NSI
Nick Simons Institute

Measuring
the Quality of
Rural Based Government
Mid-level Health Care Workers

A CLINICAL SKILLS ASSESSMENT

August 2007

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Preface

The Government of Nepal and the National Health Training Center is committed to provide 'essential health care services' to all, particularly those in the rural areas. Mid-level health care workers provide the majority of this health care. We at NHTC have been involved in various trainings for mid-level health care workers and continue to seek more effective ways to build the capacity and increase the quality of these workers.

In light of this, we are pleased to have partnered with the Nick Simons Institute in the implementation of this study: "Measuring the Quality of Rural Based Government Mid-level Health Care Workers: A Clinical Skills Assessment."

We believe that this study makes a valuable contribution to the question of the quality of the clinical skills of non-midwifery mid-level health care workers. It challenges us to renew our effort to improve our health care workforce. Our hope is that the finding of this study will encourage all stake holders to focus their attention on this important topic.

We would like to thank all those that contributed to the implementation of this study: those at NHTC, at the Nick Simons Institute and the many others who gave of their time and expertise to advise us.

Sincerely,

Amir Khati
Director
National Health Training Center

AUTHORS

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Acknowledgments

Contents

List of Acronyms

AHW	Auxiliary Health Worker (interchangeable with CMA)
ANM	Auxiliary Nurse Midwife
CTEVT	Council for Technical Education and Vocational Training
CMA	Community Medicine Auxiliary (interchangeable with AHW)
CSA	Clinical Skills Assessment
DH	District Hospital
DHO	District Health Officer
DPHO	District Public Health Officer
DoHS	Department of Health Services
EHCS	Essential Health Care Services
GoN	Government of Nepal
HA	Health Assistant
HCW	Health Care Worker
HP	Health Post
HMG	His Majesty's Government of Nepal (used prior to April 2006)
IMR	Infant Mortality Rate
MBBS	Bachelors of Medicine, Bachelors of Surgery
MCHW	Mother Child Health Worker
MLHCW	Mid-level Health Care Worker
MOHP	Ministry of Health and Population
MDG	Millennium Development Goals
MMR	Maternal Mortality Rate
NHTC	National Health Training Center
NSI	Nick Simons Institute
NGO	Non-governmental Organization
PHC	Primary Healthcare Center
SBA	Skilled Birth Attendant
Sr. CMA	Senior CMA (interchangeable with Sr. AHW)
Sr. AHW	Senior AHW (interchangeable with Sr. CMA)
SHP	Sub-Health Post
TBA	Traditional Birth Attendant
VDC	Village Development Committee
WHO	World Health Organization

Executive Summary

- We conducted a clinical skills assessment of 163 government mid-level health care workers in 4 districts (97% of all available workers).

- The participants scored 28% in adult medicine, 56% in pediatrics, 35% in maternity care and 45% in orthopedics. They scored 59% in procedures and 46% in management. With a minimum acceptable score being 60%, we found significant performance gaps in all categories other than pediatric medicine and procedures.

- There was no significant difference in scores between any category of mid-level health care worker – either by years of experience or district of work.

- Focused group discussions underlined that the workers receive almost no in-service training in clinical medicine, apart from some in childhood illnesses.

- To address these weaknesses in clinical skills, we recommend a comprehensive approach, including pre-service intervention and a in-service clinical practicum as well as national certification of mid-level health care workers.

Introduction

Nepal relies on mid-level health care workers (MLHCWs) defined as Auxiliary Health Workers (AHW), Auxiliary Nurse Midwives (ANM) and Health Assistants (HA) to provide the backbone of medical coverage in the rural areas. His Majesty's Government of Nepal's National Planning Commission's "10th Plan, Poverty Reduction Strategy Paper for 2002 -2007" states:

Despite significant progress in recent years, service delivery in the health sector remains weak. Although an extensive network of primary healthcare centers has been constructed nationwide, it has not been functioning well in many rural areas due to lack of trained staff...

The Nick Simons Institute in partnership with the National Health Training Center has undertaken a study to measure the clinical skills of non-midwifery MLHCWs in Nepal. The purpose of this study is to identify the performance gap of these workers and develop a strategy to improve the overall capacity of MLHCWs working throughout the rural areas of Nepal.

Methodology

A cross-sectional, sample group of 163 AHWs, Sr. AHWs and HAs in the government sector was assessed in four districts: Gorkha, Bardia, Dadeldhura and Rasuwa. These districts were chosen on the basis of equal representation by development region and ecological zone. Saptari district was also to be included, but the assessment there was cancelled due to political unrest. All MLHCWs in each district were assessed in order to reduce sample bias. The assumption is that competent and less competent health care workers are randomly scattered throughout the district. Assessors were also blinded as to the category, posting and years of experience of the participants.

We used three types of assessment tools. First was the collection of demographic data. This included the variables of category, district, years of experience, place of posting, and type of school. Information about school experience and current practices were also obtained through an interview.

The second tool was a clinical skills assessment (CSA) in six different domains. These domains were chosen based on the Essential Health Care Services List (EHCS), the MOHP job descriptions for AHWs, Sr. AHWs and HAs based at Health Posts and Subhealth posts. These domains were: Adult, Pediatric, Maternity and Orthopedic medicine. Procedures and management skills were also measured. A standard was set at 60% for all clinical skills, taken from the current CTEVT curriculum testing standards for practical skills. The clinical skills of the MLHCWs were measured in all domains and compared to the 60% standard. The difference between the score and the minimum standard was defined as the performance gap.

Finally, a focus group discussion was conducted in which participants were asked about how they perceived their clinical skills training in school, their

current practice and what they felt could be improved.

Findings

Non-midwifery MLHCWs, numbering 163, were assessed. This included 109 AHWs, 31 Sr. AHWs and 23 HAs. In the four districts comprehensively, 97.6% of all MLHCWs posted were assessed. The average age was 36.1 years with 12.8 years of experience. MLHCWs more often received government schooling (58.8%) than private schooling (41.3%). Postings in sub-health posts, health posts, primary health centers and district hospitals were 45.7%, 31.5%, 13% and 9.9% respectively.

Demographic data revealed that 93.9% (CI 89-97) report having to do administrative duties at their place of work and 60.1% (CI 52.2-67.7) operate their own private clinic. Other data shows that 73% (CI 65.5-79.7) of MLHCWs are doing deliveries either at their posting, in their private clinic or in homes. However, only 42.9% (CI 59.1-74) report having any formal pre-service training in labor and delivery.

Comparison of scores by category of provider, district of posting, and years of experience showed no clinically significant difference in skill level. Comparison by location of posting

showed that those MLHCWs who practiced at the district hospital had slightly better clinical skills than those who worked at PHCs, HPs or SHPs. Whether or not this marginal statistical difference makes any true clinical difference in the quality of patient care is debatable.

Analysis

Compared to the standard, the MLHCWs scored poorly in four of the six domains. Adult, Maternity, Orthopedic and Management were weak, with a performance gap of between 14% and 32%. Pediatric medicine was very close to the standard, which may be due to the effectiveness of the in-service training that has been conducted over the last decade, including Integrated Management of Childhood Diseases (IMCI) and the Expanded Program of Immunizations (EPI), etc. The survey reported that 73% (CI 65.5-79.7) of MLHCWs had taken part in the IMCI training. The focus on public and preventative health in-service training may have been effective in increasing the skills of MLHCWs.

In the focus group discussion, the MLHCWs reported that their in-service training mostly focused on public and preventative health, yet they

spent the vast majority of their time in curative health. They felt that they were expected to treat basic disease as per their job description, but did not have adequate exposure to this either in pre-service or in-service training.

Suggested Options for Change

In order to truly impact the quality of MLHCWs, a strategy must be developed that addresses both the pre-service and in-service training programs. To improve the level of MLHCWs already working in the government health sector, the performance gap in clinical skills must be addressed through a mid-level clinical skills practicum focusing on building clinical skills using competency-based education. Consideration should also be given to the development of specialized, short-term clinical training programs such as trauma care, management, orthopedics or dental care.

To address the weakness in the pre-service training institutions, a national certification system could be implemented that would also improve the long term quality of MLHCWs. Also, the clinical skills teaching staff are weak in the pre-service system. It is recommended that the pre-service institution's clinical instructors be trained in how to be effective clinical teachers.

Finally, it is recommended that maternity coverage be improved. This could either be in the form of increasing midwifery nursing staff at the HP and SHP levels and / or some form of maternity skills training be targeted to non-midwifery rural MLHCWs.

Summary of Clinical Skill Scores

DOMAIN	MEAN PERCENTAGE	STANDARD	PERFORMANCE GAP
Adult Medicine	28.25 %	60 %	31.75 %
Pediatric Medicine	56.11 %	60 %	3.89 %
Maternity Medicine	34.77 %	60 %	21.23 %
Orthopedic Medicine	45.25 %	60 %	14.75 %
Procedures	58.72 %	60 %	1.28 %
Management	45.68 %	60 %	14.32 %

Mid-Level Health Care Workers:

A Clinical Skills Assessment

Background

We are facing a critical shortage of health care workers through out the world, a shortage that is most severe in the poorest and least developed countries. Many of this century's advances in health are no longer as evident in such countries due to the lack of health care workers and a dysfunctional health care system. The shortage of health care workers can be attributed to the migration, or "brain drain" from the poor countries to the west due to higher salary and easier living conditions (Chen, Evans, Anand, Boufford, Brown, Chowdary et al., 2006). In Nepal, there is also an "internal brain drain" as doctors choose to work in the private sector rather than government service. Other reasons include lack of training institutions, a poor work environment and lack of opportunities for further education and advancement. Because of this crisis in human resources for health care, there is little hope that we will see further advances in health in the developing world unless this trend is reversed (Hongoro, 2004).

There are some references to the use of mid-level cadre as a substitute for higher level health workers. Dovlo (2004), in a review article stated that the use of these mid-level workers is very effective in that their outcomes are similar to those of higher level health workers. They were also cheaper to train and less likely to migrate. The author recommended that countries facing HCW shortages utilize more mid-levels to meet their personnel needs. Nepal also experiences shortages of health care workers, especially in the rural areas

Because of the dearth of doctors, MLHCWs serve as doctor substitutes in the rural health care system.

and has utilized mid-level health care workers (MLHCWs) to meet the deficiencies in upper level medical providers.

The national health care system is composed of multi-tiered facilities that match up with the political administrative divisions. Most of the 75 districts have district hospitals. The District Health Officer (DHO) is the government's top health officer in the district. DHOs are tasked with the administration of the district health system and some are also responsible for the clinical care at the district hospital. Under the DHO is a network of health facilities. There are two or three Primary Health Care Centers (PHC) which function as mid-level care centers, but not at the level of a hospital. Also within the districts are health posts (HPs) and finally sub-health posts (SHPs) at the village level. The SHP is to act as the primary care center at the village level with referral made to higher level facilities as the need arises.

Because of the dearth of doctors, MLHCWs serve as doctor substitutes in the rural health care system. These non-midwifery HCWs are defined as Health Assistants (HAs) and Auxiliary Health Workers (AHWs) or Community Medical Auxiliaries (CMAs). The GoN at this time does not use the CMA title, using AHW instead. For the purpose of this paper, only "AHW" will be used to refer to this level of cadre. Those AHWs who have had ten years of experience may take a six-month course and be designated Senior AHWs (Sr. AHWs). These "senior" designated cadres are

interchangeable within the government system with HAs in regard to posting. The fact that they are able to hold the same post does not, however, mean they have the same underlying pre-service training.

Health Assistants are considered to be the upper level of the mid-level health provider scale. HAs serve as the backbone of the rural government health care system. There is a government provision for the posting of MBBS doctors at PHCs, however, there is rarely a doctor on site. Thus, the HA becomes the primary provider and administrator of the PHC and HPs and is on the front line of providing health care to the rural population. Commonly, the HA is alone in providing care as well as supervising AHWs who work in SHPs under the HA's jurisdiction. An HA must have a wide range of administrative and clinical skills in order to perform as required by the government's job description for mid-level health care workers.

AHWs have less training than HAs. They serve as the primary HCWs at SHPs and work under HAs at PHCs and HPs. Their training is similar to HAs but not as long and the admission criteria is less rigorous. In remote areas it is often the case that there is no HA or Sr. AHW to fill the in-charge post at a HP. In this situation, AHWs often fill these posts. All of these mid-level cadres may also work at the district hospital under the supervision of the medical officer. There are approximately 4,500 MLHCWs currently serving in the government health sector.

MLHCW Pre-Service Training

CADRE DESIGNATION	ADMISSION CRITERIA	# OF INSTITUTIONS	SCHOOLING	ANNUAL INTAKE	POSTING
Health Assistant	SLC 2nd division	15	36 months	600	PHC, HP
Senior AHW	10 years experience	In-service by NHTC	15 months + 6 months	n/a	PHC, HP
AHW / CMA	SLC	65	15 months	2500	HP, SHP

The Council for Technical Education and Vocational Training (CTEVT) is the autonomous government body that is responsible for the training of MLHCWs in its own schools and oversees the training in affiliated private schools. Anecdotal evidence and some unpublished studies have questioned the quality of the performance and skill level of MLHCWs. At this point, there is no objective study which has examined the clinical skills of practicing MLHCWs using the standard of CTEVT approved competencies and/or the GoN EHCS List. As per the National Health Training Strategy (2004), the National Health Training Center (NHTC) is responsible for overseeing the pre-service CTEVT curriculum to ensure it is compatible with the MLHCW job descriptions. NHTC is also responsible for coordinating and conducting in-service trainings for MLHCWs in various areas of need. The Health Professional Council also monitors and approves the curriculum, facilities and activities of CTEVT training institutions.

His Majesty's Government of Nepal's National Planning Commission's "10th Plan, Poverty Reduction Strategy Paper for 2002 -2007" states:

Despite significant progress in recent years, service delivery in the health sector remains weak. Although an extensive network of primary healthcare centers has been constructed nationwide, it has not been functioning well in many rural areas due to lack of trained staff...

There are references to the poor quality and performance of health care workers in general within the literature addressing other medical and health sector deficiencies in the developing world. Rowe, Savigny, Lanata and Victora (2005) in a review article in *The Lancet* found that there was a general lack of quality in HCW performance and that single interventions were not effective. They recommended the further study of other factors affecting performance and the devising of new strategies that address these factors.

Ofori-Adjei (1996) evaluated the effectiveness of the traditional didactic method of in-service training for medical assistants in Ghana as it related to the specific treatment of malaria. His finding showed that although the knowledge portion of the medical assistants was improved with the training, the actual practice of the health care workers did not change. The author concluded that the traditional methods for training were not effective in

changing practice and that other methods of education were needed to change health worker practice. The quality of nurses in regard to barriers for referral was studied by Bossyns and Lerberghe (2004). They found that the referral system broke down at the village level because of a lack of understanding about the need for referral as well as the nurses' concern about preserving their reputations. This supports the idea of a lack of training in these health care workers.

Much attention over the last decade has been placed on improving the indicators of infant and maternal mortality. There have been a number of studies which look specifically at the health workers and system which affects maternal health. Thus, there are studies that evaluate the skills and effectiveness of Traditional Birth Attendants (TBA) and ANMs in the literature. Carlough (2004) looked at the skill levels of Maternal Child Health Care Workers (MCHWs) who had and had not attended a refresher training course in management of delivery complications. The purpose of the study was to see if MCHWs

Study Objectives
1. To identify the clinical skills of practicing MLHCWs in the government health sector.
2. To compare the clinical skills of the MLHCWs against the government of Nepal's Essential Health Care Services List and the job descriptions for MLHCWs at the SHP and HP levels.
3. To compare the clinical skills of various categories of MLHCWs and determine if there is a clinically significant difference.
4. To determine how many MLHCWs are conducting deliveries in their posts, their private medical shops or at homes.

could have the skills to be considered Skilled Birth Attendants (SBAs) at the community level. Conclusions were that MCHWs possessed the skill qualifications to be considered SBAs, but also that the in-service refresher trainings significantly affected the skill levels of the health care workers.

The inadequate and poor performance of providers at these health posts have led to inadequate preventive and curative health care services to the poor and geographically isolated populations of all ethnic groups. This public health need is evidenced by the fact that last year only 9% of births were attended by a medical provider and only 26% of children who had pneumonia were treated by a provider (UNICEF, 2006). The lack of quality providers is a significant reason for a continued high maternal and neonatal mortality rate as well as a general reduction in the quality of life due to the burden of diseases of the rural population.

The Nick Simons Institute (NSI), a charitable organization working in Nepal, has as a mission to train and support compassionate and competent health care workers for rural Nepal. NSI has been approached by some in the Ministry of Health and Population (MOHP) as well as other interested parties with a proposal to develop a MLHCW Practicum which would seek to enhance the quality of these HCWs through a practical training program.

We were unable to find a published study that examined the level of training and quality of non-midwifery MLHCWs in Nepal. NSI initiated a study called the Mid-level Pre-service Health Training Program in Nepal which was conducted between May and June 2006. This study's objectives

were to assess the quality of CTEVT managed and affiliated programs and to identify specific strengths and weaknesses. The study showed an adequate level of theory training for CMAs and HAs in which they scored 54% and 67% in a theory test respectively. The study, however, showed a considerable weakness in the practical skills portion of the training across the board. An evaluation of the clinical skills of ANMs doing antenatal care revealed very poor scores of between 21 and 41%.

There has already been action taken by the government and other development partners to address the clinical skills of ANMs through the implementation of SBA training. Rather than duplicating these efforts, this study chose to focus on non-midwifery MLHCWs. For the purpose of this study, MLHCWs will refer only to the non-midwifery MLHCWs.

NSI in partnership with NHTC is undertaking this study as part of a needs assessment of the quality of the clinical skills of MLHCWs in Nepal because of the gap in the literature. While it is important to evaluate the clinical skills of currently practicing MLHCWs in both the government and private sector, attempting to test both government and private sector MLHCWs will make any study cumbersome, expensive and difficult to analyze due to multiple variables. NSI's primary mission is to support rural health care while working within the government framework. In light of this, we opted to do a study that looks at the clinical skills of MLHCWs only in the government sector. This study seeks to fill the gap in the literature and will guide NSI in the development of a competency-based clinical skills mid-level practicum.

Design

There is little information regarding the skill level of government MLHCWs and for that reason an exploratory form was implemented. A cross-sectional study design was chosen to measure clinical skills of the sample group. This design allows for a snap-shot view of the current clinical skills of practicing MLHCWs. It did not measure any intervention that had occurred in order to improve their skills. This design has been used by Carlough (2004) in a skills assessment of MCHWs.

Permission to implement this study was obtained from the MOHP, Department of Health Services (DoHS), NHTC and the Nepal Health Research Council (NHRC). NHTC also assisted in some of the design and tool assessment development. Each participant had the study explained to them and an informed consent form was signed by each. Participants were assured that all individual findings would be confidential and remain the property of NSI, which paid for the study. NSI also plans to make the results of this study public through the publication of the findings in an international journal.

Sample

The study selected a sample of rural based government MLHCWs. To do this, five different districts, one from each of the five development regions, were selected. Each of the three ecological zones — two hilly, two flat and one mountain district — were represented in the study. Districts were chosen based on some logistical and time constraints, meaning that there was road access to the districts, a condition which eliminated some of the more remote districts.

In each district, the DHO or DPHO was contacted and a request made to evaluate all MLHCWs that were currently practicing in that district. Among the MLHCWs, the study categorized them as HAs, Sr. AHWs and AHWs. Within
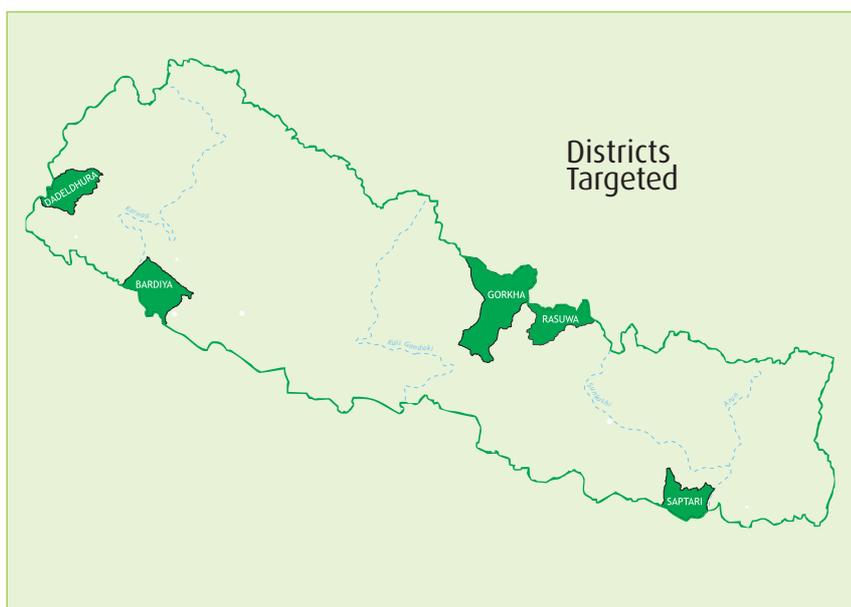
Districts Targeted

This design allows for a snap-shot view of the current clinical skills of practicing MLHCWs.

The clinical skills assessment (CSA) was the main objective portion of the study.

each category, the experience levels were grouped as follows: less than 5 years (Group 1), 5-10 years (Group 2) and greater than 10 years (Group 3). Each DHO was responsible for scheduling which MLHCWs came in on which testing day so as to minimize any loss of medical coverage.

Methods and Tools

Participants were asked to sign the informed consents and fill out demographic questionnaires in Nepali regarding their category, place of work, years of experience, school and other in-service training received. The assessors were blinded from any of the demographic data of the participants. An interview was conducted with each participant in regard to his or her clinical experience in his or her pre-service training as well as in his or her current practice. This demographic questionnaire served to identify possible variables used in interpretation of the data.

The clinical skills assessment (CSA) was the main objective portion of the study. The CSA was divided into six different domains: general medicine, pediatric medicine, maternity care, orthopedics, procedures and management. Each

domain had a standardized set of key skills that the participants were asked to perform on a model patient or a training model and graded objectively on how many of the key skills were performed correctly. Each domain was scored and reported as a percentage of the total possible points.

The specific domains chosen were determined by three different inputs. The MOHP EHCS List and the job descriptions for MLHCWs at health posts and sub-health posts were the main determinates as to what areas of clinical competencies were assessed. The criteria for assessing in each specific domain was taken from the CTEVT and GoN approved competencies required of MLHCW graduates as well as various government training texts which outlined steps.

Peer review by various experts in the specific domains were also obtained for each CSA check list to ensure that it was accurate and appropriate for a mid-level worker in a rural environment. These assessment tools used by the participants were all in Nepali and pilot-tested prior to actual implementation.

At the end of the CSA, the team conducted a focus group discussion through guided interview techniques.

Study Tools

TOOL	METHOD	TYPE
Data Collection	Questionnaire	quantitative & qualitative
Clinical Skills Assessment ▪ Adult Medicine ▪ Pediatric Medicine ▪ Maternity Medicine ▪ Orthopedic Medicine ▪ Procedures ▪ Management	Direct Observation by Field Assessment Team	quantitative
Guided Interview	Focused Group Discussion	qualitative

The focus group discussion findings served as the qualitative background that was used to better interpret the findings of the clinical skills assessment.

Data Analysis

General demographic data and testing scores were recorded using Epi-info software for analysis. Each participant was designated by category of HCW and given a group number according to his or her years of experience. The score on each domain skill test was recorded and analyzed independently of other domains. The reason for this is that different domains had a varied number of skill steps and so comparison between domains would not be valid.

The CSA score is reported in terms of a mean percentage of total possible points for each domain. The standard deviation is given in order to show precision of the testing. ANOVA, a parametric test of inequality of population means is reported for all comparative studies. The confidence interval for frequencies is also reported for statistical and clinical significance. The mean scores were compared by the variables of category, years of experience, district and posting to determine if there were any statistical or clinical differences noted.

Each domain was measured against a clinical skills standard of 60%. This is the CTEVT minimum score for practical skills that is used in their curriculum for training MLHCWs. The performance gap is defined as the difference between the mean percentage and a minimum score of 60%.

The questionnaires were used to report both school and current practice experience. The findings are understood to be more subjective because they have an inherent bias due to self reporting. However, the findings will be used to analyze the quantitative findings in the clinical skills assessment.

NSI requested the expertise of Mr. Robert B. Gerzoff, MS who is a statistical analyst with the U.S. Centers for Disease Control and Prevention (CDC) in Atlanta, GA to review the statistical methodology and analysis used in this report. Mr. Gerzoff has reviewed this study and has determined that the statistical methodology employed is appropriate.

Reduction of Bias

A targeted sample size of at least 150 participants was chosen. The sample calculations were based on "Sample size determination in health studies: A practical manual" by Lwanga and Lemeshow (1991). This targeted sample size would give an accuracy of +/- 7.87% at a 95% confidence interval. The authors believe that in testing clinical skills, any more accuracy would not be clinically significant and to increase the accuracy would dramatically increase the sample numbers needed.

Rather than a random sampling of the 4,500 MLHCWs across all 75 districts, a choice was made to sample all the MLHCWs in 5 districts. This was done primarily due to logistics, time and cost containment. In order to not have specific participants chosen by the DHO, which could influence the findings one way or another, all posted MLHCWs were targeted for testing from each district. This method should give a fair representation of the

The performance gap is defined as the difference between the mean percentage and a minimum score of 60%.

population being tested. This may on the surface appear to be injecting sample bias, however, it is assumed that clinically competent and less competent government workers are randomly scattered throughout Nepal and that choosing certain districts while ignoring others does not inject any overt bias into the sample group. This underlying assertion supports the method of attempting to test all 100% of the participants in five districts and results in a good representational sample of the whole population of government MLHCWs.

The question of cheating has also been raised. The participants were told at the beginning of the day what the testing stations were. However, the participants were tested on actual skills rather than knowledge and the transfer of practical skills between participants would be very difficult in a total three to four hours of testing. In addition, none of the participants were given any feedback as to how they did, so they would be unable to pass this information on to the other participants. We do not believe that pre-knowledge of the testing domains makes any impact on the actual clinical performance of the participants.

The assessment team was made up of medical personnel who could be construed to have a certain bias in clinical skills and practice. To reduce this measurement bias, the assessors were assigned specific domains. Thus all scoring was done by that one individual and slight variation due to differences in having more than one assessor per domain reduced. Prior to testing, the team standardized their scoring methodology through cross-checking to become familiar with the assessment tools and reduce variability in scoring criteria. The tools also used a very

objective, step-wise approach to the clinical skills, a process which reduced subjective evaluation of the participants. The assessors were also blinded as to the category, years of experience and posting of each participant.

Limitations

Because of political unrest in the eastern Terai, the plan to go to Saptari district was cancelled. This district has over 100 MLHCWs and would have significantly increased the sample size and made the study more precise in its findings. This also meant that there were no samples from the eastern development region, which may have affected the final data somewhat.

One of the objectives of this study was to compare the different categories of MLHCWs. Ideally, this would mean an equal number of participants from each category. In order to do this, we would have had to go to many more districts and tested only HAs and Sr. AHWs in order to bring their representation in the sample up. Because of logistics and time constraints, we chose not to do this. With 23 HAs and 31 Sr. AHWs tested against 109 AHWs, this may limit this study's assertion that statistically all categories of MLHCWs are clinically the same. The HAs scored about 5% points higher than the other two categories. Due to the lower sample number of HAs, this was found to be statistically significant, but also within the standard deviation of all three categories. If an equal number of HAs and AHWs had been tested, this difference may have been more significant. That said, the authors believe when speaking of actual clinical practice, a difference of less than 10% in clinical skills does not make any true difference in quality of patient care.

We believe this study gives an accurate picture of the quality of MLHCWs in the rural areas

This study utilized a model patient and the participants were aware of it. This could be a bias in that the participant would be more likely to perform more of the required clinical skills than they may have in a regular health care setting. The CSA also made available all articles used in a physical exam such as a thermometer, blood pressure cuff, otoscope, stethoscope etc. The fact that the items were in plain view should have reminded the participant to use them in their examination process. This would bias the results towards improved performance rather than poor performance.

Another limitation could be the patient scenario tested in the CSA; only one was tested. It's possible that testing all participants on one scenario may limit the study's findings as participants may have been able to do better on other patient scenarios. The authors tried to pick patient scenarios that were the most common, thus the CSA will be biased to the side of better performance rather than worse. The authors also tried to weight the assessment to the clinical process of evaluation rather than the actual diagnosis of the patient. The

limitation on the pediatric CSA was due to not using a real child model patient due to ethical restrictions. To compensate for this, the model acted as the parent of the child and was the one who interacted with the participant. However, this was still not completely adequate because the assessment was based on providing information and obtaining answers rather than strict observation of clinical skills. This may be the reason that in all the domains, other than procedures, the participants scored higher than the other domains and quite close to the minimum standard.

Despite these acknowledged limitations, the authors believe that the sample group can be considered representative of the study population. Also, we believe this study gives an accurate picture of the quality of MLHCWs in the rural areas as it relates to their clinical skills. The CSA was also designed to bias the results towards better performance than worse performance. It identifies their performance gaps and challenges the health service sector and other development partners to look at options for intervention.

The CSA was also designed to bias the results towards better performance than worse performance.

Study Findings

Participants tested

A total of 163 participants were tested. These included 23 Health Assistants, 31 Senior AHWs and 109 AHWs. The district of Saptari was cancelled due to continuing political unrest and the participants' inability to travel to testing areas.

The percent of participants tested vs. the actual MLHCWs posted was 97.6%. Two participants in Rasuwa did not come for testing for unknown reasons. Two participants in Dadeldhura did not test due to one getting married and the other being away for other training. All participants posted in Gorkha and Bardia districts were tested.

Districts Assessed

DISTRICT	REGION	ECOLOGICAL ZONE	HA	SR. AHW	AHW	TOTAL TESTED
Saptari	East	Flat	Cancelled due to political unrest			
Rasuwa	Central	Mountain	4	2	14	20
Gorkha	West	Hill	11	1	49	61
Bardia	Midwest	Flat	7	21	31	59
Dadeldhura	Far West	Hill	1	7	15	23
		Totals	**23**	**31**	**109**	**163**

Demographics Data

DESCRIPTION	GORKHA	BARDIA	DADELDH.	RASUWA	AVERAGE
Average Age	36.64	37.14	32.17	36.25	36.13
Average years Experience	12.02	14.99	9.17	12.08	12.77
Pre-Service Schooling (in %)					
Private Schooling	54.1	26.3	39.1	47.4	41.3
Government Schooling	45.9	73.7	60.9	52.6	58.8
Posting Site (in %)					
Practice - SHP	60.7	37.9	43.5	25	45.7
Practice - HP	19.7	34.5	47.8	40	31.5
Practice - PHC	8.2	17.2	4.3	25	13
Practice - DH	11.5	10.3	4.3	10	9.9

QUESTIONNAIRE DATA	PERCENTAGE	CONFIDENCE INTERVAL
Operated a private medical clinic.	60.1	52.2-67.7
Did management as part of their responsibilities.	93.9	89-97

Demographics

The average age of the participants tested was 36.13 years with 12.77 years of experience. There were more participants who did pre-service training in government institutions than trained in private schools, 58.8% vs. 41.3% respectively. Most participants were posted to SHPs at 45.7%. However, 31.5% were posted at HPs and those at the PHCs and district hospitals were 13% and 9.9% respectively. Participants also reported that 93.9% did administration within their job responsibilities and 60.1% also operated their own private clinic.

Comparison of Mid-Level Health Care Workers

The participants were compared against each other in all domains by category, district, years of experience and posting. P-values were calculated by ANOVA, a parametric test of inequality of population means. A standard deviation is given as well to show the precision of the means. The authors believe that a difference of less than 10% in the CSA scores may be statistically significant, yet in practice makes little difference in the overall quality of clinical care. In light of this, some of these comparisons may be statistically significant, but any real difference in clinical practice is debatable.

In comparing different categories of MLHCWs, the data showed that there was a slight statistical difference in the performance of the HAs as compared to the other two categories in the areas of adult and orthopedic medicine. In other domains, there was no difference between the categories. That said, the standard deviations are wide enough to conclude that we cannot make a categorical statement that HAs are significantly better than other categories of MLHCWs.

Comparison by MLHCW Category

DOMAIN	AHW (SD)	SAHW (SD)	HA (SD)	P- VALUE
Adult	27.6% (7.6)	27.3% (6.6)	32.4% (8.6)	0.0192
Pediatric	55.1% (9.8)	58.2% (9.8)	58% (9.5)	0.1786
Maternity	33.8% (11.4)	35.6% (8.5)	38.4% (10.8)	0.1731
Ortho	44.5% (7.8)	44.9% (6.6)	49.4% (10.5)	0.0288
Procedure	58.3% (21)	62.6% (16.4)	55.6% (16.3)	0.4158
Mgt.	45.2% (10.7)	47% (11.5)	46.2% (11.7)	0.7060

Comparison by Years of Experience

DOMAIN	< 5 YRS (SD)	5-10 YRS (SD)	> 10 YRS (SD)	P-VALUE
Adult	28.2% (6.1)	30.3% (7.9)	27% (7.7)	0.0600
Pediatric	52.6% (11.5)	57.5% (8.5)	56.2% (10)	0.1714
Maternity	34.5% (8.2)	36.8% (12.3)	33.7% (10.5)	0.2729
Ortho	43.1% (7.7)	46.4% (8.7)	45.1% (7.9)	0.3017
Procedure	67.7% (15.1)	58.1% (22.5)	57.2% (19.2)	0.0955
Mgt.	45.7% (10)	45.9% (12.3)	45.4% (10.5)	0.9657

Comparison by District

DOMAIN	GORKA (SD)	BARDIA (SD)	DADEL. (SD)	RAS. (SD)	P-VALUE
Adult	30.2% (8.4)	26.5% (7.4)	27.4% (6.1)	28.2% (7.1)	0.0550
Pediatric	55.6% (9.6)	57.4% (9.6)	58.1% (9.4)	51.7% (10.3)	0.0961
Maternity	33.3% (12.2)	35.5% (9.3)	37.6% (10.6)	33.8% (11.3)	0.4044
Ortho	46.6% (10.6)	45.2% (5.7)	42.6% (8)	44.2% (5.1)	0.2252
Procedure	49.7% (22.3)	61.1% (17.1)	62.8% (12.9)	74.6% (14.2)	< .001
Mgt.	45.9% (11.8)	46.2% (11.4)	45.4% (9.4)	43.9% (9.2)	0.8787

Comparison by Posting

DOMAIN	SHP (SD)	HP (SD)	PHC (SD)	DH (SD)	P-VALUE
Adult	26.2% (6.6)	28.6% (6.9)	28.6% (9.3)	35.5% (8.9)	0.0001
Pediatric	55.5% (9.1)	56.1% (10.5)	59.4% (8.9)	55.1% (11.3)	0.4247
Maternity	31.8% (10.5)	36.4% (9.7)	36.8% (10.9)	40.9% (13)	0.0061
Ortho	45% (7.6)	43.8% (8.3)	45.3% (6.8)	50.3% (10.6)	0.0524
Procedure	55.2% (20)	58% (20.2)	65% (18.4)	68.6% (18.8)	0.0399
Mgt.	45.3% (10.9)	45.6% (10.5)	46.1% (11.4)	47.6% (13.2)	0.8880

The data shows that there is no statistical difference in any domain based on years of experience. It should be noted that Sr. AHWs by definition can only be MLHCWs that have over ten years of experience. Thus there are no Sr. AHWs included in the first two groups.

The data shows that there is no statistical difference of MLHCWs' clinical skills in all domains based on district. The exception to this is procedures. There was a wide gap in the means (49.7% vs. 74.6%). However, based on the very wide standard deviations in the procedures domain, no definitive conclusions can be made about these findings.

Comparison by posting did show some statistical differences in clinical skills based on posting. Domains in which there were statistical differences were

adult and maternity medicine. Those practicing in the higher level facilities such as the district hospital had better adult and maternity clinical skills as compared to those practicing at the SHP level. The reasons for this could be related to the exposure to more patients in these higher level facilities and a chance to practice their skills. Procedures also showed a difference, but due to the wide standard deviations, no definitive conclusions can be made. These findings show that in general one finds higher clinical skills in the larger, more advanced facilities. (See chart) These differences, however, are marginal and although there is some statistical significance, it is questionable whether there is any practical clinical difference in these findings.

There is a higher percentage of HAs working at the higher level facilities. The district hospital had 37.5% HAs while the PHC, HP and SHP had 23.8%, 21.5% and 1.3% respectively. The greater proportion of HAs working in the higher level facilities and the lower number tested from the hospitals may contribute to these findings.

The comparative data show no practical clinical differences among categories of MLHCWs, as well as no difference based on years of experience and districts. Therefore the data for the clinical skills assessment will be combining all three categories of MLHCWs and reporting the mean results as a total.
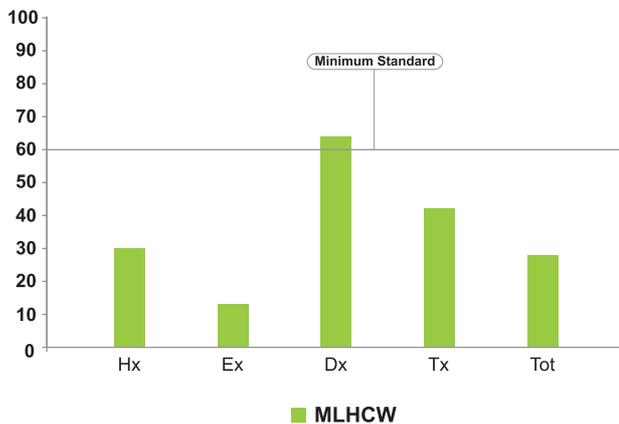

Comparison by Posting
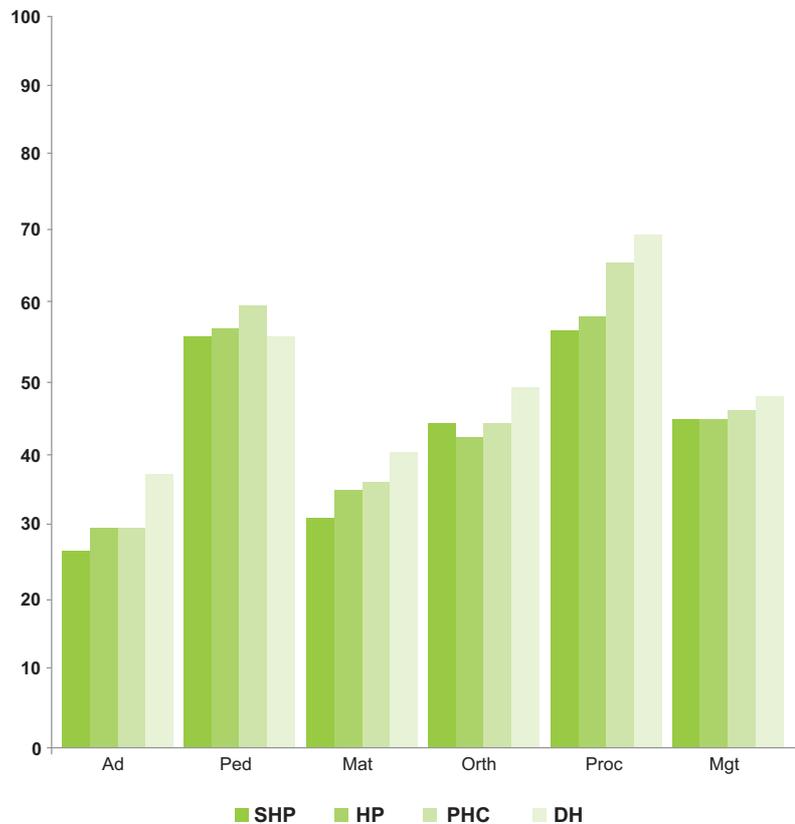
Clinical Skills Assessment

Adult Medicine   in percentage

DESCRIPTION	HISTORY	EXAM	DIAGNOSIS	TREATMENT	TOTAL ADULT SCORE (SD)
MLHCW	29.90	12.94	64.36	42.28	28.25 (7.7)
Standard	60	60	60	60	60
Performance Gap:	30.1	47.06	+4.36	17.72	31.75

Adult Medicine

Adult medicine tested the clinical skills of the basic treatment of common diseases as outlined by the Essential Health Care Service List and the MLHCW job description stating that they are to "provide regular and emergency services at the health post." This domain tested the participant's clinical skills in history taking, examination techniques, diagnosis, treatment and patient education.

The model patient was a male who had pneumonia with a fever and cough, but also had secondary diagnoses of anemia and dehydration.

This domain tested the participant's clinical skills in history taking, examination techniques, diagnosis, treatment and patient education.

14

Pediatric Medicine

Pediatric medicine tested the clinical skills of treating the pediatric population. The CSA focused on pediatric history taking, immunizations, malnutrition and patient education. This clinical skills assessment was chosen and standards were taken from the "Integrated Management of Childhood Disease (IMCI) because it is part of the Essential Health Care Services List. The addressing of immunizations and intervention for malnutrition is also part of the MLHCW job descriptions.

Because of the ethical issues associated with using a child as a model patient, this CSA utilized a "model parent" in which the participant elicited a history of the illness. No exam was done on the "child," but the pertinent physical findings were given to the participant. The child had diarrhea and dehydration. Proper diagnosis, treatment and parent education was assessed. The participant was also asked about immunizations and asked to assess the child for malnourishment using the age-weight chart. The participant was then asked to educate the parent on *sarbottam pitho* and *jeevan jel.*

Because this CSA did not use a model patient, the participants did not have to interact directly with the patient. Much of the evaluation was done through giving information and asking questions. One explanation for the better results in Pediatrics may be that there were no actual observed patient interaction and clinical skills.

Pediatric Medicine

in percentage

DESCRIPTION	HISTORY & TREATMENT	MALNUTRITION	IMMUN.	PEDIATRIC SCORE (SD)
MLHCW	45.4	65.4	96.9	56.11 (9.8)
Standard	60	60	60	60
Performance Gap:	15.6	+5.4	+36.9	3.89
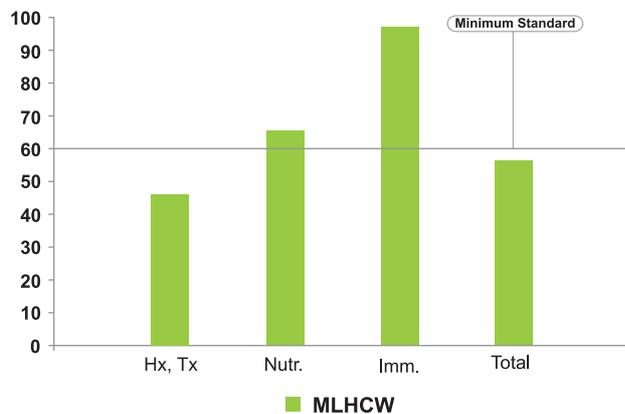
The MLHCWs scored above the minimum standard in regard to malnutrition assessment and immunizations. They only scored a few points below the minimum standard as a total in the pediatric medicine CSA. It is interesting to note that 73% (CI: 65.5-79.7%) of all MLHCWs have taken the IMCI training.

Maternity Medicine

in percentage

DESCRIPTION	NORMAL VAGINAL DELIVERY (NVD)	POST PARTUM HEMORRHAGE (PPH)	TOTAL MATERNITY SCORE (SD)
MLHCW	44.28	25.27	34.77 (10.9)
Standard	60	60	60
Performance Gap:	21.72	40.73	21.23
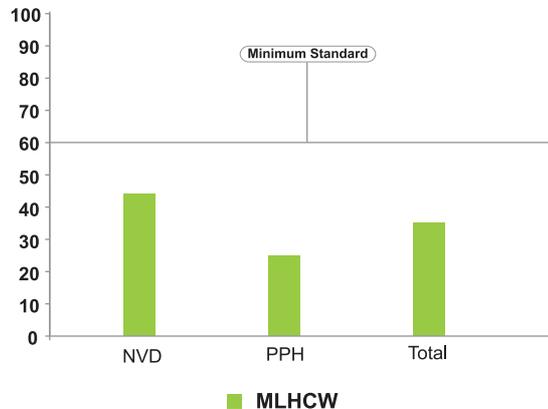
MLHCW Doing Deliveries

in percentage

TOPIC QUESTIONED	YES	NO
Does normal delivery cases?	73 CI (65 .5- 79.7)	27 CI (20.3 - 34.5)
Have had to treat delivery complications.	66.9 CI (59.1 - 74)	33.1 CI (26 - 40.9)
Has had normal delivery training?	42.9 CI (35.2 - 50.9)	57.1 CI (49.1 - 64.8)
Has had training in delivery complications?	14.7 CI (9.7- 21.1)	85.3 CI (78.9 - 90.3)

***Note:** Unlike any of the other CSAs, the maternity CSA had nine participants refuse to be assessed. Although not required to give any reason for their refusal, most said they had never had training in obstetrics and did not do any deliveries in their current practice. These participants are not included in any of the maternity CSA data. However, they are included in the data regarding the questions of whether they do deliveries and their training in maternity care.*

Maternity Medicine

The Maternity Medicine CSA focused on the skills for a normal delivery. Post partum hemorrhage is the primary complication encountered by a provider. This domain was chosen because of the emphasis on safe motherhood services outlined by the Essential Health Care Services List and the MOHP job descriptions. A pelvic birthing model was used for the assessment of the normal delivery and a case study with questions was used to assess knowledge and intervention for post partum hemorrhage. The participants had the option to use the *sutkeri samagri* (home delivery kit) commonly used in the villages or a clinical delivery kit used in health posts and hospitals.

The participants were questioned on whether they did deliveries in post, at their private clinic or at homes. They were also questioned about whether they had any formal instruction in deliveries during their pre-service or in-service training. The participants reported that 73% of them oversaw normal deliveries, yet only 42.9% had any formal clinical training in obstetrics. The data also showed a large gap when participants were questioned about delivery complications; participants reported that 66.9% of them handled complications but only 14.7% had any formal training in this area.

Orthopedic Medicine

The orthopedic medicine clinical skills assessment was designed to evaluate basic treatment of a common supracondylar fracture of the elbow. These fractures are very common,

especially among young children. Proper management and referral of this type of fracture are essential. This type of fracture, if not treated correctly, can result in life-long disability for the patient. The skills assessed were history taking, physical exam of an orthopedic injury, splinting, whether to refer and knowledge of fracture complications.

Orthopedic Medicine in percentage

DESCRIPTION	ORTHOPEDIC MEDICINE
MLHCW	45.25 (8.2)
Standard	60
Performance Gap:	14.75

Procedures (IV Canulation)

The starting of an intravenous line was assessed. The participants' understanding and practice of sterile technique, proper steps in doing the procedure, calculation of drips and possible complications of IVs were assessed. The assessment was done on a clinical model that simulated

Procedures in percentage

DESCRIPTION	PROCEDURES
MLHCW	58.72 (20.1)
Standard	60
Performance Gap:	1.28

an IV catheter insertion into the antecubital vein.

The procedures clinical skills assessment had a very large range of scores, and as a result, the standard deviation was also large. Conclusions are that those who do IV cannulation are adequately skilled, while those who do not do it in their current practice are not.

Management Assessment

Two case studies involving common management problems encountered at a health post were assessed. The participant was asked to read a paper detailing the general scenario of a health

post, including available resources. The participant was then given a problem that had arisen at the health post and asked to answer basic questions. His or her answers were graded by how many management points he/she was able to demonstrate on skills in the managing of work, information, resources and performance. This CSA had more subjectivity to the assessment process because the participants were not graded on specific skills, but instead on their answers to the questions asked.

Management in percentage

DESCRIPTION	MANAGEMENT (SD)
MLHCW	45.68 (11)
Standard	60
Performance Gap:	14.32

Summary Results

Focus Group Discussion

A focus group discussion involving all participants followed the clinical skills assessment portion. Participants discussed where they felt their clinical skills were adequate and not adequate, as well as the appropriateness of their pre-service training vs. what they were doing in current practice. Below are some of the basic issues that were addressed by the participants.

Preventive vs. Clinical Training

The participants focused on a few major points. The initial point was that the vast majority of their in-service training was in preventive or public health. They felt that this training was good and that their skills in this area were appropriate. They felt fairly confident about their ability to educate the public about health. This included areas such as tuberculosis, IMCI, leprosy, family planning, malaria and immunizations.

They were of the opinion that the relevance of their school training, although appropriate at the time, was decreasing in relevance. The reasons they gave was that there had been no refresher training specifically in clinical skills. They acknowledged that the majority of the training was in public and preventive health, however, they complained that the majority of their time was spent in basic clinical care. The public's expectations of them were for curative treatment of common diseases and not in the areas of preventive and public health. They felt that more emphasis should be put on improving their clinical skills in order to meet the work demand.

"The only clinical skills we are taught are how to refer…"

Mid-level Participant

Pre-service Training Weak in Clinical Skills

When questioned about their exposure to clinical skills in their pre-service training, two main viewpoints came out. A few participants felt that they had had adequate exposure to practical skills while in training, but upon posting in a rural health post, they quickly forgot all that they had learned due to lack of practice. Most others, however, felt that their training was very weak in practical skills. They were posted to a health post or district hospital for their practical training and due to the large amount of students and / or lack of patients they did not get adequate exposure. They also complained that there was no real supervision when they were doing their practical training. Many felt they could improve in their clinical skills if the pre-service institutions were required to provide adequate clinical exposure during their practical training.

Some of the older graduates, particularly from IOM, also stated that they saw large disparities in clinical skills and exposure between themselves and the new MLHCW graduates. They felt the new graduates were not getting the appropriate exposure to clinical medicine before being assigned to a government health post.

Practicing by "Trial and Error"

Upon being posted at a health post, they were called on to do many procedures that they had less than adequate training in. This was particularly true in the area of maternity services. Typically, a mother

gives birth at home if there are no complications. However, if there are any complications, mothers come to the health post. Many participants told of doing deliveries and handling complications by "hit and miss." Comments included, "They come to us for help, what are we supposed to do? Send them away?" Most participants acknowledged no formal pre-service or in-service training in the area of maternity complications. Even in more basic curative medicine, one participant complained, "the only clinical training we are given is how to refer."

Other areas of clinical medicine that were felt by the participants to be most deficient were in dental care, skin diseases, orthopedic trauma. MLHCWs in Bardia asked specifically for snake bite training. A significant number of participants

found it difficult to pinpoint the skills that they felt confident in, simply because they had never had their clinical skills evaluated.

Recommendations for Improvement

Participants also suggested that the government ensure the availability of a book in Nepali comprising the names, actions and adverse effects of drugs in all government health facilities. Others were favor of a *Sewa Prabesh Talim,* or job orientation program, prior to starting employment at a government health post. Other ideas were to rotate the MLHCWs between the SHP, HP and the district or regional hospitals on a regular basis, so as to give participants some exposure to clinical medicine and help maintain or improve their skills.

Comparison of School vs. Current Practical Experience

CLINICAL SKILL	HAD TRAINING IN PRE-SERVICE SCHOOL %		USES IN CURRENT CLINICAL PRACTICE %		DIFFERENCE
PROCEDURES	**YES**	**Conf. Interval**	**YES**	**Conf. Interval**	
Injections	98.2	94.7-99.6	99.4	96.6-99.9	-1.2
IV Catheterization	61.3	53.4-68.9	94.5	89.8-97.4	-33.2
Urine Catheterization	69.3	61.6-76.3	89.6	83.8-93.8	-20.3
Venipuncture (drawing blood)	68.1	60.4-75.2	63.2	55.3-70.6	4.9
Incision & Drainage	92	86.7-95.7	97.5	93.8-99.3	-5.5
Suturing	92.6	87.5-96.1	97.5	93.8-99.3	-4.9
Minor surgery	28.8	22-36.4	53.4	45.4-61.2	-24.6
Tooth Extraction	27.6	20.9-35.1	66.9	59.1-74	-39.3
Nasal Gastric Tube (NGT)	21.5	15.4-28.6	28.8	22-36.4	-7.3
MATERNITY					
Normal Delivery	42.9	35.2-50.9	73	65.5-79.7	-30.1
Post partum Complications	14.7	9.7-21.1	66.9	59.1-74	-52.2
ORTHOPEDIC					
Splinting	60.1	52.2-67.7	79.8	72.8-85.6	-19.7
Casting	12.3	7.7-18.3	22.7	16.5-29.9	-10.4
X-ray Reading	19.6	13.8-26.6	21.5	15.4-28.6	-1.9
Joint injection / aspiration	1.8	.4-5.3	8.6	4.8-14	-6.8

Analysis

This study shows that there is essentially no clinically significant difference among mid-level health care workers when analyzed by category, district or years of experience.

We believe that this study gives a good representation of the current condition of clinical skills of government mid-level health care workers. The fact that the four districts had essentially identical CSA scores suggests that other districts in Nepal would also compare similarly to the districts tested. Therefore, we believe the findings of this study can be considered representative of mid-level government health care workers working in the rural areas.

This study shows that there is essentially no clinically significant difference among mid-level health care workers when analyzed by category, district or years of experience. The HAs do have slightly higher scores in adult and orthopedic medicine than other workers in the mid-level, yet not to the extent that the difference could be considered clinically significant. When analyzed by posting however, there is a slight improvement in the clinical skills of MLHCWs in accordance to their posting level. Those who work in a district hospital score better than those at the SHP. It would seem that exposure to more patients and various clinical skills on a regular basis maintains practitioners' clinical skills. The government has a provision in which AHWs with more than ten years of service are eligible for a six-month training program in which they are able to qualify as Sr. AHWs. This allows them to fill a posting for Heath Assistants. The data showed, however, that these Sr. AHWs did not score any higher than regular AHWs. Their scores were also statistically and clinically equivalent with those of Health Assistants.

The data also supports the anecdotal evidence that the MLHCWs have poor clinical skills as related to curative medicine. The study shows particularly that in the areas of adult, maternity, orthopedic and management domains, the MLHCWs scored between 14% and 32% below the minimum standard for practical skills as per the CTEVT standards. This is a significant performance gap.

The adult medicine was the most comprehensive assessment tool. It assessed the skills of doing a proper medical history and physical exam. Although the diagnosis and treatment were included in the assessment, the tool was weighted for the history and exam. Of all sub-categories assessed, the history and exam portions were the weakest. As the history and physical exam skills, tested in the adult medicine CSA, is the basic building block of clinical medicine, the weakness demonstrated by the MLHCWs in this area is critical.

The MLHCWs were able to score close to the minimum standard in the pediatric medicine CSA. This CSA focused more on preventative health and malnutrition as per the IMCI guidelines. IMCI guidelines focus on care for infants with diarrhea, malnutrition and immunizations. Participants did particularly well in the sub-groupings of malnutrition and immunizations (65.4% and 96.9% respectively). It would appear that the in-service training of IMCI, in which 73% participated, had a positive effect on overall scores in pediatrics. Other in-service trainings that focused on immunizations and issues of malnutrition also appear to have been effective in their performance. This domain, however, may have some limitations due to the lack of a pediatric model patient. Thus,

participants were graded on answers to questions rather than actual interaction with a patient. This needs to be considered when viewing the results.

The maternity CSA measured the basic yet critical steps for a normal delivery with no complications. The standards were taken from the CTEVT standards within the mid-level curriculum. The performance gap of 21.2% in this area is significant — especially since 73% are doing deliveries in their health post, private clinic or in homes. More troubling is the admission that MLHCWs actually see a high percentage of delivery complications because non-complicated cases usually are taken care of by the family or with the village TBA. Complicated deliveries are seen by 66.9% of MLHCWs, yet only 14.7% have had any formal training in managing complicated cases. At this time, there is no mechanism for addressing this performance gap in these MLHCWs despite the practical realities that the majority of MLHCWs are conducting

both normal and complicated deliveries in the field.

Management and administration is a large part of a MLHCW's job responsibilities. When asked if they must do management within their jobs, 93.9% (CI: 89.1–97%) answered in the affirmative. The assessment of management knowledge showed a weakness in basic management principals as well as a lack of understanding of how to correct problems in such areas as public relations, resources or personnel issues within a health post.

The reasons for the general weakness in government MLHCW's clinical skills has a number of causes. First and foremost is the lack of quality practical skills training and exposure in the pre-service training of these health care workers. There are a large number of schools which continue to graduate students who have had adequate theory but no clinical exposure. Mid-levels generally get the last priority when it comes to clinical sites for training. In Nepal, there are few hospitals that offer the quality clinical exposure needed to provide training. These sites are flooded with students, including medical students, interns, resident doctors and other paramedical personnel. Thus, mid-level students are sent to health posts and district hospitals where there are few patients, little supervision and little opportunity for practical exposure.

The data regarding school experience vs. current clinical practice may be less than reliable since it is self reported and may be subject to recall bias. We also found it interesting that the skills participants reported being exposed to in pre-service training were not as low-level as one would expect based on their comments

during the focus group discussion. This could either mean that the MLHCWs are reporting higher pre-service exposure than the reality, the skills were not taught adequately, or they have lost these skills during their current practice. However, it is clear that there is a general trend of having to perform more clinical skills in current practice than they were exposed to during their pre-service training. *(See school vs. current practice comparison chart, pg. 19)*

Another reason for general weakness in clinical skills is the lack of in-service training that focuses on clinical skills and curative medicine. The IMCI training which does have a curative component was shown to make a difference in the participants' scores in the pediatric assessment. Other than IMCI, there has been little attention paid to this aspect of their job responsibilities even though they are called to do clinical medicine the vast majority of the time.

Finally, in the focus group discussion, the participants stated that their clinical skills declined after arriving at their posting. Some are assigned to a SHP where there is little support infrastructure and no orientation to their job responsibilities. Because of lack of confidence, the local villagers do not seek help at the health post and thus, the provider has no opportunity to use or improve his skills. Over time, the clinical skills deteriorate. In summary, the clinical skills of the MLHCWs are weak due to lack of proper training in pre-service training, lack of in-service training and lack of exposure in their current practice. A comprehensive strategy must include ensuring a quality pre-service education as well as in-service training in the clinical skills of curative medicine.

Suggested Options for Change

A comprehensive strategy must include ensuring a quality pre-service education as well as in-service training in the clinical skills of curative medicine.

Currently there are approximately 4,500 mid-level health care workers practicing in the government health care system. There are 15 Health Assistant schools and 65 AHW/CMA schools run under CTEVT. These schools are producing thousands of new graduate MLHCWs each year. Any intervention regarding the quality of government MLHCWs must take into account the currently practicing workers as well as the new graduates who will be joining the health care workforce. A comprehensive strategy must include ensuring a quality pre-service education as well as in-service training in the clinical skills of curative medicine.

To address the in-service issue, the authors recommend a MLHCW practicum that will seek to increase the skills of these workers through a competency-based program at health facilities that will allow for adequate exposure and clinical supervision. This could either take the form of a new training program that focuses on Health Assistants or it could be a reworking of the already existing Sr. AHW curriculum. This curriculum should focus on basic clinical skills that these MLHCWs come into contact with on a daily basis as they work in their health posts. The authors are not implying that preventive or public in-service training should be stopped or reduced. However, concentration of training in an area where only a minority of time is spent by the health care worker is not effective.

Secondly, the largest and most concerning performance gap is in the area of maternity care. The fact that 73% of these MLHCWs are doing deliveries as per their job description and the Essential Health Care Services List, yet do not have any formal clinical training despite it being in the curriculum. This should be a major concern for policy makers. The MOHP has planned to increase the midwifery coverage at the HP and SHP level. Ideally, ANMs and nurses, rather than non-maternity MLHCWs, should be doing safe motherhood services. This increase in midwifery staff may be what needs to be implemented in order to provide better maternity care coverage. However, if this can not be successfully implemented, a basic maternity skills course, including intervention for complications could be implemented either as a separate training or in conjunction with the practicum is necessary. Until these front-line health care workers are given the skills to deliver and intervene if complications arise, there will not be a substantial improvement in the state of safe motherhood and maternity care in the rural areas.

In addressing the lack of pre-service quality clinical skills training, it is not realistic to expect the GoN or CTEVT to be able to adequately oversee the large number of government and private training institutions to ensure better quality pre-service exposure to practical skills. Following the lead of the Nepal Medical Council, the authors recommend the introduction of a national certification for all MLHCWs. This certification examination process, including theory and practical skills, would set the bar for quality of MLHCWs. Those pre-service institutions would need to ensure that their students pass this certification exam at a high percentage or they would lose students who would look for institutions that offer a better quality education. A criterion

for entering government health care service would be a national certification.

In order for there to be an improved learning process in clinical skills, there must be three components: (1) Students willing and able to learn, (2) opportunities for clinical exposure and (3) clinical teachers who are able to effectively teach these skills to the students who are learning. Although this study does not specifically seek to evaluate or determine the quality of clinical teaching, one may deduce from the focus group discussions that the teaching capacity in both pre-service and in-service clinical skills training is also weak. The authors recommend that action needs to be taken to ensure that those who are actually teaching clinical skills have the training to do it.

We recognize that the delivery of quality health care does not depend only on competent clinical skills. Other factors including a supportive working environment, good logistical support and proper supervision are among some of the other factors that must be included in developing a strategy for improving the health care service delivery system. This study does not seek to evaluate those aspects of the health care system and acknowledges that those issues must also be addressed for a comprehensive change in quality to take place. However, any strategy to improve MLHCWs must include both the pre-service and in-service barriers to quality clinical skills. As Nepal seeks to continue to improve its health care services in the rural areas, competent and qualified MHLHWs must be seen as an integral part of any overall strategy in building the capacity of the government health sector.

Essential Health Care Services List

The Second Long Term Health Plan indicated that priority be given to health promotion and prevention activities based on Primary Health Care principles. It identified Essential Health Care Services (EHCS) that address the most essential health needs of the population and that are highly cost-effective. EHCS are priority public health measures and are essential clinical and curative services for the appropriate treatment of common diseases. The EHCS for Ayurveda and other traditional systems of medicines are defined separately.

ESSENTIAL CARE SERVICES FOR THE MODERN SYSTEM OF MEDICINE

Main Interventions	Health Problems Addressed
Appropriate treatment of common diseases and injuries	Common Diseases and injuries
Reproductive health	Maternal and Peri-natal
The expanded programme on immunisati Hepatitis	Diphtheria, Pertusis, TB, Measles, Polio, Neonatal Tetanus, on (EPI) and B Vaccine Hepatitis B
Condom promotion and distribution	STD/HIV, Hepatitis B, Cervical Cancer
Leprosy control	Leprosy
Tuberculosis control	Tuberculosis
Integrated Management of Childhood	Diarrhoeal Disease, Acute Respiratory Infection (ARI), Illness (IMCI) Protein Energy Malnutrition (PEM)
Nutritional supplementation, enrichment,	PEM, Iodine Deficiency Disorders, Vitamin A Deficiency, nutrition education and rehabilitation Anaemia, Cardiovascular Disease Prevention, Diabetes, Rickets, Perinantal Mortality, Maternal Morbidity, Diarrhoeal Disease, ARI
Prevention and control of blindness	Cataracts, Glaucoma, Pterygium, Refractive Error, and other Preventable Eye Infections
Environmental sanitation	Diarrhoeal Disease, Acute Respiratory Infection, Intestinal Helminthes, Vector Borne Diseases, Malnutrition
School health services	Diarrhoeal Disease, Helminthes, Oral Health, HIV, STDs, Malaria, Eye and Hearing Problems, Substance Abuse, Basic Trauma Care
Vector borne disease control	Malaria, Leishmaniasis, Japanese Encephalitis
Oral health services	Oral Health
Prevention of deafness	Hearing Problems
Substance abuse, including tobacco and alcohol control	Cancers, Chronic Respiratory Disease, Traffic Accidents
Mental health services	Mental Health Problems
Accident prevention and rehabilitation	Post Trauma Disabilities
Community-based rehabilitation	Leprosy, Congenital Disabilities, Post Trauma Disabilities, Blindness
Occupational health	Chronic Respiratory Disease, Accident, Cancers, Eye and Skin Diseases, Hearing Loss
Emergency preparedness and management	Natural and Man-made disasters.

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