

A NEEDS ASSESSMENT OF PRIMARY CARE WORKERS IN RURAL BOLIVIA

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ABSTRACT

The United Nations has recognized it is a fundamental human right for all to enjoy the highest attainable standard of health. To achieve this, countries must have a capable, supported, and motivated health workforce in the appropriate numbers and location. However, in low-resource settings poor health worker performance, and an insufficient and poorly distributed workforce, fail to adequately meet the needs of the population. This is especially true in rural areas of developing countries where communities generally have poorer health, less education, lower socioeconomic standing, and less access to health care compared to urban communities.

Bolivia is a developing country with extreme health and social disparities, and an inequitable distribution of the health workforce in rural areas. The purpose of this thesis was to assess the needs of community-based, primary care workers in a rural Bolivian municipality to develop recommendations for continuing professional development programs for workers to increase their performance in low-resource setting. This was achieved through a combination of health worker surveys, key informant interviews, and a review of the literature.

Overall, results indicated health workers had unmet needs in continuing education, advancement opportunities, professional development opportunities, building conditions, salary, clinical and office furnishings, medical supplies, and job recognition. What's more, survey

participants identified opportunities for continuing education, and training and development programs as the most important areas for health establishment improvement. A review of the literature supports the promise of tailored, continuous professional development (CPD) programs using information and communication technology (ICT) to increase the performance of health workers in low-resource countries. CPD is essential for health workers everywhere to maintain competence, improve performance, provide quality care, and meet changing health needs. However, offering CPD programs alone does not satisfy all worker needs and interventions should be combined to maximize health worker performance. The results from this thesis contribute to the public health literature by demonstrating the demand for CPD programs and the acceptability of ICT. Well-designed CPD programs are needed for community-based, primary care workers' in rural areas to maximize worker performance and improve the health of underserved populations.

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PREFACE

I would like to sincerely thank my Thesis Committee, Global Links, MEDICC, University of Pittsburgh School of Public Health, municipal government, and health worker participants for their tireless efforts to improve health, and for their collaboration developing this manuscript. In addition, I would like to thank my family who is the joy of my life and constantly supports and encourages the pursuit of my dreams.

1.0 INTRODUCTION

In 2013, Global Links and Medical Education Cooperation with Cuba (MEDICC) developed a program proposal to increase the capacity of community-based, primary care physicians in several Latin American countries to enhance the impact of their community health work. To do this, they collaborated to discover where efforts could be combined to support program development with each focusing on their area of expertise.

“Global Links is a medical relief and development organization dedicated to supporting health improvement initiatives in resource-poor communities and promoting environmental stewardship in the US healthcare system” (Global Links, n.d.). They accomplish this primarily by working with U.S. health organizations to recover surplus medical materials, and then redistribute them in developing countries of Latin America and the Caribbean. At that time, Global Links sought to expand their impact through a comprehensive programmatic approach aimed at health system capacity building, including new programs to support health workers. “MEDICC promotes US-Cuba health collaboration and highlights Cuba’s public health approaches to inform the quest for health equity and universal health worldwide” (MEDICC, n.d.). MEDICC proposed to develop and coordinate a professional development curriculum, which would provide Latin American Medical School (Spanish acronym ELAM) graduates in several Latin American countries with the skills required to successfully transition into the health workforce of their home country.

Located in Havana, Cuba, ELAM was established in 1999 and has produced 23,000 physicians from more than 100 countries making it one of the largest medical schools in the world (Reed, 2014). ELAM was first conceived after hurricanes Georges and Mitch in 1998 as part of Cuba's disaster response, and began by training physicians from four affected countries (THEnet, 2015). They have a unique recruitment approach prioritizing foreign students from disadvantaged communities, including remote and rural areas, and give full scholarships to all students for 6 years of medical training (Gorry, 2012). In return, students pledge to serve as primary care physicians in underserved areas, often in communities similar to their own; however, these pledges are non-binding and graduates are free to practice in any setting they wish. Recruiting health worker students from underserved communities has been linked to increasing their likelihood to practice in those areas. For example, a Cochrane review found numerous studies that link a health worker's rural background with an increased likelihood to practice in a rural environment (Grobler, Marais, & Mabunda, 2015).

ELAM is also remarkable for a curriculum that has a strong emphasis on health promotion, the social determinants of health, and partnering with communities to identify and resolve health problems (Gorry, 2012). What's more, ELAM embodies social accountability in its medical education, which "is defined as an institutional responsibility to orient teaching, research, and service activities to address priority health needs with a particular focus on the medically underserved" (Gorry, 2012, p. 5). This exceptional recruiting and training approach creates physicians with a sense of social responsibility, and competencies in primary care and community health, which are aimed at improving health outcomes for the individuals and communities who need it most.

In 2014, I partnered with Global Links and MEDICC to conduct a needs assessment of ELAM physicians with the goal of creating continuing professional development programs that increase their capacity and performance in their home countries. Global Links and I chose a rural Bolivian municipality as a pilot location to conduct an ELAM needs assessment; however, Global Links and I expanded the assessment's scope to include all primary care workers after municipal health officials recommended to incorporate all health professionals in the public health system during my initial meeting with them. We selected this particular municipality because Global Links had an active project there, the public health system had a high proportion of ELAM graduates, and the municipal health authorities were interested in increasing support for their health workers. I received no funding or compensation for the original needs assessment, which was part of my MPH practicum, and shared the results with Global Links and MEDICC.

The following thesis is a secondary analysis of the original data, and includes a discussion of the findings and recommendations for of creating continuing professional development programs for rural health workers.

2.0 BACKGROUND

The United Nations (UN) has recognized it is a fundamental human right for all to enjoy the highest attainable standard of health (UN, 1966). This position is echoed in numerous countries in Latin America and the Caribbean, which have made similar declarations and sought to create policies that guarantee the right to health (PAHO, 2012). There are many necessary elements to achieve this ambitious goal; however, it is apparent that a capable, supported, and motivated health workforce (Dolea & Adams, 2005), in the appropriate numbers and location (WHO, 2010), is a basic requirement to realize the highest attainable level of health for all.

The health workforce is a broad term that encompasses private and public institutions, health leaders and managers, and formal and informal health workers. Of these, the Declaration of Alma Ata recognized that community-based health workers in primary care are particularly positioned to support the right to health, especially in areas where access to services is poor (WHO, 1978). As the World Health Organization (WHO) articulated, “primary care brings promotion and prevention, cure and care together in a safe, effective and socially productive way at the interface between the population and the health system” (2008, p. 41). When this is done properly, communities receive essential services to promote, protect, and restore health to the highest attainable level.

The essential role of primary care is well established and cited as essential to achieve the current UN Sustainable Development Goals (SDGs). For example, primary care directly impacts

the SDG3 to, “Ensure healthy lives and promote well-being for all at all ages” and can contribute to the achievement of other SDGs related to the social determinants of health (Pettigrew, et al., 2015). However, achieving universal, quality primary care is a challenge and especially dependent on health worker performance. Inadequate health worker performance is an extensive problem in low-resource settings and contributes to increased morbidity and mortality (Rowe, de Savigny, Lanata & Victora, 2005). Performance is essentially the worker’s behavior at work and productivity represents the behavior’s outcome (Dolea & Adams, 2005). Although simple in definition, the determinants of health worker performance are more complex and include clear job expectations, feedback on performance, an adequate work environment, motivation and incentives to perform, and having the requisite job knowledge and skills (IntraHealth International, 2007). While all of these domains are important, some authors suggest health worker motivation is the main component in determining their performance (Dolea & Adams, 2005).

A systematic review by Willis-Shattuck et al. on motivational factors for health workers in developing countries identified seven major themes, which are sorted from most to least frequent: 1. financial (worker salary or allowances), 2. career development (potential for promotion or specialization), 3. continuing education opportunities, 4. health facility infrastructure (the physical condition), 5. resource availability (necessary equipment and supplies), 6. health facility management (positive working relationships between management and health workers), 7. and personal recognition or appreciation (from managers, colleagues or the community) (2008). In addition, they identified other important motivational factors such as fringe benefits (housing and transportation allowances), job security, personal safety, staff shortages, and social factors such as work’s effect on family life. Based on their review, the

authors concluded financial incentives, career development, management, worker recognition, and adequate resources and infrastructure are key to health worker motivation and performance in developing countries (Willis-Shattuck, et al., 2008).

In addition to the performance challenge in low-resource settings, there is also the issue of an insufficient and poorly distributed health workforce (WHO, 2010) (WHO, 2006) that fails to adequately meet the needs of the population. This is especially true in rural areas of developing countries where communities generally have poorer health, less education, lower socioeconomic standing, and less access to health care compared to urban communities. The result is a health equity issue, as reflected by “Hart’s ‘inverse care law’, which states that those with the greatest health needs usually have the worst access to healthcare services” (Wilson et al., 2009, p. 2). For example, approximately 50% of the world’s population lives in rural areas; however, only 24% of physicians and 38% of nurses work in rural areas (WHO, 2006). This observation holds true in many countries in Latin America, which have high comparative rural to urban population ratios (PAHO, 2012) that are not appropriately matched with an equitable distribution of the health workforce.

There is much attention being paid to reasons why there are health workforce shortages in rural areas, and what can be done to recruit and retain health workers to address the gap. For example, the motivational themes mentioned previously in the Willis-Shattuck et al. systematic review are also factors affecting health worker retention (2008), and are described in other reviews. This is evidenced in Lehmann, Dieleman, and Martineau’s review of studies from middle- and low-income countries that described five interrelated domains affecting health worker attraction and retention in rural areas; individual factors, local environment, work-related factors, national environment, and international environment (2008). Individual factors

influence decisions whether to work in rural areas and include age, gender, marital status, and where workers are from; however, the authors concluded the evidence was inconclusive on the role of these characteristics.

Despite an unclear understanding of individual factors, strong evidence existed on the role of local environment factors. For example, a lack of housing, schools for children, and basic living conditions were all cited as important factors in health workers' decisions to go to or remain in rural locations (Lehmann et al., 2008). Additionally, work-related factors were also found to be important and included work recognition, job stability, availability of equipment, management support, continuing education and professional development opportunities, and salary. In the national environment, country instability, poor economic conditions, and a lack of health facilities were common factors "pushing" health workers to migrate. This was compounded by the international environment where better pay, working conditions, professional development opportunities, and a higher standard of living "pulled" workers to emigrate, particularly to higher income countries (Lehmann et al., 2008).

The WHO published a set of evidence-based recommendations based on comprehensive and systematic literature reviews, and expert validation, to recruit and retain health workers in remote and rural areas, thus increasing health care access to underserved populations (2010). Recommendations fall under the four broad categories of education, regulation, financial incentives, and personal and professional support. Each category has example recommendations, and grades and summarizes the evidence to support each individual recommendation. Overall, the majority of studies were observational and they noted a lack of experimental design studies examining interventions to improve attraction, recruitment, and retention of health workers in rural areas (WHO, 2010). However, they concluded there is sufficient evidence to support the

use of recommendations, if adapted to country specific needs and context. Appendix A includes an adapted table summarizing the intervention examples.

Bolivia faces numerous health and health workforce challenges, and is a prime candidate for interventions for rural health workers to address disparities. For instance, in 2011, 34% of the 10,027,254 inhabitants lived in rural areas and experienced significant disparities in health and social standing (Barrero, 2013). Bolivian infant mortality in urban areas was 36 per 1,000 live births compared to 67 in rural areas, and child mortality under age 5 was 43 per 1,000 live births compared to 87 in rural areas (Ministerio de Salud y Deportes, 2014). These mortality rates rank among the worst in the Americas (PAHO, 2012). What's more, rural Bolivian populations are predominated by indigenous peoples and income inequality is greatest in these areas (PAHO, 2012). In 2009, there were 26,180 registered health workers, which included "11,241 professionals; 1,459 technical personnel; 7,817 auxiliaries; 2,538 administrative personnel; and 3,125 service support employees" (PAHO, 2012, p. 122). In 2011, Bolivia had 0.473 physicians and 1.005 nurses per 1,000 people, which are much lower than the world averages of 1.539 physicians and 3.28 nurses per 1,000 people (World Bank, 2016). This relative lack of health workers is compounded by a rural/urban disparity where rural areas had 0.96 health workers per 1,000 people compared to 1.64 health workers in urban areas (Barrero, 2013), neither of which meet the global benchmark of 2.28 health workers per 1000 people (WHO, 2006).

The Bolivian health system has been criticized for its fragmentation, inequity, and poor cohesion (PAHO, 2012). Despite this criticism, Bolivia has taken significant steps to improve the public health system since Evo Morales became president in 2006 (Heaton, Crookston, Forste, & Knowlton, 2014). Morales is the first indigenous president in Bolivia and leader of the

Movement toward Socialism (Spanish acronym MAS) political party. Under the Morales administration, the state has guaranteed the people's right to health and taken steps to increase health coverage and the social inclusion of the indigenous majority (Heaton et al., 2014). In 2008, only 42.4% of Bolivians were covered by public health insurance and the health system was a mix of private, public, government, and non-governmental institutions (PAHO, 2012) that left 30% of the population with no coverage at all (Ledo & Soria, 2011). In part to address these issues, and persistent health and social disparities, the government of Bolivia created the "Toward Universal Health" Sectoral Development Plan 2010-2020 defining the Unified Family, Community and Intercultural Health (Spanish acronym SAFCI) System with objectives to provide universal access to health care; expand the health services offered, especially health promotion, and early disease identification and treatment; and strengthen health system networks prioritizing infrastructure, equipment, human resources for health, and management (Ministerio de Salud y Deportes, 2009).

In practice, SAFCI is intended develop a holistic approach to health and disease that eliminates health disparities related to social and racial exclusion, and does so within the context of the family and community (Sanchez, 2013). It takes into account environmental and social determinants of health and seeks to intervene at multiple levels. In addition, it respects and values a multidisciplinary team approach, including traditional medicine, and strives to empower individuals in decision-making. In the SAFCI model, social considerations share equal weight with medical attention, which differs from previous health policies that concentrated on medical attention only and had an authoritarian approach to health (Sanchez, 2013).

Achieving the SAFCI objective to strengthen the health system required an increase in health care workers. In 2006, the Morales administration signed the Bolivarian Alternative for

the Americas, which increased cooperation with Cuba and Venezuela and led to an influx of health workers and aid (Heaton, et al., 2014). As a result of the agreement, nearly 2,000 Cuban health workers came to Bolivia and numerous Bolivian students were given scholarships to study medicine in Cuba (in ELAM). As of 2014, 4,935 Bolivian students have graduated from ELAM; more than any other country in the world (ELAM, 2014). As an implementation strategy for SAFCI, returning ELAM physicians were used in the Mi Salud (My Health) program, which began in 2013 (Sanchez, 2013). Mi Salud follows the SAFCI model and consists of community-based health workers in the public health system who provided primary care in health centers/posts, and in the homes of individuals and families. ELAM physicians were recruited for Mi Salud because their unique training in community-based primary care (Sanchez, 2013).

In summary, the combination of a poorly performing primary care workforce with inadequate numbers and inequitable distribution creates and perpetuates a community health crisis where disadvantaged rural populations have the least access and lowest quality care. Therefore, it should be a priority to realize a capable, supported, and motivated primary care workforce in rural areas, particularly in low-resource countries like Bolivia. The overall purpose of this thesis is to use the data collected in 2014 to assess the needs of primary care workers in a rural Bolivian municipality and has the following Specific Aims:

- 1) Based on a review of primary care worker survey data collected in the rural Bolivian municipality,
 - a. describe the demographic characteristics of workers,
 - b. describe the experience of workers adapting to the workforce,
 - c. describe the workers' priority needs;

2) Based on a review of the assessor's field notes (from key informant individual and group interviews), add context and richness to the experience of workers and their priority needs;

3) Based on a synthesis of the literature, and quantitative and qualitative data,
a. summarize and discuss findings,
b. present implications and recommendations with emphasis on continuing professional development recommendations for rural health workers.

3.0 METHODS

3.1 SETTING

As noted previously, the original data for this thesis came from the needs assessment I conducted as part of my MPH practicum, which began in May 2014 and finished in August 2014. All survey data came from one rural municipality in Bolivia, and included all health centers and health posts in the municipal public health system. The municipality is located in a sparsely populated, semi-arid lowland region of Bolivia with approximately 140,000 inhabitants. Municipal census data from 2001 indicate three major indigenous groups exist and include Quechua (20%), Aymara (5%), and Guarani (3%). In addition, the principal languages spoken were Spanish (73%), Quechua-Spanish (13%), Aymara-Spanish (2%), and Quechua (1%). I did not include the municipality's name due to ethical concerns, which are presented in section 3.5.

Health workers completed paper surveys during site visits I conducted in 23 municipal health centers and health posts; 12 located in rural areas and 11 located in the urban area. The municipality had one public, secondary hospital in the urban center, which was the referral center for municipal health centers and posts. Driving distances varied between the hospital and rural health centers from the closest at 30 minutes to the furthest at 3 hours. I conducted key informant individual and group interviews in a variety of municipal settings, however, interviews generally were held in the participants' place of employment.

3.2 SAMPLE

One hundred nineteen surveys were used for quantitative data and included 58 physicians, 19 licensed nurses, 19 technical nurses, and 23 “other” (this group included dentists, pharmacists, and other allied health workers). The training and job duties for the most common surveyed health workers are:

Physician – An individual who has graduated from a medical school, which typically lasts 6 years, and is licensed to practice medicine in Bolivia. Skillsets of a physician include: 1) assessing, diagnosing, and treating injuries or illness, 2) prescribing medications and ordering, performing and interpreting diagnostic tests 3) counseling patients on health promotion, disease prevention, and medical treatment, 4) supervising healthcare teams, and 5) performing administrative duties. I separated the physician category into domestically trained physicians and ELAM trained physicians due to significant training and educational differences. Domestically trained physicians generally were taught the traditional western medical model with an emphasis on curative medicine, the physical and biological determinants of illness, and were trained in health care institutions. On the other hand, ELAM physician education had an emphasis on prevention, social determinants of health, community health, and were often trained in the community (refer to the introduction for a full ELAM description).

Licensed Nurse – An individual who has graduated from a baccalaureate nursing program, which typically lasts 5 years, and who is licensed to practice nursing in Bolivia. Skillsets of a licensed nurse include 1) providing health promotion, prevention of illness and care of the ill, 2) coordinating care within a multidisciplinary healthcare team, 3) supervising technical nurses, and 4) performing administrative duties.

Technical Nurse (also known as a nurse auxiliary) – An individual who has basic nursing skills, but no training in nursing decision-making, and is regulated to work in Bolivia. This individual has completed a formal training program, which typically lasts between 1-2 years. Skillsets of a technical nurse include 1) providing health promotion, prevention of illness and care of the ill, and 2) performing administrative duties.

Survey inclusion criteria for health workers were all permanent workers who had clinical, primary care responsibilities in the 23 health centers/posts; and exclusion criteria were any worker who had temporary, part-time, intern, or student status, or did not have a clinical role. These criteria were chosen as permanent, clinical staff in the municipal health centers/posts provide the majority of the primary care services in the community, especially in underserved areas. I used convenience sampling and invited all primary care workers present during site visits to participate in the survey. No invited health workers declined to participate, though not all participants answered every question. In all, 122 primary care workers completed the survey, however, I discarded 2 surveys because they were completed by students, and 1 survey due to extensive errors.

Key informants participated in individual and/or group interviews and included Bolivian health officials at the departmental (n = 3), and municipal levels (n = 2); community members (n = 2) and leaders (n = 4); and primary care workers with a concentration on domestic physicians, ELAM physicians, licensed nurses, and technical nurses (n = 50+). I do not know the exact number of primary care workers participating in interviews as this information was not recorded. I chose health official participants based on their leadership position and knowledge of the health system, and chose health workers and community members/leaders based on convenience and presence during site visits. All health officials approached for an interview agreed to participate

but I did not record data on health worker interview refusals. The majority of health workers I interviewed also completed a survey; however, this information was not tracked nor linked in any way.

3.3 PROCEDURES AND MEASUREMENT

I developed a survey draft in English with a mix of nominal, and ordinal questions including Likert scale-type questions developed based on the themes Willis-Shattuck et al. identified in their systematic review (2008), and the programmatic interests of Global Links and MEDICC. Questions focused on worker demographics; workforce adaptation; priority health worker needs; worker satisfaction, motivation and productivity; and continuing educational preferences. I then translated the survey into Spanish, which was reviewed and edited by native Spanish speakers including my MPH committee chair and Global Links staff. A collaborative, iterative process with Global Links, MEDICC, and municipal health officials was used to refine the survey and target primary care workers in the combined 23 health centers and health posts in the Bolivian municipality. I piloted the survey with 3 municipal health workers (1 ELAM physician, 1 licensed nurse, and 1 technical nurse) to assess question clarity and relevance in the target population, refined the survey based on feedback, and then I offered the paper survey to primary care workers in all 23 municipal health centers/posts during site visits. Health workers generally completed the survey in less than 20 minutes and a copy of the survey is included in Appendix C.

I conducted unstructured, individual and group interviews with key informants in Spanish, and generally asked questions that were related to workforce adaptation, priority health

worker needs, worker satisfaction, and continuing education. I did not voice record the interviews but wrote notes in personal notebooks during and/or after the interviews on participants' responses and my personal thoughts. In some instances, I was able to directly quote participants but most notes involved paraphrasing, noting key participant ideas, and my personal reflections. Interviews varied in length from a few minutes to more than an hour.

At each site visit, I introduced myself stating my affiliation with Global Links and municipal authorization to conduct the visit. I explained that the purpose of the evaluation was to determine the needs of health workers to support programing, and that participation was voluntary and anonymous. This information was also included at the top of the surveys health workers completed. Surveys were given and completed before interviews to prevent influencing the survey results. Finally, I conducted walk-throughs in the health centers/posts, commonly at the same time I interviewed participants.

3.4 EVALUATION

I entered paper survey data into the secure, password protected Qualtrics system. To promote data accuracy, I reviewed each survey for completeness and adherence to inclusion/exclusion criteria. In addition, I compared each survey entered into Qualtrics with the original paper survey to ensure correct data entry. I used descriptive statistics (frequencies, percentages, and means) to analyze and present data. I dichotomized most Likert scale questions into positive and negative responses (neutral, positive, very positive together into "positive"; negative, very negative together into "negative"), and sorted results from most to least frequent

in tables. I used the mean to interpret health worker educational preference for one Likert scale question because there was no positive/negative dichotomy to the choices.

For the purpose of this thesis, I reread my interview notes assessing for participant responses that would help to explain or add context to survey results related to worker demographics; workforce adaptation; priority health worker needs; worker satisfaction, motivation and productivity; and continuing educational preferences.

3.5 ETHICS

The original needs assessment was directed at program planning and did not qualify as research requiring University of Pittsburgh IRB approval. However, I sought and obtained permission to conduct the assessment from the responsible municipal health authorities, and the University of Pittsburgh IRB granted exemption status to conduct the secondary analysis (see Appendix B). Moreover, I obtained written permission from the responsible municipal health authorities after the original assessment to publish the de-identified data. As noted previously, I informed health worker participants of the purpose of the assessment, and that participation was voluntary and anonymous. Additionally, interview and survey information directed at primary care workers was free of personally identifiable information, which minimized risk to assessment participants. Finally, I did not include the name or identifiable details of the municipality to protect its identity and minimize risk to municipal leaders. The assessment uncovered significant health worker dissatisfaction and other health system concerns, which could have negative consequences for the municipal leadership if published.

4.0 RESULTS

4.1 DEMOGRAPHICS

4.1.1 Age and Gender

Overall, survey participants were comprised of young adults with more than 3 out of 4 who were between ages 25 to 34. This was particularly dramatic for ELAM physicians, all of whom were within this range. Interviews with ELAM physicians indicated one of the reasons for this was that the majority of them completed their medical training in 2012 and were recently contracted by the national government.

The majority of respondents were women, with only the physician profession having a higher proportion of men compared to women. However, there appeared to be an equitable gender distribution among the different professions, except for licensed nurses, which was dominated by women. Additionally, ELAM physicians had a higher proportion of men compared to physicians trained elsewhere. Refer to Table 1 for details.

Demographic information was not collected from interview participants.

Table 1. Survey Participant Age and Gender by Profession and Place of Education (n=119)

Age and Gender	Profession					Physician Education Location	
	Physician n = 58	Licensed Nurse n = 19	Technical Nurse n = 19	Other n = 23	Total n = 119	Domestic Physician n = 27	ELAM Physician n = 31
25 to 34	91.4%	79%	57.9%	54.6%	77.1%	81.5%	100%
35 to 44	6.9%	10.5%	21.1%	22.7%	12.7%	14.8%	0%
45 to 54	1.7%	5.3%	5.3%	13.6%	5.1%	3.7%	0%
20 to 24	0%	5.3%	5.3%	4.6%	2.5%	0%	0%
55 to 64	0%	0%	5.3%	4.6%	1.7%	0%	0%
65 or over	0%	0%	5.3%	0%	0.8%	0%	0%
Female	44.8%	94.7%	52.6%	56.5%	56.3%	51.9%	38.7%
Male	55.2%	5.3%	47.4%	43.5%	43.7%	48.2%	61.3%

4.1.2 Work Experience

The majority of the workforce had 5 years or less of health professional work experience. In addition, it appeared the most skilled professions (physicians and licensed nurses) had the least amount of professional experience while the least skilled profession (technical nurses) had the most professional experience. Of note, only one ELAM physician had more than 1 year of health professional experience (refer to Table 2 for details). In fact, during interviews most ELAM physicians stated this was their first paid position as a health professional and they had been working for the health system between 1-9 months. Some domestically trained physician commented on ELAM physicians lack of experience stating, “It’s like we have one more student until they receive training and learn.”

ELAM interviewees indicated the reason for limited professional experience was two-fold. First, most of the ELAM physicians finished their medical training in 2012 and had difficulty entering the workforce due to additional requirements to become medical professionals in Bolivia. Second, there were few open positions for physicians in the public health system before the implementation of the Mi Salud program. Mi Salud was implemented in the municipality within the past year, and municipal health officials and ELAM participants indicated ELAM physicians were recruited specifically for Mi Salud to support SAFCI because of their skills in community and family health, and their unique philosophical and social approach to address health in underserved areas. As one ELAM physician stated, “Our training is to go and collaborate in the most humble, poor countries.” In the municipal Mi Salud program, municipal officials stated 29 new physician positions were opened and filled by ELAM physicians, which was a major expansion in the physician workforce.

Table 2. Survey Participant Years of Work Experience by Profession and Place of Education (n=119)

Years working as a health professional	Profession					Physician Education Location	
	Physician n = 58	Licensed Nurse n = 19	Technical Nurse n = 19	Other n = 23	Total n = 119	Domestic Physician n = 27	ELAM Physician n = 31
0 to 1 year	60.3%	42.1%	10.5%	13%	40.3%	18.5%	96.8%
2 to 5 years	27.6%	47.4%	26.3%	56.5%	36.1%	55.6%	3.2%
6 to 9 years	8.6%	5.3%	31.6%	8.7%	11.8%	18.5%	0%
10 or more years	3.5%	5.3%	31.6%	21.7%	11.8%	7.4%	0%

4.1.3 Workforce Entry

Significant proportions of all primary care workers had substantial delays after graduation before beginning work as paid health professionals according to survey data and interviews with health workers, (refer to Table 3 for details). However, ELAM physicians by far had the greatest proportion of workers that began compensated health professional work 1 year or more after graduation. ELAM physicians interviewed stated several reasons for these substantial delays. First, there were too few positions in the public health sector to accommodate the number of trained health professionals for all disciplines. Second, the process for ELAM physicians to begin work in Bolivia was more complicated than that of someone trained within the country. ELAM physicians described a difficult bureaucratic process to have their education and training recognized and validated in Bolivia. In addition, they were required to complete 6 months of social service before they were eligible to work—3 months more than a domestically trained physician. ELAM physicians indicated this requirement was initiated ostensibly because they needed more time to adapt to the Bolivian health system since they were trained abroad. Finally, health professionals across disciplines stated that one’s political affiliation and personal connections had unwarranted influence in determining who was offered work in the public health system. As one health center director stated, “if you don’t follow the [political party’s] line, there is no work.”

Table 3. Survey Participant Delay to Begin Work as a Health Professional by Profession and Place of Education (n=119)

Time after graduating to begin work as a paid health professional	Profession					Physician Education Location	
	Physician n = 58	Licensed Nurse n = 19	Technical Nurse n = 19	Other n = 23	Total n = 119	Domestic Physician n = 27	ELAM Physician n = 31
Greater than 1 year	48.3%	31.6%	31.6%	34.8%	40.3%	22.2%	71%
Between 6 months 1 year	25.9%	36.8%	26.3%	39.1%	30.3%	29.6%	22.6%
Within 6 months	25.9%	31.6%	42.1%	26.1%	29.4%	48.2%	6.5%

4.2 WORKFORCE ADAPTATION

4.2.1 Finding Employment

Overall, approximately 4 out of 5 survey respondents indicated it was difficult to find a job. Licensed nurses and physicians had the highest proportions indicating difficulty, and technical nurses had the lowest. In addition, survey data indicated ELAM graduates had more difficulty finding work than physicians trained in Bolivia. Refer to Table 4 for survey details. The reasons participants gave for this difficulty were presented in subsection 4.1.4.

Interviews with health workers in rural areas indicated that some worked in rural areas only because they could not find work in the city. As one dentist stated, “[health workers] work in rural areas because it is difficult to find work in the city.” However, both rural and urban health workers agreed it was difficult to find work regardless of the location.

Table 4. Survey Participant Workforce Adaptation Difficulty by Profession and Place of Education (n=117)

Health workers reporting difficulty for the following activities after graduating as a health professional:	Profession					Physician Education Location	
	Physician n = 57	Licensed Nurse n = 19	Technical Nurse n = 18	Other n = 23	Total n = 117	Domestic Physician n = 27	ELAM Physician n = 30
Finding a job	80.7%	89.5%	72.2%	78.3%	80.4%	74.1%	86.7%
Becoming licensed in Bolivia	50%	35.3%	56.3%	47.6%	48.2%	11.5%	85.7%
Adapting to the Bolivian health system	30.2%	0%	25%	19.1%	22.2%	34.6%	25.9%
Adapting to the local culture	20.8%	11.1%	26.7%	14.3%	18.7%	30.8%	11.1%
Treating Bolivian diseases	11.3%	16.7%	33.3%	19.1%	16.8%	19.2%	3.7%

4.2.2 Licensure

Survey data indicated health professionals experienced significant difficulty becoming licensed in Bolivia with ELAM physicians reporting the most difficulty and domestically trained physicians reporting the least. Of note, technical nurses had the second highest percentage of reported difficulty. Reasons for this difficulty were presented in subsection 4.1.4. Refer to Table 4 for complete survey details.

4.2.3 Health System Adaptation

Looking at survey data, domestically trained physicians indicated the most difficulty adapting to the Bolivian health system whereas licensed nurses indicated no difficulty. ELAM physicians indicated difficulty adapting but less than their Bolivian trained counterparts. Refer to Table 4 for complete survey details.

During individual and group interviews, ELAM physicians cited two common factors that caused difficulty. First, they mentioned the differences in health insurance between Bolivia and Cuba. In Bolivia, there were three different publically financed health insurance programs that had varying eligibility requirements and benefits. In addition, the three programs did not cover the population 100%. ELAM physicians stated they found this confusing and preferred the simplicity of the Cuban system, which offers universal coverage under a single system. ELAM physicians also stated adapting to the differences in medications used between the two countries was a challenge. Conversely, ELAM physicians stated the SAFCI model of care was very similar to the Cuban model indicating it was easy to adapt to.

4.2.4 Cultural Adaptation

Surveyed physicians trained in Bolivia indicated the most difficulty adapting to local culture followed by technical nurses while ELAM physicians and licensed nurses indicated the least difficulty. There were no clear interviewee statements as to why ELAM physicians reported less difficulty, however, several ELAM physicians were based in or near the communities they came from. In addition, several were ethnically Quechuan and spoke Quechua, which was the most common language after Spanish. Refer to Table 4 for complete survey details.

Interviews with health workers in two of the most remote health centers and posts indicated some cultural adaptation difficulty in indigenous areas where there was a language mismatch between workers and community members. Health workers commented that some community members do not speak Spanish well and that they did not speak the indigenous language, which created barriers to assessing and treating patients. For example, a domestically

trained physician stated, “In a rural area like this, you need much support. The language is very difficult and you have to speak a thousand times so that they understand.”

4.2.5 Treating Bolivian Diseases

Surveyed technical nurses reported the most difficulty treating diseases in Bolivia whereas ELAM physicians reported the least difficulty. The proportion of physicians trained in Bolivia that reported difficulty was nearly three times that of ELAM physicians. Refer to Table 4 for complete survey details. However, some domestically trained physicians stated during interviews that ELAM physicians had some difficulty treating diseases as the medications available in Cuba were different than some of those used in Bolivia. Additionally, some domestic physicians stated the diseases they treated during their training differed from the diseases they treated currently. For example, one physician stated he had never treated common tropical diseases until he began work in the municipality because those diseases were not prevalent in the Andean region where he was trained.

4.3 PRIORITY HEALTH WORKER NEEDS

4.3.1 Health Worker Satisfaction Needs Categories

Survey participants were asked to select their level of satisfaction/level of appropriateness in different needs categories where they currently work. Overall, the most frequent dissatisfaction/inappropriate categories were: 1. Continuing education opportunities, 2.

Advancement opportunities, 3. Building conditions, 4. Professional development opportunities, 5. Salary, 6. Clinical furnishings. However, there was some variation by profession and location. Refer to Table 5 for complete details.

The top area of dissatisfaction for health workers was continuing education opportunities. Of those surveyed, more than 7 out of 10 of health workers indicated dissatisfaction with technical nurses and physicians reporting the highest dissatisfaction. Numerous interviewee statements reflected this dissatisfaction. One dentist stated there were only 1-2 trainings per year and it was difficult to stay up to date on professional skills and knowledge. Municipal authorities and health workers indicated current continuing education offered to workers were insufficient and limited to workshops on health system administrative policies/procedure, and orientation activities for newly hired Mi Salud workers. In rural areas, health workers complained it was difficult to pursue continuing education opportunities because of the distance and lack of internet access. One licensed nurse described how she had driven 7 hours each weekend for months to the nearest city so she could complete a diploma program. Additionally, rural workers stated it was difficult to attend municipality sponsored training and workshops as they usually were held in the urban area, and transportation and time constraints made it difficult to get there. Even workers in the municipal urban center complained of a lack of opportunities. They mentioned the absence of a local university for health professional training and cost barriers.

The second most common area of dissatisfaction on the survey was advancement opportunities with physicians expressing the highest rates. Numerous physicians stated they wanted to complete a specialty and viewed specializing as a career advancement. However, they stated securing specialty training was both difficult and costly. First, they stated there were few

specialty openings in the country and they were highly competitive. Second, they stated they had to pay out of pocket for specialty training, which was expensive. Third, they stated they would have to move to an urban area and resign from their current position to begin training. Some physicians stated they were looking to leave Bolivia so they could receive specialty training, and it was unclear if they intended to return once they had finished.

The third most common area of dissatisfaction on the survey was building conditions. Interviewee comments centered around poor infrastructure including basic services and the physical condition of the health center or health post. Generally, the dissatisfaction statements were more dramatic in rural areas, which generally had poorer building conditions. For example, one of the most rural health centers did not have running water for 1 month, and workers were forced to manually pump water from a well. A licensed nurse stated it was difficult to keep the center clean and she expressed concerns for sanitation and patient health. In fact, health workers were so dissatisfied that some wanted to close the center until the issue was fixed. In another remote health center, a licensed nurse and physician described the consequences of inadequate conditions. “They (pregnant women) come to give birth but we have to do it in the house because we do not have the conditions here.” They indicated this was one of the reasons they were “thinking about going to another place.”

During interviews, ELAM physicians voiced dissatisfaction with a lack of medical supplies and equipment, and other health workers cited a lack of laboratory equipment and infrastructure. As one physician stated, “Some give birth without one visit, without one test” because a lack of basic equipment and supplies. This conveys risk to the mother and child, which could be prevented if they had test results. As another ELAM physician stated, “I want to do my job well but need the resources” to do so. Rural professionals reported a lack of transportation in

the community to carry out their work, and for personal travel. Interviewees in rural areas noted that community members have greater dispersion geographically and transportation options are fewer. As the director of a rural health center noted, “I need transportation—an ambulance or at least an ATV” to visit and transport rural patients. In addition, they voiced frustration with a lack of ambulances or ambulances in disrepair. Rural physicians described how this delayed patient transport to the hospital when they needed a higher level of care, which could have dire consequences. The municipality health authorities stated they had purchased ATVs for rural health centers and new ambulances, however, these had not been distributed and this further frustrated health workers.

Additional health worker comments in rural areas indicated perceived urban/rural disparities and an overall preference to work in an urban area. For example, rural health workers indicated they have extra expenses, fewer opportunities, and more hardships compared to urban areas. As one ELAM physician stated, “Because of this no one wants to work in the countryside. They waste money on food, on transport, on many things.” Additionally, they stated they worked more than their urban counterparts. In remote and rural areas, health workers often stayed near the health center or post, usually in basic housing that was part of the health establishment. As one physician stated, “Supposedly, you are to work 8 hours a day [like in an urban area]. But in reality in a rural area, it’s not like that – it’s 24 hours. Yes or yes we work more than 8 hours...the births arrive, the emergencies. Because they know there is a permanent physician here, they come at any hour.” Additionally, workers complained of a lack of financial incentives/supports, and recognition for their work. For example, and ELAM physician in rural stated, “Nobody comes to recognize our work. Nobody comes to say thank you doctor, thank you nurse.”

Rural health workers described other common hardships associated with their work location including poor living conditions and a negative impact on their family. When asked why one nurse wanted to leave, she stated “I have a family but I don’t see them. It’s tiring.” There were additional concerns for health workers who brought their family to the rural area. For example, one dentist with a wife and infant expressed worry for his child’s education and work opportunities for his wife. Other health workers complained of a lack of reliable electricity, running water, and climate control, which made the physical work and living conditions challenging. During rural health center visits, health workers reported that there were two physicians that had resigned due to the hardships of living in a rural area.

Despite the overall trend, some workers actually preferred their rural work site. For example, two ELAM physicians lived and worked in the community they came from and cited this as a benefit. This sentiment was echoed by another technical nurse who lived and worked in her community. In one instance, two ELAM physicians wanted to exchange their job locations so they could work in their rural community of origin. Additionally, some rural health workers stated that work and life was “more tranquil” compared to urban areas.

Dissatisfaction with a health worker’s job contract was another common health worker complaint and occurred in both rural and urban areas. Municipal officials and health workers described three different type of labor contracts: national government, regional government, and municipal government. All health workers’ statements indicated national government contracts were the most desirable as they were the most stable (5 year contracts) and the only contracts with benefits (vacation, insurance, etc.). Regional and municipal contracts were shorter (generally 6 months – 1 year) and had no fringe benefits. While the pay and work load was

generally equal between contracts, health workers without national contracts expressed dissatisfaction with job stability and fringe benefits.

Table 5. Survey Participant Dissatisfaction by Profession, Place of Education, and Work Location (n=115)

Health worker dissatisfaction categories	Profession				Total n = 115	Physician Education Location		Work Location	
	Physician n = 57	Licensed Nurse n = 18	Technical Nurse n = 18	Other n = 22		Domestic n = 26	ELAM n = 31	Rural area n = 65	Urban area n = 50
Continuing education opportunities	73.2%	66.7%	77.8%	66.7%	71.7%	71.1%	73.3%	69.8%	74%
Advancement opportunities	76.4%	61.1%	55.6%	63.6%	68.1%	66.7%	72.4%	65.1%	72%
Building conditions	57.2%	64.7%	75%	59.1%	61.3%	65.4%	50%	54.1%	70%
Professional development opportunities	66.1%	47.4%	50%	57.1%	58.8%	53.6%	73.3%	60.3%	56.9%
Salary	63.2%	44.5%	55.6%	45.5%	55.7%	54.8%	58.1%	47.7%	66%
Clinical furnishings	62.5%	62.5%	50%	35%	55.5%	50%	70%	57.4%	53.1%
Office furnishings	42.9%	52.9%	77.8%	36.4%	48.7%	47%	53.3%	52.4%	44%
Recognition for your work	57.1%	50%	27.8%	40.9%	48.3%	50%	43.3%	45.3%	52%
Job stability	53.6%	50%	11.1%	54.6%	46.5%	51.8%	31%	38.1%	56.9%
Staff living conditions	37.5%	29.4%	58.8%	42.9%	40.5%	42%	36.7%	48.4%	30.6%
Staff training	43.9%	23.5%	33.3%	36.4%	37.8%	38.3%	36.7%	37.7%	38%
Medical supplies	45.3%	29.4%	23.5%	14.3%	33.3%	24.7%	59.3%	33.3%	33.3%
Staff availability	39.3%	17.7%	44.4%	9.1%	31%	27.7%	40%	28.6%	34%
Supervision	26.8%	25%	33.3%	27.3%	27.5%	25.3%	33.3%	23%	33.3%
Medical equipment	30.4%	11.8%	27.8%	25%	26.1%	22.2%	36.7%	27.9%	24%
Impact on family/social life	16.4%	16.7%	16.7%	9.1%	15%	13.1%	20.7%	17.5%	12%
Management effectiveness	16.4%	5.6%	11.1%	4.8%	11.6%	8.4%	20.7%	12.9%	10%
Co-worker relationships	3.6%	0%	5.6%	4.6%	3.5%	3.6%	3.3%	6.3%	0%

4.3.2 Top Three Needs

Health workers prioritized the top three areas the establishment needs to improve where they currently work. Overall, the top three needs were: 1. Opportunities for continuing education; 2. Training and development programs; 3. Furnishings. While these three needs were also priorities for ELAM physicians, their top need was medical supplies (refer to Table 6 for details). During interviews, ELAM physicians in Mi Salud indicated they had not yet been given supplies to go into the communities to carry out their work. Each ELAM physician in Mi Salud was scheduled to receive a backpack with medical supplies and basic equipment, however, this delivery was delayed even though the municipality reported the backpacks were in its possession. Numerous ELAM physicians expressed their frustration with this stating it hindered their ability to care for community members. Other detailed statements of worker needs are included in section 4.3.1.

Table 6. Survey Participant Top Three Needs by Profession, Place of Education, and Work Location (n=115)

Top Three areas where the health workers' establishment needs to improve.	Profession					Physician Education Location		Work Location	
	Physician n = 57	Licensed Nurse n = 18	Technical Nurse n = 17	Other n = 23	Total n = 115	Domestic Physician n = 26	ELAM Physician n = 31	Rural area n = 64	Urban area n = 51
Medical supplies	50.9%	33.3%	35.3%	21.7%	40%	34.6%	64.5%	39.1%	41.2%
Opportunities for continuing education	68.4%	66.7%	70.6%	73.9%	69.6%	76.9%	61.3%	73.4%	64.7%
Training and development programs	56.1%	66.7%	70.6%	91.3%	66.7%	65.4%	48.4%	60.9%	74.5%
Furnishings	45.6%	66.7%	58.8%	47.8%	51.3%	42.3%	48.4%	53%	49%

Table 6 Continued

Medical equipment	43.9%	22.2%	35.3%	26.1%	35.7%	38.5%	48.4%	43.8%	25.5%
Recognition for your work	24.6%	33.3%	11.8%	30.4%	25.2%	30.8%	19.4%	17.2%	35.3%
Management effectiveness	10.5%	5.6%	17.7%	8.7%	10.4%	11.5%	9.7%	12.5%	7.8%
Co-worker relationships	0%	5.6%	0%	0%	0.9%	0%	0%	0%	2%

4.3.3 Worker Preparedness

Overall, surveyed physicians reported the lowest levels of unpreparedness and nursing and other professionals reported the highest levels. However, domestically trained physicians reported significantly more feelings of unpreparedness compared to ELAM physicians who reported no feelings of unpreparedness. Community health and clinical practice were the practice areas with the highest feelings of unpreparedness, and workers in rural health centers/health posts reported higher levels of unpreparedness compared to their urban counterparts. Technical nurses had the highest feelings of unpreparedness in clinical practice, which was the highest percentage for any category. Refer to Table 7 for complete survey details.

Some domestically trained physicians reported during interviews they felt ELAM physicians had less clinical preparation and cited the example that most ELAM physicians have not delivered a birth prior to entering the workforce. Conversely, some ELAM physicians stated they had superior preparation in community health, health promotion, and disease prevention compared to domestically trained physicians.

Table 7. Survey Participants Feeling Unprepared by Profession, Place of Education, and Work Location (n=114)

Practice area	Profession					Physician Education Location		Work location	
	Physician n = 57	Licensed Nurse n = 18	Technical Nurse n = 18	Other n = 21	Total n = 114	Domestic Physician n = 26	ELAM Physician n = 31	Rural area n = 65	Urban area n = 49
Community health	8.8%	5.9%	16.7%	28.6%	13.3%	18.3%	0%	15.4%	10.4%
Clinical practice	1.8%	22.2%	31.6%	15.8%	12.4%	16.9%	0%	15.4%	8.3%
Health promotion	5.3%	11.1%	5.6%	19.1%	8.8%	12.1%	0%	12.3%	4.1%
Disease prevention	3.5%	5.9%	11.1%	9.5%	6.2%	8.5%	0%	9.2%	2.1%

4.4 HEALTH WORKER SATISFACTION, MOTIVATION AND PRODUCTIVITY

4.4.1 Satisfaction and Motivation

Survey data indicated low percentages of job dissatisfaction or unmotivated feelings. However, nearly 1 in 4 ELAM physicians reported dissatisfaction (refer to Table 8 for details). Health worker and ELAM physicians' statements of dissatisfaction are included in section 4.3.1.

Table 8. Survey Participant Satisfaction and Motivation by Profession, Place of Education, and Work Location (n=116)

Worker disagreement with the following statements on a typical workday	Profession					Physician Education Location		Work Location	
	Physician n = 57	Licensed Nurse n = 19	Technical Nurse n = 17	Other n = 23	Total n = 116	Domestic Physician n = 27	ELAM Physician n = 30	Rural area n = 64	Urban area n = 52
Overall, I am satisfied with my job	17.5%	10.5%	5.9%	4.4%	12.1%	11.1%	23.3%	14.1%	9.6%
I Feel motivation to do my job well	10.9%	5.3%	11.8%	4.4%	8.8%	11.5%	10.3%	10.6%	6.3%

4.4.2 Productivity

Overall, there was minimal below average productivity for personnel and co-workers according to survey data. However, supervisor rates were higher with approximately 1 out of 4 physicians and 1 out of 5 technical nurses rating their supervisor's performance as below average. Refer to Table 9 for complete survey details.

Worker and supervisor productivity was not directly assessed during health worker interviews; however, municipal authorities reported that ELAM physicians who were part of Mi Salud had more consultation visits with patients, particularly in rural health centers/posts. They stated the reason they saw more patients is because ELAM physicians in Mi Salud went out into the community to see patients in addition to seeing patients in the health centers/posts.

Table 9. Survey Participant Ratings of Below Average Productivity by Profession, Place of Education, and Work Location (n=110)

Worker ratings of below average productivity for the following personnel where they work:	Profession					Physician Education Location		Work location	
	Physician n = 54	Licensed Nurse n = 18	Technical Nurse n = 16	Other n = 22	Total n = 110	Domestic Physician n = 24	ELAM Physician n = 30	Rural area n = 61	Urban area n = 49
Your immediate supervisor's productivity	24.5%	5.9%	21.4%	8.7%	17.8%	28%	21.4%	20%	14.9%
Your co-workers' productivity	7.6%	0%	0%	13%	6.7%	4%	10.7%	6.5%	6.3%
Your productivity	1.9%	0%	0%	0%	0.9%	0%	3.3%	1.6%	0%

4.5 EDUCATIONAL PREFERENCE

Both health workers and municipal officials stated the importance of continuing education for personal and institutional development. As one health official explained, “Development always comes with the development of people. If the people grow, then the institutions can grow. If the people don’t grow, the institutions aren’t going to grow.”

Survey data indicated ELAM and other physicians preferred specialties the most (refer to Table 10 for survey details). During individual and group interviews, most health workers, and especially physicians, discussed the benefits of being a specialist. Interview participants cited higher pay (nearly double), increased professional prestige, ability to work in an urban area, and professional development as benefits to specializing. However, physicians reported difficulty securing specialty training due to limited openings, residency locations, and cost. This led some physicians to consider leaving Bolivia for specialty training.

In addition to the high demand for specialty training, there was also demand for other types of educational possibilities, particularly more in-depth training that resulted in achieving a recognized diploma or certificate. Interview participants across disciplines indicated more in-depth training was needed to improve practice and develop new skills. Additionally, participants stated having a diploma conveyed other benefits such as increased responsibility, curriculum vitae value, and opportunities for increased financial compensation. Several municipal health officials expressed the need for more in-depth training, particularly for less skilled health workers like technical nurses. Knowing that delivering education in a developing, rural area poses numerous challenges, health workers were also asked their level of preference for online courses. Survey results and interviews demonstrated there was overall interest in online education but interviews and site visits uncovered some practical concerns to address.

Interview data from health workers and municipal officials indicated sub-optimal health system communication capacity. First, nearly all health centers and posts had computers available but less than half had internet access, and in those that did the connection speed and reliability was poor. This was especially true in the rural health centers/health posts. When health workers were asked if this issue could be addressed by offering DVDs or some other form of the content, they indicated that that would be acceptable. Second, the individual technological capacity of some of the health workers was questioned. Health worker interviewees indicated those with less formal education and experience using computers may be less skilled/comfortable utilizing technology.

Finally, interviewed health workers were asked about educational content and format. Many interviewees, particularly physicians, were interested in training that would not be beneficial to where they worked or was beyond the capability of the health system. For example, several physicians wanted radiology training, however, none of the health centers or posts had radiology equipment. Municipal officials stated this type of training may be desired but does not add value to the health system or support the ability of the health worker to improve practice where they work. However, health workers also mentioned education and training that was desirable and would build health worker and system capacity. Common themes included courses in trauma, emergency management, tropical diseases, obstetrics and prenatal care. In addition, health workers were interested in courses related to health system management/administration, epidemiology, and public health. Training format was also extensively discussed with health worker participants and it was found that they desired more extensive training, in a modular format that could be completed individually and on demand, had group follow-up for reinforcement and evaluation, and resulted in a diploma/certification.

Table 10. Survey Participant Educational Mean Preference by Profession, Place of Education, and Work Location (n = 110)

Rate the following educational possibilities on your level of preference: No Preference=1; Slightly Prefer=2; Prefer=3; Strongly Prefer=4; Very Strongly Prefer=5	Profession				Location		Physician Education Location	
	Physician n = 56	Licensed Nurse n = 19	Technical Nurse n = 14	Other n = 21	Rural area n = 60	Urban area n = 50	Domestic n = 26	ELAM n = 30
Preference - Specialties	4.3	4.2	2.6	4.1	3.7	4.4	4	4.1
Preference - Diplomas	4.2	4.3	2.4	4	3.6	4.3	4	3.8
Preference - Online courses	3.6	4.1	2.2	3.5	3.2	3.8	3.5	3.6
Preference - Short courses	3	3.3	2.7	3.1	3	3.1	3.1	2.9
Preference - Workshops (1-2 days)	2.8	3.2	2.6	3	2.8	2.9	2.9	2.8

5.0 DISCUSSION

5.1 WORKFORCE DEMOGRAPHICS

Survey results indicate that primary care workers in the rural municipal health system are young and have few years of experience as health professionals. In fact, 77% of workers were less than 35 years old, 76% had less than 6 years of work experience with 40% having one year or less. Youth and lack of experience was particularly notable in the physician and licensed nurse groups, which were younger and had fewer years of work experience than other health workers. One of the apparent reasons the lack of experience was the recent implementation of the Mi Salud program, which contracted 29 recent ELAM graduates. Young, inexperienced workers are less likely to have the requisite knowledge and skills for optimal worker performance (Dolea & Adams, 2005), which negatively impacts the quality and effectiveness of health services.

5.2 WORKFORCE ADAPTATION

Workers indicated the most difficult part of adapting to the workforce was securing employment and becoming licensed to practice. Eighty percent of the workforce indicated it was difficult to find a job, and 40% of the workforce took more than one year to begin work as a paid

health professional. Part of the reason for this difficulty is due to an absolute lack of health worker positions in Bolivia. In addition, nearly half of the workforce reported difficulty becoming licensed to practice in Bolivia. These observations were particularly dramatic for ELAM physicians who had additional requirements and longer process to validate their foreign education and training.

The inability to begin practice in a timely manner has important implications for the overall health system and for health worker performance. First, it is an indicator of unequal supply and demand where there are more available health workers than there are positions in the public health care system. Second, the longer the delay to begin practice, the more likely the health workers' skills and abilities will begin to diminish, which negatively impacts their performance once they begin work. Finally, these delays may increase frustration in health workers leading them to abandon their profession or migrate to a better job market. This contributes to the global migration problem of health workers leaving the areas where they are needed most (WHO, 2010).

It was interesting to note that ELAM physicians reported less difficulty adapting to the local culture and treating Bolivian diseases. There is some variation in local culture and diseases between Cuba and Bolivia, and ELAM physicians had the fewest years of work experience as health professionals. However, a potential hypothesis is that since ELAM recruits candidates who represent the communities they agree to serve, then they are more familiar with the local culture and diseases when they return and have less difficulty adapting.

In addition, no ELAM physician reported feeling unprepared in community health, clinical practice, health promotion, or disease prevention. This is surprising as they were the least experienced, received some criticism from domestic physicians, and were unsatisfied with

continuing education opportunities. One possible explanation is that the unique ELAM education and training approach prepared them well for their current roles. The Mi Salud strategy was tailored to the practice focus of ELAM physicians, which could result in a good fit between worker skills and abilities, and job duties. Other possible explanations are that the ELAM physicians were inexperienced and “didn’t know what they didn’t know”, or did not answer accurately.

5.3 PRIORITY HEALTH WORKER NEEDS

A health worker’s need and desire to develop professionally is well established (WHO, 2006) (Giri et al., 2012) (WHO, 2013) (Willis-Shattuck, et al., 2008) and current findings support this. For example, 72% of health workers indicated dissatisfaction with continuing education opportunities, 68% with advancement opportunities, and 59% with professional development opportunities. What’s more, survey participants identified opportunities for continuing education, and training and development programs as the most important areas for health establishment improvement. Additional frequent and priority worker needs included improving building conditions; salary and fringe benefits; clinical and office furnishings; medical supplies and equipment; living conditions; and job recognition, which have been identified in other studies (Willis-Shattuck, et al., 2008). Of note, transportation needs emerged during interviews as a frequent need in rural areas, which was not discussed in previous studies.

Not meeting the needs of health workers have important implications for health worker performance and the health of the population. For example, if the health workers’ medical supply needs are not met, then they cannot provide basic services such as cleaning and suturing

wounds, or provide lifesaving antibiotics and vaccines. Additionally, lacking the basic conditions necessary to provide safe and quality care can negatively affect worker motivation (Dolea & Adams, 2005) (Willis-Shattuck, et al., 2008), and lead to poorer performance or worker migration. This in turn negatively impacts the health of the population and contributes to inequities in health.

As noted previously, there are global problems recruiting and retaining health workers in rural areas, and poor health worker performance in low-resource settings. Health workers' statements and survey responses indicate these global problems are also an issue locally. For example, numerous health workers made statements that they were looking to leave their rural workplace, preferred urban areas, and only accepted positions in rural areas because they could not find employment in a city. Additionally, some physicians were even considering leaving the country to find better opportunities. While there did not appear to be unfilled health worker positions, there were reports of resignations from rural posts due to poor conditions.

There were additional indicators that worker performance was compromised in this low-resource setting. Dramatic health worker dissatisfaction with the basic resources needed to complete their work points to a suboptimal health system capacity to deliver quality care. Additionally, workers were often frustrated and described how a lack of equipment, supplies, working infrastructure, and transportation hindered their ability to care for community members. Dissatisfaction was also high for education and development opportunities with health workers reporting difficulty keeping up to date with on professional skills and knowledge. All these factors combined hinder the known performance determinants of an adequate work environment, motivation and incentives to perform, and having the requisite job knowledge and skills.

Fortunately, there are multiple literature reviews and guidelines aimed at recruiting and retaining health workers in rural areas, and improving health worker performance. Comparing results against the evidence-based WHO guidelines (2010), six relevant interventions stand out and should be supported by the Bolivian government at the national, departmental, and municipal levels. Five of them discussed in this section, and the sixth is discussed in section 5.5.

Recruit health worker students from rural backgrounds: Numerous studies link a health worker's rural background with an increased likelihood to practice in a rural environment (Grobler, et al., 2015). While not directly assessed, statements from health workers support this intervention's effectiveness. As mentioned previously, ELAM recruits foreign students from underserved communities, including rural communities, with the non-binding commitment to return an underserved area to practice. Statements from ELAM physicians suggest that if they were able to return to their rural community of origin, then they were more satisfied. Statements from other health workers like technical nurses supports this as they indicated satisfaction working in their native community. In addition, ELAM survey results suggest this may have a health worker performance bonus as returning physicians have less difficulty adapting and increased cultural competence.

The national government has indirectly used this intervention in their collaboration with Cuba to send Bolivian students to ELAM for free medical training. To expand ELAM's recruitment model, the Bolivian government could work with Bolivian universities to recruit health professions' students from underserved areas to increase the number of health workers with rural backgrounds. Additionally, national, departmental, and municipal governments could give a competitive advantage to health workers with a rural background to fill rural health

system vacancies. Taking these steps together would increase the number of workers with a rural background who practice in rural areas.

Make it worthwhile for health workers to move to a rural area: The Willis-Shattuck et al. review found that financial incentives were the most common interventions to attract and retain health workers in rural areas (2008). Survey results and health worker statements indicate dissatisfaction with salaries and the financial costs associated with working in rural areas, and felt financial incentives and supports would be appropriate. One study conducted in Peru mirrored this sentiment and found that rural health workers considered financial incentives a key intervention to stay in a rural area (Huicho, Canseco, Lema, Miranda, & Lescano, 2012). In the context of the studied municipality, providing financial incentives are important to entice workers to work in rural areas and help offset additional living expenses.

Financial incentives for rural health workers could be implemented rapidly by national, departmental, and municipal governments, if the resources are available. However, WHO stresses the need to carefully analyze the labor market and health worker expectations before offering incentives (2010). This is particularly important in the case of Bolivia where health workers in the public health system have different types of contracts with varying benefits. For instance, if only nationally contracted health workers receive financial incentives, then this could further exacerbate departmental and municipal health worker dissatisfaction with their work contracts.

Pay attention to health worker living conditions in rural areas: The living conditions for health workers and their families significantly influence decisions to go to and stay in rural areas (WHO, 2010). Survey results and health worker statements indicate dissatisfaction with living conditions and their impact on family and work life. Poor infrastructure and hardships were

most notable in remote areas, and as a result some health workers reportedly resigned or expressed a desire to leave. These results support similar findings in Peru where workers desired improved living conditions and reported negative impacts on family life (Huicho et al., 2012). While few studies exist evaluating this intervention's impact on recruitment and retention, numerous studies highlight its importance (WHO, 2010) (Willis-Shattuck et al., 2008).

National, departmental, and municipal governments in Bolivia have a central role in improving rural infrastructure and living conditions. Ensuring adequate housing, schools for children, and basic services (running water, electricity, ICT access) are steps the different levels of government should take to increase the attractiveness of rural locations and reduce hardships for health workers. If done correctly, this investment not only supports worker performance and retention, but also can help the economic development of rural areas (WHO, 2010).

Ensure the work place is up to an acceptable standard: Providing an adequate work environment is necessary for optimal worker performance (IntraHealth International, 2007) and poor working conditions are a common complaint in rural areas (Wilson et al., 2009). Survey results and health worker statements highlight significant problems with the working environment including a lack of supplies, equipment, transportation, building conditions, and health establishment services (running water, electricity, ICT access). These findings were similar in Peru and health workers viewed it as an incentive to improve health establishment infrastructure, medical equipment, transportation, and communications equipment (Huicho et al., 2012).

At the time of the needs assessment, the municipal government and Global Links were taking steps to improve the work environment. The municipal government had invested in ATVs and ambulances for rural areas, equipment and supplies for ELAM physicians, and Global

Links was arranging for medical material and furnishings donations for two rural health centers. However, many of these investments had not yet reached health workers and many significant gaps persisted. Lacking the basic conditions negatively impacts worker motivation and performance, and can lead to poor retention in underserved areas. Therefore, it is important for municipal governments to guarantee an adequate working environment, either through their own efforts or in partnership with non-governmental organizations (NGOs) like Global Links, to ensure health workers are attracted to and retained in rural areas, and perform optimally.

Design career ladders for rural health workers: WHO recommends providing career advancement opportunities in rural areas “so that health workers can move up the career path as a result of experience, education and training” without the need to leave rural areas (2010, p. 32). As noted in survey results, most health professionals prioritize increasing advancement opportunities. Physicians’ statements highlighted the importance of specialization as a form of career advancement and several considered leaving rural areas for opportunities. While there were no studies directly assessing this intervention, the potential for career advancement is an important factor in a health worker’s decision to work in a rural area (WHO, 2010). National, departmental, and municipal governments hold the primary roles in design career ladders at the employers in the public health system.

5.4 HEALTH WORKER SATISFACTION, MOTIVATION AND PRODUCTIVITY

Only 12% of health workers indicated job dissatisfaction and 9% indicated a lack of job motivation. Additionally, only 1% of workers rated their productivity as below average, and 7% rated their co-workers’ productivity as below average. This is surprising given the high levels of

expressed worker need and dissatisfaction in six of the seven major motivational factor themes mentioned in the Willis-Shattuck, et al. systematic review (2008). In fact, one would expect based on survey results and interviews that job satisfaction would be low, motivation would be low, and therefore productivity would be low. One possible hypothesis to explain this apparent discrepancy is that health workers have high intrinsic motivation to perform, although only anecdotal evidence exists (Dolea & Adams, 2005) and it is unclear if intrinsic motivation declines over time. Another hypothesis is that the participants' subjective assessments of motivation and productivity are inflated and may not reflect objective assessments or their supervisors' evaluations of their performance (Mbindyo, Blaauw, Gilson, & English, 2009).

While reports of individual and co-worker below average productivity were low, survey data indicated higher rates for supervisors. For example, approximately 18% of participants indicated below average supervisor productivity. This observation was more dramatic with some professions as 25% of physicians and 21% of technical nurses rated their supervisor's performance as below average. In addition, some health workers expressed interest in management training, which further suggests a need to improve supervision. Supervisor productivity has important implications because their poor productivity may trickle down to their subordinates hindering performance and diminishing the overall effectiveness of the health system. Evidence from randomized controlled trials supports effective supervision as a means to improve performance (Rowe et al., 2005), which supports the case to provide supervision training to health workers.

5.5 CONTINUING EDUCATION

Continuing professional development (CPD) encompasses health worker continuing education and activities “to maintain, update, develop, and enhance their professional skills, knowledge, and attitudes” (Giri et al., 2012, p.1). CPD is essential for health workers everywhere to maintain competence, improve performance (WHO, 2006), support motivation (Willis-Shattuck, et al., 2008), provide quality care (Giri et al., 2012), and meet changing health needs (Giri et al., 2012) (WHO, 2013). However, creating and delivering an effective CPD program can be challenging in rural areas where geographic and professional isolation, limited resources, and difficulty securing time away from work hamper program access (Moran et al., 2014). As noted previously, insufficient and poorly distributed health care workforces worldwide struggle to meet the health needs of their populations (WHO, 2006), especially in rural areas of developing countries (WHO, 2010). Bolivia has significant inequalities in health and rural areas have twice the infant mortality and child mortality under age 5 compared to urban areas (Ministerio de Salud y Deportes, 2014). In addition, the country has an absolute lack of health workers (World Bank, 2016), and an inequitable distribution favoring urban areas (Barrero, 2013). One major contributing factor to a lack of adequately trained, rural workers is a health worker’s desire to access professional development opportunities, which are usually greater in urban areas (WHO, 2010).

Globally, health workers need and desire CPD and they are dissatisfied when opportunities are lacking (Willis-Shattuck, et al., 2008). As noted previously, this assessment found that 73.2% of physicians, 66.7% of licensed nurses, and 77.8% of technical nurses were dissatisfied with CPD opportunities. What’s more, health workers were more dissatisfied with CPD opportunities than any other of the 18 categories assessed for health worker satisfaction.

Finally, health workers indicated opportunities for CPD was the most frequent priority area to improve in the municipal health system. This finding is not unique to rural Bolivia and scalable CPD programs for health workers in low-resource settings are needed to improve practice, and recruit and retain health workers where they are needed most (WHO, 2010).

Looking in the literature, the majority of research focusing on CPD and rural health workers has occurred in developed countries (WHO, 2010) (Moran et al., 2014). However, there is evidence to suggest that if CPD programs target rural health worker needs, and are accessible where they work, then they can improve worker competence, reduce professional isolation, and increase the desire to practice where they work (WHO, 2010). For instance, a continuing medical education intervention offering regular workshops to rural physicians in Australia found the program increased confidence to practice in a rural area, decreased professional isolation, and increased commitment to practice there (White, Willett, Mitchell, & Constantine, 2007). A promising way to deliver CPD programs in rural, and other resource-poor areas is through distance-learning and information technology (WHO, 2010) (Giri et al., 2012), though more research is needed (Rowe et al., 2005).

Using information and communication technology (ICT) for teaching health professionals has grown exponentially. For example, virtual learning uses ICT (such as computers, digital devices, and the internet) to train health professionals worldwide with 89.5% of WHO member states using it to educate health sciences students, and 94.7% of member states using it for educating health professionals in their job position (WHO, 2016). In Latin America, internet access has steadily increased with a 2014 access rate of 50.1%, however, this remains below the OECD country rate of 80.8% (ECLAC, 2015). Additionally, tablets and smartphones

increasingly are used as a means to access the internet (ECLAC, 2015) and could make CPD more accessible if designed for mobile friendly devices.

In addition to evidence documenting increases virtual learning and ICT access, recent evidence points to its effectiveness. The systematic review “eLearning for undergraduate health professional education” focused on non-networked computer-based and Internet and local area networked-based interventions, and found them to be equal to traditional learning and perhaps better at supporting knowledge and skill achievement (Atun et al., 2015). In addition, “they offer a more convenient, and possibly more cost-effective, alternative for facilitating competency development and the training of health-care professionals around the globe” (p. 79). This evidence supports delivering CPD using ICT, with or without Internet access.

5.6 RECOMMENDATIONS

I recommend supporting tailored, CPD programs using ICT for primary care health workers paying particular attention to rural areas to optimize worker performance and improve the health of underserved populations. Tailoring CPD programs should include addressing the learning needs and preferences of health workers, and focus on improving performance where they currently work, which will maximize benefit for the health workers and health system. Offering CPD programs using ICT has several distinct advantages. First, it allows workers to complete education on a flexible schedule (even at home) and minimizes disruption to health systems and service delivery. This is particularly important in rural health centers and posts where the absence of one or two health workers may force the health establishment to suspend services. Second, it leverages technology to reduce the cost of creating and supporting CPD, and

allows for rapid scale-up to where there is a need. This is especially attractive when attempting to support rural health workers as they are dispersed throughout the world in a variety of settings. Third, health workers would be able to complete learning activities at their own pace and have access to the materials for review and reference, which allows for personal preference and increased retention. Finally, current interest in using ICT to deliver CPD is high, which is conducive to secure funding for program development and testing, and to improve the requisite technological infrastructure.

National, departmental, and municipal governments already have a large role in the CPD of health workers; however, more should be done. For example, most municipal opportunities were focused on health system policies/programming and there was a lack of in-depth CPD aimed at developing, and enhancing health workers' professional skills and knowledge. Governments at the different levels should offer more robust CPD opportunities, especially aimed at improving performance where they currently work and meeting the health needs of the population. This can be done by partnering with educational institutions and NGOs with expertise in workforce training and education.

Implementing CPD programs directly supports two key determinants of health worker performance: having the requisite job knowledge and skills, and motivation and incentives to perform. However, it is also essential to support other performance determinants (clear job expectations, feedback on performance, an adequate work environment) to have the greatest impact. For example, a health worker who has the knowledge, skills, and motivation to work but lacks the material resources to do so cannot perform or be effective at the highest level. In addition, addressing these performance determinants can also have a positive influence on increasing access to health workers in rural areas. Indeed, multiple literature reviews present

evidence that providing an adequate work environment, CPD opportunities, and financial/non-financial incentives support health worker recruitment and retention in rural areas, thus increasing the population's access to health services (Lehmann et al., 2008) (Willis-Shattuck, et al., 2008) (WHO, 2010). This evidence also supports combining interventions as needed for maximum effectiveness. In the context of this assessment, a CPD program should be combined with financial incentives/supports, improved living conditions, guaranteeing an adequate work environment, and advancement opportunities. Addressing all these identified worker needs will likely be more effective and have a greater impact on worker performance, recruitment, and retention.

In addition to implementing tailored, CPD programs using ICT for primary care health workers in rural areas, I recommend evaluating them with rigorous research designs. Currently, there is a documented lack of well-designed studies on programs to support rural health workers (WHO, 2010) (WHO, 2013) (Grobler et al., 2015). A reason for this is it is often difficult to implement more rigorous designs such as RCTs and quasi-experimental designs when working at the system level in public health. In fact, researchers point to the barriers or inappropriateness of using these designs in real-world settings. However, more rigorous designs can and should be implemented in such settings as it holds intervention evaluation to a higher standard, and creates stronger evidence to support or refute an intervention. Therefore, pairing new tailored CPD programs using ICT with rigorous study designs is essential to determine what works and will add to the literature base. Additionally, current studies are limited to the needs and outcomes of health workers and future studies should be expanded to assess community members' perspectives and health outcomes.

5.7 LIMITATIONS

The results reported here have several limitations. First, the original data came from a needs assessment and required less oversight and rigor than a formal research study. Participant sampling for surveys was convenience-based and only used workers present during visits. In addition, not all health workers answered every survey question. Interview participant sampling also had limitations. Not all health workers were invited to participate and interviewees were chosen based on availability and willingness to participate. These factors combined may hinder the representativeness of the samples in relation to municipality's public health workforce. Additionally, surveys and interviews often occurred in group settings and it was difficult to maintain the full anonymity of participant responses. This factor may have influenced the participants' survey responses and statements during interviews. Also, themes from participant interviews may have been missed since interviews were not recorded, nor formally coded. Finally, the data is from one municipality with a relatively small sample, which limits generalizability to other settings.

6.0 CONCLUSION

There are four main implications for public health practice underscored by this project. First, it supports previous research that demonstrates the many unmet needs of health worker in rural areas of developing countries. Second, it demonstrates to governments and non-governmental organizations opportunities and priorities for programming to support rural health workers. Third, it highlights important research gaps on programs to support rural health workers that should be addressed. Finally, it demonstrates the need and demand for CPD programs as a top workforce capacity building priority, and the need to combine interventions to achieve maximum impact.

In summary, creating tailored, CPD programs using ICT are warranted to increase the capacity and performance of community-based primary care workers in low-resource countries. Furthermore, assessing and meeting the material needs of these workers will help to support performance at the highest level. CPD is essential for health workers everywhere to maintain competence, improve performance, provide quality care, and meet changing health needs. The results from this thesis contributes to the literature by demonstrating the demand for CPD programs and the acceptability of ICT. Through well-designed CPD programs, and meeting other worker needs, primary care workers' performance can be enhanced and result in improved equity and health for the underserved.

APPENDIX A: RECRUITMENT AND RETENTION INTERVENTIONS

Interventions to improve attraction, recruitment and retention of health workers in rural areas (Adapted WHO guidelines, 2010)

Intervention Category	Recommended Intervention	Strength of Recommendation
Education	Recruit health worker students from rural backgrounds	Strong
	Train health worker students closer to rural communities	Conditional
	Bring health worker students to rural communities	Conditional
	Match health worker curricula with rural health needs	Strong
	Facilitate the continuous professional development of rural health workers	Conditional
Regulatory	Create the conditions for health workers to do more	Conditional
	Train more health workers faster to meet rural health needs	Conditional
	Make the most of compulsory service for health workers	Conditional
	Tie educational subsidies to mandatory rural placements for health workers	Conditional
Financial Incentives	Make it worthwhile for health workers to move to a rural area	Conditional
Personal and professional support	Pay attention to health worker living conditions in rural areas	Strong
	Ensure the work place is up to an acceptable standard	Strong
	Foster interaction between urban and rural health workers	Strong
	Design career ladders for rural health workers	Strong
	Facilitate knowledge exchange for rural health workers	Strong
	Raise the profile of rural health workers	Strong

APPENDIX B: IRB EXEMPTION



University of Pittsburgh
Institutional Review Board

3500 Fifth Avenue
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(412) 324-1600
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<http://www.irb.pitt.edu>

Memorandum

To: Mark Cantrell
From: IRB Office
Date: 10/21/2016
IRB#: [PRO16090686](#)
Subject: A needs assessment of primary care workers in rural Bolivia

The above-referenced project has been reviewed by the Institutional Review Board. Based on the information provided, this project meets all the necessary criteria for an exemption, and is hereby designated as "exempt" under section 45 CFR 46.101(b)(4)

Please note the following information:

- Investigators should consult with the IRB whenever questions arise about whether planned changes to an exempt study might alter the exempt status. Use the "**Send Comments to IRB Staff**" link displayed on study workspace to request a review to ensure it continues to meet the exempt category.
- It is important to close your study when finished by using the "**Study Completed**" link displayed on the study workspace.
- Exempt studies will be archived after 3 years unless you choose to extend the study. If your study is archived, you can continue conducting research activities as the IRB has made the determination that your project met one of the required exempt categories. The only caveat is that no changes can be made to the application. If a change is needed, you will need to submit a NEW Exempt application.

Please be advised that your research study may be audited periodically by the University of Pittsburgh Research Conduct and Compliance Office.

APPENDIX C: HEALTH WORKER SURVEY

Estamos llevando a cabo una evaluación para determinar las necesidades de los trabajadores de la salud y nos gustaría su opinión. La participación en la encuesta es voluntaria y sus respuestas serán anónimas. Por favor, conteste con honestidad y precisión porque sus respuestas se utilizarán para apoyar la programación.

¿Cuál es su profesión?

- Médico
- Licenciada en Enfermería
- Auxiliar
- Otro

¿Dónde recibió su educación profesional?

- Bolivia, institución privada
- Bolivia, institución pública
- ELAM
- Otro

¿Cuánto tiempo después de graduarse empezó a trabajar como profesional de la salud remunerado?

- Dentro de 6 meses
- Entre 6 meses y 1 año
- Más de 1 año

Seleccione el nivel de dificultad de las siguientes actividades después de graduarse como profesional de la salud.

	Muy difícil	Difícil	Neutral	Fácil	Muy Fácil
Encontrar un trabajo	<input type="radio"/>				
Obtener la licencia en Bolivia	<input type="radio"/>				
La adaptación al sistema de salud de Bolivia	<input type="radio"/>				
El tratamiento de las enfermedades de Bolivia	<input type="radio"/>				
La adaptación a la cultura local	<input type="radio"/>				

¿Qué tan preparado se siente usted para responder a las siguientes áreas de práctica?

	Nada Preparado	Poco Preparado	Neutral	Preparado	Muy Preparado
La práctica clínica	<input type="radio"/>				
Promoción de la salud	<input type="radio"/>				
Prevención de enfermedades	<input type="radio"/>				
Salud comunitaria	<input type="radio"/>				

Califique según su nivel de idoneidad para desempeñar el trabajo que hace actualmente, los siguientes puntos.

	Muy Inadecuado	Inapropiado	Neutral	Apropiado	Muy apropiada
Equipo médico	<input type="radio"/>				
Suministros médicos	<input type="radio"/>				
Muebles clínicos	<input type="radio"/>				
Estado del edificio	<input type="radio"/>				
Las condiciones de vida del personal	<input type="radio"/>				
La capacitación del personal	<input type="radio"/>				
Supervisión	<input type="radio"/>				
La disponibilidad del personal	<input type="radio"/>				
Mobiliario de oficina	<input type="radio"/>				

Marque su nivel de satisfacción de los siguientes puntos donde trabaja actualmente.

	Muy Insatisfecho	Insatisfecho	Neutral	Satisfecho	Muy Satisfecho
Oportunidades de educación continua	<input type="radio"/>				
Oportunidades de desarrollo profesional	<input type="radio"/>				
Oportunidades de ascenso	<input type="radio"/>				
Salario	<input type="radio"/>				
Relaciones con compañeros de trabajo	<input type="radio"/>				
Eficacia de la gestión	<input type="radio"/>				
Impacto en la familia / vida social	<input type="radio"/>				
Reconocimiento por su labor	<input type="radio"/>				
Estabilidad laboral	<input type="radio"/>				

Dependiendo del lugar donde usted trabaja actualmente, seleccione las TRES principales áreas que el establecimiento necesita mejorar.

- Eficacia de la gestión
- Reconocimiento por su labor
- Relaciones con compañeros de trabajo
- Programas de capacitación y desarrollo
- Oportunidades para la educación continua
- Equipo médico
- Suministros médicos
- Mobiliario

Marque su nivel de preferencia en las siguientes posibilidades educativas.

	No tengo preferencias	Poca preferencia	Preferencia media	Preferencia alta	Preferencia muy alta
Talleres (1-2 días)	<input type="radio"/>				
Cursos de corta duración	<input type="radio"/>				
Especialidades	<input type="radio"/>				
Diplomados	<input type="radio"/>				
Cursos online	<input type="radio"/>				

Valore el nivel de productividad del siguiente personal en su entorno laboral.

	Por debajo del promedio	Promedio	Superior al promedio
Usted	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sus compañeros de trabajo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Su supervisor inmediato	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Valore su nivel de acuerdo con las siguientes declaraciones en un día típico de trabajo.

	Totalmente en desacuerdo	No estoy de acuerdo	Ni de acuerdo ni en desacuerdo	Acuerdo	Totalmente de acuerdo
Siento motivación para hacer bien mi trabajo.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
En general, estoy satisfecho con mi trabajo.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

¿Dónde se encuentra su establecimiento de salud?

- Área rural
- Área urbana

¿Usted forma parte del programa "Mi Salud"?

- Sí
- No

Género

- Masculino
- Femenino

¿Cuál es su edad actual?

- 16 a 19
- 20 a 24
- 25 a 34
- 35 a 44
- 45 a 54
- 55 a 64
- 65 años o más

¿Cuánto tiempo ha estado trabajando como un profesional de la salud?

- 0 a 1 año
- 2 a 5 años
- 6 a 9 años
- 10 o más años

BIBLIOGRAPHY

- Atun, R., Kersnik, J., Švab, I., Majeed, A., Car, J., Al-Shorbaji, N., & Wheeler, E. (2015). *eLearning for undergraduate health professional education: A systematic review informing a radical transformation of health workforce development*. Imperial College.
- Barrero Ortega, C. A. (2013). Documento técnico segunda medición de las metas regionales de recursos humanos en salud meta – Bolivia. Retrived from http://www.observatoriorh.org/sites/default/files/webfiles/fulltext/2013/segunda_medicion_metas_bol.pdf
- Dolea, C. & Adams, O. (2005). Motivation of health care workers – Review of theories and empirical evidence. *Cah. Socio. Demo. Med.*, 45(1):135-162.
- Economic Commission for Latin America and the Caribbean (ECLAC), (2015). *Latin America and the Caribbean: looking ahead after the Millennium Development Goals. Regional monitoring report on the Millennium Development Goals in Latin America and the Caribbean*. United Nations.
- ELAM. (2014). *Fuente: Base de datos de graduados, Secretaría General ELAM*. [Data file].
- Giri K, Frankel N, Tulenko K, Puckett A, Bailey R, & Ross H. (2012). *Keeping up to date: Continuing professional development for health workers in developing countries*. CapacityPlus.

- Gorry, C. (2012). Cuba's Latin American medical school: Can socially-accountable medical education make a difference? *MEDICC Review*, 14(3), 5-11.
- Global Links. (n.d.). Home. Retrieved from <https://www.globallinks.org/>
- Grobler, L., Marais, B.J., & Mabunda, S. (2015). Interventions for increasing the proportion of health professionals practicing in rural and other underserved areas. *Cochrane Database of Systematic Reviews*. Issue 6. Art. No.: CD005314. DOI: 10.1002/14651858.CD005314.pub3.
- Heaton, T. B., Crookston, B., Forste, R., & Knowlton, D. (2014). Inequalities in child health in Bolivia: Has Morales made a difference? *Health Sociology Review*, 23(3), 208-218.
- Huicho, L., Canseco, F. D., Lema, C., Miranda, J. J., & Lescano, A. G. (2012). Incentives to attract and retain the health workforce in rural areas of Peru: A qualitative study. *Cadernos De Saúde Pública*, 28(4), 729.
- IntraHealth International. (2007). *Learning for performance: A guide and toolkit for health worker training and education programs*. IntraHealth International.
- Ledo, C., & Soria, R. (2011). Sistema de salud de Bolivia. *Salud Publica De Mexico*, 53(2), S109-S119.
- Lehmann, U., Dieleman, M., & Martineau, T. (2008). Staffing remote rural areas in middle- and low-income countries: A literature review of attraction and retention. *BMC Health Services Research*, 8(1), 19-19. doi:10.1186/1472-6963-8-19
- Mbindyo, P. M., Blaauw, D., Gilson, L., & English, M. (2009). Developing a tool to measure health worker motivation in district hospitals in Kenya. *Human Resources for Health*, 7(1), 40-40. doi:10.1186/1478-4491-7-40

Ministerio de Salud y Deportes, Bolivia. (2004). *Encuesta nacional de demografía y salud 2003*. Instituto Nacional de Estadística.

Ministerio de Salud y Deportes, Bolivia. (2009). *Plan sectorial de desarrollo 2010-2020 “Hacia la salud universal.”*

Medical Education Cooperation with Cuba. (n.d.). About us. Retrieved from <http://medicc.org/ns/about/>

Moran, A. M., Coyle, J., Pope, R., Boxall, D., Nancarrow, S. A., & Young, J. (2014). Supervision, support and mentoring interventions for health practitioners in rural and remote contexts: An integrative review and thematic synthesis of the literature to identify mechanisms for successful outcomes. *Human Resources for Health*, 12(1), 10-10. doi:10.1186/1478-4491-12-10

Pan American Health Organization. (2012). *Health in the Americas, 2012 Edition: Country volume*. Pan American Health Organization.

Pettigrew, L. M., De Maeseneer, J., Anderson, M. P., Essuman, A., Kidd, M. R., & Haines, A. (2015). Primary health care and the sustainable development goals. *Lancet (London, England)*, 386(10009), 2119-2121. doi:10.1016/S0140-6736(15)00949-6

Reed, G. (2014). Where to train the world’s doctors? Cuba. Retrieved from https://www.ted.com/talks/gail_reed_where_to_train_the_world_s_doctors_cuba/transcript?language=en

Rowe, A. K., de Savigny, D., Lanata, C. F., & Victora, C. G. (2005). How can we achieve and maintain high-quality performance of health workers in low-resource settings? *The Lancet*, 366(9490), 1026-1035. doi:10.1016/S0140-6736(05)67028-6

- Sanchez, O. (2013). *Propuesta de Implementación del Modelo Sanitario de Salud Familiar Comunitario (SAFCI)*. [PowerPoint Presentation].
- THEnet. (2015). Cuba: Latin American Medical School – ELAM. Retrived from <http://thenetcommunity.org/thenet-schools/cuba/>
- UN General Assembly. (1966). *International Covenant on Economic, Social and Cultural Rights*. United Nations, Treaty Series, vol. 993, p. 3. Retrieved from <http://www.refworld.org/docid/3ae6b36c0.html>
- White, C.D., Willett, K., Mitchell, C., & Constantine, S. (2007). Making a difference: Education and training retains and supports rural and remote doctors in Queensland. *Rural and Remote Health* 7:700
- Willis-Shattuck, M., Bidwell, P., Thomas, S., Wyness, L., Blaauw, D., & Ditlopo, P. (2008). Motivation and retention of health workers in developing countries: A systematic review. *BMC Health Services Research*, 8(1), 247-247. doi:10.1186/1472-6963-8-247
- Wilson, N. W., Couper, I. D., De Vries, E., Reid, S., Fish, T., & Marais, B. J. (2009). A critical review of interventions to redress the inequitable distribution of healthcare professionals to rural and remote areas. *Rural and Remote Health*, 9(2), 1060.
- World Bank. (2016). World Health Organization's Global Health Workforce Statistics. Retrieved from <http://data.worldbank.org/indicator/SH.MED.NUMW.P3?locations=BO>
- World Health Organization. (1978). *Declaration of Alma Ata. International conference on primary health care, Alma-Ata, USSR, 6-12 September 1978*. World Health Organization. Retrived from http://www.who.int/publications/almaata_declaration_en.pdf?ua=1
- World Health Organization. (2006). *World health report 2006 – Working together for health*. World Health Organization.

World Health Organization. (2008). *World health report 2008: Primary health care – Now more than ever*. World Health Organization.

World Health Organization. (2010). *Increasing access to health workers in remote and rural areas through improved retention – Global policy recommendations*. World Health Organization.

World Health Organization. (2013). *Transforming and scaling up health professionals' education and training: WHO education guidelines 2013*. World Health Organization.

World Health Organization. (2016). *eHealth in the Region of the Americas: breaking down the barriers to implementation. Results of the World Health Organization's Third Global Survey on eHealth*. World Health Organization.