
WHO	World Health Organization

GLOSSARY

Ecological Belts   Nepal is made up of three ecological belts running laterally across the country: the Mountain belt in the northern highlands, Hill in the central belt, and Tarai lowland plains in the southern belt.

Basic-level HWs   Basic-level HWs have received Technical School Level Certificates (TSLC). They are trained for 12-18 months, primarily through affiliated institutions of CTEVT and are able to provide basic services in their trained areas.

Birthing Centre   A health facility with the equipment and skilled birth attendants to assist women to give birth safely.

Deputation   Deputation is the secondment of personnel, irrespective of the numbers of sanctioned posts, for a given period of time.

Development Regions   For administrative purposes, Nepal is divided up into five Development Regions: Eastern Development Region (EDR), Central Development Region (CDR), Western Development Region (WDR), Midwest Development Region (MDR), and Far Western Development Region (FWDR).

Facilities   For the purpose of this report, facilities can mean either those provided to health workers i.e. housing, or those in the health centre i.e. x-ray machines.

High-level HWs   High-level health workers have obtained either a Bachelor or Post-Graduate degree in Health Sciences. These high-level health workers provide more advanced services and are produced by different universities and autonomous academic institutes, and their affiliated institutions.

HRH   Human Resources for Health (HRH) include those 'engaged in actions whose primary intent is to enhance health' (1).

Ilaka   A segment within a district that comprises several, largely homogeneous VDCs. There is one Health Post in each Ilaka.

Mid-level HWs   Mid-level health workers have attended a three-year training course (Proficiency Certificate-Level or Diploma-Level courses). They perform a curative, preventative, and diagnostic function, and are responsible for supervising the basic-level HWs. They are produced primarily by affiliated institutions of CTEVT, and by Tribhuvan University (TU), Kathmandu University (KU) and B.P. Koirala Institute of Health Sciences (BPKIHS).

Paramedical   Paramedical staff are a section of the health workforce representing basic and mid-level technical categories, including Health Assistants, Auxiliary Health Workers, Laboratory Technicians, Laboratory Assistants, Radiographers, Anaesthetic Assistants, Ophthalmic Assistants, Physiotherapy Assistant.

Sanctioned posts   Sanctioned posts are posts that have been centrally approved by the MoHP within health institutions.

Safe Abortion   Legal abortion performed by certified medical staff in registered health facilities.

Skill mix   The 'combination of different health workers that produce a given level of healthcare' (2).

Wards   These refer to clusters within the VDC, of which there are 9 in each VDC.

DESCRIPTIONS OF NEPALI HEALTH STAFF ACRONYMS

AHW	Auxiliary Health Worker: AHWs are trained for one year after secondary school. They are the Sub-Health Post in-charge and also service providers in the HP, PHC and Hospitals. Their main role is to provide promotive and preventive care in the community and refer to primary healthcare facilities.
ANM	Auxiliary Nurse Midwife: ANMs are based at Health Posts to conduct maternal and child health care services. They are trained for 18 months and like the MCHW, the ANM's main job is to conduct antenatal clinics, provide TT immunization, nutrition education, conduct normal deliveries, recognise danger signs and refer women to for more specialised care. ANMs provide Safe Motherhood services, Basic Emergency Obstetric Care and Family Planning services.
FCHV	Female Community Health Volunteers: FCHVs are grassroots level health volunteers based in their respective Wards, who are selected by the Mothers' Groups and trained for 18 days on basic healthcare. They are responsible for conducting Mother's group meetings and delivering health messages to the Mothers and distributing pills, condoms, polio drops, oral rehydration salts and Vitamin A. The government provides training and refresher training to them.
HA	Health Assistant: HAs are based in Health Posts as the Health Post In-charge, holding a Proficiency Certificate in Medical Science (General Medicine). They perform promotive, curative and preventative roles and are responsible for supervising the Health Post staff and Sub-Health Posts in their area. HAs report to the District Public Health Office (DPHO) / DHO at district level.
MCHW	Maternal and Child Health Worker: MCHWs are selected mainly from the local VDC. MCHWs are based in Sub-Health Posts to provide maternal and child health services, after receiving six months' training. MCHWs conduct antenatal clinics, provide TT immunization, post natal clinic nutrition education, and conduct normal deliveries. They also provide counselling to couples on family planning and provide Family Planning services. They are also responsible for conducting EPI clinics and PHC/ORCs.
SBA	Skilled Birth Attendant: "An accredited health professional, such as a midwife, doctor or nurse, who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period and in the identification, management and referral of complications in women and newborns" (3).
VHW	Village Health Worker: VHWs are the community level government employee with initial six months' training in the health system. Together with MCHWs, they conduct outreach clinics in their villages, and are involved in immunization of children. In addition, they distribute contraceptive pills, condoms and refer clients for other methods of family planning. They supervise FCHVs and attend Mother's group meetings. They also provide health education in the village.

EXECUTIVE SUMMARY

Introduction: The Ministry of Health and Population (MoHP) of Nepal has identified major challenges in Human Resources for Health (HRH), specifically in the shortage, distribution and skill mix of health workers in the country. This report aims to provide insight into specific challenges and policy recommendations for MoHP and concerned stakeholders.

Methodology: A cross-sectional descriptive study was conducted using mixed method with observation checklist. Fifteen districts representing eco-developmental regions of Nepal were selected using multi-stage cluster sampling method. Out of 404 sample, 747 health workforce from 375 health institutions were interviewed (<10% non-response rate) using the Probability Proportionate to Size method as per WHO guideline. Observation was carried out in 256 health facilities. Further, secondary review was carried out for triangulation of findings.

Key Findings: In Nepal, booming of private academic institutions has led to relatively high production of some categories of health workforce like nurses, doctors and paramedics, however, their distribution is not equitable. By contrast, other health cadres are in low production (e.g. MDGP and surgeons). The available secondary data were inconsistent, inaccurate and incomplete amongst different sources (in both public and private sectors). The cumulative data of Medical and Nursing Council show 16 registered health workforce per 10,000 population (including public and private sectors). Yet many registered health professionals have migrated, turned to private practice or retired. Furthermore, the public sector has a ratio of only 2.9 health workers (including doctors, nurses, and midwives) per 10,000 population which is far below the WHO standards, which recommends 23 health workers per 10,000 population to meet health related MDGs.

Despite the fact that the population has increased by 45 percent in the last two decades, the number of sanctioned posts is still based on the 1991 Health Policy. Overall, 14 percent of sanctioned positions for all health workers were vacant, with a 38 percent deficit of doctors in the surveyed districts. There were a low percentage of filled doctors' positions in private health facilities, partly due to the cost-saving mechanisms of private facilities with less filled sanctioned positions. This was also the case in I/NGO run clinics. It is also found that in the absence of sanctioned posts for ANMs at the SHP level, recruitment was found to be carried out locally, based on the needs of the population.

Determining and achieving the 'right mix' of health workers, who are productively efficient is an enormous challenge for most health systems. Only 43 percent of hospitals and 18 percent of PHC facilities had an appropriate skill mix i.e. at least one health worker from each HRH cadre (Medical Doctor, Nurse, Heath Assistant, Assistant Health Worker, Laboratory Assistant/Technician, Radiographer). Furthermore, the in-service curriculum does not take into consideration the epidemiological shifts in the population, and despite the fact that the prevalence of non-communicable diseases is 36.5 percent, yet only 17.4 percent of Health Workers have received orientation or training on NCDs from government.

Conclusion and Recommendations: There is scarcity of doctors and other health cadres in the public sector, particularly in rural areas. The skills of those serving in the health sector have also not been updated in line with changing disease trends and technological advances. The data available on HRH is limited and ambiguous. The number of sanctioned positions, categories of health workers and training curriculum should be revised to account for epidemiological shifts and population growth in the last two decades.

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INTRODUCTION

1.1: Background

"Manpower (Human Resources) is the cornerstone of any health system and, unless manpower development patterns are appropriate to people's health needs and social circumstances, countries will never be able to achieve a level of health that will allow their people to lead socially and economically productive lives" (4).

Dr. Halfdan Mahler, Former Director General WHO

The Human Resources for Health (HRH) situation in Nepal has been met with several key challenges particularly related to the shortage and uneven distribution of the health workforce in the country (5). Despite the need for an 'appropriate number and distribution of different cadres of health personnel, who are socially responsible, technically competent and are available at the right time and place (6), as outlined in the National Health Policy 1991, these challenges have prevented policy from being translated into practice. Moreover, the National Health Policy has not taken into consideration the epidemiological transitions and demographic developments that have occurred over the last two decades.

Although South-East Asia is home to approximately 25 percent of the world's population with almost 30 percent of the global disease burden, it has only 10 percent of the global health workforce (4). Nepal reflects the regional context, and has been identified by the World Health Organisation as one of 57 nations with a critical shortage of health workers (5). This creates a huge deficit in the requirements for high coverage of essential interventions, including those necessary to meet the health-related Millennium Development Goals (MDGs). In Nepal, this is unlikely until the threshold density of health workers (doctors, nurses and midwives) is at least 23 per 10,000 in the population (5). Furthermore, policy has not addressed the changing demographics in the country, as despite a population increase of more than 45 percent in the last two decades (7), the public health workforce has only increased by 3.4 percent during that time (8).

The distribution of health workers has been raised as a concern in Nepal, with huge variations between ecological zones (Mountain, Hill and Tarai) and among the 5 development regions of the country (Far-Western, Mid-Western, Western, Central and Eastern). Workforce surpluses or shortages have the capacity to 'decrease productivity and efficiency, deplete scarce resources and squander worker capabilities' (9). The absence of doctors and qualified health professionals in the most remote areas has also been a long standing issue.

These issues are compounded by the movement of high-level health workers, such as doctors and nurses, to private health institutions or overseas, due to the high demand for health workers in industrialised countries, as well as attractive incentives that they offer. Furthermore, with the emergence of non-communicable diseases due to a changing lifestyle and environment, there is also the need to rethink the current skill mix of health workers (10).

The most recent draft of the Human Resources for Health Strategic Plan 2011-2015 (7) has identified major challenges related to HRH in the country. These include imbalances in the mix of staff and skills, particularly in light of the changing burden of disease, changing healthcare technologies and increasing population and demand for quality curative services (7). National policies and plans have not been based on detailed evidence regarding the situation on ground. Thus, in order to address the major issues related to HRH in Nepal, empirical evidence is required to quantify these key gaps and explore the magnitude of existing challenges in the system.

1.2 Aims and Objectives

This report is part of an operational research project which aims to facilitate the improved delivery of healthcare in Nepal through strengthened human resources for health (HRH) policy development and implementation by enhancing civil society engagement. The specific objectives of this particular research paper are as follows:

1. To analyse the current shortage, uneven distribution and skill mix of the health workforce.

2. To provide recommendations to MoHP and other concerned stakeholders for improvements in HRH policy and strategic plans and its implementation and monitoring through engagement of civil society.

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CHAPTER **II**

METHODOLOGY

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A cross-sectional descriptive study, using both qualitative and quantitative research methods, was conducted in 15 districts of Nepal to obtain comprehensive information on the Human Resources for Health (HRH) situation in the country.

2.1 Primary Data Collection and Analysis

2.1.1 Quantitative methods

2.1.1.1. Sample Design

A multi-stage cluster sampling method was used to select a representative sampling frame for this study (see Appendix 1). Of the 75 districts in Nepal, 15 districts were selected, one from each of the three ecological belts (Mountain, Hill and Tarai) and each of the five development regions (Far-Western, Mid-Western, Western, Central and Eastern) using a random sampling method.

Table 1: Selected Districts for Research Study, Nepal 2011

Development Region / Ecological Belt	Far-western	Mid-western	Western	Central	Eastern
Mountain	Darchula	Mugu	Manag	Rasuwa	Sankhuwasabha
Hills	Doti	Pyuthan	Palpa	Lalitpur	Panchthar
Tarai	Kailai	Bardiya	Kapilvastu	Dhanusha	Jhapa

The sampling frame consisted of 5146 health institutions in the selected 15 districts, including Government Hospitals (Regional, Zonal or District), Primary Health Centres, Health Posts, Sub-health Posts, Ayurvedic Centres, Non-governmental and Private health outlets. A total of 404 health institutions were then selected using the Probability Proportionate to Size (PPS) method, based on the size of health institution by available HRH, as per WHO guidelines (11) (see Appendix 2). Out of the selected health institutions, data was collected from 375 health facilities. A total of 29 health facilities were not included in the study due to the unavailability of staff, demonstrating a response rate of 93 percent (see Appendix 3).

2.1.1.2 Research participants

Research participants were service providers including Doctors, Specialists, Nurses, Midwives, Public Health Workers, Health Assistants, Auxiliary Health Workers, Laboratory Technicians, Radiographers and Pharmacists.

2.1.1.3 Data collection tools and processes

An interviewer-administered questionnaire was carried out by Public Health graduates trained as enumerators with 747 health workers from the 375 selected health institutions in 15 districts, selected on the basis of WHO guidelines (11). Self-appraisal forms were also completed by 54 doctors, 218 nurses and 324 paramedical staff from within the sampling frame, with the exclusion of 20 respondents due to lack of complete information. An observation checklist was also carried out by research supervisors in 256 health facilities, in keeping with WHO standards of observing at least one third of health facilities from the sampling frame (11).

2.1.1.4 Data analysis

Quantitative data was entered into a computer software system (EpiData 3.1) by trained data entry personnel. In order to validate the data, 10% was randomly cross-checked. After editing and cleaning, the data was transferred onto a statistical software package (SPSS 17.0) for analysis.

2.1.2 Qualitative Methods

2.1.2.1 Research Participants

Based on availability, a total of 645 participants were selected for the qualitative study, which aimed to support quantitative research findings (see Appendix 4). Participants were selected from the following groups: service providers, as in section 2.1.1.2, and also inclusive of Female Community Health Volunteers (FCHVs), Maternal and Child Health Workers (MCHW); service users, such as exit-patients of health service outlets; and lastly the facilitator group which included members of Government Health Institutions including District Public Health Office, District Health Office, District Development Committee, and Village Development Committee; Professional Associations; Civil Society organisations and people working in Trade Unions and the field of advocacy, civil rights, media and social campaigns; local leaders, social workers and school teachers.

2.1.2.2 Data Collection Tools and Processes

Key data collection tools included Focus Group Discussions (FGDs) and Key Information Interviews (KIIs), conducted by Public Health graduates. A series of 74 FGDs were held, with at least one group of service providers, service users and Health Management Committees in each district. Purposive sampling was used to select 29 informants to take part in semi-structured KIIs. Consultation workshops with MoHP, NHRC and other key stakeholders were held to discuss the research methodology and tools prior to data collection and also to discuss preliminary findings and recommendations.

2.1.2.3 Data Analysis

Qualitative data was transcribed and translated into English, and was then analysed according to different thematic areas based on the relevant research objectives. The data was then triangulated with quantitative and secondary data findings.

2.2 Secondary Data Collection and Analysis

A review of the literature on national and international research papers on HRH was carried out. The review also included key national MoHP health Policies, Plans and Acts (6-8,10,12-21) , as well as key information on health worker pre-service training numbers from University websites and key contacts. Findings from the secondary data were triangulated with both qualitative and quantitative data.

2.3 Validity and Reliability

1. A standard statistical tool was used to determine the sample size and sampling strategy to reduce systematic error in the design phase of the study, based on WHO Standards.

2. Internal consistency reliability was ensured in quantitative data analysis by obtaining Cronbach's Alpha on key variables (>0.85).

3. To avoid questionnaire information bias, questionnaires were pre-tested in three districts, and feedback from the pre-test was incorporated into the final questionnaire design to improve validity and reliability.

4. To avoid interviewer information bias, interviewers, who were Public Health graduates, were trained for two days on data collection tools and methods according to WHO standard protocols.

5. Regular supervision visits were carried out, with appropriate feedback ensured from the central level during the collection of data.

6. Triangulation of primary and secondary data ensured consistency of the research data.

2.4 Ethical Issues

Ethical approval for this study was obtained from the Nepal Health Research Council (NHRC), and researchers adhered to national NHRC standard operating procedures and ethical guidelines for health research. Informed consent was obtained from each respondent, and confidentiality in terms of information disclosed and identity of respondents was ensured.

CHAPTER III PRE-SERVICE TRAINING OF THE HEALTH WORKFORCE IN NEPAL

This chapter provides an analysis of the pre-service training of the different health cadres in Nepal. It sets the scene for the following chapters, as a basis for comparison with the actual situation on the ground.

3.1 HRH Categories in Nepal

To support the health system of Nepal, various health cadres are produced to provide promotive, preventive, curative and rehabilitative health services. For this research study, HRH categories have been grouped into Basic-level, Mid-level and High-level categories of health workers, based on the HRH strategic plan 2003-2017 for the classification of High-level staff, and the Council for Technical Education and Vocational Training (CTEVT) for the classification of Mid and Basic-level health workers (see Table 2).

Table 2: Pre-service Training of HRH in Nepal, According to Health Cadre and Category

Category	Cadre	Pre-service Qualification
High-Level	Medical Specialist	Doctor of Medicine (MD), Master of Surgery (MS)
	Medical Officer	Bachelor of Medicine and Bachelor of Surgery (MBBS)
	Ayurvedic Medical Specialist	MD Ayurveda
	Ayurvedic Medical Officer	Bachelor of Ayurvedic Medicines and Surgery (BAMS)
	Public Health	Master/Bachelor of Public Health (MPH/BPH)
	Integrated Medical Officer	Bachelor of Ayurvedic and Modern Medicine and Surgery
	Dental Surgeon	Master/Bachelor of Dental Surgery (MDS/BDS)
	Pharmacist	Master / Bachelor of Pharmacy (M Pham. / B Pham.)
	Graduate Nurse	Master/ Bachelor of Nursing (MN/ BN), BSc Nursing
	Radiography Technologist	BSc/MSc in Medical Imaging Technology (BSc/MSc MIT), BSc/MSc Radiography Technology (BSc/MSc RT)
	Medical Laboratory Technologist	Bachelor/Maser of Medical Laboratory Technology (BMLT/MMLT)
Mid-Level	Assistant Pharmacist	Diploma in Pharmacy
	Staff Nurse	PCL in Nursing
	Health Assistant	PCL in General Medicine
	Laboratory Technician	PCL in Medical Laboratory Technology
	Assistant Radiographer	PCL in Radiography
	Dental Hygienist	PCL in Dental Hygiene
	Other Allied health occupation	Example: PCL in Homeopathy, Diploma in Ophthalmic Science
Basic-Level	AHW	TSLC in Community Medical Assistant (CMA)
	AAHW	TSLC in Ayurvedic Auxiliary Health Worker (AAHW)
	AAW	TSLC in Acupuncture Auxiliary Worker
	ANM	TSLC in Auxiliary Nurse Midwife (ANM)
	Laboratory Assistant	TSLC in Laboratory Assistant (LA)
	Dental Assistant	TSLC in Dental Assistant
	VHW/MCHW	Training as Village Health Worker/Maternal & Child Health Workers

Source: *Adapted from HRH Strategy 2003 – 2017 & CTEVT*

3.2 Pre-service Training of Health Workers in Nepal

The pre-service training of the Health Workers in Nepal started officially in 1933 with the establishment of the first Ayurvedic academic institution 'Nepal Rajkiya Ayurveda Vidhyalaya'. Training for basic and mid-level health workers officially started in 1972, following the establishment of the Institute of Medicine (IOM), which later started MBBS courses in 1978. The Council for Technical Education and Vocational Training (CTEVT) was formed in 1989, for the pre-service training of technical and skilled mid-level health workers. Thereafter, there was continuous progress in the pre-service training of health workers by many other universities, namely Kathmandu University (1991), BP Koirala Institute of Health Sciences (1993), Purbanchal University (1993), National Academy of Medical Sciences (1994 proposed), Pokhara University (1997) and Patan Academy of Health Sciences (2009). All academic institutions are producing different cadres of health professionals (22).

As data on the current capacity and pre-service training of all levels of health workers is not stored in a central database, information on the pre-service training of different levels of health workers was collected from various sources, such as University and College websites and key contacts at academic institutions.

3.2.1 Pre-service Training of Basic-level Health Workers

Health professionals that constitute the basic-level health workforce have primarily received their education through affiliated institutions of CTEVT. More than 91,000 basic-level health workers were produced between 1993 and 2011 (see Table 3).

Table 3 : Pre-service Training of Selected Basic Level Health Workforce

SN	Programmes	Graduate from 1993 to June 2011
1	CMA	55,755
2	ANM	20,624
3	Lab Assistant	10,790
4	AAHW	3,367
5	Dental	633
6	Acupuncture	47
	Total	**91,216**

Source: *CTEVT Profile, 2011*

There has been an increase in enrolment figures of basic-level Health Workers, particularly for Community Medicine Assistants and Assistant Nurse Midwives, whose enrolment figures have doubled during last three years. (see Table 4).

Table 4 : Three Year Trend of Enrolment of Basic Level Health Workers

Programmes	Graduate from 1993 to June 2011		
	2007	**2008**	**2009**
CMA	586	703	1735
ANM	432	540	1190
Lab Assistant	40	40	40
AAHW	296	298	546
Dental	82	77	116
Total	**1436**	**1658**	**3627**

Source: *CTEVT Profile, 2011*

3.2.2 Pre-service Training of Mid-Level Health Workers

CTEVT data on mid-level health worker graduates in Nepal shows that a total of 12,355 health workers graduated between 1993 and 2011 (see Table 5).

Table 5: Graduates of Selected Mid-level Health Workforce (1993-2011)

SN	Programmes	Graduates from 1993 to June 2011
1	PCL Nursing	7,051
2	PCL General Medicine	2,704
3	PCL Medical Laboratory Technology	96
4	Diploma in Pharmacy	2,190
5	PCL Dental Hygiene	295
6	Diploma in Ophthalmic Science	19
	Total	**12,355**

Source: *CTEVT Profile, 2011*

In the pre-service training of mid-level health workers, the number of training institutes has grown, which has resulted in an increase in enrolment (see Table 6). For the capacity of different universities of mid-level cadres in 2011 (see Appendix 5). Furthermore, during KII, an NGO Coordinator in Lalitpur expressed that there are opportunities to work overseas for mid-level health workers, such as nurses resulted in increment of their enrolment.

Table 6 : Three Year Trend of Enrolment of Basic Level Health Workers

Programmes	Enrolment		
	2007	2008	2009
PCL Nursing	1466	1644	1797
PCL General Medicine	532	946	955
Dental Hygienest	67	128	125
Lab Technician	80	432	591
Diploma in Pharmacy	511	490	624
Radiography	0	41	156
Total	**2656**	**3681**	**4248**

Source: *CTEVT Profile, 2011*

3.2.3 Pre-service Training of High-Level Health Workers

Secondary data from the Nepal Medical Council and other sources (University and College websites), illustrates the expansion of medical colleges offering MBBS and BDS training in Nepal in the last two decades (see Appendix 6), with the recent addition of 6 colleges currently under the process of affiliation. The current annual capacity and pre-service training of high-level health workers is shown in Table 7.

Table7: Current Annual Capacity and Graduate High-level Health Workers

Name of Programmes	Current Total Annual Capacity 2011	Current Total Annual Graduates 2011
Masters Level		
MD/MS	376	369
MDGP	26	20
MD Ayurveda	2	0
Master in Allied Health Science*	55	45
MPH	45	30
MN	59	43
Bachelors Level		
MMBS	1955	1255
BAMS	98	28
BDS	330	180
B Pharm	590	240
B Optm	7	7
BMLT	201	111
BSc MIT	17	8
BASLP	4	0
BSc Nursing	511	311
BPH	880	455
BN	749	499

Source: *University and College websites and key contacts*

*Including Microbiology/Biochemistry/Medical Imaging Technology

The annual pre-service training capacity of MBBS graduates is 1,955, excluding those who study abroad. The opening of new medical facilities and subsequent oversupply of doctors in the country did not result in the desired effect of more professionals moving to work in rural areas. Rather, it led to an increase in emigration of graduates students (23). A study carried out by the NSI and IOM in Nepal on migration patterns of the first 22 batches of MBBS graduates revealed that 36 per cent were working abroad, 36.8 per cent were working in Kathmandu and only 27.2 per cent were working in other regions of the country (24). This emphasises the need for retention strategies of the current workforce, rather than an increase in pre-service training (23).

The data also shows the undersupply of specialist health cadres, such as those who graduate with MD/MS and MD in General Practice (MDGP). For example, MDGP is one of the critical categories of high-level HRH in Nepal, yet the annual capacity for students is much lower than the need of the country. This can be attributed to the low annual capacity of academic institutions, which has an impact on the numbers of doctors who must migrate overseas to study specialist courses.

3.3 Ratio of Health Workers to Population (Doctors, Nurses/Midwives)

Health workforce ratio are commonly used to show the adequacy of HRH and to estimate the density of the existing health workforce (25). The World Health Report 2006 has set a 'threshold' density of 23 doctors, nurses and midwives (per 10,000 in the population) for the achievement of health related MDG goals (4). According to WHO Global Health Atlas, WHO 2006, MoHP and HuRIS in Nepal, the ratio of doctors and nurses/midwives to the population is comparatively less than other South-East Asian countries (7), although it must be noted that data often differs between sources, and is often subject to unreliability. The WHO 2006 report shows that there are 7 nurses/midwives and doctors per 10,000 population, while the latest statistics of registered personnel from Nepal's Medical and Nursing Councils suggest a ratio of 16 per 10,000 population (See Table 8).

Table 8 : Ratio of Doctors and Nurses to Population

Categories	Total Registration to June 2011	Ratio/10,000 Population***	Working in Public Sector until 2011****	Ratio/10,000 Population (Public Sector)
Medical Doctors	10,753*	4	1,112	0.4
Nurses Including ANMs	32,948**	12	6,553	2.5
Total	**43,701**	**16**	**7,665**	**2.9**

Source: *Nepal Medical Council, **Nepal Nursing Council, 2012 situation analysis, ***Total Country population = 26,620,809 (CBS 2011) ****HRH Strategy 2011-2015.*

Though this data shows a comparatively better ratio, the reality on the ground is somewhat different. Not all registered health personnel remain in Nepal and many of them have migrated to western countries. Furthermore, the MoHP HRH strategy 2011-2015 claims that the ratio of doctors and nurses, based on an estimated 2011 population of 26.6 million and using the 2011 data of staff working in public sector is 0.42 doctors per 10,000 population and 2.5 nurses per 10,000 population (6,553), which provides a ratio of 2.9 health workers per 10,000 in the population (7). This demonstrates a low ratio of government health workers to the population.

CHAPTER *IV* DISTRIBUTION OF HEALTH WORKFORCE IN NEPAL

This chapter is focused on the current distribution of sanctioned, filled and vacant health posts, disaggregating data by ecological belt, urban-rural locality, development region and types of health facilities in order to establish the shortages and surpluses of various basic, mid and high-level health professionals. The analysis is based on observation checklists from 256 health facilities surveyed in 15 districts.

Sanctioned positions are based on the types of health facilities and the level of healthcare provided. The government regulation clearly states the numbers of HRH positions required in private or I/NGO health facilities, based on the number of beds and type of services they plan to provide in each facility. It is the responsibility of the managers of such facilities to fill these posts. In the public sector, HRH positions are sanctioned based on the National Health Policy 1991 (see Table 9), and the MoHP is responsible for filling provisioned posts per institution and allocating benefits to them.

Table 9: Sanctioned Position of HRH By NHP 1991 Vs. Current Sanctioned Posts (PHC/HP/SHP)

SN	Post	Sanctioned post and number in PHC		Sanctioned post and number in Health Post			Sanctioned post and number in Sub- Health post	
		By NHP 1991	Current situation*	By NHP 1991	Current situation*		By NHP 1991	Current situation*
					Tarai	Hill and Mountain		
1	Medical Officer	1	1	x	x	x	x	x
2	HA/Sr. AHW	1	1	1	1	1	x	x
3	Staff Nurse	x	1	x	x	x	x	x
4	AHW	3	2	2	2	1	1	1
5	ANM	3	3	2	1	1	x	x
6	Lab Assistant	x	1	x	x	x	x	x
7	VHW	1	x	1	x	x	1	1
8	MCHW	x	x	x	x	x	1	1

Source: *Health services operating manual 2004, DoHS, x: no sanctioned position according to policy*

The table above shows the similarity in the number of sanctioned posts in public sector facilities between 1991 and 2004, despite the significant increase in the population. As a coping strategy for the distinct lack of sanctioned positions, local authorities also recruit locally for certain positions based on the need.

4.1 Distribution of all HRH Cadres

The table below shows the distribution of filled positions and vacancies of all HRH cadres. These figures reflect the percentage of health workers that are available on the official payroll, rather than the number of health workers who are available at the working stations during working hours.

Table 10 demonstrates that only 86 percent of total sanctioned positions are filled. Similar data is shown by the DoHS Annual Report (2007/08), with around 89 percent filled nationally. Variation in the distribution of filled posts in all three ecological belts was found, with the Hill belt having the highest proportion of vacant posts. The highest percentage of filled HRH posts were found in the Far-Western Development region (FWDR) (106%), which reflects the additional support provided by VDC/DDC and INGOs to improve the health indicators of the least developed region in the country.

Table 10 : Distribution of all Types of HRH Cadres in Nepal

Characteristics		Total (including local recruitment)		
		Sanctioned	Filled	Vacant
		No	%	%
Ecological Belt	Mountain	327	88	12
	Hill	725	84	16
	Tarai	810	88	12
Development Region	EDR	343	71	29
	CDR	515	72	28
	WDR	405	95	5
	MWDR	190	92	8
	FWDR	409	106	-6
Locality	Urban	736	85	15
	Rural	1,126	87	13
Types of Health Facility	Hospitals	608	93	7
	PHC	200	81	19
	HP	226	91	9
	SHP	538	88	12
	Ayurvedic Centres	58	95	5
	Private Clinic/Hospital	125	66	34
	I/NGO Clinic /Hospital	107	62	38
Total		**1,866**	**86**	**14**

Source: *HRH Field Survey 2011*

Among the total filled positions, the government contributed to 86.7 percent of the recruitment of Health Workers, compared to 13.3 percent of Health Workers through local recruitment (DDC/VDC, I/NGO, private sector and management committees). The survey data includes staff recruited through DDCs/VDCs which had made remarkable contribution in the Health Posts (9%) and Sub-Health Posts (10%), and Management Committees, who made the highest contribution in Hospitals (11%) (see Appendix 7).

This data also resemble the most recent figures on the number of sanctioned and filled public health posts in the country from the DoHS Annual Report 2007/2008, which reported an 11.3 percent deficit in sanctioned posts (see Appendix 8).

One of the senior officers from the Hill belt highlighted that doctors or other health professionals did not want to work in remote areas of the district due to lack of facilities and the additional income gained from private practice. This is despite Article 59c of the 'Health Service Act 1997, which does not permit HWs to be involved in private practice without prior consent from the concerned authorities. Of those involved in additional income activities, 18.3 percent were involved in private practice and 17.8 percent were running private pharmacies, though these figures may be prone to under-reporting. There was slight variation in the distribution of filled posts in all three ecological belts with hill having the highest proportion vacant posts. Regarding development region wise distribution of filled percent with respect to sanctioned positions, the highest percentage of health human resources were found to be filled in Far-western Development Region (FWDR) (106%), and lowest fulfilment of HRH was found in the Eastern Development Region (EDR) (71%). The distribution of human resources for health was found to be more than the sanctioned positions in the FWDR by six percent which is due to local recruitment by the health facility and Hospital Management Comittees of additional health workers. VDCs/ DDC budgetery support and support from I/NGOs paid for these additional staff members. For example, in Kailali District of the FWDR, 54 health workers were recruited with the above mentioned support, rather than the allocated sanctioned positions. Similarly the fact is also supported by DHO in Darchula and he reported that 28 ANMs and two laboratory assistants were locally recruited by the respective Village Development Committees in local health facilities. Further analysis found that the EDR suffered from higher gaps in staffing in the zonal hospital, where only 34per cent of posts were filled.

The survey data also showed that the private-sector health facilities had a higher proportion of vacant posts compared to public sector health facilities, with 38 percent of vacant santioned positions I/NGO clinics/hospitals. The disparity in filled and sanctioned posts are further explained by a manager from an I/NGO Hospital of Tarai District of CDR, who highlighted the lack of long-term job security due to donor dependency, as well as the absense of career development opportunities. It can also be explained by dual practice, whereby health professionals are working in more than one facility but are considered as employees of only one facility for reporting purposes. One key informant (officer of a private nursing home in Lalitpur) also emphasised that due to profit-making motives of the private sector, HWs try to manage hospitals/clinics with the minimum number of staff required. He also claimed that staff have to work more than regular duty hours with lower pay, and that staff regulation policy and decision-making processes remained exclusive.

No significant difference was found between the urban and rural distribution of filled HRH positions. However, the distribution of filled HRH posts differed by type of health facility with highest percentage of filled posts found in Ayurvedic Centres (95%) and the lowest in PHCs (81%), among public sector health facilities.

Most participants of focus group discussions, including from groups of service users, service managers and service providers from various study districts stated that a shortage of health workers had been experienced in their surrounding health facilities. A key informant, a DHO in the Hill belt, claimed that even if the sanctioned positions were filled, these would not be sufficient to meet health needs. To solve the shortage and mal-distribution of HRH, the DHO suggested the involvement of the private sector in health service provision in areas where there are major gaps in the public sector. He stated that *"the government should encourage the private sector to provide services in rural areas and ensure better working environment"*.

However, according to the DHO in the Tarai belt, health services provided by the private sector are not affordable to the general population. Furthermore, private sector facilities are not quality assured, and work with few health workers, as the above quantitative data on the high number of vacancies shows, which jeopardises the quality of care of patients.

Although some sanctioned posts were filled, they were usually not present at their duty stations. A *teacher from* from MWDR in the Hill ecological belt stated: *"here is a lack of health workers. Health workers are never present in health institution. We can meet them only once or twice in a month".* The survey found that in hill belt only 48.4 percent of health facilities had at least one ANM at the time of survey, and only 18.7 percent of health facilities had at least one HA/AHW (see Appendix 9).

Regarding urban-rural disparities of workforce distribution, a Senior Public Health Adminstrator in an urban area of Lalitpur district said that the distribution of the health workforce was adequate for the region as a whole, but that there was a scarcity of health workers in rural areas. Similar evidence was found in discussions with service users. FGDs with service users in Mugu District (MWDR) showed that there were no health services due to unavailability of health workers.

4.2 Distribution of Doctors

The table below illustrates the distribution of doctors according to ecological belt, development region, locality and type of health facility. It highlights the deficit of filled sanctioned doctors' posts in the Hill belt (40% vacant) of the CDR (62% vacant) in private clinics/hospitals (58% vacant), INGO Clinic/Hospitals (57% vacant) and the public sector PHCs (47% vacant).

Table 11: Distribution of Doctors

Characteristics		Surveyed HF No	Doctor		
			Sanctioned	Filled	Vacant
			No	%	%
Ecological Belt	Mountain	62	19	63	37
	Hill	91	89	60	40
	Tarai	103	86	64	36
Development Region	EDR	45	29	69	31
	CDR	85	76	38	62
	WDR	43	37	95	5
	MWDR	34	12	83	17
	FWDR	49	40	65	35
Locality	Urban	32	147	63	37
	Rural	224	47	60	40
Types of Health Facility	Hospitals	14	105	71	29
	PHC	17	17	53	47
	HP	42	-	-	-
	SHP	144	-	-	-
	Ayurvedic Centres	13	13	85	15
	Private Clinic/Hospital	9	38	42	58
	I/NGO Clinic /Hospital	17	21	43	57
Total		**256**	**194**	**62**	**38**

Source: *HRH Field Survey 2011*

Overall, only 62 percent of sanctioned positions for doctors were filled at the time of survey. Data from the DoHS Annual Report (2007/08) shows comparatively more, with 77 percent of filled sanctioned posts (8) (See Appendix 8).

While considering the total of 70 institutes with sanctioned positions for doctors, 32 health institutions located in urban settings had a total of 147 sanctioned doctors' positions, whereas in rural settings, only 47 doctors were sanctioned in 38 health institutions. This demonstrates that the number of both sanctioned and filled positions is higher in urban areas, due to the fact that PHC are primarily located in rural settings, with only 1 sanctioned position for doctors. Furthermore, there is a high vacancy rate of doctors at the PHC level (47%), which emphasises the inequities in access to essential health care services for rural populations. The data also shows the high number of vacant positions in private clinics/hospitals (58%), which could be prone to misreporting as a result of private institutions trying to avoid legal implications of declaring filled sanctioned positions of doctors who are also working in the public sector. Vacancies were also high in I/NGO clinics (57%), due to the high turnover of staff and donor dependency.

There is a further disparity in the number of doctors according to ecological region, with a lower number of sanctioned positions in the Mountain belt than in the Hill and Tarai belts, which is also illustrated in the figure below.

Figure 1 : Health Workforce Distribution-Medical Officers
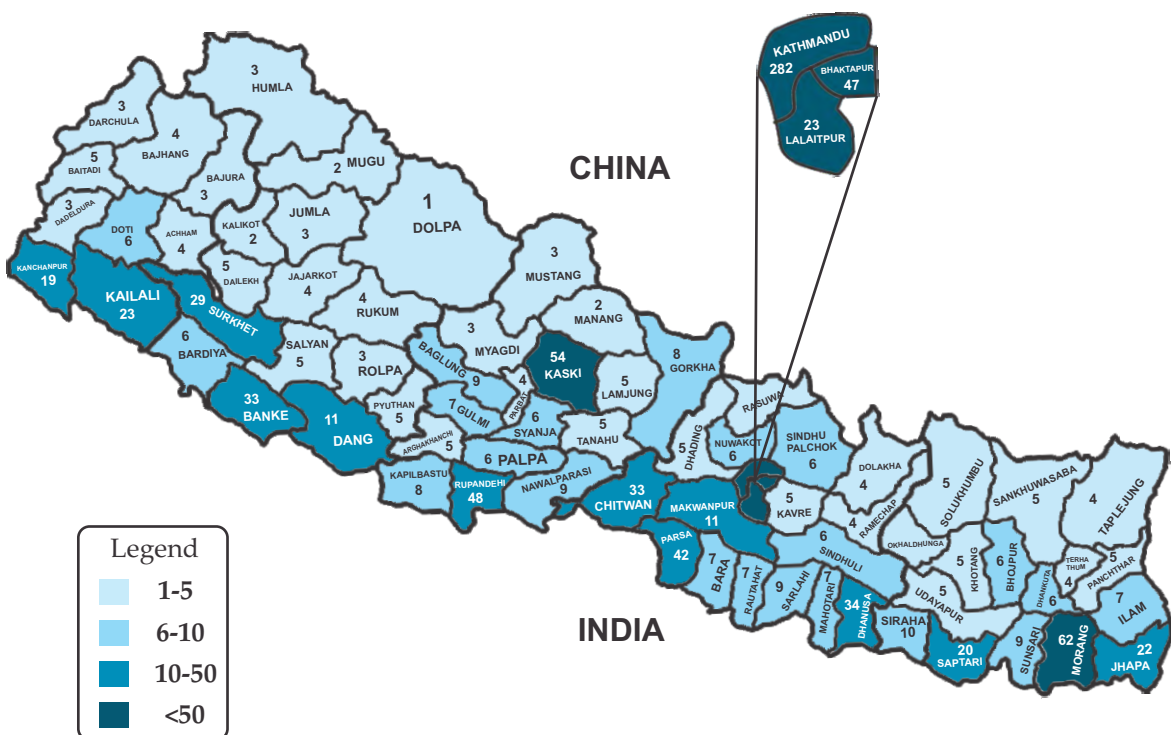
Source: *DHS/MoHP*

The highest percentage of filled doctors' posts were found in WDR (95per cent), because more doctors were sanctioned and present in I/NGO facilities (Mission Hospital) where all of the 28 doctors posts were filled, due to the good reputation of the facility hospital, according to FGDs.

The number of unfilled sanctioned positions was higher among private and I/NGO run hospitals and clinics. Reasons for this are that private clinics will often employ fewer doctors, regardless of the number of required sanctioned positions, as a cost-saving mechanism. This reduces the quality of private practice and should be monitored more efficiently. A KII with the Coordinator of an I/NGO in Dhanusha district stated that doctors' posts were vacant in private health facilities due to the high workload, low pay particularly in urban areas due to high competition, lack of job security and career opportunities.

Deficits shown in the table are supported and explained by qualitative data, reflecting a common theme across ecological belts, development regions and districts, where service providers, service users and managers revealed that doctors were not always present in their sanctioned posts. A teacher from Kadamandu VDC of Doti District, in the Hill belt, who explained: *"Doctors want to stay in the district hospital and do not want to work in PHCs in remote parts of the district. One support staff is provided by the VDC to health facilities who prescribes the medicine to patients in the absence of all other health workers."*

Similarly, FCHVs in a remote PHC of Bardiya District (Tarai belt) claimed that despite all other positions in the PHC being filled, the absence of a doctor was the major problem in health service provision. Information from a former president of the district hospital management committee of Bardiya District highlights this issue:

"Sanctioned positions for doctors are limited and employed doctors are not always present at the centre. The services provided to the district are not sufficient to meet the needs of the local population. People are bound to go either to Nepalgunj or to India for treatment because of the lack of availability of doctors here."

During FGDs with FCHVs and service user groups of Nar VDC, in the Mountain belt of Manang District (WDR), most of the participants said that doctors did not stay at the health institutions, thus people seeking treatment had to go to Chame (District Headquarters) and other cities by helicopter for treatment, which is very expensive.

A political leader of Mugu District (Mountain belt) stated:

"There are SHP, HP, PHCC and a hospital in Mugu District but there is lack of health workers and an insufficiency of medicine and equipment. Even if there were medicine and equipment, there are no doctors anyway. There is only one doctor posted in the District Hospital who is not available most of the time. So the community have to go to Surkhet or Nepalgunj for treatment of serious cases which increases the financial burden on them". Despite the fact that doctors are available on paper, they are frequently unavailable in the health facilities, which have an impact on service users. For example, only 35.3 percent of doctors were available in health facilities in the Mountain belt (see Appendix 9).

4.3 Distribution of Nurses Including ANMs

The deficit of nurses in sanctioned positions has been analysed using the same spatial characteristics and institution as shown in table below.

Table 12: Distribution of Nurses Including ANMs

Characteristics		Surveyed HF No	Nurses (Including ANM)		
			Sanctioned	Filled	Vacant
			No	%	%
Ecological Belt	Mountain	62	87	86	14
	Hill	91	233	88	12
	Tarai	103	183	93	7
Development Region	EDR	45	94	89	11
	CDR	85	134	69	31
	WDR	43	137	96	4
	MWDR	34	44	84	16
	FWDR	49	94	114	-14
Locality	Urban	32	259	91	9
	Rural	224	244	88	12
Types of Health Facility	Hospitals	14	231	94	6
	PHC	17	69	78	22
	HP	42	53	91	9
	SHP	144	-	74*	-
	Ayurvedic Centres	13	-	1*	-
	Private Clinic/Hospital	9	27	81	19
	I/NGO Clinic /Hospital	17	48	77	23
Total		**256**	**503**	**90****	**10**

Source: *HRH Field Survey 2011*
* Local recruitment and upgraded positions (i.e. MCHW to ANM) ** Excludes local recruitment

Analysis of collected data shows that of 256 health facilities in 15 districts, 90 percent of sanctioned posts for nurses were filled. The DoHS Annual Report 2007/08 shows similar findings, with 89 percent filled (See Appendix 8 for details).

Across ecological belts, the survey found the highest percentage of filled sanctioned posts in Tarai (93%) followed by the Hill (88%) and Mountain (86%). Urban facilities were found to have a higher number of filled posts, with 91 percent compared to 88 percent in rural settings. Across the various surveyed health institutions, the data showed 94 percent of sanctioned posts in hospitals were filled, 91 percent at the health post and 78 percent at PHCs.

During the survey, 74 Nurses/ANMs were found in-post at SHPs, some of whom were recruited at DDC and VDC level and others were upgraded from MCHWs to ANMs after receiving 18 months of ANM training. This shows how the local authorities take on the responsibility of recruitment to address local needs. Therefore, sanctioned positions for ANMs should be introduced and approved by the Government at all levels, including SHP level. Vacant nurses' posts are found to be higher (23%) in I/NGO clinics and hospitals. Similarly to the vacancy of doctors, the gap was higher in PHCs (22%), which are often in remote locations.

FWDR was found to have the highest percentage of filled sanctioned positions at 114 per cent. This is followed by WDR at 96 per cent and CDR at 69 percent, which was the lowest. The reason behind the higher percentage of nurses than actual sanctioned positions in the FWDR was local recruitment with the support of VDC/DDC/DHO and RHD to support the policy of MoHP to promote HPs as birthing centres. ANMs have been temporarily recruited and government policy is in place to upgrade MCHWs to ANMs. Qualitative findings support the notion of short term recruitment of ANMs to address poor maternal health indicators; DHO Darchula (Mountain FWDR) reported that 28 ANMs and two laboratory assistants were locally recruited by respective Village Development Committees.

"ANMs are recruited on a contract basis in most of the health institutions through local recruitment by DPHO/DDC/VDC or by other agencies".

Issues of sustainability have emerged from KIIs and FGDs. Many participants cited the unsustainable nature of local recruitment for health professionals. VDCs are unable to continue to fund HRH yet are seemingly better placed to recruit health workers.

Increasing the number of sanctioned positions is not the only solution to HRH shortages, as availability at the health facility is also crucial. FGDs with service users, providers and managers revealed that in some health facilities the non-technical personnel like support staff, are found performing health provision duties in lieu of any HRH. One FCHV from Bardiya explained, *"Doctors and nurses mandated to perform their night duties are also not found and at night, and the support administrative staff are found performing the doctors' duties."*

Key managers of Rasuwa District emphasised the importance of local recruitment and local health workers, saying that in some HFs, though AHW and ANM are posted, due to the absence of one health worker, a single ANM has to be the sole service provider. Most of the ANMs recruited through contracts are worked on a regular basis, rather than the health workers seconded from other districts. They further added that local recruitment increased continuity and proved more sustainability than recruiting HWs from outside the area – the highest shortages, however, remained in the most remote areas. Once again, it was also observed in KII, that a shortage of health workers is more serious in remote parts of the mountain district.

4.4 Distribution of HA, Sr.AHW and AHW

The following table shows the distribution of HA/AHW across the ecological belts, development regions and types of health facilities.

Table 13 : Distribution of HA, Sr.AHW and AHW Staff

Characteristics		Surveyed HF No	HA, Sr.AHW and AHW		
			Sanctioned	Filled	Vacant
			No	%	%
Ecological Belt	Mountain	62	96	81	19
	Hill	91	152	89	11
	Tarai	103	188	*104	-4
Development Region	EDR	45	90	83	17
	CDR	85	120	93	7
	WDR	43	76	88	12
	MWDR	34	61	*102	-2
	FWDR	49	89	*104	-4
Locality	Urban	32	88	*105	-5
	Rural	224	348	91	9
Types of Health Facility	Hospitals	14	69	*117	-17
	PHC	17	56	82	18
	HP	42	86	92	8
	SHP	144	161	92	8
	Ayurvedic Centres	13	18	106	-6
	Private Clinic/Hospital	9	29	83	17
	I/NGO Clinic /Hospital	17	17	65	35
Total		256	435	94**	6

Source: *HRH Field Survey 2011 *Recruitment at the local level **Excludes numbers of locally hired positions*

Analysis of the distribution of paramedical staff across the different ecological belts reveals more filled sanctioned positions in the Tarai region (104%), followed by the Hill belt (89%), and the Mountain belt (81%t).

Across development regions, the FWDR and MWDR contained a greater number of health workers than sanctioned positions; 104 percent and 102 percent respectively. The paramedical staff from private clinics and hospitals, and those with I/NGO support or temporarily recruited by Hospital Management Committees and HFOMC, have accounted for the surplus of paramedical staff in these regions. In other development regions, paramedical staff numbers seem satisfactory in comparison to other health cadres.

Paramedical staff filled 105 percent of sanctioned roles in urban areas and 91 percent in rural areas. A senior official from DPHO Bardiya claimed one reason was that health workers were attracted towards urban health institutions because of the opportunity for alternative earning from private practice.

Hospitals held the highest percentage of paramedical staff to sanctioned positions (117%). The lowest percentages were observed in I/NGOs clinics and hospitals (65%). In Ayurvedic Centres 106 percent of sanctioned positions were filled. For SHPs, HPs, PHCs and private facilities the figures are 92, 82 and 83 percent respectively.

A higher deficit of paramedical staff was found in the Mountain belt (19%), in the EDR (17%), in rural areas (9%), I/NGO clinics and hospitals (35%), or PHCs (18%). Overall, there was 6 percent deficit of paramedical staff observed in the 256 health facilities surveyed in the 15 districts.

FGDs with service users, providers and managers revealed that paramedics are mostly found in urban centres and gave more time to their private practices than to government institutions. Regarding this, a key informant within a group of service users of a Hill belt in Lalitpur district said:

"Health workers from different health facilities have become urban centric. Nowadays they live in urban areas or near the market area where they can run their private clinic, and that is the reason why health workers are unavailable at public health institution."

Most KIIs and FGDs again revealed a shortage of HRH in rural areas. This includes less sanctioned positions and those that were sanctioned are largely vacant. Participants in discussions demanded an increase in sanctioned positions of health workers and assurances that the positions will be filled quickly. A member of a Mothers' Group from Panchthar District (EDR Mountain) explained:

"People sometimes are at the stage of dying but the health worker is not available in the health centre. If ever health personnel are found to be there, they are only the VHW or the newly appointed nurse locally. AHWs are rarely present. Medicines are also not available. They ask us to buy it from private pharmacies."

A case study on the impact of the unavailability of health workers in Mugu District is provided below.

HRH issues as access to health services, Mugu

This is a true story of a sixteen year old pregnant girl who suffered very long labor pain and did not received any health services due to absence of health workers in nearby health institution.

A sixteen year old girl named Susmita Malla, the permanent resident of Dhainkot VDC of Mugu district was in labor pain. This VDC is two-day walking distances from the district headquarter, Gamgadhi. The VDC is located in the bank of the Mugu Karnali River and at the blessing of nature with the cultivable land. Moreover, there is an Illaka level health post and a higher secondary school along with two private clinics. But in reality no health persons are seen regularly in the health post. Most of the time, the villagers have to depend on private clinic for the health service care delivery.

When she had a labor pain, she could not access the maternity services from both public and private clinic of her village due absenteeism of the health workers. As the labor pain was increasing and time was running out, the family was helpless in deciding what to do. After the five days of labor pain, family members decided to let her see by traditional healer *(Dhami)* of the same locality. Despite with the effort of the traditional healer she could not deliver and then on 6th day she was made ready to take in district hospital, Gamgadi. She was carried on the stretcher, but on the way of two hours, place called Chhecho they met the renowned traditional healer of the area. He started healing her by the supernatural medication system. He threw *Aaksheyata (purified rice grains used to offer God in Hindu culture)* on her and fortunately, she delivered a healthy girl child. More interesting is that she walked back to Dhainkot on foot on the same day.

The father of the patient shared that whether it was the effect of healer's Aaksheyata or it was natural delivery, he doesn't know. But what he knows is, he suffered unnecessary burden psychologically and financially because of the absence of health workers in the village. Should there be any kind of technical health worker, the decision would have been taken in time and his daughter could suffer less pain.

4.5 Distribution of Technicians

The following table shows the distribution of technicians (radiology and laboratory technicians) according to ecological belt, development region and health facility.

Table 14 : Distribution of Technicians

Characteristics		Surveyed HF No	Technicians (Laboratory and Radiography)		
			Sanctioned	Filled	Vacant
			No	%	%
Ecological Belt	Mountain	62	21	71	29
	Hill	91	66	67	33
	Tarai	103	44	100	0
Development Region	EDR	45	23	78	22
	CDR	85	45	47	53
	WDR	43	31	90	10
	MWDR	34	14	100	0
	FWDR	49	18	122	-22
Locality	Urban	32	76	80	20
	Rural	224	55	76	24
Types of Health Facility	Hospitals	14	60	92	8
	PHC	17	21	95	5
	HP	42	-	5*	-
	SHP	144	-	2*	-
	Ayurvedic Centres	13	0	0	0
	Private Clinic/Hospital	9	26	58	42
	I/NGO Clinic /Hospital	17	17	35	65
Total		256	131	79**	21

Source: *HRH Field Survey 2011 *Recruitment at the local level **Excludes numbers of locally hired positions*

Across Nepal's ecological belts, 100 percent technicians' sanctioned positions were filled in the Tarai belt, 71 percent in the Mountain belt areas and 67 percent in the Hill belt. Analysis of development regions demonstrated that in the FWDR, 122 percent of sanctioned technicians' positions were filled, 100 percent in MWDR, 90 percent in WDR, 78 percent in EDR and 47 percent in CDR. That there are more technicians than sanctioned positions is due to local recruitment by VDC/DDC in the FWDR.

Survey data also showed that PHCs and District Hospitals contained a higher percentage of filled technician roles. However, there was an even spread across both urban and rural health facilities. Overall, a one-fifth deficit in technicians occupying sanctioned positions was found across all surveyed districts.

As table 14 demonstrates, the highest deficit of technicians is found in rural (24%), I/NGO facilities (65%) of the CDR (53%), particularly in the Hill ecological belt (33%). Overall, there is a 21 percent deficit of technicians in all surveyed districts. Shortages of technicians were also revealed from qualitative findings of FGDs and KIIs; *"…in the District Hospital the post of Radiographer has been empty since 1993 and because of that the office assistant is operating the dark room."* Similarly, one NGO coordinator of Dhanusha District said that *"There is a lack of technical personnel. At the PHC level, there is a post for a technical person but most of the posts are vacant".*

It seems that in private and I/NGO clinics the deficit is considerably higher because of the use of one technician by more than one health facility.

CHAPTER V THE SKILL MIX OF THE HEALTH WORKFORCE

The "Skill Mix" of the health workforce has several definitions in practice, and can refer to 'the mix of posts in an establishment, the mix of employees in a post, the combination of skills available at a specific time or the combination of activities that comprise each role' (26). The skill mix can be examined within occupational groups or across different groups, such as nurses and doctors, or between different sectors of the health system'.

Determining and achieving the 'right mix' of health workers, who are productively efficient (26) is an enormous challenge for most health systems (27). Different professional backgrounds, skills, grades, qualifications, expertise and experience must also complement one another. Changing the skill mix in a health facility is used as a resourcing strategy to address shortages of HRH (28). The skill mix of HRH presented in this chapter is the combination of at least one member of each type of sanctioned health worker at government Hospitals and PHCs at the time of survey.

5.1 Skill Mix of Health Workforce at a Government Health Facilities

To provide the minimum level of health care, the government has sanctioned posts for the required HRH in each health facility. An analysis was carried out on the mix of HRH on the basis of availability of at least one of each HRH cadre at surveyed PHCs and Hospitals. The criteria for an effective HRH mix for this survey included the availability of at least one Doctor, one Nurse/ANM, one AHW/HA and one Laboratory Assistant in a filled position and available workforce at the time of survey.

Table 15 : Percentage of HFs with at Least One Type of HRH Available at the Time of Survey

Cadre of HRH	Surveyed PHC (n=17)	Government Hospital (n=14)
At least one Doctor	18	100
At least one Nurse	41	86
At least one ANM	82	93
At least one HA	59	64
At least one AHW	82	71
At least one LT/LA	77	93
Radiographers	6	50

Source: *HRH Field Survey, 2011*

The data shows the availability of different cadres of HW at their respective health facility. At least one doctor was found in only 18 percent of PHCs and nurses were found in less than half of PHC (41%). All hospitals visited had at least one doctor available and 86 percent had at least one nurse. Availability of most of the various types of HWs was better in the district and urban hospitals compared with rural PHCs (see also Appendix 9 for details).

Of the 17 PHCs surveyed, only 8 PHCs (47%) had the full mix of filled sanctioned positions and only three PHCs (18%) were found to have this mix of health workers available at the time of survey (see Table 16).

Table 16 : Skill Mix of HRH at PHC Level

Spatial Characteristics	No. of PHCs Observed	No. of PHCs with a *Mix of all cadres among filled post	No. of PHCs with a *Mix of all cadres available at the time of survey
Ecological belt			
Mountain	4	0	0
Hill	5	4	1
Tarai	8	4	2
Development Region			
EDR	4	2	1
CDR	4	2	0
WDR	2	2	0
MWDR	3	1	1
FWDR	4	1	1
Total	**17**	**8**	**3**

*Source: HRH Field Survey 2011. *At least one Doctor, Nurse, AHW/HA, LA, in filled position and available at the time of survey*

At the hospital level, an analysis of the mix of health workers showed that of 14 District hospitals, only 7 (50%) had all health cadres filled. Of those, only 43 percent of hospitals had HWs available at the time of the survey. It also showed that the skill mix of health workers was particularly poor in the hospitals in the Mountain region, without a mix of all cadres in filled posts.

Table 17 : Mix of HRH at Hospitals in Filled Positions and Available

Spatial Characteristics	No. of Hospitals Observed	No. of Hospitals with a *Mix of all cadres among filled post	No. of Hospitals with a *Mix of all cadres available at the time of survey
Ecological belt			
Mountain	4	0	1**
Hill	5	3	2
Tarai	5	4	3
Development Region			
EDR	3	2	2
CDR	3	1	1
WDR	3	1	1
MWDR	2	1	0
FWDR	3	2	2
Locality			
Urban	10	6	6
Rural	4	1	0
Total	**14**	**7**	**6**

*** Locally recruited*
**At least one Doctor, Nurse, AHW/HA, Radiographer, LA, in filled position and available at the time of survey*

This issue was raised during qualitative data collection with regards to maternal and child health. A Senior District Health Manager from the Hill belt of the EDR stated in a KII:

"Overall, the sanctioned posts are not enough to give required health service to the people. The technical human resources are not enough in the health institutions where there are birthing centres. Compared to the flow of patients in the district hospital, the posts sanctioned for here are not enough. Similarly, the number of available Laboratory Technicians, Radiographers and staff nurses is very low".

A common theme among service users, service providers and civil society organisations was the need to address the unavailability of health workers by enhancing the capacity of those health workers who were available, such as community health workers, in order to increase the access to quality health services. A journalist from Doti argued: *"If the health centre is carefully observed, we will find ANM, FCHVs, MCHW working in the health centre as doctors…if doctors are really not available in the communities, community health workers should be trained properly."* This was supported among a group of MCHW, VHW and FCHV in Darchula, who were required to fill the positions of absent health staff: *"We are in urgent need of training, since we are compelled to fill higher responsibilities than our mandated positions".*

The negative implications of the poor skill mix in health institutions was highlighted in several FGDs with service users and managers, which revealed that due to the lack of technical health workforce in some health facilities, the services were provided by non-technical staff (administrative staff, office assistants etc.) Participants of an FGD discussion with members of the Management Committee of Gauradha HP in Jhapa District stated during discussions: *"The health centre should have staff with knowledge in health, but here there is a person from a completely different background - a VDC secretary - has been placed. It is shameful that in the post which should be filled by a skilled and experienced health person has a VDC secretary instead. How can a person with no knowledge related to the health field serve the people?"*

5.2 Skill Mix on the Basis of the Current Burden of Disease

As mentioned before, sanctioned positions are based largely on the 1991 National Health Policy and there has been minimal change since then (see Table 9). There is high pressure for all cadres of HWs to serve an increased population (more than 45 percent increase since 1991) (7), with an increased burden of disease and an increased number of vertical health programmes from central to village level (29).

There is also rise in the proportion of morbidity and mortality associated with an increasing burden of non-communicable diseases (30-31). Secondary data has shown the high percentage of morbidity due to non-communicable diseases, which accounts for 36.5 percent of in-patient visits (29, 32-34). Data from previous reports show that this trend is increasing over time.

NHSP IP II has planned for the implementation of training on the prevention and control of NCDs, but an official training course has not yet been developed by the NHTC and training is therefore occurring on an ad-hoc basis. For this reason, only 17.7 per cent of health workers have taken part in training on NCDs, which was found to be particularly low in hospitals (13.8%) and among doctors (15.5%), nurses (11.9%) and technicians (5.4%) (See Appendix 10). A senior official at MoHP argued that the emphasis given to communicable diseases does not match to the existing diseases burden and health needs:

Furthermore, an employee of a Non-governmental Organisation (NGO) in Pyuthan expressed the irony in the lack of awareness and training on NCDs among health workers, who themselves suffer with diseases related to their lifestyle, such as hypertension, diabetes and chronic lung disease.

Furthermore, the global debate on NCDs has emphasised the particular vulnerability of women as well as the effect of NCDs on the health and life chances of their children(35), and research has suggested the importance of integrating the prevention and control of NCDs into maternal and child health programmes (36). Training on MCH should therefore raise awareness among all levels of health workers of key interrelated problems, such as hypertension and diabetes in pregnant women, as well as expose the barriers that cause women to be particularly vulnerable to these diseases. Health Workers at SHP and HP levels should be aware of these issues, so as to effectively identify and refer NCD cases.

A survey respondent at the DPHO at Palpa district said that health workers should have comprehensive training that covers emerging health problems and makes them capable of providing a range of quality services. This issue was highlighted by the Health Secretary of MoHP in November 2011:

"There has been a paradigm shift in the trend of diseases and unlike the scenario two decades ago, people now are suffering more from non-communicable diseases like cardiovascular diseases, diabetes, cancer, blood pressure. Therefore, it would not be an exaggeration to term the health policy a failure, as it lacks government's stands and clear visions in dealing with new diseases that have been emerging with the changing time" (37).

This emphasizes that epidemiological changes and the need to revise the health policy are currently high on the political agenda in Nepal, but the process of implementation should be strengthened.

CHAPTER *VI* CONCLUSIONS AND RECOMMENDATIONS

This study has shown that there is an uneven distribution and skill mix of Health Workers in the country. The number of sanctioned positions and categories of Health Workers production do not take into consideration epidemiological shifts and population growth in the last decade. On the basis of qualitative and quantitative findings discussed in this report, the following summary of major findings is presented below.

6.1 Pre-service Training of the Health Workforce

Conclusions

- The hypothesis that the spill-over effect of over-production of health workers would positively affect the availability of HRH at remote service delivery stations has not been realised.

- The uncontrolled growth of private academic institutions, has led to a relatively uncontrolled production of doctors who do not join the public health sector and often migrate to western countries, leaving the Nepalese population with little or no benefit from this highly skilled workforce. By contrast, other crucial HRH cadres are in low production, such as General Practice doctors (MDGP).

- There is a lack of collaboration between the MoHP, Ministry of Education and HRH pre-service training institutions to ensure a robust monitoring and quality assurance system.

- The research study also found inconsistencies in HRH data and policy documents, particularly with regards to definitions of health cadres and categories.

Recommendations

- There should be strong coordination between the Ministry of Health & Population and the Ministry of Education to ensure that HRH pre-service training is based on the needs of the population and addresses the current imbalance between supply and demand.
- The ministries (MoHP and MoE) should strengthen and enforce the current bonded scholarship scheme.
- To improve the consistency of HRH data in Nepal, the MoHP should strengthen the Human Resource Information System covering public, private for-profit and private not-for-profithealth facilities. Creating a database that includes private academic institutions and high level health cadres should also be considered.

6.2 Distribution of the Health Workforce

Conclusions

- Despite the fact that the population has increased by 45 percent in the last two decades, the number of sanctioned health posts is still based on the 1991 Health Policy.

- Overall, 14 percent of sanctioned positions for all health workers were vacant, with a 38 percent deficit of doctors and a 10 percent deficit of nurses in the surveyed districts.

- There was a high percentage (58%) of vacant doctors' positions in private health facilities, partly due to the cost-saving mechanisms of private facilities with less filled sanctioned positions. This could also be a result of under-reporting as government staff are not permitted to work for private institutions without prior approval. This was also the case in I/NGO run clinics/hospitals (57%).

- Though there is no sanctioned posts for ANMs at the SHP level, recruitment was carried out locally, particularly in the FWDR.

- There was a greater shortage of health workers in rural health facilities compared to urban areas.

Recommendations

- The MoHP should increase the current number and revise type of sanctioned positions taking into consideration the shifting disease burden and population growth in the country. It would be better if the ministry could introduce sanctioned positions for ANMs at the SHP level, to promote maternal and child health services.

- The MoHP should encourage the hiring of health workers at local level through district health system as a part of devolution considering the local needs. Civil Society Organisations can advocate for improvements in these issues.

    The MoHP and the respective Councils should strengthen the monitoring systems of private
- for profit and not for profit hospitals/clinics to ensure that sanctioned positions are filled and there are consistent quality services.

6.3 Skill Mix of the Health Workforce

Conclusions

- The research study found that the number of PHCs and hospitals with a complete mix of filled sanctioned posts in PHCs was particularly low in the Mountain belt (0%) compared to other belts (80% in the Hill belt and 50% in the Tarai belt), where staff had to be locally recruited to fill the gap.

- Qualitative data highlighted that absence of one category of health workers negatively impacted on the performance of other health workers which affects health delivery system as a whole.

Recommendations

- The MoHP should create a pool of health staff at the Regional level who can be transferred to rural health facilities to fill gaps.
- Considering the requirement of skills to address the health needs of the people, the health system should also promote the skill mix trainings to HRH.

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APPENDICES

Appendix 1: Sampling Method

```
┌─────────────────────┐      ┌─────────────────────┐      ┌─────────────────────┐
│   5 Regions:        │      │  3 Ecological belts:│      │   75 Districts      │
│   EDR, CDR, WDR,    │──────│  Mountain, Hill,    │──────│                     │
│   MWDR, FWDR        │      │  Terai              │      │                     │
└─────────────────────┘      └─────────────────────┘      └─────────────────────┘
                                        │
                                        ▼
                             ┌─────────────────────┐
                             │  Sampling frame     │
                             │  of 15 districts    │
                             └─────────────────────┘
                                        │
                                        ▼
                             ┌─────────────────────┐
                             │  404 selected health│
                             │  institutions (PPS  │
                             │  method)            │
                             └─────────────────────┘
                                        │            ┌─────────────────────┐
                                        │───────────▶│ Staff not available │
                                        │            │ in 29 HFs - Response│
                                        ▼            │ Rate of 93%         │
                             ┌─────────────────────┐ └─────────────────────┘
                             │  375 selected health│
                             │  institutions       │
                             └─────────────────────┘
                                        │
                                        ▼
                             ┌─────────────────────┐
                             │  747 selected       │
                             │  respondents        │
                             └─────────────────────┘
```
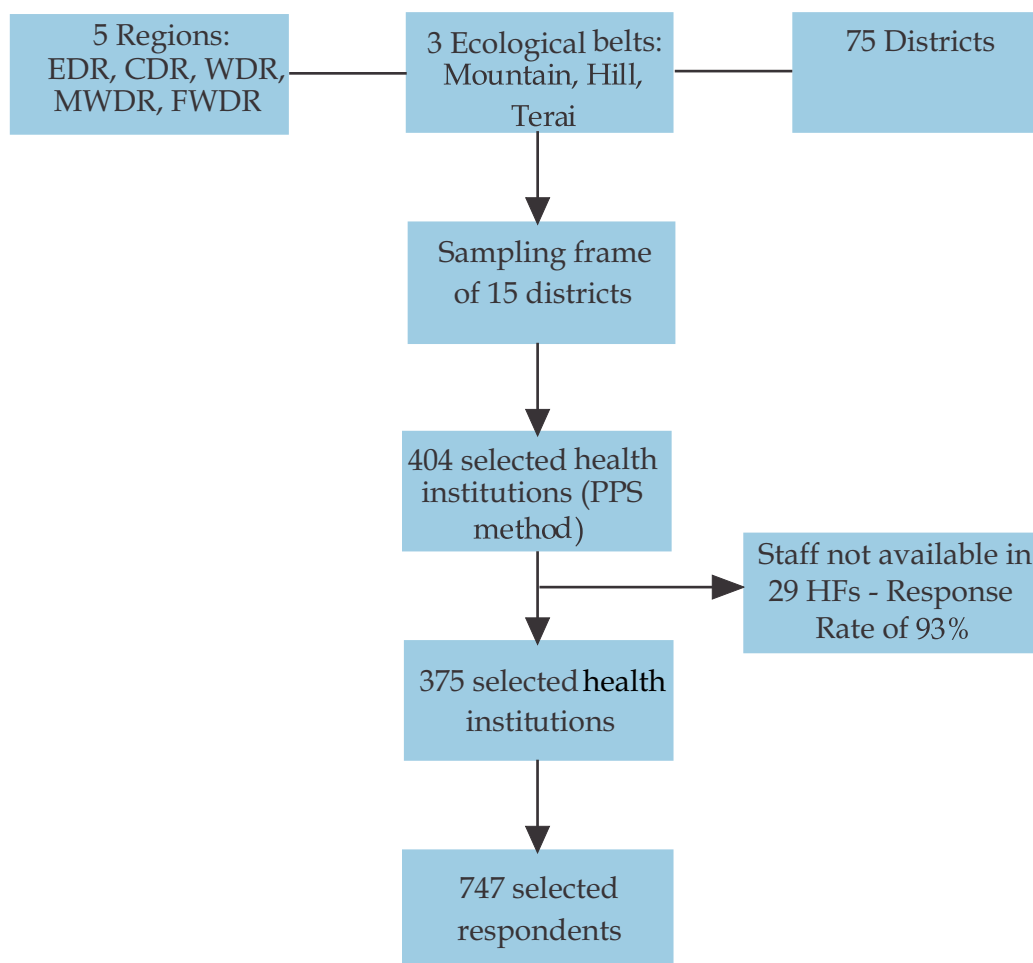
Appendix 2: Derivation of Sample Size

Major features of sample determination:

1. Total Institutions = 5146

2. Total Hospitals, PHC/HC and HP = 1000

3. Proportion of Targeted Health Facilities = 1000/5146= 0.194

4. The formulae for calculating the sample size

$$n = Z^2_{1-\alpha/2} * p * (1-p) * deff * (1+nr) / d^2$$

Where:

$Z^2_{1-\alpha/2}$ = 5% level of significance=1.96

p = proportion of the targeted coverage of health institutions

Note: Since all categories of health workforce are found in District Hospital, Primary Health Care Centres/ Health centres and Health Posts, the total number of these institutions (1000) is divided by the total health institutions (5146) in the country to calculate the proportion.

deff = Design effect, which is set as to minimize sampling variability caused by cluster sampling

The design effect set for this sample determination is 1.5

nr = Non response rate, which is an estimated rate for the non-response of respondents and it is set as 10 percent (0.1) in this sample selection.

d = Allowable error, which is usually considered as 0.05 that indicates its range from 14.4 to 24.4 percent.

The equation for deriving the sample size is given as below.

$$n = Z^2_{1-\alpha/2} * p * (1-p) * deff * (1+nr) / d^2$$

or n= $(1.96)^2 * 0.194 * 1.5 * (1+0.1) / 0.05^2$

or n= $(3.84*0.16*1.5*1.1)/0.025$

or n= 1.01/0.025

or n= 404

Appendix 3: Total Number of Institutions by Districts, Ecological Belts and Development Region

SN	Development Region	Ecological Belt	District	Selected Number of Institutions							
				District Hospital	PHCC/HC	Health post	Sub-Health Post	I/NGO - Clinic	Private Institution	Ayurvedic	Total Institution
1	Far-West	Mountain	Darchula	1	1	5	10	0	0	1	18
2	Far-Western	Hill	Doti	1	1	4	16	1	0	3	26
3	Far-Western	Tarai	Kailali	1	2	3	13	2	1	2	24
4	Mid-Western	Mountain	Mugu	1	1	1	4	2	0	0	9
5	Mid-Western	Hill	Pyuthanl	1	1	5	14	0	1	1	23
6	Mid-Western	Tarai	Bardiya	1	1	3	9	6	0	1	21
7	Western	Mountain	Manag	1	0	2	1	0	0	1	5
8	Western	Hill	Palpa	1	1	4	23	1	0	3	33
9	Western	Tarai	Kaplibastu	1	1	3	27	1	0	1	34
10	Central	Mountain	Rasuwa	1	1	3	2	2	1	1	11
11	Central	Hill	Lalitpur	2	1	4	12	17	5	1	42
12	Central	Tarai	Dhanusa	1	2	4	37	2	0	3	49
13	Eastern	Mountain	Sankhuwasaba	1	1	4	10	1	1	2	20
14	Eastern	Hill	Panchthar	1	1	4	12	1	0	0	19
15	Eastern	Tarai	Jhapa	1	2	3	18	9	6	2	41
Selected number of institutions by ecological belts											
1	Mountain			5	4	15	27	5	2	5	63
2	Hill			6	5	21	77	20	6	8	143
3	Tarai			5	8	16	104	20	7	9	169
Selected number of institutions by development region											
1	Far-Western Development Region			3	4	12	39	3	1	6	68
2	Mid-Western Development Region			3	3	9	27	8	1	2	53
3	Western Development Region			3	2	9	51	2	0	5	72
4	Central Development Region			4	4	11	51	21	6	5	102
5	Eastern Development Region			3	4	11	40	11	7	4	80
Total				**16**	**17**	**52**	**208**	**45**	**15**	**22**	**375**

Source: HRH Field Survey 2011

Appendix 4: Qualitative Data Collection

District	Focus Group Discussions (FGD)							Key Informant Interviews (KII)				Grand Total of Participants
	Management Group		Service Providers		Service Users		Total # of FGD	Management Group	Service Provider	Service User	Total # of KII	
	# of FGD	# of Participants	# of FGD	# of Participants	# of FGD	# of Participants						
Sankhuwasaba	1	9	1	10	1	12	-	-	-	-	-	-
	1	6	-	-	-	-	-	-	-	-	-	-
	1	12	-	-	-	-	-	-	-	-	-	-
Total	3	27	1	10	1	12	5	0	1	0	1	50
Panchthar	-	-	1	8	1	10	-	-	-	-	-	-
	-	-	1	13	1	6	-	-	-	-	-	-
	-	-	-	-	1	9	-	-	-	-	-	-
	-	-	-	-	1	7	-	-	-	-	-	-
Total	0	0	2	21	4	32	6	0	1	0	1	54
Jhapa	1	7	1	6	1	8	-	-	-	-	-	-
	-	-	1	10	-	-	-	-	-	-	-	-
	-	-	1	6	-	-	-	-	-	-	-	-
Total	-	7	3	22	1	8	5	1	1	0	2	39
Dhanusa	1	7	1	12	1	8	-	-	-	-	-	-
	-	-	-	-	1	10	-	-	-	-	-	-
Total	-	7	1	12	2	18	4	1	1	0	2	39
Lalitpur	-	-	1	4	1	9	-	-	-	-	-	-
	-	-	-	-	1	7	-	-	-	-	-	-
Total	0	0	1	4	2	16	3	1	1	1	3	23
Rasuwa	1	7	1	7	1	7	-	-	-	-	-	-
Total	1	7	1	7	1	7	3	0	1	0	1	22
Palpa	1	8	1	8	1	8	-	-	-	-	-	-
	1	-	1	7	1	9	-	-	-	-	-	-
	-	-	-	-	1	9	-	-	-	-	-	-
Total	2	8	2	15	3	26	7	1	1	0	2	51
Manang	-	-	1	7	1	10	-	-	-	-	-	-
Total	0	0	1	7	1	10	2	1			1	18
Kapilvastu	1	8	1	7	1	7	-	-	-	-	-	-
	1	6	-	-	1	6	-	-	-	-	-	-
Total	2	14	1	7	2	13	5	0	1	0	1	35
Mugu	1	14	-	-	1	8	-	-	-	-	-	-
Total	1	14	0	0	1	8	2	0	0	0	0	22
Pyuthan	1	6	1	7	1	9	-	-	-	-	-	-
	1	7	-	-	1	11	-	-	-	-	-	-
	-	-	-	-	1	9	-	-	-	-	-	-
Total	2	13	1	7	3	29	6	0	3	0	3	52
Bardiya	1	6	1	8	1	8	-	-	-	-	-	-
	-	-	1	8	1	9	-	-	-	-	-	-
	-	-	1	7	-	-	-	-	-	-	-	-
Total	1	6	3	23	2	17	6	1	2	1	4	50
Doti	1	8	1	9	1	11	-	-	-	-	-	-
	1	8	1	6	1	8	-	-	-	-	-	-
Total	2	16	2	15	2	19	6	0	1	1	2	52
Darchula	1	16	1	7	1	17	-	-	-	-	-	-
	1	8	-	-	1	15	-	-	-	-	-	-
Total	2	24	1	7	2	32	5	0	4	0	4	67
Kailali	1	9	1	6	1	6	-	-	-	-	-	-
	1	6	1	6	1	6	-	-	-	-	-	-
	-	-	-	-	1	9	-	-	-	-	-	-
	-	-	-	-	1	9	-	-	-	-	-	-
	-	-	-	-	1	12	-	-	-	-	-	-
Total	2	15	2	12	5	42	9	0	1	1	2	71
Grand Total	20	158	22	169	32	289	74	6	19	4	29	645

Appendix 5: Annual Enrolment Capacity of Different Universities of Mid-level Health Cadres (2011)

SN	Programmes	CTEVT	TU	KU	NAMS	BPKIHS	TOTAL
1	PCL Nursing	3640	271	40	40	40	4031
2	PCL General Medicine	1942	0	-	0	0	1942
3	PCL Medical Lab Technology	1350	18	-	-	-	1368
4	Diploma in Pharmacy	920	18	-	-	-	938
5	PCL Radiography	450	18	-	-	-	468
6	PCL Dental Hygiene	200	-	-	-	-	200
7	PCL Homoeopathy	40	-	-	-	-	40
8	Diploma in Ophthalmic Science	40	-	-	-	-	40
Total		**8582**	**325**	**40**	**40**	**40**	**9027**

Source: A profile of Technical & Vocational Education Providers 2011, CTEVT

Appendix 6: List of Medical Colleges with Intake Capacity and Establishment Date

SN	Name of Medical College	Date of Est.	Student intake capacity
1	Maharjgunj Medical Campus (MMC), Kathmandu	1978	60
2	BP Koirala Institute of Health Sciences (BPKIHS), Dharan	1993	100
3	College of Medical Sciences, Bharatpur	1993	150
4	Manipal College of Medical Sciences, Pokhara	1994	160
5	Nepalgunj Medical College (NGMC), Nepalgunj	1996	150
6	Universal College Of Medical Sciences(UCMS), Bhairhawa	1998	150
7	Nepal Medical college (NMC), Kathmandu	1999	100
8	Kathmandu Medical College (KMC), Kathmandu	2000	100
9	KU School of Medical Sciences, Kavre	2001	60
10	National Medical College, Birgunj	2001	150
11	Janaki Medical College (JMC), Jankpur	2003	75
12	Lumbini Medical College, Palpa	2006	100
13	KIST Medical College (KIST), Lalitpur	2006	100
14	Chitwan Medical College (CMC), Chitwan	2006	140
15	Nobel Medical College, Biratnagar	2007	150
16	Patan Academy of Health Sciences, Lalitpur	2008	60
17	Nepalese Army Institute of Health Sciences, Kathmandu	2010	50
18	Gandaki Medical College, Pokhara	2010	100
MBBS Total			**1955**

Source: Institutional Survey 2011

Appendix 7: Percentage Contribution of HRH from Different Stakeholders

Type of Institution	Government Contribution	DDC/VDC Contribution	NGO Contribution	Private Sectors' Contribution	Management Committee Contribution
Hospital	84.1	0.8	2.4	0.8	11.8
PHC	88	3.1	0.5	3.7	4.7
Health Post	86.6	9	0	1.4	3.1
Sub-Health Post	87.2	10	0.1	0.9	1.7
Ayurbedic Centres	100	0	0	0	0
Total	**86.7**	**5.2**	**1**	**1.1**	**6**

Source: *HRH Field Survey 2011*

Appendix 8: MOHP Sanctioned and Filled Posts in 2007/08

Position	Sanctioned	Filled	Vacant	Filled % Postion
Medical Doctor	1,062	816	246	76.84
Nursing Staff including ANMs	5,935	5,307	628	89.42
Paramedics	10,642	9,212	1,430	86.56
Others	6,838	6,394	444	93.51
Total	**24,477**	**21,729**	**2,748**	**88.77**

Source: *Annual Report, DoHS, 2007/08, cited in NHSP-2*

Appendix 9 : Percentage of Health Facilities with Available Health Workers in Selected Districts

Availability of Health workers* (%)						
Characteristics	Doctors	Nurses	ANM	HA	MCHW	VHW
Ecological Belts						
Mountain	35.3	35.7	54.8	16.1	32.7	34.7
Hill	51.9	58.3	48.4	18.7	29.0	42.0
Tarai	57.7	63.2	38.8	22.3	35.3	51.8
Development Regions						
EDR	57.1	60.0	64.4	17.8	5.7	22.9
CDR	37.0	45.8	40.0	16.5	30.6	46.8
WDR	60.0	42.9	32.6	23.3	40.0	60.0
MWDR	50.0	57.1	32.4	26.5	37.9	51.7
FWDR	63.6	77.8	61.2	18.4	47.6	40.5
Types of Institutions						
Hospitals	100	85.7	92.9	64.3	0	0
PHC	17.6	41.2	82.4	58.8	5.9	52.9
HP	0	0	71.4	35.7	14.3	42.9
SHP	0	0	33.3	4.2	41.0	43.8
Ayurvedic Centres	46.2	0	15.4	38.5	0	0
Private Clinic/Hospital	44.4	33.3	55.6	22.2	0	0
I/NGO Clinic/Hospital	47.1	52.9	35.3	17.6	0	0

Source: *HRH Field Survey 2011 *At least one health worker was available at the time of survey*

Appendix 10 : Percentage Distribution of Training of 4 Weeks or Longer and Less Than 4 Weeks Taken by the Health Workforce (N=747)

Characteristics		MCH		Infectious Diseases		HIV/AIDS		Disaster Management		NCDs		Others	
		>4 wks	<4 wks	>4 wks	<4 wks	>4 wks	<4 wks	>4 wks	<4 wks	>4 wks	<4 wks	>4 wks	<4 wks
Ecological Belts	Mountain	15	52	2.5	43	1.7	33	0.8	11	2.5	14	13	78
	Hill	19	51	6.2	53	6.2	40	1.8	14	1.5	19	8.1	89
	Tarai	9.9	48	8.8	51	4.8	38	2.3	14	1.7	14	5.6	88
Development Region	EDR	15	44	9.6	46	4.6	35	1.5	9.1	1.5	16	6.6	88
	CDR	16	50	5.2	54	4.7	39	2.6	18	1	16	7.3	89
	WDR	10	55	3.4	59	0.9	43	0	20	0.9	16	13	88
	MWDR	19	47	8.9	51	5	35	2	16	3	21	3	85
	FWDR	11	55	6.4	43	8.5	38	2.8	7.8	2.8	11	8.5	82
Types of Institutions	Hospitals	15	42	8.5	48	7.5	40	3.8	14	3.8	10	13	87
	PHC	27	64	9.6	81	-	48	-	17	-	15	7.7	79
	HP	24	59	9.1	63	5.8	45	3.3	22	1.7	22	11	83
	SHP	13	67	7.6	63	4.7	44	1.1	13	1.4	23	7.2	91
	Ayurvedic Centres	0	8.6	0	8.6	2.9	5.7	0	2.9	2.9	5.7	5.7	80
	Private Clinic/Hospital	3.6	11	3.6	15	1.8	13	1.8	1.8	0	7.3	0	91
	I/NGO Clinic/Hospital	7.8	28	2.9	22	5.9	30	2	15	2	3.9	3.9	83
Localities	Rural	16	58	7.7	58	4.3	40	1.5	15	1.5	19	7.5	88
	Urban	8.5	27	4.7	30	6.1	31	2.8	11	2.3	7	8	84
Types of Health Cadres	Doctors	8.8	34	3.8	34	5	31	1.3	11	2.5	13	8.8	83
	HA/AHWs	8	55	7.4	61	5.3	45	1.6	15	2.1	21	5.1	88
	Technicians	1.8	13	11	32	1.8	18	1.8	3.6	1.8	3.6	3.6	91
	Nurses/AMMs	29	55	6	43	4.7	33	2.6	15	0.9	11	12	85
Sex	Female	26	50	6.7	42	4	31	2.4	13	0.7	11	9.8	87
	Male	6.4	50	6.9	55	5.3	42	1.6	14	2.4	19	6.2	86
Total		14.1	49.5	6.8	50.2	4.8	37.6	1.9	13.4	1.7	15.7	7.6	13.4

Source: *HRH Field Survey 2011*

Field Research Team

Research Management Team
SOLID Nepal
Dr. Khem B. Karki
Bhuwan Baral
Manju Neupane
Raju Prajapati
Binod Kumar Maharjan
Sarita Chhetri
Marichman Shrestha
Tika Adhikari
Jun Bahadur Tamang

Merlin Nepal
Catherine Whybrow
Anant Nepal
Dr. Khakindra Bhandari
Chandika Shrestha
Sajana Amatya
Daman Baij

Research Assistants
Dr Achyut Raj Karki
Ajit Acharya
Anita Bajgain
Anup Adhikari
Chandani Rana

Research Supervisors
Badri Prasad Mainali
Barsha Rijal
Chandra Laxmi Bhasima
Dinesh Bhandari
Kabita Adhikairi
Kalpana Rimal
Mona Giri
Pasang Devi Tamang
Pratiksha Khadka
Ranjila Joshi
Ranju Bhandari
Roshani Poudel
Sandeep Silwal
Sangita Bajgain
Sarita Adhikari
Shekhar Adhikari
Yubaraj Budhathoki

Quantitative Data Entry/ Qualitative Data Transcription
Barsha Rijal
Chandra Laxmi Bhasima
Dip Prasad Khatiwada
Kirti Sagar Baral
Latshering Glan Tamang
Mona Giri
Mingma Glan Tamang
Pasang Devi Tamang
Pratikshya Khadka
Radha Devi Gurung
Roshni Poudel
Sarita Chhhetri

Research Enumerators/ Interviewers

Anil Kumar Jha
Anita Tako
Archana Shrestha
Bala Ram Aawasthi
Basanta Katwal
Basanti Thapa
Bhanu Neupane
Bharat Bhandari
Chhaya Kumari Shrestha
Dhankala Kunwar
Dilip Khanal
Dipak Tamang
Durga Rokaya
Ganesh Prasad Shrestha
Govinda Sharma Neupane
Gyanu Ojha
Hemlal Kunwar
Jit Bahadur Shrestha
Keshav Ojha
Khem Raj Baniya
Kishor Shrestha
Laxmi Rawal
Laxmi Shah

Mahabir Yadav
Mahesh Prasad Shah
Manu Dulal
Parmeshwori Shah
Puspa Pandey
Ram Dhulari Rana
Ram Nath Shah
Randip Kumar Kunwar
Renu Gupta
Roshan Neupane
Sabita Acharya
Sandesh Bahadur Sunar
Sarita KC
Shankar Bhattarai
Shreejana Chaudhary
Sita Neupane
Suman Shrestha
Suman Tamang
Sundar Singh Bohora
Sunil Adhikari
Sunita Kandel
Tara Nath Fulara
Yeshu Bai Rai