Enabling the performance of nurses in rural Guatemala:

THE ROLE OF RELATIONSHIPS

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Department of Public Health and Clinical Medicine
Epidemiology and Global Health
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"Injustice anywhere is a threat to justice everywhere. We are caught in an inescapable network of mutuality, tied in a single garment of destiny. Whatever affects one directly, affects all indirectly."

Martin Luther King Jr., Letter from Birmingham Jail, 1963

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Abstract

Background:
Enhancing the performance of front-line health workers serving vulnerable populations is crucial for redressing inequities. Traditional approaches have focused on introducing technical solutions, such as guidelines and incentives, to modify performance outcomes. Recognition of the complex social nature of health system function draws attention to the intangible software elements that shape performance, including the values, ideas, interests, and norms that guide human behavior and interactions. Insight into the operation of software elements can provide a base for people-focused solutions to support health workers and enable them to confront constraints in low resource settings. This study examines the social environment of the practice of front-line auxiliary nurses (AN) in rural Guatemala, in order to understand the role of health system software elements in enabling their performance and to gain insight into how organizational support can be strengthened through locally-relevant actions.

Methods:
A mixed methods approach provided a multi-level view of the AN practice environment, situated in the regional health system of the rural department of Alta Verapaz. Interviews with ANs and observations of practice were conducted to understand the values orienting them and how these shaped their relationships with patients and communities. A theory-driven case study of AN supervision was conducted in selected health posts to understand the values orienting supervisors in their role and examine how these shaped their relationships with ANs. The participatory method of concept mapping was used to examine the views of health workers, district and regional managers on actions to strengthen organizational support for the performance of ANs.

Results:
The values of nursing vocation and community connectedness were prominent in ANs' interpretations of their work. In relationships, nursing principles oriented

them to be attentive to understanding patient needs, and a shared ethnic identity and personal experience of local needs served as a base for engaging with local leaders in community work. The dominant orientation of supervisors in their role was managerial control, and it provided limited support. It contributed to standard-centered relationships with ANs focused on fulfillment of ministry criteria. Supervision oriented by a holistic understanding of ANs' needs and the goal of improving patient care was more successful in enabling AN motivation. This relationship was characterized as people-centered, based in a shared interpretation of the value of work with patients and the responsive support provided to ANs' problems. "Organizational climate of support across levels", where working relationships are characterized by respectful treatment, attention to psycho-social well-being and responsiveness to needs, was identified by health-system actors as a top priority for improving performance.

Conclusions:
To enable performance, there needs to be a balance between attention to standards and attention to the human dimensions of health worker practice. The dominant approach to supervision did not recognize or build on AN values. Supervision and management should be oriented by a more holistic view of the ANs' work and their needs, in order to promote a people-centered approach to working relationships. Locally relevant action to strengthen district and regional management's support for AN performance should focus on operationalizing performance goals that go beyond standards to encompass care that responds to patient and community needs.

Keywords. Health workers, nurses, performance, health services management, health systems research, people-centered health systems, work environment, Guatemala.

Original papers

This thesis is based on the following four papers, referred to as Papers 1–4.

1. Hernández AR, Hurtig AK, Dahlblom K, San Sebastián M. Translating community connectedness to practice: A qualitative study of mid-level health workers in rural Guatemala. ISRN Nursing, 2012;648769.

2. Hernández AR, San Sebastián M. Assessing health post efficiency in rural Guatemala: a data envelopment analysis. Global health action, 2014; 7:23190.

3. Hernández AR, Hurtig AK, Dahlblom K, San Sebastián M. More than a checklist: A realist evaluation of supervision of mid-level health workers in rural Guatemala. BMC Health Services Research, 2014; 14(1): 112.

4. Hernández AR, Hurtig AK, Dahlblom K, San Sebastián M. Supporting the performance of rural nurses: A concept mapping study with regional health system actors in Guatemala. (manuscript).

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Prologue

This thesis is motivated by the inspiration I gain from Guatemalan nurses. I have come to know them through the intersection of following my interests and influential people in the course of my life. I was drawn to the field of public health by my interest in developing and implementing action to address the injustice of health inequalities. After earning my MPH, I decided to study nursing because I felt that many preventable health problems faced in vulnerable populations can be improved by strengthening community nursing services. Family ties led me to the context of Guatemala, and a great nursing mentor showed me the path of supporting the professional development of Latin American nurses.

During my nursing education, I had the opportunity to conduct a qualitative study with nurses and nurse educators in Guatemala City about the development of research in their country. The study made me aware of the potential of nursing research through the eyes of other nurses. They expressed that to strengthen nursing practice, utilization of international research was somewhat limited by differences in culture and context. They felt the need to develop their own knowledge base of nursing in the Guatemalan context to be able to better meet the great needs of the multi-lingual, multi-ethnic population they serve.

Before starting the PhD, I learned of a distance education program for auxiliary nurses offered through the National Nursing School in Coban, which sought to make training more accessible for indigenous rural residents, with content adapted to the community health setting. By meeting with the nurse who founded and directed this program and the nurse in the Ministry of Health who supported its accreditation, I gained insight into the importance of auxiliary nurses as front-line health workers in rural areas as well as some of the political challenges for efforts to support their performance. Learning about this program and the efforts of other programs in Guatemala to strengthen the training curriculum for auxiliary nurses and the model of rural health care they provide led me to focus on how to support auxiliary nurse performance through my PhD research.

In the process of conducting this project, I have struggled with the question of how public health research can best contribute to strengthening nursing practice and improving health. Since this research was not tied to any intervention or larger project, I sought to develop the project in collaboration with local institutions responsible for these goals. The Regional Health Office of the department of Alta Verapaz and the National Nursing School in Coban served as a base for the studies. Through the relationships I developed with the managers in the Nursing Unit of the Regional Health Office and the educators at the nursing school, I was able to generate interest in the research topic, consult with them about how to focus the studies and involve them in discussion of the results. Their collaboration in the research process helped me to produce evidence that provides a view of human dynamics in the enactment of nursing practice in their setting and reveals local strengths that can be further developed to support nurses' contribution to rural health.

Even though this research was motivated by Guatemalan nurses, the knowledge produced and the methodological approach can be relevant to a wider audience. Auxiliary nurses share much in common with other rural front-line health workers and the everyday realities of the institutional setting of the health system in Guatemala are similar to other low- and middle-income countries. Managers may recognize their reality, and recommendations for strengthening support for front-line health workers may be relevant for other settings. Research can serve as a tool for change, and the methodological tools used to identify locally-relevant paths to improving performance may be of interest for managers, nursing leaders, and health systems researchers.

This thesis aims to contribute knowledge relevant for strengthening organizational support for health workers in low resource settings. Knowledge was generated through study of auxiliary nurses delivering health care to vulnerable populations in primary and secondary care services in rural Guatemala. I sought to understand what enables their performance in order to indicate directions for enhancing support that are based in the reality of the local health system and build on existing strengths.

Introduction

"At the heart of the right to the highest attainable standard of health lies an effective and integrated health system" (1).

Strengthening health systems

The importance of strengthening health systems has received growing attention in recent years. Profound inequalities in health outcomes have proven highly resistant to well-funded global health initiatives launched under the umbrella of the Millennium Development Goals in 2000. Weak, fragmented health systems in low- and middle-income countries (LMIC) have been widely recognized as the fundamental barrier to the delivery of essential services and interventions to vulnerable populations (2). In order to promote a common understanding of what a health system is and how to organize efforts to strengthen them, the World Health Organization (WHO) issued a *Framework for Action*, where a health system is broadly defined to include "all the activities whose primary purpose is to promote, restore or maintain health" (3). The health system functions that must be strengthened in order to fulfill this purpose have been structured in a framework of six building blocks: service delivery, human resources, information, medicines and technologies, financing and governance (**Figure 1**). These interconnected building blocks represent the dynamic architecture of local sub-systems where interventions to improve health need to be implemented (4). The centrality of people in the figure reflects that the health system is driven by human interaction, from political decision-making to the relationships among actors involved in managing, delivering and receiving care and engaged in broader efforts to promote health (5).

Service delivery is a central function of the health system, and the performance of front-line health workers in LMICs is a key focal point for efforts to enable vulnerable communities to achieve the highest attainable standard of health. Realization of health system goals depends on health workers' performance in the dimensions of being available, competent, productive and responsive (6). Availability has

Figure 1: Health system building blocks

Source (4)

been a priority concern, as having health workers in place is a pre-requisite for attending to the other dimensions of performance. Chronic shortage of health professionals is most acutely experienced in rural and remote areas, due to insufficient numbers trained, concentration of existing professionals in urban areas and loss to international migration (7). Extreme scarcity of professionals also tends to coincide with the highest levels of poverty.

Health workforce: The role of mid-level health workers

Mid-level health workers (MLHWs) play an important role in filling these gaps in availability, and they constitute the front-line of health service delivery for the poorest, most vulnerable populations in many LMICs. MLHWs receive a shorter training and have a more restricted scope of practice than professionals. However, they are different from community health workers because they receive formal certification from nationally-accredited training institutions (8). They may work under direct or indirect supervision of a professional, but in many cases they also render care independently in primary and community care, and when professionals are scarce or absent in rural health centers and district hospitals. Increasing deployment of MLHWs is facilitated by their shorter training duration, which typically lasts one to three years, and it can also be appealing as a lower cost alternative for improving coverage. Lower entry level education requirements

make it easier to train locals from underserved areas who have potential to provide more culturally and linguistically appropriate care, and may be easier to retain than urban professionals (9).

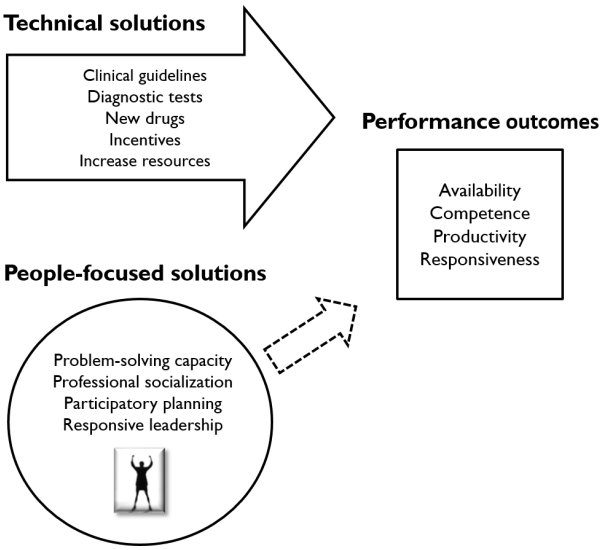
In some African and Asian countries, new groups of MLHWs, such as health extension workers in Ethiopia and lady health workers in Pakistan, have been created to improve coverage in underserved areas. In most Latin American countries, the front-line workforce is characterized by a high proportion of auxiliary nurses, which is a long-established group of MLHWs (10, 11).

Mid-level health workers provide a practical means for targeted delivery of much needed services in areas where professionals are scarce, however, there are also concerns about the ethics of this solution. Increasing reliance on high numbers of MLHWs can be seen as allowing governments to "do their duty" of providing coverage, while they bypass the cost of paying professionals and specialists for more competent services. This argument can be interpreted as protectionism strategies of physicians and professional nurses who want to assure their place in the public sector, and it has been used to block the development and justify the elimination groups of MLHWs in some countries (12, 13). Still, this argument has great validity as an expression of concern about the poor's right to the same standard of quality services as the wealthy. Efforts to increase availability of professionals in underserved areas, who can resolve higher level health problems, should be complementary to MLHW deployment. At the same time, the resources offered by local health workers, in the form of knowledge of local needs, language and culture, should be recognized as a contribution to the quality of care. In addition, the competencies of MLHWs should not be considered fixed, but instead should be continually enhanced. Studies indicate that with adequate training and continued support, MLHWs can provide care comparable to that of professionals, and providing them with opportunities for professional advancement is an important intermediary strategy (14, 15).

How to improve performance in low resource settings?

Attention to availability alone is insufficient to enhance health worker performance. Once health workers are in place, they confront work environments characterized by lack of basic equipment and supplies, delayed wages, and poor management (16). Their capacity to have an impact on health outcomes may be limited by poor availability of water and sanitation services, and poor access to education in the communities they serve. Their performance under these conditions is dependent on their motivation to confront challenges and act as agents of health change (7). Improving the performance of existing workers in low resource settings

Figure 2: Examples of approaches for strengthening health worker performance



is a complex dilemma due to the intersection of multiple factors at the health system, community and individual level that influence health workers' ability and willingness to carry out their role (17-19).

Focus on technical solutions

Efforts to address this dilemma have taken different approaches, depending on how performance problems are analyzed and which performance goals are valued. Common approaches that are prominently featured in health worker performance literature share an orientation towards technical solutions (**Figure 2**). There are many examples of interventions that seek to enhance health worker competence by introducing evidence-based guidelines, protocols, and technologies which have been shown to improve health outcomes in other settings. The implementation of guidelines for integrated management of childhood illness and guidelines for using new technologies in diagnosis and treatment of malaria are two examples of competence-focused interventions that have been evaluated extensively in low resource settings (20-24). Interventions using incentives focus on motivating health workers to achieve specific performance targets through rewards for desired behaviors and/or punishment for undesired behaviors (25). Pay-for-performance schemes are another example of a kind of intervention that has been applied in LMIC health systems to promote attainment of a range of performance goals, such as compliance with direct-observed therapy protocols for tuberculosis treatment and improving coverage for preventive services (26-28). Another approach that is

widely advocated focuses on redressing the structural deficiencies in the health system, which studies indicate are a root cause of performance problems (29-32). This approach implies solutions through top-down policy change to modify allocation of resources, ensuring there are enough medicines and supplies, and salaries are paid on time.

These technical solutions offer important tools for improving performance in low resource settings, however they also have limitations. Examples of successful implementation of these kinds of interventions exist, but their success is dependent on context and the collaboration of the people who implement them, and findings show that no single intervention is effective across all settings (25, 33). Even investments to overcome resource constraints do not necessarily translate to improved health outcomes if organizational management and coordination are not functioning well (34, 35). Attention to the human organizational processes that integrate them into the dynamic architecture of local health systems is also needed.

Focus on enabling performance

An alternate perspective on the dilemma of improving performance in low resource settings focuses on enabling the potential of health worker agency. It has been argued that health system actors' sense of powerlessness to make changes that may improve the quality and impact of health services is a key component of the health system crisis (34). While constraints have considerable influence on the way in which actors operate, variation in performance under constrained conditions points to the significance of human factors (36, 37). Focus on the potential of health workers to take action and make changes that positively influence performance leads us to consider what allows their motivation to thrive, and how to elicit their commitment and encourage their contribution (38).

Actions to enable health workers' capacity to confront constraints more effectively are directed toward the workers themselves, as well as toward the social qualities of the organizational environment that support their motivation to exert and maintain effort towards health system goals (19). Examples of people-focused solutions shown in **Figure 2** focus on promoting local capacity to generate context-specific responses to problems, socialization of values and priorities that engage health workers' professional commitment, encouraging their involvement in management processes, and responding to their needs (34, 39, 40). These kinds of approaches to improve performance in low resource settings have not received as much attention as technical solutions, in part because it is seen as more difficult and complex to change individuals' behavior and social environments, and in part

because their connection to performance outcomes is not as straightforward (41). However, the connection of technical solutions to performance outcomes is not as direct as it appears, because their uptake and success also ultimately depend on adaptations of health worker behavior and organizational environments that support these changes. Recognition of the dependence of technical solutions on social qualities of health workers and the environment as well as the human potential of health workers to negotiate with conditions and find solutions to improve care point to the importance of understanding the social nature of health system function.

Health Systems Research: understanding health systems as social systems

My focus on organizational support that enables health worker performance in low resource settings places this thesis in the field of Health Systems Research. Interest in Health Systems Research has grown over the past decade with recognition of the fundamental role of strong health systems in the achievement of global health goals. Health Systems Research is defined as generation of knowledge to "understand and improve how societies organize themselves in achieving collective health goals, and how different actors interact in the policy and implementation processes to contribute to different outcomes" (42). This definition highlights the field's orientation to questions of *how* the health system functions through social processes of organization and interaction. By developing understanding of the social nature of health systems, the field contributes to expanding the range of knowledge available for strengthening their operation (43).

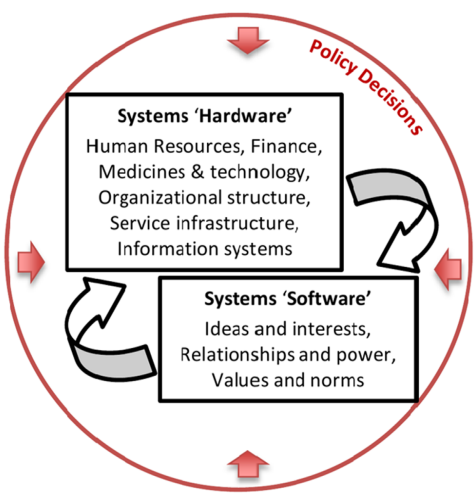
Public health research traditionally focuses on the measurement and control of disease, and the health system is usually conceived as a mechanistic structure for delivering scientific-technical interventions. Mechanistic structures are characterized by ordered arrangement of human and non-human components that work together efficiently and reliably, coordinated by roles, rules and procedures (39). This implies that the behavior of the system can be understood by studying the operation of its component parts, and this understanding provides a basis for expecting predictable cause-and-effect linkages when interventions are introduced. When these interventions do not work as predicted, efforts to facilitate their function focus on manipulating the factors inhibiting the desired outcomes. Initiatives such as financial incentives, reminder systems and regulatory policies are introduced to align individuals' behavior with the requirements of the intervention (44, 45).

In Health Systems Research, the complex social nature of health system function and the central role of human actors and their interrelations are emphasized

(46). Their function is conceived to be generated through the dynamic interplay between their structural and social components, illustrated in the framework shown in **Figure 3** as "hardware" and "software" (47). Hardware corresponds to the building blocks of the health system: types and levels of human resources, finance, biomedical products, infrastructure of services, and information systems. The building block of governance is represented in the figure by "organizational structure" as well as the policy decisions which shape the system. Software refers to ideas, interests, values, norms and power dynamics that guide actions and underpin relationships among system actors. These intangible software elements guide, shape and are shaped by human behavior and the interactions among actors. Software also represents the means through which human activities are coordinated in cooperative action towards health system goals (39).

Recognition of the adaptive interplay of hardware and software draws attention to the role that reflective, reactive human actors at all levels play in driving the function of the health system. This recognition also implies that a system's behavior is more than the sum of the behavior of its parts - it also consists of the intricate relationships among them which emerge through social processes (42, 44). The way actors interpret their roles and the relationships among them are critical points of focus for understanding and improving the function of social systems.

Figure 3: Model of health system function based in the interaction of hardware and software components



Source (47)

Health worker performance: outcome and process

Performance as an outcome

Health worker performance outcomes can be analyzed in multiple dimensions and at different levels (6). Depending on the dimension and level the analyst is interested in, health worker performance can be seen in different ways. The dimension of availability considered at a workforce level can consist in the absolute numbers and geographical distribution of health workers, as well as the balance of the skills mix (e.g. auxiliaries, nurses, doctors, specialists) in the health workers trained and employed. The dimension of competence at the level of individual workers can be assessed in many different areas, such as prescribing practices, diagnostic accuracy, and communication skills. Productivity can be examined at the facility level, in terms of number of patients attended or services delivered within particular programs, like maternal health. Performance in the dimension of responsiveness refers to how well people's expectations are met by health workers, and assessment can include patient satisfaction, treatment with dignity, and cultural acceptability of care.

The approaches to improving health worker performance based on technical solutions described previously focused on interventions to enhance specific outcomes in the dimensions of competence and productivity. These interventions are based on the expectation that the health worker will readily comply with the change in practice and serve as an instrumental means to the end of a measurably improved outcome. While such interventions can provide health workers with crucial tools for improving service delivery, introducing new guidelines or diagnostic tools implies changing the behaviors and expectations associated with previous norms. Incentives for particular practices can often have unanticipated, adverse effects on other outcomes or cause resentment among other groups of workers who do not receive incentives (4). The gap between what is intended and what actually happens when interventions are introduced highlights the influence of the personal views and interests of the implementers as well as the organizational context in shaping performance (41, 48). This draws attention to the processes that connect the technical inputs to the outcomes.

Performance as a process

Performance can also be understood as a transactional social process between health workers and their environment (19, 49). Health workers' practice is a complex behavior that is based on their knowledge and skills, as well as their professional values and personal goals, and these are continually developed and adapted in relation to other actors in their environment in the process of perfor-

mance (18). The environment consists of the work setting, including organizational and physical features of the health facility and health system as well as the conditions and social context of the communities served (6). In the mechanistic view of health system function, qualities of the health worker and their environment are usually considered as context factors, peripheral to the intervention (47). Focus on the transactional process of performance brings the social environment of health worker practice situated in the local health system into the foreground.

I have chosen the understanding of performance as a transactional social process as the orientation for this thesis because it provides a stronger base for exploring paths to enable health workers' agency. Rather than being in a passive role of receiving technical solutions, health workers are seen as social actors engaging with their environment, and their performance is seen as being generated through adaptive interaction with the structural components (protocols, physical conditions, wages) and social components (working relationships, organizational culture) of their environment. Based on the understanding of health systems as social systems, focus on the operation of software elements can provide tools for making sense of how social components of the environment contribute to shaping this process.

Health systems in Latin America

Based on trends of economic growth and improving health outcomes, Latin American countries appear to be well-positioned among low and middle income countries. However, regional and national averages hide deep, persistent inequalities in the distribution of wealth and well-being (50). International comparison based in the Gini index, which captures the range of cumulative family income in the population, indicates that eight of the 20 most unequal countries in the world are in Latin America (51). These inequalities are also manifested in the distribution of mortality and morbidity. Rural, poor, indigenous and Afro-descent populations are the most vulnerable and bear a disproportionate burden of ill health (52, 53).

The region's health systems have varying structures, made up of different combinations of public sector, private sector, national institutions of social security, and subcontracted organizations (54). Despite differences in structure, health systems face similar challenges that reflect their common history and limit their capacity to address the population's health needs. Health sector reforms were implemented on a broad scale in low income countries in the 1980s and 1990s under the guidance of the World Bank and the International Monetary Fund. Although reform legislation varied, it generally promoted decentralization of the management of public services to sub-national levels, and introduced measures to increase efficiency, such as privatization and sub-contracting of service provision and targeted delivery of basic packages of services (55). These reforms have contributed to the major current challenges for strengthening health systems in the region: fragmentation of service provision, seen in parallel subsystems that are not integrated or coordinated, and segmentation of coverage, seen in differential access to services across subgroups of the population (56). These challenges are compounded by low levels of public financing for the health sector, and by the governments' weak role in overseeing and regulating the function of the diverse subsystems and orienting them to meet the needs of the population.

Recent initiatives to improve access and reduce inequities have taken different paths in attempt to respond to weaknesses in existing national structures. Reforms in Uruguay, Argentina, Mexico, Chile and Peru have aimed to offer greater social protection by expanding the percentage of the population enrolled in national insurance schemes, as well as the services covered (54). Primary health care programs in Brazil, Colombia, Argentina and Ecuador have sought to expand coverage and strengthen the comprehensiveness of services, incorporating citizen participation and intersectoral collaboration (57). However, reform efforts continue to face challenges due to underfunding, variable political commitment, inadequate coordination between national and regional levels, and sub-national inequalities in the structural development of the health system (57, 58).

Health workforce in Latin America

The health workforce is one of the weakest links in Latin American health systems (59). The situation is generally characterized by shortage in absolute numbers of professionals and inequitable distribution between urban and rural areas (54). The deficit in professional nurses is particularly critical, as physicians outnumber professional nurses by three to one in many Latin American countries (11). The higher numbers of physicians reflect in part the growing presence of private medical schools whose graduates almost exclusively go on to work in the private sector (6). Physicians in the public sector have roles in management and patient care, and they are most often graduates of public medical schools. Many countries in the region require these graduates to complete one or two years of compulsory service in rural postings.

The composition of the nursing workforce in Latin America varies by country, but there is generally around four auxiliary nurses for every professional nurse (11). Exact training profiles differ, but professional nurses have university training, while auxiliary nurses have shorter technical training. Whatever their training, nurses have a prominent role in the public health workforce: professional nurses are typically responsible for issues related to management, supervision and planning, while the auxiliary nurses work in direct contact with patients in primary, secondary and tertiary levels of care (10). Despite their prominent role, participation of nurses in national planning and decision-making is limited, and national information systems often do not differentiate auxiliary nurses from professionals, which makes it difficult to fully account for nursing in health workforce planning (60).

Working conditions in the public sector contribute to the weakness of the health workforce. Since the health sector reforms, there has been a rise in "flexible"

models of employment that favor temporary contracts over permanent positions with retirement and social security benefits (61). This trend in labor contracting has contributed to increasing numbers of health workers with precarious employment as well as the coexistence of different contracts and benefits for similar work. Wage delays, which became more common with decentralization, combined with low salaries add to the challenges for maintaining a motivated public sector workforce (62).

Health system in Guatemala

Guatemala is the largest country in the sub-region of Central America, with an ethnically diverse population of 15 million. There are 22 indigenous ethnic groups that constitute 40% of the total population, and 52% of the population lives in rural areas (63). Around half of the total population lives in poverty (51%), and the percentage rises to 75% among the indigenous population (64). Health indicators in Guatemala are among the worst in the region. Chronic malnutrition affects one in two children under five years of age, and the maternal mortality rate is estimated to be 290 per 100,000 live births after adjusting for underreporting (65). A closer look at the distribution of these health indicators reveals that rural and indigenous populations are disproportionately affected.

Figure 4: Location of Guatemala in Central America

The Guatemalan health system is comprised of three subsystems, including the public sector managed by the Ministry of Public Health and Social Assistance [1] (MoH), the Guatemalan Institute of Social Security (IGSS), and the private sector.

[1] MSPAS are the initials of its name in Spanish. I use MoH to indicate Ministry of Health.

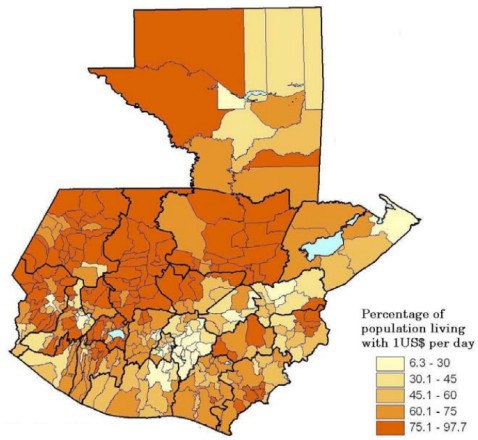
In rural areas, health services are predominately delivered through the public sector, which are governed and financed by the MoH. Health sector reforms that were initiated in the mid-1990s decentralized administrative authority in the public sector to the regional level, where responsibility for planning, execution, supervision and evaluation of health services and national programs is managed by Regional Health Offices (RHOs) (66). The health regions roughly correspond to the 22 departments that make up Guatemala. The regions are divided into districts, where service delivery and program implementation in primary and secondary care facilities (health posts and health centers) are directly managed. Within the public sector, the MoH also provides services for the most rural populations through the Program to Extend Coverage (*Programa de Extensión de Cobertura*, PEC). This program was established in 1997 with financial support from the Inter-American Development Bank, and it aimed to extend services to broad segments of the population that lacked access at that time (67). The model of service delivery is based on sub-contracting non-governmental organizations (NGOs) to deliver a package of basic services to rural villages via mobile health teams. Implementation of PEC is managed by the NGOs, but they are to some degree integrated with the health regions through oversight and support from the RHO. This model continues to receive wide criticism due to the minimal nature of the coverage provided through the basic service package and the sporadic nature of visits by the mobile health team (67, 68).

More recent health sector reforms initiated in 2005 have aimed to fortify the health posts and health centers in the districts by expanding opening hours, increasing the number and qualification of staff, and expanding maternity care service at the secondary level (69). Though the basic structural changes were implemented and the number of services delivered increased, administrative procedures to support the new models were not adequately developed and budgeting did not correspond to the resources needed for operation, which has resulted in on-going deficits in the new models (66).

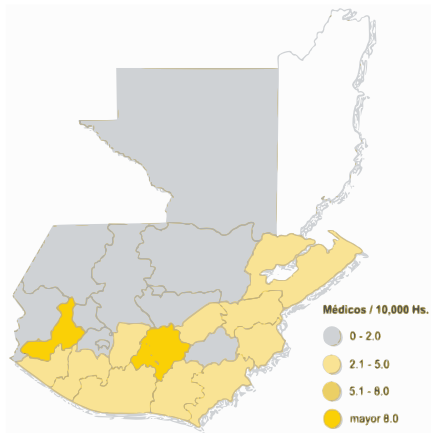
Health workforce in Guatemala

The Guatemalan health workforce, like others in the region, is characterized by a shortage of health professionals, particularly in rural areas where poverty levels are highest. An illustration of this distribution is shown in **Figure 5**. At the national level, there are four professional nurses and ten physicians per 10,000 inhabitants, which falls short of the WHO's recommended density of 25 professionals per 10,000 (6, 68). While the number of physicians graduating from public institutions

Figure 5: Comparison of the distribution of extreme poverty and physicians in Guatemala



(a) Poverty by Municipalities, 2002



(b) Ratio of Physicians to inhabitants, 2006

The darkest areas in Map A represent the areas where more than 75% of the population lives with 1 USD per day, while the gray areas in Map B show the areas with fewer than two physicians per 10,000 inhabitants.

has been declining since the year 2000 [2], training by private institutions has risen, and the number of physicians has remained steady (70). The number of professional nurses has been increasing slightly, which reflects steady production from the National Schools of Nursing and more recent introduction of nursing training at private universities (70). Training for professional nurses lasts three years, and covers theoretical and practical training in clinical nursing care as well as nursing administration. This training provides a technical degree granted by a university. Professional nurses can earn a Bachelor's degree by completing two years of additional training focused on nursing care and administration as well as teaching and research. In the public sector, most professional nurse positions at the district level require only a technical degree while regional management positions require a bachelor's degree.

Auxiliary nurses (ANs) constitute the largest group of health worker in Guatemala, with 18 ANs per 10,000 inhabitants, and their numbers have been increasing due to growing availability of training institutions (68). Training is offered in the National Nursing Schools, as well as private institutions that must be accredited

[2] In 2000, the public university (la Universidad de San Carlos de Guatemala) initiated admissions exams, which limited the possibility for students educated in institutions outside the metropolitan area to matriculate.

by the MoH. There are also a number of unaccredited private programs whose graduates are not recognized as ANs until they pass a national exam (71). To enter AN training, the student must have completed three years of secondary school, compared to requirement of completing secondary school (five years) to enter professional training. This makes AN training more accessible for rural residents.

The training to become an AN is one year in duration and consists in three phases focusing on medical-surgical care, maternal and child care, and community health. An additional training profile to develop community auxiliary nurses was accredited by the MoH in 2007. This profile includes more competencies relevant to primary and secondary care, such as community participation and intercultural care, and less focus on hospital-based care. Community AN training has been facilitated with NGO support though distance education in prioritized underserved areas to increase the availability of local health workers and provide them with training oriented to rural health services. Auxiliary nurse positions in the public sector accept training from either profile.

According to data from the MoH, the nursing workforce in the public sector consists of four ANs for every professional nurse, and 20% of nurses are male (71). There is little difference between the salaries of ANs and professionals, and overall, 60% of nurses in the public sector earn the national minimum wage or less. Professional nurses in higher management positions earn around two to three times more than other nurses, but considerably less than other professionals in similar positions. Prior to 2008, 66% of all nurses in the public sector had permanent contracts. However, this balance has shifted with hiring in relation to the reforms to fortify health posts and health centers. In 2008, two years before field work for this study started, many new positions with temporary contracts were created in prioritized regions of the country. The increase in the numbers of ANs, professional nurses, and physicians employed by the MoH from 2006 to 2009 is shown in **Table 1**. While the numbers of health workers in all categories increased, in the most rural and impoverished regions there was a high vacancy rate in the positions for physicians (from 29 to 87%), and the vacancy rate for new AN positions in the same regions was much lower (from 1 to 24%) (70). ANs were hired on temporary contracts that were to be renewed on a yearly basis, and wage delays have been common.

Regional priorities for strengthening health systems and the workforce

The Pan-American Health Organization (PAHO) is an international agency that provides technical cooperation and coordinates partnerships to improve health and the quality of life in the Americas (72). PAHO serves as the Regional Office

for the Americas of the World Health Organization (WHO). As such, the organization plays an important role in translating the international agenda of strategic initiatives for improving health to the regional level, and coordinating efforts in Latin America towards global health goals. Current areas of priority action related to health systems and the health workforce focus on initiating formulation of national-level plans toward Universal Health Coverage and coordinating on-going efforts during the Decade of Human Resources for Health. The strategic actions involved in these initiatives are multi-layered and multi-faceted, and below I highlight areas to which this thesis' focus on enabling the performance of existing health workers may contribute.

Table 1: Composition of the public sector health workforce, 2006–2009

Health worker	**2006**	**2007**	**2008**	**2009**
Auxiliary nurses	3585	4675	NA	7602
Professional nurses	653	893	NA	1638
Physicians	1099	1441	NA	2120

Source (70)

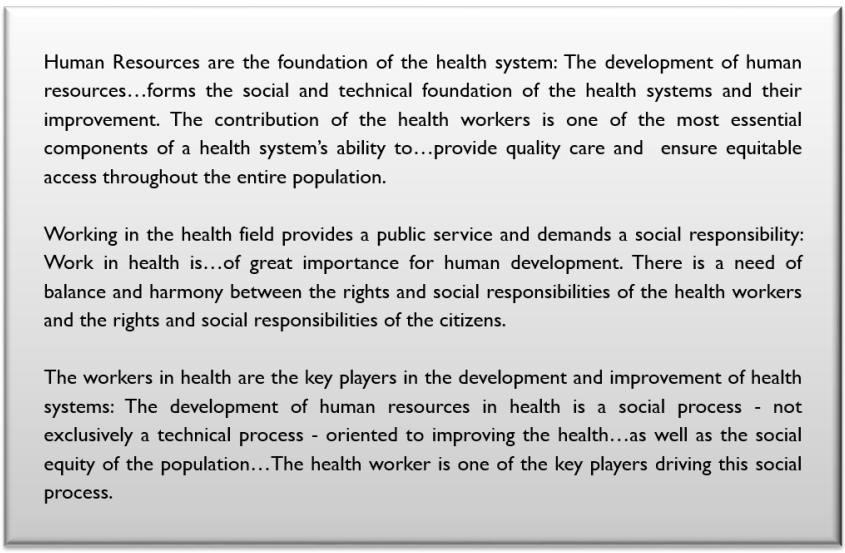
Universal Health Coverage is set to have a prominent place in the post-2015 global health agenda that will follow the Millennium Development Goals. This over-arching goal is intended to provide a pathway for mobilizing countries and global health actors in efforts to strengthen the contribution of health systems to human development and equitable attainment of the right to health, based in the strategy of primary health care. PAHO has recently adopted a "Strategy for Universal Health Coverage" which calls upon countries in the Americas to define national policies guided by the established strategic lines of action and based in their own social, legal, economic, political and cultural context (73). These lines of action direct focus to the areas of: people-centered comprehensive health services, stewardship and governance, financing and promotion of equity, and intersectoral action to address social determinants of health. While these lines of action are interdependent, the provision of a comprehensive model of people-centered health services is particularly relevant to issues of health worker performance. Development of people-centered services implies that care is focused on and responsive to the needs and expectations of people, rather than diseases and epidemiological profiles (74). Patient-centered care is based on a holistic understanding of individuals' needs in the context of their lives, while people-centered care extends beyond the individual to also encompass the needs of the community and their role in shaping health policy and services (75).

The actions indicated for strengthening people-centered health services at the country-level addressed structural elements as well as social elements (73). Structure-focused actions included defining a universal package of legally guaranteed services, essential medicines and health technologies, increasing investment in first level of care, and increasing attractive employment options at the first level of care. Actions focused on social elements included transforming the organization and management of health services through development of models focused on needs of people and communities, and implementing programs for the empowerment of people. It is noteworthy that while the structure-focused actions point to concrete steps, the actions related to social elements are more open to interpretation and more difficult to operationalize.

In the World Health Report 2006, "Working Together for Health", the WHO called for a decade of global effort to strengthen the development of human resources for health (6). The beginning of the Decade of Human Resources for Health (2006 – 2015) in the Americas was marked by the issue of the Toronto Call to Action. This document was drafted by representatives from the national Observatories of Human Resources for Health [3] to guide collective, intentional, long-term efforts to strengthen and develop the health workforce in all countries of the region of the Americas (76). The Call to Action names three guiding principles as the base for coordinating action, shown in **Figure 6**, which prominently feature recognition of the health worker as the social and technical foundation of the health system and as a driving force of its improvement. Strategic areas of action to address critical human resources challenges focus primarily on ensuring availability through long-term planning, equitable distribution, and regulation of migration. The regional network of national Observatories of Human Resources for Health has worked to coordinate relevant groups of stakeholders to address these challenges through efforts to raise the political priority given to workforce issues and provide policy makers with timely information (77). Regarding the situation of existing health workers, the Call to Action also named *"(generation) of labor relationships between the workers and the health organization that promote healthy work environments and foster commitment to the institutional mission to guarantee quality health services for all the population"* as a critical challenge. National efforts in this area have focused on monitoring labor conditions, providing platforms for conflict negotiation as well as efforts to strengthen the preparation of managers (77, 78).

[3] Observatories of Human Resources for Health were established by PAHO in Latin American countries in 1998, following the example a model implemented in Brazil. Observatories function like "think tanks," oriented towards policy, research and advocacy to support the development of the health workforce (77).

Figure 6: Guiding principles for efforts to strengthen the health workforce in the Americas



Source: "Toronto Call to Action" which initiated the Decade of Human Resources for Health in the Americas (76)

Attention to software needed to guide strategic action

Priorities and principles for strengthening health systems and the health workforce in Latin America reflect clear recognition of the importance of the technical as well as the social elements of health system function. However, the more prominent areas of strategic action focus efforts towards structural issues, such as defining a package of services and enhancing health worker availability, that primarily contribute to strengthening the technical elements. One explanation is that social elements are more difficult to operationalize because they are dependent on system actors' interpretations of their role in implementing value-based goals, such as quality service in accordance with people's needs and equitable attainment of the right to health. The perceived difficulty of addressing social elements also reflects the traditional framing of the human organizational environment of the health system as the context to technical solutions (41).

Strategic focus on the social elements of regional priorities for strengthening health worker performance should be guided by understanding of how the health system functions as a social system through human interaction. Insight into the operation of software, including the values, ideas, interests, norms, and power dynamics that guide system actors' actions and underpin their relationships, can provide a base

for different approaches to support health worker performance (47). In this thesis, I have employed the software frames of *values* underpinning *relationships* and *ideas* about organizational support to gain knowledge useful for guiding strategic action to strengthen the performance process.

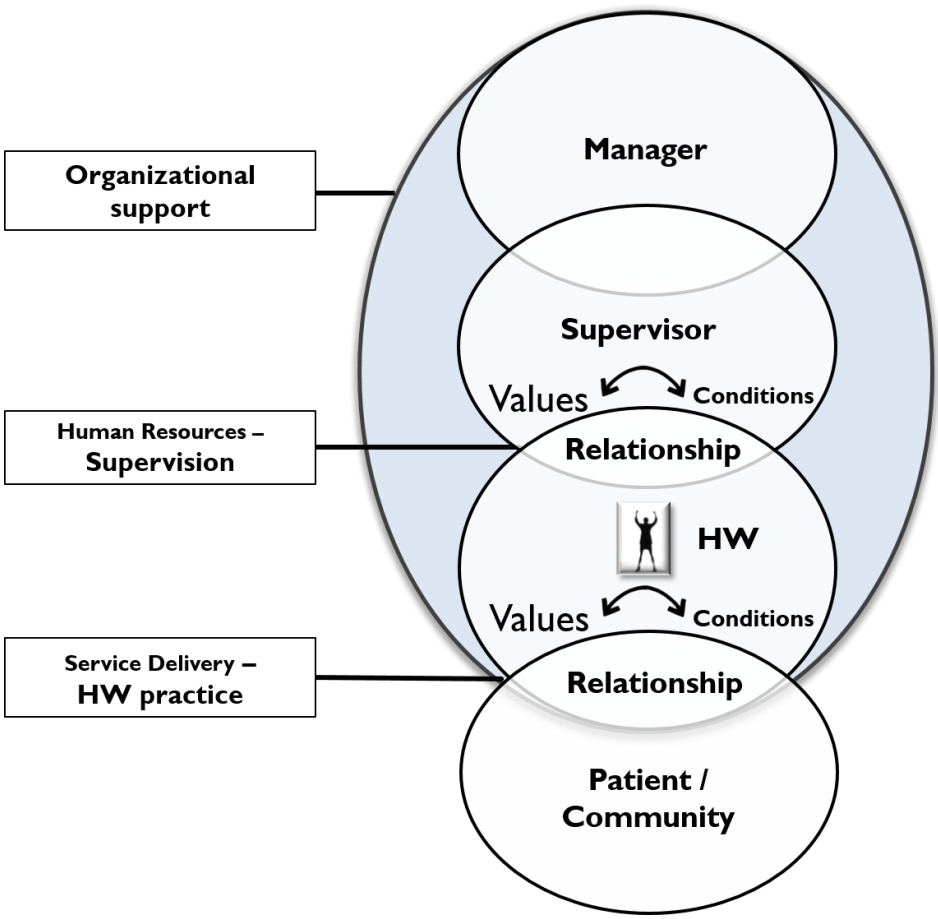
Objectives

Main objective:
To examine the social environment of the practice of front-line auxiliary nurses (ANs) in rural Guatemala in order to understand the role of health system software elements in enabling their performance and gain insight into how organizational support can be strengthened through locally-relevant actions.

Specific objectives:

1. To understand the values orienting ANs and examine how their relationships in practice with communities and patients are shaped by the interaction between their values and the conditions they confront
2. To understand the values underlying supervisors' orientation to their role and examine how their relationships with ANs are shaped by the interaction between these values and the organizational environment
3. To examine the views of actors from different levels of the regional health system on actions needed to support the performance of ANs

Figure 7: Conceptual framework



HW = Health worker

Conceptual framework

The conceptual framework presented in **Figure 7** provides a depiction of the components of the social environment of health worker practice that are in focus in this thesis. The image of the health worker at the center reflects my interest in understanding what enables health worker agency and their motivation to confront challenges in pursuit of health system goals. The interlinked circles of patient / community, health worker, supervisors and managers represent levels of actors whose interactions drive the social process of performance, and the function of the local health system. Software elements of values and relationships, which form part of the social process, are shown at the points of intersection between levels. The broader operation of organizational support, which also contributes to shaping the process of performance, is depicted by the gray oval that lies behind the intersecting circles of health worker, supervisor (front-line manager), and managers (mid-level manager).

Within the health system building blocks of service delivery and human resources, I examine the human functions of health worker practice and supervision. The roles that the health worker and supervisor play in the health system routines of delivering and managing services are largely enacted through relationships (health worker-patient, supervisor-health worker) (5). The nature of relationships is an important aspect of the social process of performance because the dynamic interaction among system actors implies that they influence each other mutually. Relationships are shaped by the interaction between the actors' values and the conditions in the organizational environment. Values are manifested in actors' interpretations of the meaning and purpose of their work, which in turn orient the way they engage in their roles (39, 79). Understanding actors' values also provides insight into their way of identifying with the goals of the health system, which are intrinsically value-based as they encompass not only technical delivery of services but also pro-active pursuit of equity goals and responsiveness to population needs (38, 46). In addition, values and the capacity to act on them are also influenced by conditions in their environment, including physical and organizational features

of the health system and the community. Attention to actors' interaction with conditions is important for understanding the process of performance because they are influenced by conditions in their environment and also capable of influencing them.

I also examine multi-level views on organizational support for health worker performance in the local health system. Organizational support encompasses a broad range of structures, processes and resources that influence performance; such as, efforts to enhance worker capabilities, provision of resources and structured processes, feedback related to performance, as well as indirect aspects such as work culture (19). In order to understand how organizational support is operating and how it can be strengthened, we need an integrated view of the knowledge and perceptions of actors involved in generating and receiving it. These include actors at the level of health worker, their supervisors and other managers working closest to them, as well as the managers of the managers. While communities can play an important role in supporting health workers performance, I have focused on the views of actors within the formal organization of the health system and actions through which managers can support health workers.

Overall, this framework depicts my combined focus on the software elements shaping health workers' interactions with patients, communities, and supervisors and the broader operation of organizational support from multi-level viewpoints. This focus provides me with diverse points of entry for gaining insight into the transactional social process of performance. Together these insights can provide a rich knowledge base for generating actions to enhance the performance process that are relevant and meaningful for actors in the local health system.

Study setting: Alta Verapaz

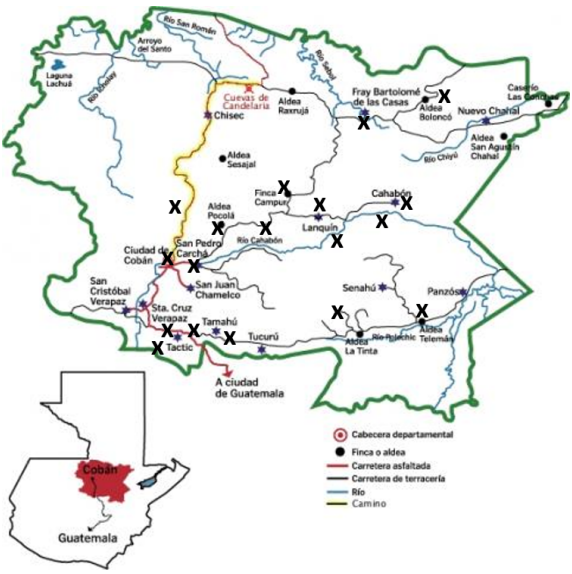
The department of Alta Verapaz is located in the highlands of northern Guatemala, about 200 kilometers from the capital city. Alta Verapaz has 1.1 million inhabitants who live predominantly in rural areas, and 90% are indigenous, from the Mayan ethnic groups Q'eqchi and Poqomchí. The main source of economic livelihood is agriculture, including subsistence farming of maize and beans, and commercial farming of cardamom and coffee. Residents of Alta Verapaz have the highest rate of extreme poverty (38%) and second highest rate of illiteracy (40%) in the country (63). The majority of the rural population is monolingual in the local indigenous language and has little formal education. The leading causes of mortality include pneumonia, acute diarrheal diseases, and malnutrition, and the maternal mortality rate is one of the highest in the country.

Alta Verapaz was among the regions prioritized for the fortification of health services. As in other regions, the scaling up of AN positions was successful, with 97% of positions created filled, while there was 50% vacancy in the positions created for doctors and nurses (70). The increased number of AN positions in rural health services were filled in part by graduates from the community auxiliary nurse training program, run by an NGO that was based in the National School of Nursing in Coban, Alta Verapaz. I selected Alta Verapaz as the site for this research project based on my contacts with the nurse who founded the program and her support helped facilitate my initial access to actors in the Regional Health Office.

Organization of the regional health system

The RHO of Alta Verapaz is responsible for the administration and oversight of health programs and services in the department. It is made up of units which oversee specific functions, such as human resources, nursing, management of service provision, epidemiology, statistics, and financing, as well as units that

Figure 8: Map of Alta Verapaz. X's indicate sites I visited to collect data.



oversee health programs such as vector- transmitted disease control, mental health, and nutrition. The health region is led by the director, with support from the head regional nurse and an advisory team made up of the head of each unit. The region is divided into 19 municipal health districts, which are managed by a director and a district nurse. Secondary care services are delivered through 17 health centers, and tertiary care is provided in two district hospitals and one regional hospital. At the community level, primary care services are provided through 34 health posts and 497 community clinics serviced by 51 NGO-managed health worker teams in the PEC model.

Primary care service delivery

Health posts provide coverage for a population of around 2,000 inhabitants and typically employ two ANs. In the health post, ANs provide basic maternal and child health services, attend consultations, treat diseases and injuries of low complexity, and refer cases of higher complexity. They also visit the villages in the catchment area to provide immunizations, growth monitoring, nutritional supplements and health education, and maintain census and epidemiological data. Their work with preventive maternal and child health services and specific priority diseases is structured by the guidelines of ministry programs, which specify service delivery routines and documentation, and indicators for coverage goals. Other actors involved in supporting health post work include local leaders, community

health volunteers, and additional staff. Implementation of health promotion strategies depends on collaboration with the leaders who make up the local community development councils. In most communities, the development councils also have a health committee that is responsible for disseminating information in the case of disease outbreaks and establishing a plan for emergency transport (80). The roles of community health volunteers which are specified by the health system include "health guardians," who help transmit information between the AN and the community, detect individuals in need of services, and maintain census data, as well as traditional birth attendants, who help in monitoring and referral of pregnant women and newborns (81). In some health posts, there is also additional staff, including an educator, who assists with health promotion and/or a rotating medical student who attends patient consultations, usually with the AN serving as interpreter.

In the PEC model, the mobile health team is responsible for delivering a basic package of health services to a jurisdiction of about 10,000 inhabitants. The mobile team normally includes one to two ANs, one professional nurse or a physician, and an educator. The team makes monthly visits to the community clinics in the jurisdiction catchment area. The community clinics serve remote villages, which typically require several hours to access through challenging terrain. Primary care activities are similar to those performed in the health posts, though in PEC, consultations are attended by the professional nurse or physician, and the ANs are responsible for delivering preventive services and health promotion activities, documenting the implementation of ministry programs, and collaborating and coordinating with community leaders and volunteers.

Secondary care service delivery

Health centers are located in the urban center of the municipal districts, and provide inpatient, emergency, and maternity care as well as outpatient consultations, and maternal and child health services. In addition to the director and district nurse, the staff typically includes a few additional physicians who are hired to work part-time shifts, and around 15 ANs. Depending on the size of the district, there may also be one or two additional professional nurses who oversee the different departments of the health center and the health posts. One AN is usually designated to primary care activities in the catchment area of the health center, and the other ANs attend patients in the departments of the health center, including pre- and post- consultation, family planning, immunization and inpatient beds. The physicians and professional nurses are intended to attend the patient consultation, emergencies and manage inpatient care, however their availability may be limited due to administrative duties, high volume of patients,

or position vacancies. In these situations, ANs also serve as the front-line in these roles. In both secondary and primary care, ANs utilize the ministry's Standards of Care manual as a resource to guide assessments and provision of care and they receive continuing education at the district and regional level orienting them to the content.

The tertiary level of care in the regional health system also employs many ANs, but in this thesis I have only focused on their roles in primary and secondary care.

Methodology

Methodological orientation

Methodology refers to "the set of theoretical ideas that justifies the use of a particular method or methods"(43). The selection of methods for the studies composing this thesis was guided by the following assumptions, which reflect my view of reality in the situation of inquiry and the purpose of research:

1. Social processes are only knowable through the interpretations of human minds. This implies that the people involved in social processes are the most important source of knowledge for understanding them (82).

2. Social processes are embedded in multiple layers of context. This implies that the actions of people engaged in social processes cannot be understood by looking only at the actions themselves (82). Incorporating multiple levels of perspectives and interpretations, and giving attention to patterns of interaction across levels provides a more complete base for analyzing how the process is generated.

3. System change starts and ends with people, and people operating at diverse levels of the system (not just policy makers) have different capabilities for processing and utilizing knowledge to change and improve it (83). This implies that the potential contribution of research to action for improvement is facilitated by the quality of engagement with local system stakeholders in the research process. Interaction and dialogue with local stakeholders serve to enhance both the validity of the research findings and their usefulness for informing locally meaningful action.

Table 2: Overview of Studies 1 - 3

	Study 1	**Study 2**	**Study 3**
Design	Qualitative exploratory study of factors influencing AN performance in rural health services	Multiple case study applying realist evaluation to analyze operation of AN supervision in health posts	Concept mapping study of health system actors' views on actions to support AN performance
Methods	Interviews, Observation	Data Envelopment Analysis of productivity data for 34 health posts in 2008, 2009, 2010 – provided basis for case selection. Interviews, document review at selected health posts	4 step participatory process: Brainstorming ideas for action, Rating ideas, Sorting ideas into themes, Interpretation of results maps
Sample	6 ANs in Primary care, 8 ANs in Secondary care[1]	5 health post cases – 3 with "strong" and 2 with "weak" performance.[2] AN, supervisor and community supporters interviewed for each case	Health workers, District managers, Regional managers [3]
Analysis	Thematic analysis	Theory-driven comparative case analysis	Quantitative analysis of qualitative data used to generate maps
Dissemination			
Papers	Translating community connectedness to practice *(Paper 1)*	Assessing the efficiency of health posts *(Paper 2)*, More than a checklist *(Paper 3)*	Supporting the performance of rural nurses *(Paper 4)*
Reports in Spanish	Current situation of Auxiliary Nurse performance[4]	From standard to humanized supervision: Tendencies and potential	How can performance be promoted? Health worker and manager views
Presentation and feedback	RHO advisory team, District Nurses, Nursing School faculty	Nursing School faculty, RHO stakeholders	RHO advisory team, Regional nurse managers

RHO = Regional health office

[1] Table 3 presents further information about participants

[2] Table 4 presents further information about health post cases

[3] Figure 9 presents information about who participated in each stage of the research process

[4] This report also included results from evaluations of AN performance conducted by the RHO, as well as results of the efficiency analysis.

4. The rational fallacy refers to the tendency to see technical and rational as the most important modes of operation for human activity (84). While I fully acknowledge the necessity of technical knowledge for attaining technical goals, I also maintain that greater understanding of software elements is needed to guide attainment of value-based goals. The goal of software-oriented research is to produce input into on-going social dialogue and provide a practical base for action rather than to generate universal, unequivocally verifiable knowledge (84).

Research design

The research conducted for this thesis consisted of three studies, and an overview of the work carried out for these studies is presented in **Table 2**.

The starting point was an exploratory study of the factors influencing the practice and performance of auxiliary nurses working in rural health services. Fieldwork was carried out from January to March 2010. The study process was supported by a local advisory committee with representatives from the units of nursing, human resources and the Program to Extend Coverage (PEC) from the RHO, as well as faculty from the School of Nursing and educators from the community auxiliary nurse program. The advisory committee reviewed and gave input on the study protocol before submitting it to the Director of the RHO for approval.

The second study of this thesis was conducted in October to December 2010, and aimed to build on insights gained in the first study and deepen understanding of the operation of existing institutional functions intended to support the performance of ANs. During field work for the first study, supervision, continuing education and community involvement were identified as important functions established in the regional health system to support performance. Supervision became the focal point for this study, because the activities through which it was intended to influence AN performance were clearly defined and widely understood, yet its implementation and impact varied across settings. The study was designed as a multiple case study to explore how supervision operated in practice to support AN performance.

The third study of this thesis was designed with the aim of disseminating findings about local factors supporting the performance of ANs and gaining insight into system actors' views on how those factors could be developed. Concept mapping was chosen as the methodology to facilitate this aim because its multi-step, participatory process provides the opportunity to involve diverse groups in visualizing their ideas around an issue of mutual interest and develop common frameworks (85). Field work took place February to April 2012. The exact focus of the study

was defined in collaboration with the head of the Nursing Unit and the director of the RHO, and the disconnect between managers' and health workers' views of performance problems was identified as a key area to explore. Among each group, the faults of the other were seen as the problem, as managers saw health workers as apathetic and unmotivated and health workers felt their work and efforts were unrecognized and unappreciated by managers. RHO leaders felt that the study could be used develop a more holistic vision of how to improve performance in the region, which was in line with the director's work with strengthening management and stewardship in the districts.

Methods

Study 1: Qualitative exploratory study

Semi-structured qualitative interviews with ANs were the primary means of data collection. Five districts were visited and district managers granted permission for staff to be interviewed. A total of 14 ANs were interviewed, and sampling was purposive to include a balanced representation of primary and secondary care services and males and females. All were indigenous and spoke Q'eqchi' or Poqomchi' as well as Spanish, and most had temporary contracts and less than four years of experience. Information about participant characteristics is shown in **Table 3**. I conducted the interviews in Spanish in the work setting and they lasted around 30 minutes. The interview guide focused on their motivation, their work and work environment, sources of satisfaction and frustration, sources of support and suggestions to improve work. The interviews were transcribed verbatim by local research assistants.

Insight into the ANs' work situation gained through the interviews was complemented by accompanying primary care workers during community health promotion visits and observing secondary care provision in health centers. Interviews were also conducted with supervisors in three districts and five groups of community members. I conducted community interviews through an interpreter, and questions focused on their experiences with health services, their impressions of and activities with the ANs, and recommendations for improving AN performance. Transcriptions of these interviews as well as field notes from observations of practice and informal conversations provided useful information for understanding the organizational and social environment and helped to contextualize findings from the interviews with the ANs.

Table 3: Characteristics of auxiliary nurses interviewed for Study 1

Participant No.	Age	M/F	Work Site	Primary/ Secondary Care	Experience (yrs)	Previous work	Contract	Training
1	36	M	HP	1°	1.5	Other HP	Temporary	DE
2	29	M	PEC	1°	10	Other PEC	Temporary	NSN
3	25	F	PEC	1°	1.5	–	Temporary	DE
4	37	M	HC	1°	13	–	Permanent	NSN
5	34	M	PEC	1°	4	CHW	Temporary	DE
6	28	M	HC	1°	1.5	CHW	Temporary	DE
7	21	F	HC	2°	2	Hospital	Temporary	NSN
8	41	F	HC	2°	14.5	–	Permanent	NSN
9	25	F	HC	2°	4	PEC	Temporary	NSN
10	24	F	HC	2°	3	PEC	Temporary	NSN
11	26	F	HC	2°	1.5	PEC	Temporary	DE
12	29	F	HC	2°	1.5	PEC	Temporary	DE
13	24	M	HC	2°	1.5	–	Temporary	DE
14	34	M	HC	2°	1.5	CHW	Temporary	DE

HP= Health Post; PEC= Coverage Extension Program; HC= Health Center; CHW = Community Health Worker; NSN = National School of Nursing; DE= Distance Education

A thematic analysis approach was used to interpret the data (86). Familiarization with the interview data was achieved by listening to the interviews to check the accuracy of the transcriptions, and by preparing a summary of the interviews, with description of each participant, impressions from the interview and initial observations of points of interest. The interview summaries also permitted the research team to gain familiarity with the data. An index of recurring themes was generated based on topics in the interview guide and information that emerged in the responses. The themes were used to label sections of the interview text with the program OpenCode 2.1. Analytical observations were recorded after labelling each interview and the index of themes was refined accordingly. The data were sorted into themes and matrices were created summarizing the information from all participants for each theme. Dynamics within and connections across themes were analyzed by seeking to characterize central tendencies and examining the consistency of patterns in the experiences and attitudes expressed by ANs who shared particular traits, including work setting and gender. Groups of themes whose content was interrelated were identified, such as Motivation-Satisfaction-Importance of work-Community values and Constraints-Frustrations-Suggestions to improve-Taking initiative. An initial analysis of these constellations of themes, including extensive quotes from participants, provided grounds for discussion with the research team and refinement of the concepts used to capture the characteristics of responses in the results section.

Study 2: Multiple case study

A multiple case study design was selected to examine the operation of supervision in practice. Case studies provide a rigorous methodological path for studying how social phenomena operate in their real-life context, and multiple cases provide the opportunity to examine the phenomena of interest in different settings (87). Health posts were selected as the unit of analysis based on the similarity of the resources they are equipped with and the relative simplicity of the model of care they provide. While the size and staff mix of health centers vary by district, health posts are generally staffed by two ANs who are responsible for the implementation of ministry health programs, attending patients with minor illnesses and referring patients in need of higher levels of care. The consistency of these qualities made it easier to focus in on variation in the phenomena of interest across multiple cases.

In order to better understand how supervision contributes to the performance of ANs working in health posts, a realist evaluation approach was employed. Realist evaluation is a theory-driven approach to evaluation, focused on identifying, testing and refining the logic of how the activities of an intervention generate changes in outcomes. The logic is articulated in theoretical propositions which describe how interventions activate causal mechanisms, amongst whom and in what conditions (88). This approach is particularly well-suited for social interventions like supervision because their operation depends on the internal mechanisms of how participants interpret, act upon and respond to its activities (89). Realist evaluation is a good fit with case study methodology because case study design is guided by theoretical propositions about how and/or why the phenomenon of interest occurs, and theory development provides a base for transferring findings to other settings (87).

Initial formulation of a theoretical proposition describing the activities of health post supervision and the mechanisms of their influence on AN motivation and performance was based on interviews conducted during field work for the first study. The initial version was refined through discussion with nurses with experience in supervision. Based on this process of formulation, the theoretical proposition on which the study was based can be characterized as a program theory that captures the assumptions, often held implicitly, which explain how the activities of an intervention are intended to contribute to the desired outcomes (90). It described three central aspects of the supervisor role and the mechanisms through which they are intended to influence AN's motivation and ability to perform:

> *Regular monitoring motivates the AN to complete their responsibilities because they know that their work is being observed. Individualized support*

> *through guidance in problem resolution and fortifying deficient areas improves the AN's ability to work in the desired way. Accompaniment in work tasks motivates the AN through the interpersonal relationship which allows the AN to feel the support of their supervisor and recognition of their work.*

This program theory formed the basis for development of a protocol for data collection in the health posts. The protocol was designed to gather information about how the each of the activities was working from various sources, including interviews with supervisors and ANs and documentation of supervisor visits to the health post. Interview questions and document review focused on capturing observable implications of the program theory, or what one would expect to see empirically if supervision does function as described in the theory (91). Though contextual factors that might influence supervision were not specified in the program theory, information about physical conditions at the health posts and the nature of community involvement were included in the protocol so that their influence on the phenomenon of interest could be assessed.

The selection of health post cases to include in the study was guided by capturing variance in performance outcomes so that the adequacy of the program theory for understanding supervision's function could be evaluated in diverse settings. Even though the program theory did not specify how supervision activities would affect performance outcomes, I expected that it would be more likely that supervision activities were influencing AN motivation as intended in health posts with better performance outcomes. In order to gain insight into variation in performance patterns across the health posts, I considered the data that was available at the RHO. To provide an indicator of performance outcomes in recent years, the efficiency of all health posts in Alta Verapaz was assessed for the years 2008, 2009 and 2010 using secondary data available from the national health information system[4]. Five output variables that reflected priorities in maternal, child and general health programs were selected in collaboration with RHO stakeholders. The number of health workers per health post was used as the input variable, based on the data available for the same years in the Human Resources Unit's register. Data envelopment analysis was used to estimate the efficiency of the health posts, resulting in scores from 0 to 100% where 100% represents the highest level of efficiency within the sample (92). The results of this analysis indicated that among the 34 health posts in the region, eight had scores over 90% and three had scores under 75% for all of the three years analyzed. This analysis and the

[4]Data for the years 2008 to 2009 was collected during field work for Study 1. Additional data for the first nine months of 2 010 was collected and analyzed during field work for Study 2 to provide insight into the most recent performance patterns.

results from the years 2008 and 2009 are reported in-depth in Paper 2 (93). In order to gain another view of performance, the results of personnel evaluations of ANs working in health posts, conducted by Nursing and Human Resources Units during 2009, were also used to guide selection of cases. These evaluations were completed by the district nurses, and reflected their views of the quality of the ANs' performance with regards to specific competencies. Together these efficiency scores and personnel evaluations were used to select three health posts with "strong" performance (HP 1 – 3) and two with "weak" performance (HP 4 – 5), representing different regions of Alta Verapaz. The performance scores and characteristics of the five health post cases are presented in **Table 4**.

Table 4: Characteristics of Health Post Cases in Study 2

Health Post *Distance and access to Health Center*	**Performance scores** *TE (2008, 2009, 2010)* [A] *AN evaluation* [B] *HR evaluation* [C]	**Staffing** *Number and position For ANs: (M/F, Years experience)*	**Population** *Dispersion of population covered*	**Physical Conditions** *Services available* *Structural problems reported*
HP 1				
1 hour from HC in microbus (3-4x/day)	TE(100%, 100%, 100%) AN evaluation (NA) HR evaluation (87%)	2 ANs (M, 6 yrs, **F, 2 yrs**) 1 Educator, part-time	Concentrated in 2 communities, within 30 min. walking	Potable water Electricity Cellular signal
HP 2				
45 min. from HC in microbus (every 30 min.)+ 15 min. walking	TE(100%, 100%, 100%) AN evaluation (80%) HR evaluation (80%)	2 ANs (**F, 1.5 yrs**, M, 1yr) 1 Educator, part-time 1 Medical student	Disperse – covers 10 communities, most within 30 min, and farthest village 2 hours walking	Rainwater collected Electricity No cellular signal Leaking roof Wall damaged
HP 3				
15 min. from HC in bus (on main highway, frequent)	TE(100%, 100%, 91%) AN evaluation (81%) HR evaluation (80%)	2 ANs (F, 13 yrs, **F, 2 yrs**) 1 Educator 1 Medical student	Concentrated in 3 communities, all within 15 minutes walking	Potable water Electricity Cellular signal Leaking roof Wall damaged
HP 4				
30 min. from HC in microbus (every 30 min.)	TE(38%, 46%, 52%) AN evaluation (NA) HR evaluation (59%)	2 ANs (**M, 6 yrs**, F, 2 yrs) 1 Educator 1 Medical student	Concentrated in 1 community within 30 min walking	Rainwater collected Electricity Cellular signal
HP 5				
30 min. from HC in collective taxi (1-2x/day) or 3 hours walking	TE(68%, 48%, 74%) AN evaluation (61%) HR evaluation (NA)	1 AN (**M, 1 yr**) 1 Educator 1 Medical student	Disperse – covers 4 communities. Farthest village 1 hr 15 min walking	Potable water Electricity not connected Cellular signal nearby

HP=Health post, HC = Health center, TE=Technical efficiency, AN=Auxiliary nurse, HR=Human resources, NA=Not available. AN information in bold indicates who participated in the interview.

[A] Technical efficiency scores from Data Envelopment Analysis of secondary data from Regional Health Office

[B] Evaluation of Auxiliary Nurse Work Performance, implemented by Nursing Unit, Regional Health Office, 2009

[C] Evaluation of Personnel Performance, implemented by Human Resources Unit, Regional Health Office, 2009

The site visits were arranged by first contacting the district nurse supervisor and then the AN by telephone. The ANs were asked to arrange for community members who supported the health post to participate in an interview the day of the site visit. I conducted a total of 14 interviews, with one AN, one community group and one supervisor interview from each site. Only four supervisors were interviewed because two of the health posts (HP 3 and 5) shared a supervisor. The interviews lasted from 20 minutes to one hour. Open-ended questions were posed to supervisors and ANs about what supervision consisted of, how the activities of monitoring, individualized support and accompaniment were perceived to function, and how the activities influenced the ANs. In addition, the ANs were also asked about their motivation and perceptions of their work. I conducted community member group interviews with the assistance of hired interpreters. I asked about the ANs' relationship with the community and the nature of community involvement in supporting the health post. The ANs also provided me with access to the Register of Activities, records from supervisor visits, and correspondence received. Notes from the review of documents in the health post and other observations were recorded in field notes. I transcribed the interviews and organized the data collected by case prior to analysis.

Analysis consisted of three stages: writing case reports, examining patterns across cases and revision of the program theory. Case reports for each of the health posts provided a thorough case description and explored the relevance of the program theory for explaining the operation of supervision. To analyze the data for each case, an index of themes was developed based in the activities, mechanisms and outcomes described in the program theory, and characteristics of the actors and context. Themes were applied to interview transcripts using NVivo 8.0 software in order to organize the data from different sources and allow for triangulation. Information pertinent to the themes from field notes was labelled by hand. Analysis proceeded on a case- by-case basis, and the research team reviewed and discussed each case report as it was produced. Text from the case reports was sorted into the three categories of supervision activities (monitoring, individualized support, accompaniment) to facilitate examination of patterns across cases. Analysis at this stage focused on capturing patterns of similarity and variation in the implementation of each supervision activity and its outcomes, discerning the mechanisms underlying the activities that explain how they contributed to the different outcomes observed, and understanding the influence of context on the process of supervision and its outcomes.

Study 3: Concept mapping study

The concept mapping process involves the steps of generating ideas, structuring ideas through sorting and rating, representation in maps and interpreting the maps. Four idea generation sessions were held during scheduled meetings at the RHO and in the districts, where regional and district managers and health workers were gathered. In order to orient participants to the topic, results from previous studies were presented describing local challenges in health service delivery and AN characteristics that enabled them to confront difficult conditions. The purpose and process of the concept mapping study were explained, and they were asked to write three or more suggested actions in response to the following focus prompt statement:

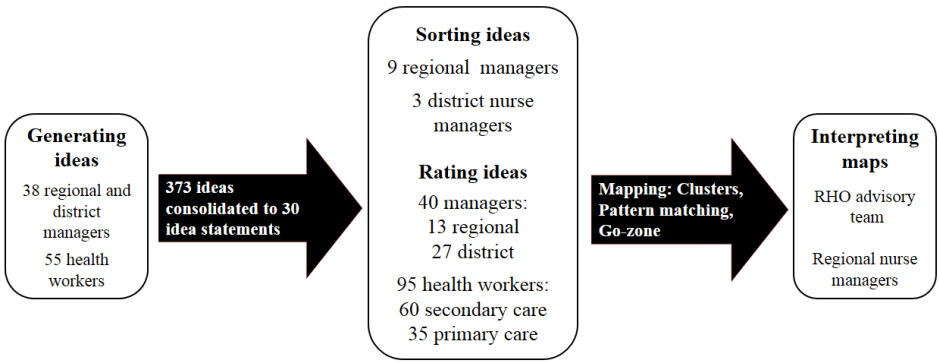
> *Name some actions that could be taken or are being taken to support and develop the performance of the nursing staff in the district health services.* [5]

In total, 93 persons contributed ideas of whom 38 were managers and 55 were health workers (see **Figure 9**). All 19 districts and four units of the RHO were represented among managers and 15 districts were represented among health workers. The ideas submitted were consolidated by combining repetitions, excluding statements that did not suggest an action, and then organizing the ideas by theme. The thematic consolidated list was discussed with managers from the Nursing and Human Resources Units at the RHO, and 30 action statements were formulated. We aimed to achieve a balance of full representation of the themes in the ideas generated and reaching a number of items that would be feasible to assess in the following step of rating.

The activities of sorting and rating capture participants' views on interrelationships among the ideas for action and their relative importance. Participants in sorting were approached individually in their work setting and provided with 30 cards with an action statement on each. They were asked to arrange the cards in groups that made sense to them and name the groups. The numbers of the actions composing the groups were recorded and elaborations on the logic of the organization were noted when provided. A total of 12 managers participated in sorting, and two units of the RHO and two districts were represented. The 30 actions were also used to create a rating sheet. Participants were asked to assess the importance of each action on a scale of one to five, where five represented great importance and high priority and one represented low importance and low priority. Representation of regional and district managers as well as primary and

[5] The description of the focus was named as nursing staff at this point due to finding in previous studies that ANs were seen as nurses in this setting.

Figure 9: Participation in the concept mapping process.



RHO = Regional health office

secondary care health workers in the rating sample was obtained through various means. Regional and district managers completed the ratings during a scheduled meeting at the RHO. Forty managers participated and all 19 districts and five units of the RHO were represented. District nurses, technical coordinators from the Program to Extend Coverage, and regional nurse managers assisted in data collection by administering the rating sheets to health workers in the districts. The sample included 95 health workers from 15 districts, of which 60 worked in secondary care and 35 in primary care. Participants in sorting and rating activities are shown in **Figure 9**.

The data gathered through sorting and rating was analyzed using concept mapping techniques to produce visual representations that synthesize the ideas and priorities of groups of actors (94). Analysis of the sorting data to produce cluster maps involves three steps: creating a similarity matrix that depicts the number of times pairs of action statements were grouped together, multi-dimensional scaling to configure the points on a bivariate plot based on their similarity, and hierarchical cluster analysis to aggregate statements that represent similar concepts into clusters (95). The most appropriate number of clusters was determined by examining the conceptual coherency of the statements grouped together at successive levels of clustering. Six clusters were identified and labels were selected from those suggested by participants in sorting. Dynamics in the priorities of managers and secondary and primary care workers were analyzed through comparison of role-stratified averages of the six clusters of actions and the 30 items. Go-zone maps are used to depict average importance ratings of individual action items by different groups on an X-Y bivariate plot, with the respective averages serving as

their x- and y-coordinates. The X-Y plot is divided into quadrants by lines crossing each axis at the mean importance score of all actions by the respective group so that items plotted in the top-right quadrant (the Go-zone) are those rated above average by both groups and represent points of consensus for action.

The final step of interpreting the maps is important for validating the results. Maps produced in the previous step were presented in a workshop for regional nursing supervisors and a meeting of the RHO advisory team, made up by heads of the units. In the workshop the participants worked in small groups to evaluate the clusters generated by the analysis, discussed connections among the clusters of actions, and shared their own experiences with actions to improve performance. After presentation of the maps in the RHO advisory team meeting, attendees reflected on the accuracy of the depiction of the dynamics across organizational levels and discussed factors influencing implementation of prioritized actions.

Ethical considerations

Engagement with key stakeholders at the RHO and the School of Nursing during the planning and implementation of each study was key to gaining access and developing institutional support for this research. Knowledge gained through this engagement helped ensure that local norms were recognized. There was no ethical review board in Alta Verapaz, and the biomedical ethics committee in Guatemala City only required ethical approval for studies involving clinical trials and experimentation with human subjects. Approval by the director of the RHO was needed to collect data from health system actors. Study protocols, including informed consent forms, were evaluated and approved for each study. Authorization of the studies was provided in the form of a letter of support, which was presented to district managers and study participants.

Engagement with the health workers and managers who provided data for this research was approached with respect for their work and their autonomous decision to participate. Health workers and managers have many demands on their time. Efforts were made to minimize interference with their work by conducting interviews after they had finished attending patients and other health facility responsibilities. Integration of data collection activities for the concept mapping study into scheduled meetings also facilitated participation with minimum interruption of other work. The letter of support from the director of the RHO facilitated access for conducting the studies, but could also potentially give the impression that participation was required. To ensure that the decision to participate was their own, managers and health workers were oriented to the purpose of the study, the intended use of results, what their participation would consist in,

the option to decline or withdraw from participation at any time and measures to protect confidentiality. Upon agreeing to participate, they were asked to sign an informed consent form and they were provided with a copy. All who were invited decided to participate in interviews, though there were a few managers who declined to participate in the concept mapping study.

Community interviews and observations of AN practice were used to gain insight into the social environment of health service delivery and the nature of their work. Initial contact with community members who participated in interviews was facilitated by the ANs. When participants were gathered and the interpreter was present, I explained the purpose of the study, the nature of the questions, how the information they provided would be used, and the option to decline or withdraw. Consent to participate and permission to record were obtained orally prior to beginning the interview. Permission to observe practice was obtained from the AN and the patients. No patient data was involved in this study, and information gathered through observations primarily focused on how the AN engaged in practice.

Communication of results to local stakeholders is an important ethical consideration. On re-establishing contact for each successive study, I disseminated reports in Spanish with the results of the previous study and got feedback through presentations in meetings with regional and district managers and with the faculty at the School of Nursing. These considerations provided the basis for development of mutual understanding which enhanced institutional support for the study, the quality of the research process and the trustworthiness of the results.

Results

This chapter presents findings from the three studies, organized by the functions of AN practice, supervision and organizational support depicted in the conceptual framework of this thesis. "Section 1: Auxiliary nurses in practice" draws on data collected through interviews with ANs in Studies 1 and 2. "Section 2: Supervisors in practice" is based on the analysis of health post supervision in Study 2 and presents some insights into secondary care supervision gained in Study 1. "Section 3: Organizational support for performance" presents the findings from Study 3.

Section 1: Auxiliary nurses in practice

Auxiliary nurses play a variety of roles in the delivery of primary and secondary care services. This section presents the values underlying ANs' orientation to their role and the influence of local conditions in shaping their relationships with patients and community in the enactment of their practice.

What are the values guiding AN practice?

The practice of ANs is oriented by their interpretation of the meaning and purpose of their work. Based on ANs' accounts of what they thought was important about their work, their motivation to pursue work in this field, and their sources of satisfaction, I gained insight into how they interpreted the meaning of their work. I found that ANs' approach to practice was guided by three interrelated values: community connectedness, nursing vocation and institutional goals.

Community connectedness

The connection to the community began with the high proportion of ANs working in Alta Verapaz who were from rural communities and belonged to the same ethnic group as the people they were serving. This was true of 17 of the 19 ANs who participated in Studies 1 and 2, and of the other two, one was non-indigenous and one was working with an indigenous group that was not his own.

The ANs identified with the population they served based on shared language

and ethnicity even though they often were not residents of the communities where they worked. They also identified with the communities because they had similar experiences with difficult access to health services and losing loved ones to preventable causes of death. Their experiences had led them to study to become an AN, and contributed to their sense of the importance of their work, even when they were not able to meet 100% of the needs. The following quotes illustrate how the ANs were guided to this career path by their connection with the needs of the community and how their capacity to address these needs was important in their personal identity.

> *"I wanted to study this because of the need. Those who worked here before were not from here... they neglected their work. They would leave on Thursday, come in late on Monday. That was how I decided to study this, and also to have a career, to be somebody in life"* (Participant 4, Primary care, Study 1)

> *"Two of my sisters died: one post-partum and one who was pregnant. Since we didn't know the warning signs, we just watched them there suffering for two or three days... Because we didn't have the knowledge at that time, my two sisters died. Thank God, with the achievement of studying this career, it is very important in life. (I am able to) support the communities"* (Participant 6, Primary care, Study 1)

Motivation to engage in the challenges of the AN role was based in the feeling that they need to help their people, as well as a sense of their unique value as local workers compared to health workers who come from outside.

Nursing vocation

The ANs also described that they were motivated to engage in this work based on their interest in healing, and their desire to work with people and be able to help them. Some had previous experience attending patients through work in small pharmacies, while others had accompanied relatives working in health, and they wanted to pursue training as an AN to increase their knowledge of illnesses and treatments. ANs also expressed that they valued their work because it is humanitarian and permits them to be a person who serves others. Through their work as ANs, they were in a position to contribute to saving lives, because:

> *"Nursing is a job focused on the people with the greatest needs, ... and as nurses we have to make an effort to support the people with the greatest needs, especially pregnant mothers and children, and help save lives"* (Participant 14, Secondary care, Study 1)

Nursing vocation was closely related to community connectedness for many of the ANs who saw the skills and knowledge of nursing as a means of realizing their desire to help their community.

Institutional goals

Many of the ANs described that they identified with the value of particular institutional goals guiding their work. The goal of preventing maternal mortality was particularly significant for the ANs, as they interpreted the importance of many of their activities based in their contribution to this goal. Gathering information about pregnant women from the traditional birth attendants, formation of emergency committees in communities, prenatal education about warning signs, monitoring during labor, and even family planning were seen as important based on the value of preventing maternal deaths. For some ANs in primary care, the delivery of immunization, growth monitoring, vitamin supplementation and other ministry programs was a meaningful aspect of their work that provided them with satisfaction.

> *"Our work is based in (coverage) goals and...it feels good when you obtain the results"* (Participant 5, Primary care, Study 1)

ANs in secondary care referenced adherence to guidelines in describing the importance of their work, particularly related to the Standards of Practice. These goals and guidelines seemed to provide a concrete base for feeling like they had done their job well.

How do these values shape their relationships in practice?

The main functions in AN practice are health promotion work in communities and attending the patients who arrive to health facilities. The nature of the relationships with the community and patients through these functions was shaped by the interaction between AN values and the conditions in the health system and community.

In community work

For primary care ANs, the model of service delivery required a great deal of support from the community. Attainment of coverage goals depended on volunteers who served as the ANs' link to the population by maintaining census information and gathering the people for immunization and growth monitoring visits. The traditional birth attendants helped them to identify and monitor the pregnant women. Local leaders' support was needed to coordinate community-based action to prevent maternal mortality, and the leaders' commitment to health goals

also contributed to greater acceptance of the services and health promotion messages, and facilitated organization of volunteers. ANs described how they actively sought to develop support through their relationships with leaders and volunteers by attending local meetings, good communication, and treating them well. The ANs' connectedness to the community provided the basis for these relationships through shared interest in the health of the families of the community as well as understanding of local needs and living situation.

When ANs' relationships with leaders and volunteers were working well, mutual engagement in efforts to improve health contributed to institutional goals and also helped reinforce their motivation to take action to confront challenges. This was demonstrated in several examples of collaborative initiatives with leaders to solicit funds and organize labor for improving the health facilities and addressing community-defined problems such as water availability. Community leaders expressed that the health promotion work that the primary care ANs carried out was valuable for educating people, and that they also shared and were working for the same goals of saving the lives of women and children. Primary care ANs described that they gained satisfaction from this recognition and the feeling that they had the communities' support.

> *"I like what I do, being in contact with the people. It makes me happy that the people like me, they know me, I have their support... Working with people in the communities, being able to help my people, that is why I feel satisfied"* (Participant 4, Primary care, Study 1)

While ANs were able to get the basic support needed to realize their functions in most cases, coordination of volunteers was often challenging and the level of mutual engagement with leaders varied.

The nature of the relationships developed between the ANs and the leaders and volunteers depended on the ANs' efforts, but were also shaped by conditions in the health system and community. From the health system side, one influential factor was the variable availability of incentives. Historically, community supporters were commonly provided with monetary incentives for fulfilling their role and when they participated in trainings. However, there were no longer funds allocated for this purpose in the primary care services provided through health posts and health centers. At the same time, the NGO providers in the PEC model followed their own incentive structure, which typically involved providing at least boots and flashlights for volunteers. This meant that the challenge of organizing support was increased by expectations regarding incentives, which ANs did not consistently have the resources to meet. ANs also cited the challenge

of arranging meetings due to the incompatibility of their own work schedules and those of leaders and volunteers, who were engaged in agricultural work during health facility hours. Efforts to develop relationships at the community level were largely invisible to managers, who had minimal contact with the primary care environment.

Circumstances in the communities also impacted the nature of relationships, and the level of mutual engagement from leaders and volunteers. The history of community organization and the status of relationships among the leaders were very influential in the manner in which they engaged in collaborative work with the AN. In some cases, engagement was enabled by leaders who were very active and had been working together for the community for many years. While in other cases, collaboration was not working well even locally due to history of local conflicts, such as land disputes, and disagreements among leaders. One AN described that, in his experience, some communities like to collaborate and others do not, depending on the nature of relationships existing in the community.

> *"Many times people [collaborate] because they like each other in the community - they have a relationship. What I have seen is that a community that is united, that gets along well, is also easy to work with. But in other communities where there are rivalries among leaders or the people hold hatred or resentment, it is difficult to work with them"* (AN, HP 4, Study 2).

Traditional gender norms in the rural communities also influenced the nature of relationships between ANs and community collaborators. Leadership roles were held by males, volunteers responsible for the census were typically males and traditional birth attendants were typically females. Among primary care ANs, there tended to be more males than females, due in part to the challenges of travelling in remote areas alone as a woman. Generally it was easier for male ANs to gain recognition and collaborate with community leaders, while the female primary care ANs were more likely to work with the traditional birth attendants. There were examples of female ANs responsible coordinating collaboration with leaders and male volunteers in Alta Verapaz, but there were none among participants in this study.

In attending patients

In both primary and secondary care facilities, ANs attended patients who arrived to seek preventive as well as curative care. While in some cases ANs played a supporting role to professionals or medical students, they were also often alone and they were the ones seeing patients. In describing their manner of approaching the responsibility of attending patients, ANs referenced nursing principles that

guided their actions. Attending patients with kindness and respect were repeatedly named as important aspects of their work, and good communication was seen as the key to establishing trust and showing that they cared. This attention to the relationship with the patient was described as part of providing "nursing care." Listening to the patient in order to be able to understand and meet their needs were at the core of their approach to care. One AN explained that vocation was needed to be able to fulfill this role, and attentiveness to patient needs and intentional listening were important tools in her work.

> *"You have to have vocation for this... because to attend someone you have to listen and attend to what they need... There are times when people don't just need medicine or to be examined. Sometimes they need you to listen to them. This is when they realize that they can trust you"* (AN, HP 2, Study 2)

The ANs' connectedness to the community was also reflected in the way they approached the work of attending patients. Understanding of patients' language and living situation was also seen as important to be able to attend patients well. Language was central to patients' need to be heard and ANs' capacity to listen, because the majority of rural villagers have very limited knowledge of Spanish. A sense of shared identity also provided a basis for their attention to relationships with patients, as illustrated in the following quote:

> Interviewer: *"Based in your experience until now, do you think you would like to continue working here?"*
> AN: *"Yes, especially since it's my people. I need to help them, because they know me and I know them. I think there is more trust between us than with another person who comes in... So I need to help my people"* (Participant 7, Secondary Care, Study 1)

They expressed that their common language and culture facilitated their efforts to achieve good communication and help patients understand health education messages and home care instructions. In some health centers, understanding of the situation of rural villagers who had to travel long distances to reach the facility also guided the routine for passing patients to consultation. They recounted how they gave priority to the rural villagers by seeing them before lunch, even when people from the town were insisting they needed to be attended quickly. Their capacity to provide care with respect, kindness and good communication was seen as especially important by secondary care ANs, in part because it was something they had control over even when facing other constraints. However, their relationships with patients often did not offer the same opportunities for reinforcement of their motivation and satisfaction as the ones experienced by

primary care workers.

Interviews at the community level provided some general insights into patient perceptions of health services staffed by ANs. Many of the community participants acknowledged that they appreciated being attended in their own language and felt they were treated with respect. However, they more strongly expressed their discontent with health services due to the lack of medicines. Some community members expressed dissatisfaction specifically with the way they were treated when being sent home from the health center due to being in an early stage of labor.

Confronting patients' dissatisfaction played a prominent role in ANs' experience of attending patients. ANs empathized with the frustration patients felt when receiving a prescription instead of medicine, and they also lamented that the lack of resources greatly limited their capacity to resolve patient problems. ANs also described times they took initiative to confront resource constraints by using their own money to purchase small items for patients or the work setting or by travelling to the Regional Health Office to try to obtain supplies. However, they generally felt they had little capacity to overcome the resource constraints because these were a result of structural problems at higher levels. They also expressed that frequent delays in payment of their wages did not allow them to provide more assistance to patients personally, because they were also struggling to make ends meet.

While ANs' accounts of their own approach to attending patients reflected the influence of their values in their work, they also expressed that there were other ANs who treated their work as a job rather than a vocation and were not interested in the well-being of the patients. Some ANs working in primary care services indicated that the patients who they referred to the health center or the hospital for deliveries were not treated well. Managers often named lack of vocation as a prominent issue contributing to low motivation. This disconnect between ANs' accounts of their approach to care and perceptions of ANs' lack of vocation may be explained by in part by the eventual demotivating impact of not being able to satisfy patient expectations and meet their needs due to resource constraints.

Increasing demands of paperwork on their time was also frequently named as a health system condition that prevented them from attending patients as they would like, and ANs expressed that they often ended up attending more to the papers than the patients. They recognized that the ministry had good reasons for introducing new protocols and documentation requirements, but felt that little consideration was given to the human requirements for fulfilling these standards

and that implementation could be in tension with attending patients well.

> *"Those who are sitting at desks at the top say 'this paper, the auxiliary will do it, and this one and this other one.' But has anyone paid attention to how much time it takes to do it all? How much can we do? We are human beings and we have limits... Registries are important... If it is in the chart it is for a good reason. I don't deny it... But there is not enough staff. We rush to attend to the papers and we don't manage to give quality care"* (AN, HP 4, Study 2)

Section 2: Supervisors in practice

Supervision is a function of the health system intended to support the performance of ANs. The program theory formulated to explain local understanding of supervision's function focused on the mechanisms of how the activities were intended to influence AN motivation. However, findings from health post cases indicated that the implementation and impact of supervision activities were shaped by the supervisors' interpretation of their role, as well as the social environment of the health system. I gained insight into the values underlying supervisors' interpretation of their role based in how they saw the purpose of their actions in relation to the health system and the health worker. Examination of the supervisors' actions and interests from the perspectives of supervisors and ANs provided further insight into how their values shaped their practice and their relationships with ANs.

What values orient supervisors in their role?

The health post supervisors who participated in Study 2 were professional nurses with many years of experience in varying roles in the regional health system. Their first language was Spanish, and three of the four had a good command of the local indigenous language. Variation across the health post cases indicated two tendencies in supervisors' orientations to the purpose of their role in relation to the health system and the health worker: managerial control and humanized support.

Managerial control

Supervisors whose approach was characterized by managerial control had a strong orientation to the value and importance of ensuring health programs were implemented according to ministry guidelines and standards. These guidelines and standards provided a framework for evaluating completion of institutional goals. Supervisors felt that the purpose of their work was to orient, motivate and equip ANs to meet these standards. One supervisor illustrated the prominence of institutional goals in her interpretation of her role as she named "reaching the percentage of the coverage indicators that the ministry asks for" as the benefit that ANs received from supervision (Supervisor, HP 3 & 5, Study 2).

Their approach to supervision was also shaped by their view of the ANs, who were seen to have the "human tendency to neglect certain areas of their work" (Supervisor, HP 3 & 5, Study 2). Supervisors expressed that deficits in health post performance were due to lack of motivation among the ANs. They felt their purpose in relation to the ANs was to keep them focused on completing their responsibilities, because if there was no supervision the ANs would stop doing many things that would affect implementation of the health programs. In this sense, it seemed that the supervisors valued the ANs primarily as a means to attaining institutional goals and their relationship to them was through their role as a manager who helped keep them in line with these goals.

Humanized support

The approach of humanized support was seen in one health post case where the supervisor held a different interpretation of her role in relation to the health system and the health worker. Even while this supervisor was also checking on the same framework of standards required by the ministry, she expressed that the desired outcome of supervision was to contribute to better care for patients. This orientation to a broader health system goal reflected an underlying value of nursing vocation, which guided her actions as a supervisor.

In this approach, the supervisor's view of the AN was also distinguished by a more empathetic orientation to the ANs' experience of their work. She acknowledged that "the truth is, their work is hard and they are often alone." Her interpretation of her role in relation to the AN indicated that insight into their well-being was essential for providing support:

> *"Remember that sometimes, since we are human beings, anything can happen to us. Even if we are close by, if we don't know how they are we can't support them"* (Supervisor, HP 1, Study 2)

The idea that you cannot support someone if you do not know how they are reflected that she viewed her function as more than a means of correcting deficits in the health post work activities. Rather, her focus was on supporting the person performing the work activities.

How do these values shape relationships with ANs in practice?

The orientations of managerial control and humanized support were identified in Study 2 based in cases of health post supervision. I found indications of both tendencies in secondary care ANs' accounts of management approaches in health centers. The actions of supervisors and managers who were guided by these two

orientations could be characterized as standards-centered and people-centered, and AN perceptions of the support they received through these approaches provided insight into their influence on the relationship. These approaches also reflected influences of the institutional environment of the health system.

Standards-centered approach to supervision

The supervisors' focus in monitoring served to orient the AN to the priorities that they valued. Monitoring was carried out through monthly district meetings, visits to the health posts, observations in the health center, and revision of reports and documentation. These activities provided a structure for regular contact with the ANs, as well as a means of checking on the physical state of the facility, inventory of medicines and supplies, completion of paperwork, progress towards coverage goals and production of services. The criteria used to evaluate the ANs' work in these areas were basically the same for all supervisors and managers because they are established by the guidelines of the ministry. While this focus in monitoring was common across all settings, in standards-centered practice these criteria formed the base of the supervisors' and managers' relationship to the AN. In this sense, they viewed the ANs' work through the lens of the criteria of the ministry's standards, and the aspects they observed and their communication with the ANs reinforced the importance of fulfilling these criteria. In primary care, much of their interaction revolved around attaining coverage goals. Correct documentation and maintaining an orderly appearance in the facility were prominent in both primary and secondary care settings.

The information gathered through monitoring regarding these criteria guided the actions that supervisors and managers took to support the ANs to improve their performance. ANs were encouraged to develop action plans to improve coverage when indicators were deficient. Supervisors helped them generate strategies and sometimes assisted in carrying out actions such as vaccination sweeps. Documentation of patient care, inventories and reports for the different programs was an area that required a great deal of support in both health posts and health centers, particularly for recent graduates. Managers and supervisors helped orient ANs to the requirements on a one-on-one basis and also through district-level trainings. ANs were encouraged to maintain order in their files and work stations, and supervisors would sometimes help them procure folders or other materials to aid in organization.

The priorities communicated through standard-centered practice were reflected in the ANs' own priorities. They knew what aspects of their work were evaluated and this guided how they conducted and thought about their work. They ac-

knowledged that the support they received helped them to do their job better and they gained confidence and satisfaction from improving their skills and meeting goals. However, they also experienced the standard-centered focus on completion of monitoring criteria as a source of pressure and felt that supervision "falls into the error of only seeing the bad" (Participant 8, Secondary care, Study 1). One AN described:

> *"They tell you, I need this report on this day... And that day you have to see how you are going to get it done... And if you don't turn it in on time, they start reprimanding you"* (AN, HP 4, Study 2)

The ANs felt that other aspects of their work were not visible to the supervisors. They expressed that that the full scope of their work and efforts to keep up with the demands of the people were not recognized, which is illustrated in the following quote:

> *"[The supervisor] doesn't work with us. She doesn't realize what we do... She thinks that we don't do anything, when we are really putting ourselves out to make sure that everything [at the health post] is okay... Here the people are the ones who demand the most from us because they need us"* (AN, HP 2, Study 2)

The prominent AN perception that supervisors only saw the bad and think they don't do anything reflected how the supervisors' view of the AN as having a tendency to neglect influenced the ANs' experience of the relationship.

The institutional environment of the health system played an important role in shaping the nature of relationships between actors in the roles of AN and supervisor. The ANs' efforts and the supervisors' attention were coordinated and directed towards ministry standards by the routines and structural features of the institutional environment that facilitate monitoring and evaluation of district health system performance. Thus their personal encounters took shape around the presentations of the number of services delivered and the percentage of population coverage obtained for different services at monthly district meetings, and turning in and reviewing reports on medicine and supply inventory, census and epidemiological data, and service production.

Accompanying the ANs in practice in the health posts and health centers was also widely acknowledged as a function of the supervisor role, intended to provide space for working beside the AN and making them feel supported. However, supervisors had many responsibilities that prevented them from dedicating the time they should to make monthly visits to the health posts. Even in the health

centers, where ANs and supervisors worked in close proximity, other demands took priority over spending time to help the ANs improve in their practice. While the institutional environment promoted recognition of the importance of accompanying ANs, in the end the measurable criteria were most often prioritized because they provided the grounds for assessing health system performance.

People-centered approach to supervision

Actions guided by the humanized support approach to supervision observed in one health post case contributed to a more people-centered approach, which was seen in the focus of actions carried out to support the AN. The health post supervisor's orientation to the goal of better care for patients was evident in her description of the kinds of problems that she assisted the ANs to resolve. Examples of support revolved around uncertainties about patient cases, following-up on malnourished children, and obtaining medicines. Actions included reviewing patient records, accompanying the ANs on home visits to see patients and trying to procure medicines for cases the AN was concerned about at the district hospital. Even in cases characterized by standards-centered practice, some ANs recalled times their supervisors had supported them by going to visit a patient, but these actions were not described by supervisors as part of their contribution.

People-centered practice was also distinguished in the level of personal engagement in understanding the ANs' situation and resolving issues detected. The supervisor emphasized that through monitoring she found out about the ANs' assessment of their needs, and then tried to address them.

> *"[Through monitoring] I find out how they are, what they are missing, what they need, how they want us to help them, or any problem they may have...If I can solve it, then I do so right away. If not, then I find out who can help them resolve their problems"* (Supervisor, HP 1, Study 2)

Though the orientation of managers and supervisors was not directly studied in the secondary care setting, the ANs and district manager in one health center described management actions that were more people-centered. The approach of encouraging team work among the ANs in the different divisions of the health center was described by one AN as "teaching us to work in harmony," to ensure that patients' needs were met at each step of their visit (Participant 10, Secondary care, Study 1). Working in harmony also included being able to fill the roles of colleagues in their absence in order to ensure that patients' needs were attended, such as providing a tuberculosis patient with his medicine when the AN in charge of the tuberculosis program was off-duty. The district manager described that, due to the shortage of professionals, he tried to help the ANs improve their clinical

skills by attending patient consults with them and orienting them to diagnosis of classes of disease and their treatment. Management's focus on improving patient care was reflected in the ANs' view of what their supervisors valued. One AN in this health center reported that her supervisors put most emphasis on deliveries and family planning, because of their importance for preventing maternal deaths. This contrasted with ANs' perceptions of management priorities in health centers with a more standard-centered approach. One AN stated that her supervisor was most concerned with seeing if they were filling in the labor monitoring form correctly, documenting procedures for avoiding medication errors, and maintaining the medicine inventory in order. While these issues are also relevant for the quality of patient care, in the absence of a broader vision of their purpose, they generated a different quality of interaction.

Focus on broader health system goals of improving patient care and health outcomes, combined with attention to ANs' needs and active engagement in problem solving formed an integral basis for development of a supportive interpersonal relationship that enabled the AN's motivation and ability to perform. The management's orientation towards better patient care fortified their own interpretation of the importance of their work in attending patient needs, which was central to their motivation, and enabled them to improve their capabilities in ways they valued. The supervisors' personal engagement in taking actions to help the ANs with their needs was reflected in the ANs' satisfaction with "learning many things" (Participant 11, Secondary care, Study 1) and examples of their own initiatives to resolve problems, including soliciting resources for the health post from the palm oil company and a local NGO. The nature of the relationship with the AN generated through this approach was seen in the ANs' perception that their supervisors were not like "those who come to give orders," rather they came to see what the ANs were doing and support them (Participant 10, Secondary care, Study 1). They were also unique in feeling that their supervisors valued their work. The AN in HP1 described that she felt valued because the supervisor recognized their efforts in patient care and complimented them on how they handled their many roles.

The orientation and actions of these managers and supervisors indicated that the demands of fulfilling standard criteria were not the only frames of reference present in the institutional environment. Even while they participated in the same standard-centered routines, their interpretation of priorities encompassed a broader view of patient care. Accompanying the ANs in practice and making them feel supported was facilitated because their interpersonal relationship took shape around attunement to the ANs' needs and the shared value of improving patient care.

Section 3. Organizational support for performance

The regional health system is made up of groups of actors with dynamic views on how to support the performance of ANs. The results of Studies 1 and 2 revealed values that contributed to ANs' motivation in their work and shaped the nature of relationships between ANs, the community, patients and their supervisors in practice. In Study 3, these results were presented to health workers and managers from different districts and levels of the regional health system, in order to gain insight into their perceptions of actions needed to fortify positive tendencies and support ANs' performance. Interpretation of the ideas for action generated and their evaluation of thematic areas and priorities indicated that the language and logic of a people-centered approach to supporting performance were present in this setting.

Diverse ideas for action

The range of actions suggested for supporting ANs reflected recognition of the interconnection of their performance with other actors in the health system. The consolidated list of 30 actions (**Table 5**) included actions aimed at the ANs themselves as well as managers, and community supporters. Direct actions for supporting ANs included accompanying them and being receptive when they ask for help (item 24), and providing training on sensitivity in human relations as well as the standards of practice and ministry programs (item 16, 11). There were suggestions aimed at supporting district managers, such as accompanying them in problem-solving and improving their ability to use information in decision-making (item 3, 5). Examples of support at the community-level focused on communication and coordination with leaders and training for volunteers (items 8, 14). The inclusion of actions focused on the people who compose the ANs' work environment highlighted their understanding that health workers' performance is influenced by the people around them. Suggestions to promote support for managers and communities indicated their perception that better addressing their needs and interests also contributed to ANs' capacity to perform.

Centrality of relationships across levels

The nature of relationships across hierarchical levels of the health system was identified as a cross-cutting issue that was central to performance. Regional nurse managers, who participated in the interpretation of the concept mapping findings, expressed that relationships between patients and ANs, ANs and district managers, and district managers and regional managers operate in a chain reaction. They described that the satisfaction of the patient begins with the ANs' sense of well-being, which is influenced by their relationship to their managers. Treating

Table 5: Action items organized by clusters and their average rating scores

Action items organized by cluster		Average rating
Tools to orient work		
1	Provide orientation and induction for new employees	4.32
2	Promote monitoring of quality of care	4.26
3	Accompany the districts - do not just point out problems, rather understand and support them	4.11
4	More supervision of work at the community level including suggestions on how to work better in the communities	4.09
5	Fortify district managers' capacity to utilize information to guide decision-making	4.02
6	Personalized orientation to humanitarian aims of work - not just productivity	3.91
7	Provide guidelines for implementation of monitoring for employees at the district level	3.80
Communication and coordination		
8	Improve communication with community leaders and the community so that we work as a team with better coordination	4.17
9	Promote team work by delegating responsibilities and authority, and recognizing the importance of the contribution of all	4.15
10	Accompaniment from district and regional management in some community meetings to promote trust in the services	3.95
Skills development		
11	Trainings in the standards of practice and programs of the Ministry	4.45
12	Continuing education meetings in the districts with themes that respond to detected needs	4.12
13	Promote the use of technology to facilitate communication and efficient use of information	4.00
14	Fortify trainings for community team with support from the district and educational materials	3.97
15	Classes in Q'eqchi/Poqomchi for personnel who are not proficient in the local language	3.97
Professional development		
16	Sensitivity trainings for personnel on empathy, trust and respectful treatment to promote good human relations	4.29
17	Facilitate support to continue studies with permissions from the regional health office	4.11
18	Strengthen training in vocation in the local nursing school	4.06
19	Opportunities for development through short courses	4.05
20	Develop nursing forums where nursing leaders share their vision and accomplishments to promote identification with the profession	3.56
Organizational climate of support		
21	Negotiate for the timely payment of monthly wages	4.56
22	Treat personnel with respect – do not speak to them in a derogatory way and value the psycho-social human being	4.53
23	Promote climate of trust and mutual support through positive leadership at all levels	4.06
24	Accompany nursing personnel: be attentive to their needs, resolve their doubts, and be receptive when they ask for help	4.01
25	Recognize and support the actions carried out at the local level to obtain resources, develop projects and coordinate transport	4.00
Motivation through recognition		
26	Recognize positive aspects like dedication, quality of service and connection to the population	4.15
27	Recognition of actions that contributed to a saved life	4.13
28	Management should recognize our work through verbal and written congratulations	3.98
29	Recreational activities with personnel to promote better interpersonal relationships	3.84
30	Recognize an employee of the month with a certificate	3.62

personnel with respect, valuing their psycho-social well-being, being attentive to their needs and recognizing their contributions were actions that helped ANs feel good in their work (items 22, 24, 26, 27, 28). In the same way, district managers' sense of well-being is shaped by their relationships to regional managers through the way they are treated and the nature of the support they receive to perform their role (items 3, 6). The regional nurse managers pointed out that because the nature of relationships operates in a chain reaction, it was possible to improve patients' satisfaction by modelling respectful treatment and responsive support at the top level of the regional health system.

Importance of organizational climate and other domains of action

Analysis of the sorting data indicated six thematic domains of actions which captured different forms of support that contribute to performance: *Tools to orient work, Communication and coordination, Skills development, Professional development, Organizational climate of support, and Motivation through recognition*. The cluster map based on grouping of related action items is shown in **Figure 10**. Among these forms of support, the actions in the theme *Organizational climate of support* were seen as most important for improving the performance of ANs by both health workers and managers who participated in rating. Within this theme, there were actions that contributed to a positive environment of working relationships (items 22, 23, 24) and actions to resolve problems which serve as responsive feedback, reinforcing that the workers' needs are understood and considered important (items 21, 24, 25). It is particularly noteworthy that the action rated most highly overall was to *"Negotiate for timely payment of wages"*. This finding indicated that responsiveness to health workers' needs should begin with efforts to alleviate the unfairness of the burden placed on them and their families of working without payment for months at a time.

The importance of an *Organizational climate of support* was also confirmed in the interpretation of results based in its interrelationship with other clusters. They perceived that the environment of working relationships would shape the way actions in the cluster *Tools for orienting work*, such as induction for new employees and monitoring, were implemented and their impact. The provision of opportunities for *Skills development* and *Professional development* in line with the needs detected would demonstrate responsiveness and contribute to an *Organizational climate of support*.

Dynamics in perceived importance of support for community work

Comparison of the rating of individual actions by the sub-groups of primary and secondary care health workers and managers provided insight into dynamics in

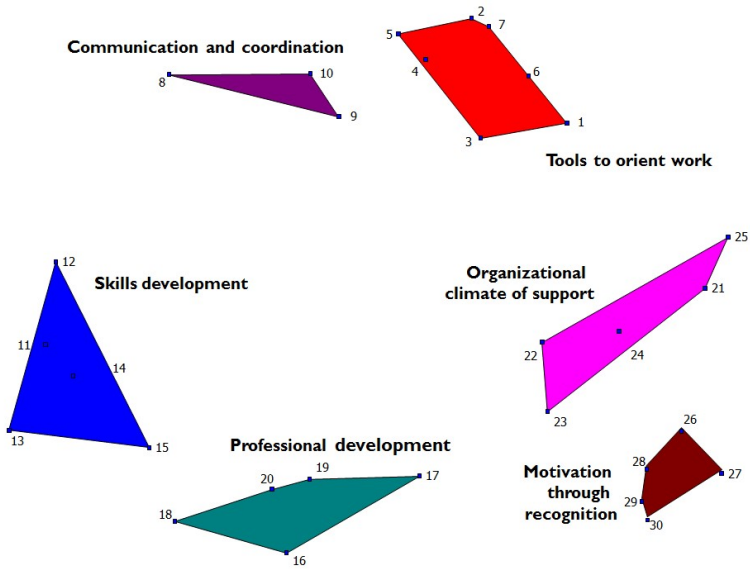
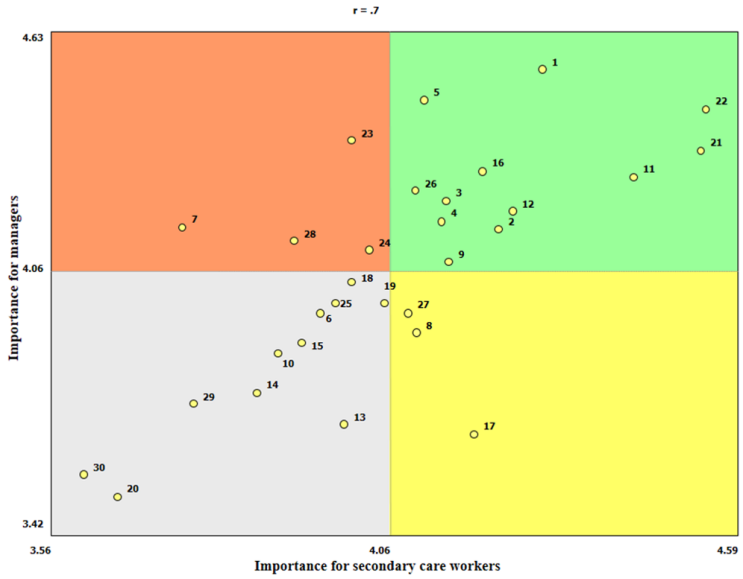
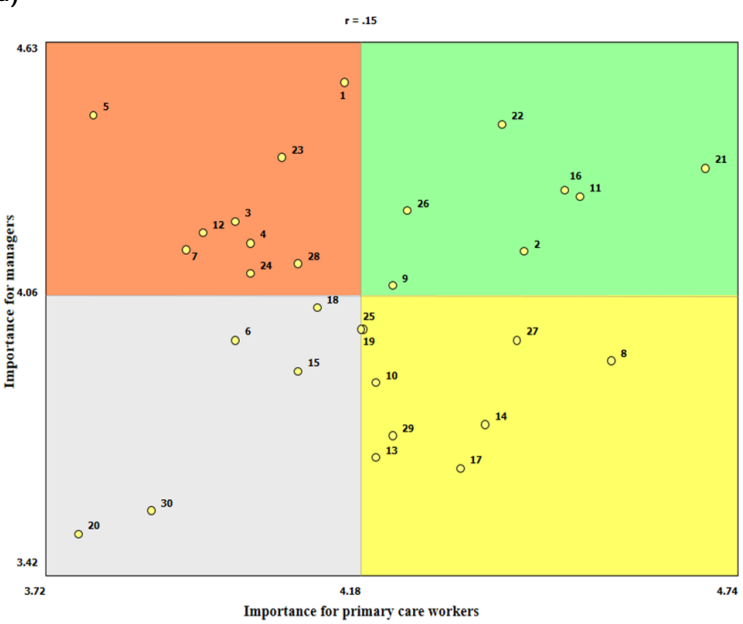


Figure 10: Cluster map. Numbers on the points correspond to items in list of actions. Proximity of points in the map reflects the frequency with which items were grouped together in the sorting exercise.

the kinds of support most valued in this context. While the inclusion of suggested actions focused on the community level reflected recognition of community supporters' contribution to performance, these actions were not highly valued by managers. The Go-zone maps (**Figure 11**) show actions that were given above average ratings by both managers and the indicated sub-groups of health workers in the upper right quadrant. Comparison of **Figure 11a** an **Figure 11b** indicates that the majority of actions that were highly valued by secondary care workers were also rated highly by managers. However, many of the actions that primary care workers considered important, particularly for supporting performance at the community level (items 8, 14, 10), were less valued by managers. The similarity of the interests of managers with those of secondary care workers may be expected since managers are mostly based in the secondary care work environment, while primary care is developed in coordination with remote communities with limited direct supervision. However, this finding also reflected that strengthening collaboration with the community was outside the scope of managers' interests and as such, was not a high institutional priority.



(a)



(b)

Figure 11: Go-zone maps a. Importance rating of items by secondary care workers (X-axis value) and managers (Y-axis value) b. Importance rating of items by primary care workers (X-axis value) and managers (Y-axis value)

Discussion

This thesis examined the role of software elements in enabling health worker performance among ANs in a rural department of Guatemala. Discussion of the main findings reflecting the role of values and relationships in AN practice and supervision, and local actors' ideas about organizational support are presented below.

Values orienting auxiliary nurses to local needs

The ANs' work was strongly oriented by values of community connectedness and nursing vocation, which were reflected in the importance they placed on understanding the needs of patients and communities. My findings provided a generally more positive portrayal of ANs' orientation to their work than other studies of the experiences of health workers in LMIC settings, which highlight how poor working conditions contribute to frustration and dissatisfaction (29, 96, 97). However, it is important to note that the ANs are not perfect, and feelings of frustration with challenging conditions, including lack of medicines, wage delays and difficulty coordinating with leaders also played a significant role in their experience. I lifted up the ANs' orientation to these values as an important finding because their commitment to addressing the needs of vulnerable communities was a social resource that provided them with a base for confronting challenging conditions. Their description of coping with challenges through greater attention to the principles of nursing care in the patient relationship and building collaborative relationships with community leaders indicate that these points of human interconnection are an important focal point for enabling performance.

Limitations of standard-centered supervision

The dominant standards-centered approach to supervision did not recognize or build on ANs' social resources. Instead supervision activities mainly functioned to orient ANs to attaining the targets and filling in the reports used to monitor implementation of ministry health programs. Their approach reflected the institutional priorities that had been operationalized through frameworks of criteria

and organizational routines for assessing them, such as monthly district meetings. Standardization is a strategy that has been widely applied in LMIC health systems because it provides a base for delegating health care tasks to non-professional health workers, and a means of monitoring the efficiency of service provision to meet the requirements of international agencies involved in financing (98). ANs' responses to standards-centered supervision were not entirely negative, as they did feel they received support to fulfill the criteria used to evaluate their work. However, they also felt that the full scope of their work in meeting the demands of the people was not recognized or valued, and that supervisors tended to only see the bad. This echoes sentiments expressed by other health workers in LMIC settings who note the unfairness of reducing the complexity of their working time to numerical outputs (99), and who predominantly experience supervision as a fault-finding inspection (16, 96, 100). The failure of standardized procedures to account for human dimensions of care provision was also reflected by the lack of concern for the time demands on the health worker of filling in increasing amounts of paperwork and the impact on their capacity to attend to the patients.

Potential of people-centered supervision: Building on professional values

In the people-centered approach, the supervisor's orientation to helping the ANs to carry out their work in a way that allows patients to get better care reflected that she was guided by her professional values as a nurse. Her attentiveness to the ANs' well-being and to their own perceptions of their needs also paralleled the nature of the interpersonal relationship that forms the basis for nursing practice (101, 102). This way of seeing the "other" strongly contrasts with the view of the AN as having the tendency to neglect their work, which was the basis for the supervisory relationship oriented to aligning the AN with the institutional standards. The empathetic view of the AN as a human being with a hard job provided the base for a people-centered approach, which involved shared orientation to patient care issues and responsive feedback to AN problems, and the result was seen in the AN's sense that the supervisor valued her work.

This approach closely resembles recommendations for supportive supervision, which emphasize that joint problem resolution, constructive feedback, and promotion of quality patient care are more conducive to improving health worker performance than facility inspection and control of service statistics (6, 103). However, even though policy documents in many LMICs reflect a move from traditional to supportive supervision, studies indicate that implementation is complicated by hierarchical top-down organizational culture and lack of managerial skills (104-106).

This thesis showed that nursing principles provided a complementary and locally-relevant framework for enhancing the supportive nature of the supervisory relationship. Even in cases characterized by a standard-centered approach, supervisors acknowledged the importance of accompanying ANs in their work and ANs gave examples of receiving support with patient cases. Professional ethos for improving patient care and recognition of the importance of accompaniment represent local social resources that can be built on to promote integration of attention to standards with a more holistic view of the AN and their work.

Local priority for supporting performance: Strengthen organizational relationships

This thesis also provided insight into local health system actors' ideas about how to support AN performance. The diverse ideas generated reflected that the kinds of action needed to enhance performance encompass technical and social aspects of ANs' work, as well as support for managers and community volunteers who make up their work environment. Organizational climate was rated as the most important domain of action for supporting performance by both managers and health workers. The concept of organizational climate has been defined as "the atmosphere that employees perceive is created in their organization by [management] practices" (107). Health workers' desires for a more supportive organizational environment, and the association between organizational climate and health workers' satisfaction in their job have been documented previously in LMIC settings (16, 100, 108, 109). System actors' participation in generating the ideas and interpreting the domains of action in the maps provided additional insight into how a supportive organizational climate is conceptualized in locally meaningful language. Important qualities included: a positive psycho-social environment where workers are treated with respect, attention to their well-being and not just their working patterns, and responsive feedback to their needs. The strategic importance of organizational climate was also confirmed by the interpretation that the nature of relationships across levels was the core, cross-cutting issue in supporting performance, because relationships operate in a "chain reaction". This interpretation reflects the common sense understanding that how you are treated affects how you treat others, but it also captures how organizational behavior in a social system is fundamentally shaped by human interactions and relationships (39, 45).

The relevance of managerial focus on relationships for strengthening performance is born out theoretically and by evidence from high-income countries. The understanding of health systems as social systems indicates that the behavior of a system is as much a function of the qualities of its interconnections as the qualities of its

components. This understanding draws attention to the nature of relationships as both an outcome of interest and a mechanism for achieving outcomes (39, 110). Focus on management of relationships and relationship building has been promoted as an approach to improving the quality of health care work environment, strengthening health workers' perception of organizational support and their commitment to organizational goals (110, 111). Nursing research from high-income countries has shown that leadership practices oriented to understanding employees, building trust and responding to employee concerns contribute to better outcomes in job satisfaction, productivity and effectiveness than task-oriented leadership practices (111). Examples of successful efforts to develop organizational environments that empower nurses and strengthen their commitment to relationship-centered care in North American hospitals have demonstrated the relevance of nursing theory for guiding administrative and management changes (112-115). Though there is very little research from LMIC health systems on approaches that contribute to an organizational climate of support, one study of a well-performing hospital has highlighted the role of positive reciprocal relationships between management and health workers in increasing organizational commitment (116).

The contrast between the actions prioritized by primary care workers and managers was also an important finding in this thesis. Managers' rating scores indicated that they considered that actions to support community work were among the least important for supporting AN performance. This finding was supported by evidence from Studies 1 and 2 which indicated that the primary care ANs' work at the community level was largely invisible to managers. Specific actions valued by primary care workers, such as improved communication with local leaders, training for the team of volunteers and accompaniment by managers in some community meetings, echo recommendations from other studies that point to the importance of strengthening support for the worker-community interface (117, 118). Institutional support at this level is relevant for enhancing the relationship between the health system and the community and supporting the development of health promotion activities that are responsive to community needs.

I have drawn attention to the findings from Study 3 that revealed how local health system actors in Alta Verapaz conceptualized and prioritized the need for actions to strengthen organizational relationships. This is in line with my focus on understanding local interpretations of the role of software elements in shaping the performance process. However, I also acknowledge that both managers and health workers placed high importance on the need to support performance through development of ANs' skills. The potential of organizational support to enable AN performance also critically depends on active engagement by actors at all levels of

the health system to ensure that necessary medicines, equipment and supplies are available and that workers' human need for timely payment of wages is met.

People-centered orientation to relationships: Critical resource for enabling performance

The three studies of this thesis were focused on different levels of the regional health system, and each provided insight into the role of relationships in the performance process. Across the three levels of AN practice, supervision and organizational support, there was evidence of a people-centered orientation to relationships that consisted in attention to the well-being of the other and responsiveness to their needs. This orientation resonates with the focus on the whole person and their role in guiding the support provided that is at the heart of primary health care and people-centered care (74, 75). While the importance of this orientation is most often considered at the level of health worker practice, this thesis indicated that it is also relevant for strengthening the manner in which the health system supports and enables health worker performance through supervision and management practice.

Methodological considerations

Strengths of the research project

A major strength of this research was the combination of methods, which were chosen because they were well-suited for studying social dynamics in complex systems. In addition, the order in which they were employed allowed each study to build on understandings gained in the previous one. The first exploratory study permitted contact with ANs, managers and communities in various districts of Alta Verapaz. The use of interviews and observation provided rich insight into different perspectives on health system function, which was valuable for developing an integrated view of local dynamics in ways of thinking about AN practice, performance expectations and existing support mechanisms. The combination of realist evaluation and multiple case studies in the second study provided a structured approach for examining the operation of health post supervision, driven by the program theory's tentative explanation of the mechanisms through which it was intended to influence AN motivation to perform. This approach was useful for understanding the nature of the interconnection between the AN and the supervisor because the program theory provided grounds for gathering data and comparing their perspectives on specific aspects of their shared experience. The participatory multi-step process of the concept mapping study provided a path for involving diverse groups of system actors in generating, structuring and interpreting ideas for supporting AN performance. This method provided the op-

portunity to present results of first two studies and directly involve potential users in interpreting and conceptualizing how these results could be applied. The resulting maps offered a complex view of local understanding of what organizational support should consist in and what kinds are most needed.

Another strength of this research was that I was able to achieve a high level of stakeholder engagement in deciding the focus of the studies and the interpretation of the results within the time constraints of the field work visits. This contributed to the validity of the findings and their potential utilization. However, it was difficult to assess the extent to which the results may have influenced practice, as there were many priorities and demands competing for health system actors' attention. This research made a contribution to raising the status of "support for auxiliary nurses" among those priorities, and planting and disseminating ideas about what that support could look like. Longer field work periods and opportunity for follow-up visits for each study would have provided greater opportunity to assess the impact on practice and strengthen the research in this regard.

Conducting interviews as a cultural outsider

In the first two studies, data was collected primarily through interviews. Important considerations for obtaining data that accurately reflects the phenomenon of interest from the perspective of participants include establishing rapport and ensuring mutual understanding (86). As a cultural outsider in the research setting, these considerations were especially important as participants may question the researcher's presence and be hesitant to speak openly. Explanation of the motivation and purpose of the study, and being respectful of their working time facilitated establishing rapport with the supervisors and ANs, and the ANs particularly expressed appreciation of the attention to their practice. My background as a nurse and previous experience with nursing professionals in Guatemala also helped me gain the trust of both supervisors and ANs. I conducted the interviews in Spanish, which is my second language and was the second language of most ANs and the first language of supervisors. It is possible that language barriers may have limited full comprehension of each other's meaning in posing and answering questions, and I may have missed opportunities to probe nuances in their responses in the moment. However, the transcripts of the interviews reflected that responses were in line with the questions and the dynamics in the data indicated that our mutual comprehension was sufficient to obtain insight into nuances of their experiences and perspectives. In the case of the community interviews, I was able to obtain information that provided me with some insight into their views, but the data obtained was more superficial compared to the other groups of

participants. This difference reflected that I faced greater challenges in establishing mutual understanding. To gain richer insight into the communities' perspective, a more prolonged engagement with their social environment would enable me to better understand their situation as well as their views.

Trustworthiness of the analysis

Analysis of qualitative data is an interpretive process. While objectivity is not possible, transparency about decisions made and reflexivity about the influence the researcher's predispositions enable the reader to assess the trustworthiness of the interpretations offered (119, 120). The first exploratory study provided a wealth of data and offered different directions for analyzing what influences AN performance. My choice to focus on their values and relationships was based on my feeling that it was more useful for generating change to understand what was behind their coping strategies than to focus on the emotional effects of constraints, which were also present in the data. It is also possible that they framed their interpretations of their work in a more positive manner than they would in other circumstances due to the manner in which I communicated my consideration of the importance of their role in the health system when explaining the rationale of the study. However, the questions posed regarding their views on their work were open-ended, and the ANs interviewed in different districts consistently brought forward similar themes suggesting that these ways of thinking were present in the setting. My focus on identifying ways to enable the ANs' performance may have also limited my ability to perceive evidence to support the view of many supervisors and managers that the main performance problem in the districts was that ANs were unmotivated. It is possible that more contact with the practice environment of secondary care ANs would have provided me with a different view of their approach to practice. However, the insight obtained into perspectives of both supervisors and ANs allowed me to observe that the important issue was not which side's interpretation was correct. Instead, it seemed that the disconnect between their interpretations was an important point of entry for understanding social dynamics of the work environment.

The trustworthiness of the interpretative process was also enhanced by iterative rounds of analysis and discussion with the other members of the research team, and feedback from stakeholders in Guatemala. The other members of research team are fluent in Spanish and familiar with the Latin American context, so it was possible to maintain the data in its original language during the analysis process. In addition, they also have extensive experience in qualitative thematic analysis and research on health systems and health workers in other LMIC contexts. Discussions with the research team provided the opportunity to get critical input on

the fit of the interpretation with the data and also to reflect on how the patterns detected compared with other Latin American contexts. Presentation of the findings with various groups of local stakeholders and one-on-one discussions with ANs and other health system actors allowed me to get feedback from individuals who were familiar with the local situation. These discussions and feedback helped ensure that the interpretations offered were not mine alone, but were true to the data and reflective of reality in the context.

Facilitating the concept mapping process and interpreting results

The collection of data for Study 3 was based in the specified steps of the concept mapping process. Application of this method to explore the views of regional health system actors in an LMIC setting required considerable innovation and adaptation, which involved some trade-offs in the full intended participatory nature of the process. Concept mapping is typically carried out over a series of workshops or using an internet platform (121, 122), and neither of these options was feasible in this setting due to the time demand of convening health system actors from various districts and the challenge of coordinating internet access. Broad participation of managers and health workers from different districts was obtained in the first step of idea generation by taking advantage of planned gatherings of actors. It was possible to obtain managers' participation in rating by visiting their monthly meeting at the RHO. However, gatherings of health workers from the districts were more sporadic. Health worker participation in rating was facilitated within the time constraints of the field work visit by having managers assist in administration in the districts. This may have led health workers to feel pressured to participate or may have made them less inclined to report their true views. This means of administration also implied variation in the way the instructions for the rating survey were explained. When orienting the managers, I emphasized that participation should be voluntary and that participants should be encouraged to try to use all the numbers in rating, and to consider the importance of the items relative to each other. Despite these efforts, there was a relatively low range of variation in the rating, which might reflect that participants had a hard time assigning low priority to the suggested actions. This is a fairly common occurrence in this stage of concept mapping (95). Overall average ratings ranged from 3.56 to 4.56 based on a scale of one to five. Comparison of stratified average ratings showed differences in managers' and health workers' views of priorities. However, the differences were small and should be interpreted with caution.

Interpretation sessions involved two groups of regional managers: the RHO advisory team and the nursing managers. The various forms of concept maps provided a concrete base for discussion of directions for strengthening organizational sup-

port for AN performance and reflection on how to address the interests of different groups. Feedback from regional managers confirmed that the findings captured the "feeling" of the regional health system, and reflected dynamics that they perceived but were not documented. In the interpretation session with the nursing managers, we also evaluated the appropriateness of the divisions and names of the thematic clusters and discussed the relationships among the themes based in the cluster map. The possibility to involve participants in this level of interpretation is a unique strength of concept mapping compared to other qualitative methods, such as focus groups and interviews, where the researcher identifies and interprets the themes in participant data (123).

It is important to acknowledge that the results of the concept mapping study also reflect the influence of my own presentation of results from previous studies prior to the brainstorming sessions. The range of suggestions indicated that participants were not limited by the ideas presented, but it should be kept in mind when interpreting the results.

Limitations and directions for further development

A significant weakness of this research project was the limited insight provided into the perspectives of patients and community members. As depicted in the conceptual framework, their perspectives are clearly needed to gain an integrated and holistic view of the local health system. In particular, my understanding of how ANs applied their values in relationships could be greatly enhanced by richer community level data reflecting patient experience of the responsiveness of care, and leaders' and volunteers' experience of collaboration with ANs.

The decision to focus on ANs in both primary and secondary care provided me with a broader view of their role in rural health services, but there were limitations in the representation of these levels. Field work involved more contact with the practice environment of primary than secondary care ANs, and the results are more reflective of their reality. However, the understanding of the primary care ANs' experience could also be refined through greater attention to the differences in the health post compared to the NGO-managed PEC model. Insight into the function of management and supervision at the secondary care level could be enhanced through more extensive observation of the routines of service delivery, interactions among health center staff and the activities of district managers. These observations could provide a base for designing a multiple case study of health center management, similar to Study 2.

Study 2 employed a realist evaluation approach, and these results could be strengthened through follow-up efforts to more fully address the method's focus

on the relationships between context, mechanism, and outcome. In this study, I gained understanding of two mechanisms of supervision, and I identified influential contextual factors that were not specified in the original program theory. Repeated contact with these health post cases, and others that share the same supervisor, would be useful to identify more clearly what outcomes in the AN performance process can be expected as well as the manner in which local contextual factors influence the different supervision mechanisms. New findings could be used to refine the program theory, and then test its relevance for understanding supervision in additional cases.

Involvement of local actors in the co-production of knowledge about their organizational context was the greatest strength of Study 3, but there are several ways in which the participatory nature of the process could be improved. As it was, this study most strongly incorporated the participation of regional managers in defining the focus, consolidating the actions to be included, sorting them into groups and interpreting the findings. Negotiation of the consolidated list of actions would have ideally involved representation from health workers and district managers to ensure that ideas representing their interests were included. Recruitment of participants for the sorting exercise could also have been expanded to include health workers. Comparison of health workers' ways of grouping the actions may have provided insight into important differences in their view of the operation of organizational support. The most important improvement would be to involve health workers and district managers in the interpretation of the results, by conducting additional interpretation sessions. And finally, to better understand and support the translation of the findings of this study to practice I would follow-up with regional managers regarding efforts to develop an organizational climate of support at the regional and district levels and to implement other actions to support performance.

Conclusions

Implications for enabling the performance of nurses in rural Guatemala

Based on the findings of this thesis, I have identified three paths of action that would contribute to enabling the performance of ANs. Though my focus has been on the performance of ANs, these paths of action are also more broadly relevant to strengthening the capacity of the nursing workforce to address the health needs of vulnerable communities in rural Guatemala.

Operationalize holistic performance goals

The first path to enabling performance is to develop a more holistic understanding of performance goals in the regional health system, particularly at the levels of district and regional management. At the national level, the ministry's goal of ensuring that Guatemalans receive comprehensive health services with quality and care, dignity, humanism, and cultural relevance, offered with equity by competent providers is upheld by the Standards of Care and the Health Code (124, 125). While this goal exists on paper, I observed that the means of supporting its achievement were not operationalized in the institutional standards and routines guiding the dominant approach to supervision and management. Establishing additional monitoring parameters and routines, including community-level monitoring, can help to direct more systematic focus to issues related to quality of care, patient satisfaction and accountability to community needs. However, there is also a need for attention to development of the values base that sustains the delivery of service with quality and care, dignity, humanism and cultural relevance. This thesis gave voice to ANs' orientations to their work through the values frames of community connectedness and nursing vocation which are relevant to sustaining realization of more holistic performance goals. These frames can be built on to foster dialogue about and commitment to an organizational sense of purpose that goes beyond standards to encompass quality and care.

Promote a people-centered approach to management

The second path of action is to promote a people-centered approach to supervision and management in the regional health system. The results of this thesis indicated tendencies and logic of people-centered approaches that already exist in this setting, and these reflect professional values which can be built on to enhance the support provided to ANs. These values can provide a base for balancing focus on the administrative demands of monitoring and reporting with attention to improving care for patients though supervision. Explicit focus on modeling the relationship qualities of attentiveness to the well-being of the other and responsiveness to their needs in management practice can contribute to the realization of these qualities in AN practice with patients and communities. These qualities are at the core of health care that is oriented to understanding and responding to people's needs as they perceive them. The potential of people-centered care to empower patients and communities as active agents in the management of their health is also a relevant justification for prioritizing integration of this approach in organizational relationships, in order to empower health system actors to be agents of change (75). Developing an organizational climate that promotes supportive relationships is important not only for enabling the performance of ANs, but also of managers and supervisors who confront constraints and institutional demands that inhibit their own motivation to exert effort and make changes to improve health service delivery.

Strengthen managerial support for community work

The third path to enabling AN performance is to strengthen managerial support for community-level work. National health policy specifies that "organized communities that prioritize actions for health promotion and prevention" are the functional base for comprehensive health care (125). In my interactions with regional health system actors, I found that the importance of community involvement in health promotion was widely recognized in principle. However, responsibility for developing collaboration with communities rested on the shoulders of the ANs, and managers and supervisors gave very little attention to the operational aspects. The results of this thesis indicated that ANs' sense of connectedness to rural indigenous communities was a valuable resource in this work, but they also faced on-going challenges in organizing support. Managers can help enable performance at this level by first being more attentive to ANs' perceptions of the social environment of their work and their efforts to engage with community leaders and volunteers. Creating a platform for ANs to learn from each other's experiences and increasing managers' direct engagement with community leaders and volunteers would further enhance organizational support and provide opportunity for strengthening

relationships among system actors.

Summary of contribution

In this thesis, I aimed to contribute knowledge relevant for strengthening organizational support for health workers in low resources settings. Through the research conducted, I have demonstrated an approach that combined exploratory, theory-driven and participatory methods to deepen understanding of the organizational reality of a local health system. The tools employed allowed me to recognize patterns in the operation of software elements and identify context-specific social resources that can be built on to enable health worker performance. This approach is highly relevant for engaging system actors in the development of bottom-up solutions to strengthen the organizational processes that support performance in other LMIC health system contexts.

This thesis has provided rich insight into the social environment of front-line health worker practice in rural Guatemala. The patterns of values, constraints and institutional standards shaping their relationships with patients, communities and managers may resemble the practice environment of other LMIC settings. Recommended actions to enable health worker performance through operationalizing holistic goals, promoting people-centered management and enhancing managers' connection to communities can also be relevant for strengthening support for health workers in similar conditions. These actions are particularly relevant as practical points of focus for strategic efforts to develop the software elements that orient and sustain health workers in the delivery of people-centered care. This thesis identified promotion of an organizational climate of person-oriented, responsive relationships across hierarchical levels as an important and locally meaningful approach to generating support and enabling the performance of health workers in this setting.

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A person can find anything if he takes the time, that is, if he can afford to look. And while he's looking, he's free, and he finds things he never expected.

A Summer Book – Tove Jansson

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