“Predictors of service integration by *Estratégia Saúde da Família* (FHS; Family Health Strategy) transdisciplinary health teams in Brazil’s *Sistema Único de Saúde* (UHS; Unified Health System)”

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Abstract

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Background: Integration of social services (e.g., civil registration, community mobilization) with public health and primary care has been recommended as a key strategy by practitioners, researchers and policy-makers to solve the multifactorial determinants of chronic diseases. Despite efforts to increase service integration in the past 50 years, there is limited evidence on effective approaches to integrating myriad services. This study investigated the influence of individual- and organizational-level factors, and job characteristics on service integration using 262 providers from the Estratégia Saúde da Família teams. Brazil’s Sistema Único de Saúde is acknowledged worldwide as a model for studying integration as FHS transdisciplinary teams, which comprise of Community Health Agents (in Portuguese, Agentes Comunitário de Saúde or ACS), nurses, and physicians, are mandated to integrate services.

Methods: Cross sectional data were collected from 168 ACS, 62 nurses and 32 physicians in Mesquita and Santa Luzia. Service integration was measured by three services: HIV prevention, community mobilization, and civil registration. HIV prevention refers to biomedical interventions that prevent the spread of HIV by blocking infection (e.g., condoms), decreasing infectiousness (e.g., antiretroviral therapy), or reducing acquisition/infection risk (e.g., medical male circumcision). Community mobilization is the participation of citizens in activities, such as community walks, geared towards understanding their sociopolitical environment. Civil registration is the documentation of deaths, births and household information. Multiple logistic regression analysis and Structural Equation Modeling (SEM) were used to identify salient job
characteristics, individual- and organizational-level factors associated with the three measures of service integration and service integration in itself. Individual factors were measured by providers’ confidence, knowledge and skills, community familiarity, perseverance, and efficacy of the FHS team. Job characteristics were measured by transdisciplinary collaboration, provider’s autonomy in making decisions, skill variety (ability to use a set of diverse skills); and consumer-input. Organizational factors were measured by work conditions and resources.

Results: Majority of participants were ACS (64%); 24% nurses; and 12% physicians. Of the sample, 82% were females (n =214). The highest proportion of participants identified as pardo (multiracial; n= 123; 46%); 82 (31%) as white; and 54 (21%) as black or Afro-descent. The mean age was 34 (SD = 10); ranging from 20 to 70 years. Results from the multiple logistic regression indicated that pardo providers, ACS, providers with a caseload of more than 500 usuária (service consumers), reported greater perseverance, and less work methods autonomy had greater odds of offering HIV prevention services. Providers with higher levels of knowledge and skills, greater confidence and skill variety had greater odds of engaging in civil registration. Providers who identified as pardo, had less than 5 years or 5 years of work experience with the FHS, reported higher levels of knowledge and skills and greater skill variety had greater odds of mobilizing communities. Providers with experience of 5 years or more reported more service integration. After accounting for all variables, community mobilization, HIV prevention, and civil registration were strongly correlated. The following variables positively influenced service integration: higher levels of knowledge and skills; greater discretion by the job to use a variety of skills, confidence, and perseverance. Greater work-methods autonomy and decision-making autonomy were negatively associated with service integration. No organizational-level factors influenced service integration.
Conclusions: This dissertation initiates a conversation in the literature on a framework to studying service integration. Provider trainings globally should incorporate activities that enhance providers’ confidence, perseverance, knowledge and skills, and ability to make decisions on the spot use diverse skills while integrating services. While Brazil’s FHS program endorses transdisciplinary collaboration as a process for providers to integrate services, transdisciplinary collaboration was not significant predictor. Greater research needs to be designed and implemented in collaboration with providers to assess their perceptions of transdisciplinary collaboration. Research going forward also needs to be conducted on how organizational level factors impact service integration.
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Chapter 1: Introduction

Background to service integration

Globally, underrepresented groups, such as ethnic/racial groups and sexual minorities lacking social and/or economic resources, often have higher incidences of chronic diseases, such as HIV/AIDS (Dean & Fenton, 2010). Individual risk behaviors arise within the context of wider social and structural determinants, such as the physical, familial, cultural, organizational, economic, legal, or policy aspects of the environment in which they live (Dean & Fenton, 2010; Herman, 2011). Given the ubiquity and severity of chronic diseases such as HIV, there has been a shift in emphasis within international discourse and policy-making from individualized approaches to disease prevention, to approaches that take key structural determinants of vulnerability and resilience into account (Auerbach, Parkhurst, & Cáceres, 2011; Bruner, Waite, & Davey, 2011; Ogden, Gupta, Fisherc, & Warnerd, 2011; Pinto, da Silva, & Soriano, 2012).

Practitioners, researchers and policy-makers from Joint United Nations Programme on HIV/AIDS (UNAIDS) and World Health Organization (WHO) advocate for countries worldwide to support collaboration across the health and social sectors. As a means to support the incidence of chronic disease such as HIV/AIDS, Diabetes, Hypertension, Tuberculosis (TB), etc., professionals worldwide ought to be supported and mandated to integrate social services (taking structural vulnerabilities of service consumers into account) with disease prevention (Kanste, Halme, & Perälä, 2013; Pinto, da Silva, et al., 2012).

Service integration of social services with disease management has become a long-standing theme in social and health care ever since the Declaration of Alma-Ata at the International Conference on Primary Health Care (PHC) in 1978 (Clark, Moreland, Greaves, Greaves, & Jolley, 2013). At this conference, global policy makers urgently encouraged
governments to protect and promote the health of all individuals vis-à-vis health service systems (Valentijn, Schepman, Opheij, & Bruijnzeels, 2013). PHC was based on principles of equity, social justice, and community participation (Baatiema, Skovdal, Rifkin, & Campbell, 2013).

Despite the revolutionary spirit of the Alma Ata Declaration three decades ago (Paim, Travassos, Almeida, Bahia, & Macinko, 2011), global health systems continue to be dominated by biomedical experts whose medical/technical solutions to health issues deny community members opportunities to appropriate solutions that apply to their local realities (Steiner, Aquino, & Fenton, 2013). Moreover, there is a fragmented supply of health and social services due to segmentation, specialization, and differentiation between the health and social sectors (Valentijn et al., 2013). This is because health and social systems are typically structured to address specialized niches of care, based on the education and on-the-job training professionals receive. For instance, health care professionals (nurses, physicians, dentists, anesthesiologists, physical therapists, etc.) are trained to identify and treat clinical symptoms, prescribe medications, and engage in prevention of infections and transmissions to others. Conversely, social professionals (social workers, outreach workers, mental health counselors, substance abuse counselors, etc.) are educated to focus on ecological issues such as mental health, nutrition, family planning, housing, food provision, and educational needs of consumers (Hudson, 2002). Between the health and welfare/social camps there is a deep division of labor based on health and social professional trainings. The diversity in expertise could underpin the workings of teamwork with the belief of professionals that their expertise could be sufficient to deal with consumer care. The reality is that populations have complex conditions that require the integration of medical and experiential expertise of professionals to address their myriad social and health needs.

As envisioned in the Declaration of Alma-Ata, PHC has four goals: a) to be the first
contact between users and health professionals, b) guarantee continued services, c) ensure timely and comprehensive care and, d) coordinate with other levels of the health network to protect, restore and rehabilitate the health of the individual, family and community (Valentijn et al., 2013). The purpose of coordinating care with the community is to have medical decisions rooted in the needs and health characteristics of myriad populations (Valentijn et al., 2013).

The first goal of PHC is to direct service consumers to appropriate sources of care within an adequate timeframe by being the first point of contact for care (Van Lerberghe, 2008). To achieve this goal, a number of countries (such as Pakistan, Brazil, Ethiopia Mozambique, Uganda, Bangladesh, Thailand, Haiti) since the Alma-Ata have implemented the Community Health Worker (CHW) Program (Kim, Farmer, & Porter, 2013). Although referred to with many titles, CHWs globally are often members of their own communities, by whom they are selected by and to whom they are answerable. They are supported by the health system but not necessarily a part of its organization by not being paid, and receive less training than medical professionals (Haines et al., 2007). CHWs are the PHC professionals that offer the first contact of care to consumers. They connect health and social care services to underserved communities, and help contextualize PHC in their communities through their experiential knowledge.

Experiential knowledge is defined as the professional’s awareness in community’s culture, traditions, beliefs, language, lifestyles, and sociopolitical events (Herman, 2011). A detailed discussion of CHWs’ roles, their utility and the context of PHC teams will be presented in Chapter 2. While this discussion will be rooted in a general overview of CHWs worldwide, special emphasis will be placed on CHWs in Brazil who are referred to as Community Health Agents (in Portuguese, *Agentes Comunitário de Saúde* or ACS), given that this study is based in Brazil.
Continued care, another goal of PHC, means that service consumers should receive regular clinical testing and counseling over time. Concurrently, PHC professionals should maintain continual relationships with service consumers by knowing and understanding them, showing concern and interest, and taking the time to listen and explain issues pertaining to their needs (Rabkin & El-Sadr, 2011). Comprehensive care, the third goal of PHC, refers to an array of services tailored to the changing needs and situations of the population served (Van Lerberghe, 2008). These services include curative, rehabilitative, social and supportive care, as well as health promotion and disease prevention. Coordination of care, the last goal of PHC, means that professionals ought to combine structures, processes and techniques to fit the needs of consumers’ populations across the continuum of care (Valentijn et al., 2013).

**Scientific curiosity for developing this dissertation**

My practice work as a program coordinator over two years at a public health research institute in Karachi, Pakistan, led me to witness that medical professionals diagnosis and treatment plans often do not correspond to consumers lived realities. For instance, during the my visits to households in impoverished communities, I took note of ecological conditions as impacting consumers health, such as the lack of sanitation, open sewers, and garbage thrown in front of houses where children played. Besides being malnourished, children were at risk for severe diarrhea, malaria, and respiratory infections as a result of these living conditions. Moreover, in conversing with household members, it became evident that their contact with PHC professionals was limited; they did not have access to testing for or prevention of diseases such as HIV and TB, nor to nutritional counseling. Many service consumers did not have a National Identity Card (NIC) or a birth certificate that could prove that they were citizens of Pakistan. Without establishing this, many individuals were neither eligible for free medical care nor for
social benefits, such as free food rations.

Those that did access a PHC professional - on account of a diagnosis such as TB - needed to travel many hours back and forth to visit a physician and refill prescriptions. Lack of funds to purchase medications added to the cost of transportation, and prevented consumers from complying with medication. Failure to comply with a treatment plan specifically for TB, poses a risk of transmission to family members. It was apparent to me that the medical professionals needed to communicate frequently with community-based stakeholders to learn how disease care and prevention activities and treatment plans need to be congruent with the grassroots needs.

Needless to say, I visited an atypical community in rural Sindh, Pakistan in which leaders mobilized community members to practice preventive care. The leaders did have training on basic medical care and held frequent community meetings to publicize emerging health risks, such as dengue in the monsoon season. They engaged in role-play to teach members about the importance of using repellents and mosquito nets to prevent dengue. In the absence of trained physicians and nurses, this initiative had the potential to save lives. The need to involve community members in identifying and resolving challenges related to the community’s health conditions became apparent. Moreover, I realized the need for culturally appropriate counseling to provide information on disease prevention, including access to testing and healthcare that would take into account cultural norms and languages spoken, especially given that Pakistan is home to seventeen ethnic groups, each of which speaks a different language.

**Objective of the study**

Against the aforementioned professional background and considering the lack of literature studying collaborative practices between social and medical professionals and community members, this study initiates a conversation on how different professionals partake in
a community-based model of service delivery with the goal of providing comprehensive care. Specifically, this study’s objective is to offer a framework to investigate system-level complexities, job characteristics and individual factors of professionals as predicting service integration of HIV prevention with social services – civil registration and community mobilization.

**Overview of the study**

This study uses *Brazil Estratégia de Saúde da Família* (FHS; Family Health Program) as a case example to understand facilitators to service integration as offered by myriad professionals. *Brazil’s Sistema Único de Saúde* (UHS; Unified Health System) is a model for studying service integration, as it is the only national system that has institutionalized the integration of health and social services according to Brazil’s 1988 federal constitution and the 1990 *Lei Orgânica da Saúde* (Organic Health Law) (Paim et al., 2011). These laws mandate that the FHS offer free, universal PHC through a decentralized health system. The FHS employs transdisciplinary health teams, each comprised of a physician, a nurse, 2-3 nurse auxiliaries and four to six Community Health Agents (*Agentes Comunitários de Saúde* or ACS), providing social and health care to approximately 800 - 1,000 families, representing some 4,000 people within each given geographic area (Bhutta, Lassi, Pariyo, & Huicho, 2010). Transdisciplinary collaboration is characterized by professionals working side-by-side, incorporating diverse knowledge and solutions to health and social-related issues in a way that transcends individual disciplinary perspectives. It is the optimal team structure for seeking consensus and facilitating collaboration (D’Amour, Ferrada-Videla, San Martin Rodriguez, & Beaulieu, 2005; Kilgore & Langford, 2009). Noteworthy to mention is that depending upon municipalities funding, their FHS teams may include specialized medical professionals, psychologists, occupational and
physical therapists and dentists. In this dissertation, medical and social providers are referred to as medical and social professionals to reflect the terms used in the Brazilian National Health Policy. Collectively, the FHS teams provide PHC to over 60 million Brazilians (Paim et al., 2011).
Chapter 2: Literature Review

Overview of this chapter

This chapter will provide an overview of the existing literature on: (i) definitions of service integration, so as to provide a workable definition of service integration as used in this study; (ii) measures of service integration under study, including HIV prevention services, community mobilization (which entails a discussion of CHW programs worldwide), and civil registration; and (iii) key concepts that explain how demographics, job context, individual-level, job characteristics, and organizational-level factors influence service integration. Within the discussion of organizational-level factors, the structure of Brazil’s SUS and reasons for studying it will be discussed.

Definitions of service integration in the literature

Despite significant efforts to increase the integration of health and social services globally for the past 30 years, there has been limited and contradictory evidence on determining best practices for service integration (Guerrero, Aarons, & Palinkas, 2014). The primary reason for this is the lack of a consensual definition of ‘integration’ (Howarth & Haigh, 2007). Recent empirical studies consider integration to be polymorphous, as different disciplines understand the term differently (Shigayeva, Atun, McKee, & Coker, 2010). There is a wealth of terminology that speaks to service integration, such as integrated care, integrated services, horizontal programs, case management, continuity of care, coordinated care, managed care, comprehensive care, patient-centered care, and seamless care, to name a few (Shigayeva et al., 2010). These terms vary as per discipline.

In the health care literature, service integration is referred to as ‘managed care’ when services for consumers, particularly older adults, are integrated based on individuals’
diseases/medical conditions (Stange & Ferrer, 2009). Social scientists speak of service integration as related to ‘person-centered care’. They recognize that diseases are simultaneously medical, psychological and social problems. Hence, they view consumers as co-creators in a care process in which common ground is located between medical opinions and consumer preferences and needs (Valentijn et al., 2013).

In organizational behavioral literature, integration has been viewed as the mechanism by which finance, and management modalities are combined to coordinate the efforts of professionals belonging within and between health and social sectors (Shortell, Gillies, & Anderson, 1994). Integration of systems or within social and health departments can be achieved through two means - horizontal and vertical (Axelsson & Axelsson, 2006). Vertical integration refers to a management hierarchy in which decisions are made at the top and implemented at lower levels. Horizontal integration refers to a decentralized management where professionals within different departments or systems work together and are accountable to each other for actions taken for consumer care (Axelsson & Axelsson, 2006). A detailed discussion of how Brazil’s Sistema Único de Saúde (Unified Health System) facilitates horizontal integration within the Estratégia de Saúde da Família (FHS; Family Health Program) team members will follow.

**Definition of service integration in this study**

In combining the above viewpoints on integration, service integration is defined for the purposes of this study as: a distinct pattern of service delivery that involves the coordinated behaviors of different professionals who offer multiple, related services to populations at risk for multiple comorbidities under one health care system (Steiner et al., 2013). It is not necessarily that all professionals perform all three services (HIV prevention services, community
mobilization, and civil registration) but that they combine their expertise and skills and consult one another periodically to offer either one of the three services or a combination of the services. In this study, the service professionals under discussion are physicians, nurses, and ACS. The services discussed here include HIV prevention and social services - e.g., community mobilization and civil registration. Figure 1 gives pictorial representation on how service integration is defined for this study.

**Figure 1: Definition of Service Integration (SI) as offered by ACS, nurses, and physicians**

**Definition of three measures used to explain service integration in this study:** HIV prevention in this study is defined as teaching consumers to block HIV infection (e.g., with male and female condoms), decrease its infectiousness (e.g., with antiretroviral therapy), and reduce acquisition/infection risk (e.g., with voluntary medical male circumcision) (HIV/AIDS, 2010). According to the National Standards for HIV prevention, the FHS teams in Brazil are expected to
teach/prevent/ counsel: usuária (service consumers/patients in Brazil) on the importance of HIV testing; educate usuária on how to get tested; provide counseling pre- and post the HIV testing; design health campaigns to clarify myths on HIV/AIDS; distribute condoms and teach usuária on how to use condoms; and educate communities on safe needle-exchange practices (Brazil Ministry of Health, 2006; Miranda, Figueiredo, McFarland, Schmidt, & Page, 2011; Okie, 2006).

Social services enable consumers and their families to manage the psychological/behavioral and social aspects of illness to promote better health (Institute of Medicine of the National Academies, 2008, p. 2). Examples of social services include: counseling services that offer emotional support to usuária; assisting usuária to navigate community resources; registering households with the state so usuária can access public services; making referrals to other professionals; child and senior welfare services; and mobilizing usuária to take ownership of issues within their community by having them identify their needs and strategize solutions accordingly.

Among the numerous social services that professionals offer/facilitate, this study will focus on two: a) community mobilization, defined as the promotion of community dialogues to have usuária collectively question and resolve challenges related to the community’s social and health conditions (Lippman et al., 2013); and b) civil registration, defined as the registration of births, marriages, divorce and deaths with the state and the monitoring of health care diagnosis and follow-ups made by the professionals (Axelsson & Axelsson, 2006; Bruner et al., 2011; Pinto, da Silva, et al., 2012; Rabkin & El-Sadr, 2011; Valentijn et al., 2013).

**HIV Prevention Services**: Individuals are at risk for HIV transmission through intimate human relations, such as unprotected sex, sharing of needles, or from mother to
child through pregnancy, birth or breastfeeding (Howarth et al., 2013). HIV/AIDS worldwide is concentrated in marginalized social groups, underscoring associations between macro-social inequalities, community living arrangements, and interpersonal interactions. Brazil is home to one-third of the world’s HIV-positive Latin American, with the highest transmission rates seen among individuals with low educational attainment and those who face economic inequalities (Greco & Simao, 2007; Renesto, Falbo, Souza, & Vasconcelos, 2014).

By 2011 there had been 608,230 AIDS cases in Brazil, including those still alive (Brazil Ministry of Health, 2011). In 2010, 34,218 cases were reported, a rate of 17.9 cases per 100,000 inhabitants (Brazil Ministry of Health, 2011). From 2000-2010, incidences of HIV by region increased in the South (27.1% to 28.8%), North (7% to 20.6%), Midwest (13.9% to 15.7%), and Northeast (7.1% to 12.6%) (Brazil Ministry of Health, 2011). The prevalence of AIDS amongst those infected is greatest among men and women 25 - 49 years of age. Of the total number of infections, 83.1% women and 42.4% men are infected by heterosexual contact, and 22% of men have been infected due to homosexual contact (Brazil Ministry of Health, 2011; Miranda et al., 2011; Okie, 2006). By 2011 210,000 women were infected with HIV/AIDS in Brazil, with the an upward trend for women in the Southern, Northern, and Northeastern regions, where socio-economic disparities are prominent (Renesto et al., 2014).

FHS teams have been instrumental in launching Brazil’s aggressive and proactive preventive mechanisms to reduce HIV rates and risk-taking behaviors. The strategies employed by FHS teams have been discussed in the definition of HIV prevention, above. In spite of a collaborative team model employed by the Brazilian health system, HIV prevalence has remained at a rate of 0.6% since 2004, but it is estimated that only one-third of HIV-positive
Brazilians are aware of their status (Dourado, Veras, Barreira, & Brito, 2006). Moreover, although free HIV testing is available, only 20% of those sexually active have been tested for HIV (Dourado et al., 2006). The reality is that UHS continues to struggle with access, quality, and service coordination (e.g., scheduling, monitoring, stigma related to HIV, and less-perceived risks to HIV) (Pinto, Wall, Yu, Penido, & Schmidt, 2012; Victora et al., 2011). It is for this reason that studying organizational factors and their impact on professional’s perceptions is important in relation to service integration.

With respect to HIV/AIDS, not only are issues of knowledge, behavior, and inter-personal negotiation at stake, but so are issues of stigma, identity, and social status (Howarth et al., 2013). This holds true worldwide as infected individuals are doubtful in revealing their status due to fear of isolation and discrimination (Renesto et al., 2014). Disclosing one’s status could end relationships, prevent new relationships from forming, and limit work and family planning opportunities.

A usuária’s decision to take an HIV test, or to access and compliance to a treatment plan is contingent on that usuária’s understanding of the risks and benefits, coupled with the degree of trust they have in the health care system. In Brazil, many women discover their infection during their prenatal treatment at the Básicas de Saúde (BHU) clinics or at the time of birth, when they are offered an HIV test. Usuária have felt that medical staff sometimes communicated the HIV test results objectively, with no interest shown in the consumers’ story or life context (Renesto et al., 2014). It has also been noted that HIV tests have been done in Brazil without the usuária’s consent and results were subsequently shared with family members (Renesto et al., 2014). This practice discourages usuária from accessing medical care, as they develop distrust in the health care system. Revealing a usuária’s HIV status to family members without their
preference can also create problems for the *usuária*, depending upon how supportive the family is. A common barrier to disclosure by a HIV-positive *usuária* is the fear of disrupting relationships as family members may possibly evoke stigmas related to HIV/AIDS such as not permitting a *usuária* to sleep in the same room or eat from the same plates (Kalichman, DiMarco, Austin, Luke, & DiFonzo, 2003). Therefore, disclosing one’s HIV status is not always in one’s best interest and can lead to rejection, abandonment, and other sources of lost social support.

It becomes clear that HIV/AIDS care requires more than the medical services offered by physicians and nurses. It requires frequent counseling that is sensitive to consumers’ lifestyle, cultural and linguistic preferences, adherence support, patient education and outreach in the home and the community (Rabkin & El-Sadr, 2011). The need for adherence and self-care on the part of those infected is especially important, as HIV is distinguished by asymptomatic periods of illness (Sabo et al., 2013). Owing to those asymptomatic periods, *usuária* may be denied support on the family or community level as family members or friends may not believe that the *usuária* is infected if they are not presenting with symptoms associated with AIDS.

Due to stigmatization faced by people living with AIDS and due to competing beliefs about HIV (Campbell, Nair, Maimane, Sibiya, & Gibbs, 2012), community mobilization within HIV Prevention services has been stipulated in the World Health Organization's Ottawa Charter for Health Promotion as being necessary (Lehmann & Sanders, 2007). Community members’ belief in myths and stereotypes about HIV/AIDS are likely to undermine the community’s acceptance of biomedical information about the causes of HIV transmission and how to prevent it. For these reasons, community mobilization is indispensable within HIV prevention services, as will be discussed below in the context of the role of ACS in Brazil and CHWs globally.
Community Mobilization: The founding principle of Brazil’s UHS, is to encourage usuária to actively participate in the design and implementation of health programs and policies that impact their community’s well-being. Community mobilization in Brazil can be perceived as occurring in two forms. Firstly ACS, representing communities they work and reside in, are expected to acquire a sense of ownership of community problems in identifying emerging health needs within the catchment area they serve (Hall & Taylor, 2003). Secondly, ACS within the UHS are recognized as integral members of the FHS teams who are expected to relay the situational diagnosis of the locality they reside in to FHS team members so that treatment plans and preventative activities are appropriate to local needs (Dowbor & Westphal, 2013).

To mobilize communities with HIV prevention services, the following approaches have been recommended by Campbell et al. (2012): (i) enhanced knowledge on HIV/AIDS within communities; (ii) a safe space for dialogues on HIV/AIDS; (iii) critical analysis of impediments to effective HIV prevention approaches; (iv) sense of ownership of the social, economic, and political problems faced by community members, created by identifying the strengths and resources of the community to create change that results in health-enabling social environments (Campbell et al., 2012).

The strategy advocated by Campbell et al. (2012) is based on Brazilian educator Paulo Freire’s, pedagogical approach of critical consciousness. Freire (1973) argues that a prerequisite for community members to vocalize the social, economic and political issues faced by them, a supportive environment is needed (Romero et al., 2006). A supportive environment provides a context where community members can collectively understand their social problems and work
through their reservations on taboo topics. Subsequent to building supportive environments, dialogues can be held in which community members can connect their personal experiences to larger economic, political and social contexts (Campbell et al., 2012). Freire refers to this stage as ‘conscientization.’ Usuária, such as ACS, in understanding that configurations of poverty and power contribute to the spread of HIV/AIDS, can be empowered to create and implement plans to resolve targeted problems, as opposed to having outsiders or medical experts resolve community health issues. Such empowerment is said to build a sense of community ownership of local problems (Baatiema et al., 2013).

To assist communities build a sense of ownership of their problems, policy makers around the globe have endorsed the integration of community members into health teams (Hall & Taylor, 2003). The premise underlying this endorsement is the existence of Community Health Workers (CHWs). CHWs globally are referred to by many titles, such as Agentes Comunitários de Saúde (ACS), lay health advocates (or workers), health auxiliaries, barefoot doctors, village health workers, health extension workers, ART aides, health surveillance assistants, lady health workers, indigenous health workers, promotores(as) de salud, outreach educators, and others (Haines et al., 2007).

CHWs globally are members of the communities in which they work. Their roles and activities are enormously diverse within and across countries and programs (Lehmann & Sanders, 2007). As a consequence, there is a lack of an accepted scope of practice for CHWs worldwide (Ingram et al., 2012). They typically but not always provide the following services: (1) bridging/cultural mediation between communities and health care systems; (2) providing culturally appropriate and accessible health education and information; (3) assuring that community members get the services they need; (4) providing informal counseling and social
support; (5) advocating for individual and community needs; (6) providing first aid and treatment of simple ailments; (7) referring service consumers to other levels of care if needed; and (8) monitoring and evaluating the overall health of their communities (Brownstein, Hirsch, Rosenthal, & Rush, 2011; Ingram et al., 2012; Kash, May, & Tai-Seale, 2007; Mayfield- Johnson, 2011; Mukherjee & Eustache, 2007; Pérez & Martinez, 2008; Sabo et al., 2013). Within the above functions, CHW programs focus specifically on: maternal health (reproductive health and family planning), child health (immunization), nutritional care, treatment of acute respiratory infections, and care of chronic diseases such as TB, malaria, HIV/AIDS, diabetes, and cancer (Lehmann & Sanders, 2007). The focus of the country’s CHW program depends upon the country’s pressing health needs. For instance, in Brazil, the Programa de Agentes Comunitários de Saúde (Community Health Worker Program, PACS) is focused on designing and implementing promotional and preventive health activities to residents of the communities in which they live. In addition ACS register household level information by collecting data on births, socio-demographic information (employment, number of individuals living in the house), deaths, symptoms of illnesses, disease incidence and immunization status of children (Magalhães, Cotta, Martins, Gomes, & Siqueira-Batista, 2013; Moura et al., 2012; Zanchetta, Salami, Perreault, & Leite, 2012).

CHWs globally have a long and valuable history as important and trusted members of communities. They are often the ones to whom community members turn to for health advice, even though they have limited medical training. In Brazil, ACS offer education on nutrition and hygiene, medications and family planning and work to create change in consumer’s health behavior using jargon-free communication, local idioms, and storytelling to impart medical knowledge/skills (Zanchetta et al., 2014). ACS are also known to educate communities using
empathy, patience, and persistence (Mayfield - Johnson, 2011; Mukherjee & Eustache, 2007; Pinto, da Silva, et al., 2012; Zanchetta et al., 2012). Through these approaches, ACS engage in dialogue with usuária and are able to identify risk behaviors, motivate members to engage in risk management practices, and encourage members for maintaining these efforts (Brownstein et al., 2011).

The ACS also assists usuária access civic services like voter registration and identification cards (Johnson et al., 2013; Victora et al., 2011; Zanchetta et al., 2012). They are known to help usuária to apply to the social program Bolsa Familia (Family Financial Support Program), a direct cash transfer program for families in poverty, so usuária who are unemployed or do not have sufficient funds are able to purchase food items, and pay for rent and utilities. ACS also are instrumental in identifying senior or child abuse by making household visits, and report the abuse to social workers (Johnson et al., 2013; Victora et al., 2011).

At a global level, CHWs have also played important roles in the planning and development of social mobilization projects. CHWs are known to take upon the role as an observer, paying attention to community realities and relaying information to co-workers and policy makers. They are expected to critically understand their own sociopolitical environment and identify their own needs and implement solutions (Rosenthal et al., 2010; Spencer, Gunter, & Palmisano, 2010; Swider, Martin, Lynas, & Rothschild, 2010). For example, in Sabo et al.’s (2013) study, ACS in Brazil recognized structural barriers in their communities. The ACS urged elected officials and civic bodies to make environmental changes such as safe lighting and housing, potable water, healthy food choices, and the designation of public recreational spaces to have long-term health implications for the usuária they serve (Sabo et al., 2013). Furthermore,
ACS update FHS members on the detection and evolution of illnesses impacting usuária within the catchment area they serve (Santos, Saliba, Moimaz, Arcieri, & Carvalho, 2011).

ACS have not only defined their sociopolitical environments and relayed that information to FHS team members and to policy makers, but have mobilized communities to define their socio-political conditions by facilitating group activities, lectures, and discussions at the BHU clinics. These activities are generally held on days where all can attend, like holidays (de Oliveira Moura, Carvalho, de Almeida, Lages, & Fontenele, 2014). The activities included providing information usuária through role play on: healthy eating habits, urging the need for usuária to wear comfortable shoes to avoid foot and ankle issues, instilling a sense of importance amongst usuária to carry bottles of water to avoid dehydration, and teaching usuária on how to monitor their blood pressure. Photo exhibits were also held at the BHU clinics, where usuária upon viewing the photographs identified problems with waste disposal that could pose a public health risk. As a result of the exhibit, usuária mobilized themselves to organize a cleanup day that involved picking up garbage thrown outside homes and disposing the waste in designated garbage bins (de Oliveira Moura et al., 2014).

**Civil Registration:** Integrating civil registration within disease prevention is significant in two ways. From a global standpoint, legal documentation establishes an individual’s identity, nationality, and kinship, some or all of which are necessary for establishing property rights and accessing health care and social services, such as food rations/ stamps (President’s Emergency Plan for AIDS Relief, Plan International, United Nations Children’s Fund (UNICEF), & World Vision, 2008). In the context of HIV prevention services, civil registration is necessary for those infected to gain access to social services, which are restricted for citizens. An example of social services restricted
to citizens is accessing food rations/stamps. The prevalence of food insecurity is particularly high among HIV-positive consumers, and lack of food security has been associated with lower antiretroviral (ARV) drugs adherence, declines in physical health status, decreased viral suppression, increased incidence of serious illness, and increased mortality (Weiser et al., 2011). With the ultimate goal of saving lives, documentation is necessary for individuals to receive nutritious food supplies, in order to slow disease progression in HIV-infected individuals.

Civil registration data also allows professionals and policy-makers to measure the population’s general health and life conditions, to measure the community’s progress against international standards (i.e., Millennium Development Goals), and to prioritize interventions that address pressing problems (Bhutta et al., 2010; Silva, Dias, & Ribeiro, 2011). Hence, the integration of civil registration and disease prevention becomes a necessity.

In countries such as Australia and Canada where members of indigenous communities are predominant, such communities refuse to participate in the national census. Typically they register themselves with their reserve rather than with the state (Newbold, 1998). To the author’s knowledge, citizens in Brazil are required to be registered with the state with the assistance of the FHS teams (Bhutta et al., 2010). In Brazil, collection of health data at the PHC level is primarily in the hands of the ACS. The active role of ACS in collecting citizenship and health data is aligned to global role of CHWs who are primarily responsible for registering/certifying births and deaths and documenting other household information such as socioeconomic information. This is because, in making household visits, CHWs are at the front lines and are the primary contacts for health service consumers.
ACS collect data on the following indicators: demographic (such as family composition, number of individuals within a household); epidemiological (vaccination, diseases); socio-economic (educational levels, employment status, child welfare status; and sanitary data on the assigned families (Bhutta et al., 2010; Muzzi, 2010; Zanchetta et al., 2012; Zanchetta et al., 2009). Through data collection, ACS are able to understand the frequency of illnesses and risk taking behaviors of usuária. Hence, ACS are able to engage in dialogues with communities on how to minimize existing health risks in the community and avoid transmission of illnesses or diseases to other usuária (Bhutta et al., 2010; Bittar, Meneghim, Mialhe, Pereira, & Fornazari, 2010).

**Demographic predictors of service integration**

Studies in Brazil show that there is a distinctly gendered profile of nurses and ACS, who are predominantly female (Canesqui & dos Santos Spinelli, 2006; Medeiros, Carvalho, Cavalcanti, & de Souza Salvador, 2011; Santos et al., 2011). This aligns with global studies on CHWs and nurses that indicate the feminization of these two professions being female-dominated (Doherty & Coetzee, 2005; Tomasi et al., 2008). Nurses and CHWs worldwide are viewed as feminine professions as they take upon the role of ‘carers’ that women have stereotypically embodied (Baptistini & Figueiredo, 2014). They have been responsible for the education and care of children as well as for the care of elderly family members. Affection and patience are qualities that are inherent in the female nature (Rocha, Barletto, & Bevilacqua, 2013). Literature globally suggests that due to the gendered role that nurses and CHWs fill, they typically are relegated to subordinate positions within health teams (George, 2008). Given these gender dynamics within global health teams, it is necessary to study the impact of professionals’ gender on the service integration practiced by those teams with the context of Brazil.
Existing literature reveals contradictory conclusions about the impact of gender and age on service integration and collaboration between professionals. In some studies, women and older professionals of both genders have shown a willingness to engage in collaborative practices geared towards integrating services (Hansson, Arvemo, Marklund, Gedda, & Mattsson, 2010; Pinto, Wall, et al., 2012). In a study conducted by Hansson et. al. (2010), it was learned that younger physicians had a less positive attitude towards nurse-physician collaboration than their counterparts over 45 years of age. The explanation provided for this finding was that, while younger physicians were trained in less hierarchical environments, they felt insecure in their newly acquired roles. Thus, they were inclined to stick to the traditional practice of taking ownership of consumer care from a medical point of view (Hansson et al., 2010).

In the literature, a professional’s race/ethnicity does not appear to be associated with their willingness to integrate. Nonetheless, race is still considered as a variable in this study, as Brazil has a long history of recognizing racial and color distinctions within its population (Loveman, Muniz, & Bailey, 2012). Brazil’s social surveys typically use three racial or color terms to capture the range of identification, which are: white (branco), brown or mixed (pardo), and black or Afro-descent (preto) (Bailey, Loveman, & Muniz, 2013). With the privileging of whiteness in Brazilian society, researchers posit that the availability of a ‘mixed’ category on national census forms encourages Brazilians to ‘deny their blackness’ and ‘lighten’ themselves (Bailey et al., 2013). Brazilian citizens might plausibly do this because racial classification in Brazil is to some degree connected with social status. In Brazil black (preto) or individuals who identify as Afro-descent exhibit worse general living conditions and health status compared to white populations (Fillenbaum et al., 2013). In a population-based survey, racial discrimination was found to create an inverse effect on physical, mental health of the Brazilian population of
blacks or those who identify as Afro-descent and *mulatto* (Pavão, Ploubidis, Werneck, & Campos, 2012). Studying service integration in the context of race is important, because white professionals, who often are physicians, may dominate FHS team meetings and may be reluctant to learn from professionals of other races.

Literature reports that within the FHS, high turnover rates for physicians have been observed. In one of the first mixed methods study conducted by Medeiros et al. (2010) to examine turnover rates within FHS professionals, it was learned that across 31 teams in 25 towns in Brazil, physicians turnover exponentially increased over the years (5.9% in 2002; 32.1% in 2003; 25.8% in 2004; and 64.5% in 2005). However, nurses turnover rates were erratic over the years (27.7% in 2001; 47% in 2002; 17.8% in 2003; 41.9% in 2004; and 22.6% in 2005) (Medeiros et al., 2010).

Reasons provided in Medeiros et al.’s study (2010) as contributing to the turnover of nurses and physicians within the FHS was due to the interference of ruling political parties who enforced their management decisions on the medical professionals, precarious working conditions, high caseloads and low wages (Medeiros et al., 2010). The impact of professionals’ years of experience on service integration has yet to be studied. However, it is important to study whether long periods of time spent on FHS teams might enable professionals to better incorporate disease prevention services, due to a richer understanding of the communities with which they have interacted. As mentioned in the introduction chapter, each FHS team is responsible for 800 to 1,000 families. The more years of service a professional has, the more frequent their contact with the families assigned to them. Therefore, with greater contact with families, professionals are able to develop stronger bonds with the *usuária* they serve and tailor better treatment plans according to *usuária* needs (Martins et al., 2010).
The length of the ACS’s commute to work within the context of service integration has not been studied. It has been suggested that, compared to nurses and physicians, ACS are likely to have shorter commutes and to live close to their workplaces. This is because ACS are typically recruited from the geographic area in which they will work (Bhutta et al., 2010). By being residents of the communities they serve, ACS are considered to have a better understanding of the social conditions in those communities. Accordingly, they are able to tailor disease prevention services to the social practices of and conditions in the community. It is for this reason that CHA’s proximity to their communities and the length of their commute to work should be studied to examine their impact on service integration.

**Organizational Factors**

In the literature, work climate and work resources are two organizational factors said to influence service integration. The work climate can be impacted by an organizational structure and its processes (Cotton & Hart, 2003). Organizational structure can be defined by two concepts - formalization and centralization. Formalization refers to the extent to which jobs are standardized (Katsikea, Theodosiou, Perdikis, & Kehagias, 2011). If a job is highly formalized, the professional will have the least possible freedom of action to perform activities related to the job. Centralization refers to the degree to which decision-making is concentrated at one unit point in the organization (Katsikea et al., 2011). Work resources refers to the physical and social aspects of the job that help achieve work goals, reduce job demands and stimulate personal growth, learning and development (Bakker, van Veldhoven, & Xanthopoulou, 2010). In discussing how organizational factors might predict service integration, the structure of Brazil’s UHS will be discussed in relation to its effectiveness, climate and resources.

Brazil’s UHS guarantees universality of healthcare access to Brazilian citizens, moving
away from hospital-centered care and placing the family unit at the center of healthcare (Rocha et al., 2013). To help legitimize the dictatorship in 1964, healthcare was made universal (Sampaio, 2012). Health services and social security benefits were centralized under the military government, reducing decision-making power at the state and municipal levels. As a result, the system was extremely unresponsive to Brazil’s local needs and regional diversity. In the 1970s, inflation was rampant and the Brazilian economy was in crisis. With a severe recession in the early 1980’s, public healthcare expenditures fell substantially, driving down the quality of health services and infrastructure. In tandem to these deteriorating health care conditions, different sections of society from grassroots sectors to middle-class populations and trade unions mobilized themselves into a social movement called the Sanitary Reform Movement (Reforma Sanitaria). The movement endorsed the view that health is not as an exclusively biological issue that needs to be resolved by medical services, but needs to be responsive to the social conditions of Brazilians residing across different regions (Paim et al., 2011).

A council consisting of federal ministry representatives also joined the Reforma Sanitaria. The Reforma Sanitaria lobbied for the Ministry of Health and INAMPS (Instituto Nacional de Assistencia; main financing mechanism in Brazil) to decentralize health service delivery from the federal to state and municipal levels (Alves & Timmins, 2001). The efforts of the Reforma Sanitaria led to the creation of the SUDS (Sistemas Unificados e Decentralizados de Saúde) in 1987-88, which completed the process of decentralization (Alves & Timmins, 2001). Brazil’s Unified Health System (Sistema Único de Saúde; UHS) was subsequently signed into law in 1990, making the federal government responsible for providing health care through a comprehensive, decentralized, participatory system (Paim et al., 2011).

The goal of the UHS as advocated by the reform movement is to provide continued care
(following the person throughout their life course), integrity (services provided according to the family and community’s socioeconomic and cultural needs), and coordinated care (management to ensure continuous care). The UHS accomplishes its goal by undertaking health promotion, health surveillance, vector control and health education as a priority. It ensures that care is provided to all Brazilians at the primary, secondary and tertiary levels (Paim et al., 2011).

Health care in UHS are classified into three levels (prevention, promotion and treatment) as championed by the WHO. The primary level offers primary health care (PHC). The *Estratégia de Saúde da Família* (FHS – Family Health Program) was created as a strategy to enact PHC by focusing on disease prevention and care, in addition to individualized medical assistance. FHS transdisciplinary health teams deliver PHC, which are comprised of one physician, one nurse, two to three nurse’s auxiliaries, and four to six ACS (Sampaio, 2012). The FHS health teams are expected to deliver PHC services throughout a defined area vis-à-vis local health centers known as *Básicas de Saúde* (BHU) clinics (Bhutta et al., 2010). Salaries of and services rendered by the FHS team are funded by municipalities’ income, which is allocated by the federal government. Depending on the level of federal funding, some municipalities include on their teams specialized medical professionals, such dentists, pharmacists, nutritionists, physical educators, psychologists, physiotherapists, speech therapists, occupational therapists, social workers, etc.

Each FHS team is responsible for 800 to 1000 families, for a total of approximately 4,000 individuals served by each team. The functions of FHS teams include but are not limited to: i) ameliorating key risk factors at the community level; ii) performing continued care; iii) promoting education and health awareness activities; vi) mobilizing the community and acting as a link between its different sectors, so that the community can develop strategies for specific health interventions; and v) using information systems to monitor decisions and health outcomes.
The PHC offered by the FHS teams is considered as the entry point to two other levels of care. At the secondary level, specialized medical attention (consultation) is available for e.g. cardiology, pulmonology, endocrinology, dermatology, urology, and surgery. The tertiary care is responsive for hospital care when technology (procedures, equipment) becomes necessary. Intercommunication in the single health system is done through referrals and counter-referrals (Falavigna, Canabarro, & Medeiros, 2013).

The Ministry of Health recommends assignments for each member of the FHS. The physician’s job is to ensure that the usuária has an appropriate care plan. Nurses are expected to perform nursing care, request laboratory tests, prescribe medications, supervise and coordinate the actions of the ACS, and engage in disease preventive activities (Frigo, Costa, Kolhs, & Busnello, 2013). Nurse auxiliaries and ACS are required to collect data at the household level on births, socio-demographic information, deaths, symptoms of illnesses, disease incidence and immunization status of children (Magalhães et al., 2013; Moura et al., 2012). ACS in addition to registering households offer disease preventative services, facilitate educational groups on safe sex practices, diabetes, pregnancy, cancer, Pap smear, child care, hypertension TB, leprosy, and oral health, etc. They also engage in child health (immunization, nutrition, breast feedings), women’s health (family planning, prenatal care, screening of breast and cervical cancer), and health of the elderly (Falavigna et al., 2013). They are also known to offer socio-emotional counseling to usuária while providing information on how to maintain healthy promoting behaviors.

Although FHS was implemented in 1994, it did not gain momentum till 1998. It has now expanded substantially; in 2010 there were roughly 33,000 FHS teams, caring for approximately
98 million people in 85% of Brazil’s municipalities (Paim et al., 2011). The FHS teams included 236,000 ACS (Paim et al., 2011). The FHS seems to be most effective in the North and Northeast regions of Brazil and in municipalities with greater rural populations and poorer public health infrastructure (e.g., sewer systems and access to treated water) (Bhutta et al., 2010). FHS professionals have improved the documentation of vital statistics and have helped reduce hospital admissions by almost 15% nationwide since 1999 (Paim et al., 2011).

The FHS teams have been particularly notable in reductions of infant mortality. Mackino et al. (2006) performed an impact evaluation of the FHS at the national level and found that a 10% increase in area coverage by the health teams resulted in a 4.6% decrease in infant mortality rates. The analysis controlled for variables such as access to clean water and sanitation, average income, women’s literacy and fertility rates and access to health facilities and personnel. The findings implied that FHS coverage was found to be a significant contributor to improvements in infant mortality rates (Macinko, Guanais, & de Souza, 2006). A study by Malta et al. (2010) also found evidence supporting a causal relationship between the extension of services by FHS and the reduction of infant mortality. The researchers found that avoidable infant mortality rates decreased by 37% between 1997 and 2006. This was found to be attributable to the increase in the provision of health services by FHS health teams, especially the increase in access to prenatal and postnatal care (Malta, Duarte, et al., 2010). Aquino et al. (2009) found a similar correspondence between reductions of infant mortality with increase of FHS coverage (Aquino, de Oliveira, & Barreto, 2009).

The effectiveness of the FHS can be attributed to the two hallmarks of the UHS - participatory and decentralization. The process of decentralization in Brazil involves the federal government disbursing funds to the state and municipalities for FHS activities, bypassing the
state level and vesting responsibility for primary health care at the municipal level (Molina, Vargas, & Londoño, 2014, pp. 39-40). A decentralized system of this kind depends on the belief that health needs of individuals should be addressed according to social realities that may not be consistent across the different regions. Instead of being compliant to perceived standards set by the federal government, municipalities have autonomy to decide how they can best spend their share of the federal money. The amount allocated is specified to accomplish the following activities: health education; immunization; nutritional care; consultations with physicians in basic specialties, including dentistry; home visits made by a nurse or ACS; basic emergencies; minor operations; antenatal care; family planning; and births at home by a physician (Collins, Araujo, & Barbosa, 2000).

The UHS is participatory in nature through its inclusion of community members into health teams, namely ACS. The ACS are integrated into FHS as liaisons between the FHS team and communities, and are selected through a public selection process by community members (Bhutta et al., 2010). ACS have typically been required to demonstrate leadership, residence in one’s community for at least two years, and be familiar with the practices of the community to be served (Bhutta et al., 2010). The role of the ACS has been explored aforementioned in the section on community mobilization. The theoretical assumption of FHS teams being participatory in nature will be explored in the job characteristics section below.

In terms of work resources, the FHS professionals have spoken of UHS as being a resource-poor setting (Silveira et al., 2010). The FHS teams have reported the lack of adequate staff support they receive from the UHS in terms on manpower. They face a heavy workload and their attention deters them from focusing attentively on the complaint and symptoms of usuária (de Oliveira Moura et al., 2014; Figueira, Leite, & Silva, 2012; Rissardo & Carreira, 2014). In
addition, FHS professionals have stated the lack of medical supplies and the absence of a physical space at the BHU clinics where professionals, such as nurses, can engage in a dialogue on sensitive subject matter with *usuária* without having a physician or dentist overhear the conversations (Rissardo & Carreira, 2014). Nurses in particular have reported that the tedious reporting system of the work process of the FHS team takes them away from planning activities that promote healthy behaviors amongst the community (Rissardo & Carreira, 2014). In addition, the lack of telephone and Internet services at the BHU clinics, delays the FHS team from sending reports to higher authorities at the municipal, state, and federal level. The lack of telephone services and Internet services also leads to operational difficulties amongst the FHS team members, limiting communication amongst each other and preventing referrals to be made to specialist professionals (Cunha & Vieira-da-Silva, 2010). Therefore, looking at the demands of communities versus the available resources (human, material and informational), the ability of professionals to integrate services may be compromised (Bakker et al., 2010; Teles et al., 2014).

Organizational literature suggests the importance of creating the right work climate to buffer the stress created by the inability to attend to a professional’s needs or the unavailability of resources (Meeusen, Van Dam, Brown-Mahoney, Van Zundert, & Knape, 2011). The purpose of the transdisciplinary FHS teams and of the interactions between professionals with different competencies and abilities is to integrate services according to the needs of the *usuária* and communities (Teles et al., 2014). Participatory decision-making, less government interference, and uninterrupted time for team meetings is important for the discussion of *usuária* cases (Finlayson & Raymont, 2012; Lin, Lin, Lin, & Lin, 2013). In particular, a supportive climate offered by FHS team members can allow professionals to bounce back after facing setbacks or dealing with lack of resources (Teles et al., 2014). When a setback occurs due to a professional’s
mistake, those in a supportive climate will not fear reprisal. Instead, they will remain focused on the tasks at hand, putting the setback behind them and responding in a positive way by consulting co-workers and supervisors (Flores, Miranda, Muñoz, & Sanhueza, 2012). The role and value of the need for support from colleagues within the FHS team has been further discussed in the job characteristics section.

**Individual Factors**

Individual-level factors impacting service integration have been explored in the literature, in the context of professionals’ knowledge, skills, perseverance, confidence, efficacy of their associated team, and familiarity with the catchment area in which they work.

The literature emphasizes the biomedical knowledge that nurses and physicians possess on the etiology and epidemiology of diseases such as HIV (Gilkey, Garcia, & Rush, 2011). Medical professionals, that is, physicians and nurses, are known to show technical competence in relieving pain relief and providing comfort through diagnosis, and in creating treatment plans in the form of prescribing medications, and performing minor surgeries. Experience worldwide has shown that most consumers will want medical professionals to have an upper hand than community-based professionals, such as ACS, in their health decision, as they believe that medical knowledge will result in the best treatment or procedure for them (Barry & Edgman-Levitan, 2012).

CHWs globally are given basic medical training to offer health promotion activities, but their importance lies in their experiential knowledge of the communities they serve (Kvåle & Bondevik, 2010). Experiential knowledge is the awareness in community’s culture, traditions, beliefs, language, lifestyles, and sociopolitical events (Herman, 2011). Since they are the closest to the consumers, they tend to be the most familiar with communities’ lifestyles, traditions, and
habits. ACS are known to develop affective relations in the community by demonstrating perseverance in providing health education to low income community members using lay language (Zanchetta et al., 2014). Usuária have reported that medical professionals - as opposed to ACS - are reluctant to discuss sexual risk reduction strategies with service consumers; such as contraceptive methods or condom use (Finocchiaro-Kessler et al., 2012; Malta, Todd, et al., 2010; Mitchell & Oltean, 2007). HIV-infected usuária have voiced their dissatisfaction with physicians’ and nurses’ inability to converse with usuária, with their lack of empathy and their inability to combat their own personal prejudices when interacting with usuária during appointments (Santos et al., 2002).

While physicians and nurses desire optimal outcomes for usuária, they often lack training in building partnerships with usuária and in engaging communities in developing critical consciousness (i.e., in facilitating dialogues so community members are able to identify sociopolitical issues impacting the community and are able to strategize and take action to create change) (Brownstein et al., 2011; Silva et al., 2011). Literature suggests that professionals will avoid engaging in skills they feel uncomfortable practicing, such as, in this case, medical professionals offering socio-emotional counseling to usuária. The most effective way for professionals to develop confidence is for them to engage in mastery experiences that involve practicing socio-emotional skills by observing and shadowing other professionals, such as ACS, who already possess those skills. In the FHS team, the skills and knowledge bases of ACS and medical professionals can be exchanged and practiced. ACS, through role-play and speaking about their experience, can assist medical professionals with socio-emotional counseling skills and emphasize the need for them to be empathic to consumers’ needs and situations (Pinto, da Silva, et al., 2012).
Thus, FHS teams are set up to achieve a synergistic process of exchanging information and resources in order to integrate HIV prevention with social services (Pinto, Wall, et al., 2012). The process of sharing one another’s skills and knowledge can enhance professionals’ confidence in learning certain social or medical tasks they previously may not have been able to perform (Ammentorp, Sabroe, Kofoed, & Mainz, 2007), as described above. It also allows professionals within the FHS team to appreciate one another’s strengths and enhance the efficacy of the team, which is the perception of the professionals that the existence of their teams has improved the quality of health offered to consumers. FHS physicians have noted that, in being able to discuss and exchange knowledge, expertise, opinions, and perspectives within the team setting, they have been able to recognize the need to formulate disease prevention services and treatment plans according to the needs of usuária (d’Ávila, de Assis, de Melo, & Brant, 2014).

However, factors that can impede efficacy of the FHS teams are inherent to hierarchies within professions. Team members are meant to bring forth their specializations, consult with one another, and provide comprehensive care through collective decision-making. A dichotomy exists between biomedical/scientific knowledge and experiential knowledge. This dichotomy creates a sense of polarity between the FHS team members (Zanchetta, Leite, Perreault, & Lefebvre, 2005). For instances, ACS are considered subordinate due to their experiential knowledge and with medical professionals perceiving medical knowledge as superior, scaffold the decision-making process. As result of the decision-making of usuária made with limited input of the ACS, the efficacy of ACS is likely to be impacted. In a study by Menegolla et al. (2003), the ACS reported that cooperation from FHS teammates is essential for coordinated and continuous care to usuária. However, ACS did report that lack of teamwork caused dissatisfaction amongst themselves and among usuária (Menegolla, Polleto, & Krahl, 2003).
This fact was corroborated by a study conducted by Pedrosa & Teles (2001), who reported difficulties in collaboration between FHS physicians, nurses and ACS. They pointed out that, for physicians, one of the problems was the lack of definition of the role of the agents (dos Santos Pedrosa & Teles, 2001). Not understanding the role of agents and the value they bring to the teams, physicians and nurses are liable to hold ACS in low esteem, which can impact the efficacy of the ACS in the FHS health team.

**Job Characteristics**

Job characteristics refer to how the activities, tasks and assignments of a professional and the amount of discretion given to professionals allow them to make decisions about *usuária* and community level interventions (Morgeson & Humphrey, 2008, pp. 39-92; Obi–Nwosu & Joe-Akunne Chiamaka, 2013; Shafae, Rahnama, Alaei, & Jasour, 2012). The following job characteristics have been considered as predictors of service integration in this study: *usuária*-Input, transdisciplinary collaboration, decision-and work methods—autonomy, and skills variety.

Collaboration, a key component of service integration, is seen in the context of a professional’s partnership with consumers and co-workers. Collaboration is understood to involve: (1) cooperation, coordination, and exchange of resources (e.g. information, ideas and skills); and (2) mutual respect for individual or collective goals that enables a search for solutions that transcend one’s knowledge or understanding of an issue (Kanste et al., 2013). Professionals may collaborate with their co-workers in teams. A team can be defined as two or more individuals, who interact socially with one another, and in having complementary skills and knowledge are expected to consult one another to accomplish a common goal (Morgeson & Humphrey, 2008). There are three types of team structures among health and social professionals: multidisciplinary; interdisciplinary; and transdisciplinary.
In a multidisciplinary team, professionals work independently on the same usuária or community-level health or social issue, with limited interaction (D'Amour et al., 2005). On an interdisciplinary team, members with distinct disciplinary training make complementary contributions towards usuária care or a community-level issue (Mccallin, 2001; Mitchell, Parker, Giles, & White, 2010). Interdisciplinary team members open their professional boundaries to ensure greater flexibility in sharing responsibilities to solve a common set of problems associated with usuária (D'Amour et al., 2005; Kilgore & Langford, 2009). Transdisciplinary collaboration is characterized by professionals working side-by-side, incorporating diverse knowledge and solutions to health and social-related issues in a way that transcends individual disciplinary perspectives. It is the optimal team structure for seeking consensus and facilitating collaboration (D'Amour et al., 2005; Kilgore & Langford, 2009).

FHS teams are transdisciplinary, with the goal of merging experiential-based knowledge of the ACS with the bio-medical/technical knowledge of nurses and physicians (Zanchetta et al., 2014). Frequent meetings between professionals allows for mobilization of community relations and knowledge construction (Santos et al., 2011). The experiential knowledge of the ACS serves as input for diagnoses and treatments so that they are grounded in the context of individual and community issues. The ACS acts as a social mediator, translating for FHS medical professionals the health, social and cultural needs of the community (Santos et al., 2011). The inclusion of the ACS in the planning, execution and evaluation of health activities enables the voice of the community to enter into health decisions of underserved communities, which previously were entrusted to medical professionals. Integrating medical information with information on the social conditions of the community allows for the construction of new knowledge that is combination of experiential knowledge with bio-medical knowledge. Within transdisciplinary
teams, this integration of medical and experiential knowledge can develop coherence and a common ground in serving usuária (Oborn & Dawson, 2010), which will be discussed below.

Studies have reported several benefits of using transdisciplinary teams, as opposed to multi- or interdisciplinary teams. Benefits include: usuária satisfaction due to professionals enhanced problem-solving; reduced duplication and service fragmentation resulting in a lower turnover of professionals; increased job satisfaction for professionals; reduction in medications dispensed per service consumer; improved short- and long-term service consumer outcomes; fewer out-of-hours consultations and hospital visits; reductions in health costs; and greater medication adherence (Finlayson & Raymont, 2012; Hojat et al., 2003; Kilgore & Langford, 2009; Mitchell et al., 2010). While the benefits of using transdisciplinary teams are many, the barriers to their proper functioning cannot be ignored, as they can negatively influence professionals’ ability to integrate services. Barriers associated with transdisciplinary collaboration include incompatible communication styles; lack of willingness to share the work equally in the team; role ambiguity; and an organizational environment that is not conducive to collaboration (Hojat et al., 2003; Mitchell et al., 2010).

Despite the call for transdisciplinary collaboration in the mid-1970s, physician-centered practice remains the dominant model of primary health care delivery globally (Sicotte, D'Amour, & Moreault, 2002). This is due to physicians and to some extent nurses professional socialization and education that are bound to standardized protocols, and vocabulary, inhibiting communication with professionals from different disciplines (DeBourgh, 2012; Kilgore & Langford, 2009), as discussed below.

The different bachelor, graduate degrees and diverse certificates of professionals within the FHS teams creates varying statuses (Gillespie, Reader, Cornish, & Campbell, 2014). Most
FHS team members are university-educated, with MD degrees, masters or specialized degrees in community/public health. However, ACS in Brazil typically have completed their high school degree creating an educational power imbalance between ACS and the rest of the FHS team members. Nurses within the FHS take upon the role of being managers for the FHS. Although ACS are known for their value in bringing in experiential knowledge to the FHS, the unequal education level amongst the team members creates issues involving integration, collaboration and partnerships among team members who have unequal levels of decision-making power (Jones, Bhanbhro, Grant, & Hood, 2013; Zanchetta et al., 2012). From a socialization perspective, physicians worldwide are trained to be independent, and often feel as though they have the final word in consumer care (Finlayson & Raymont, 2012; Hudson, 2002). Conversely, nurses and CHWs preferences for collegial cooperation and trust are in sharp contrast to physicians presumptions of individualism (Churchman & Doherty, 2010; Oborn & Dawson, 2010).

Physicians in particular are seen as doing ‘boundary work’, adopting professional ideologies that distinguish themselves from others, particularly when their professional jurisdiction is threatened (Mitchell et al., 2010). The language they use has specialized meanings, often symbolizing the privilege to their profession and preventing the sharing of knowledge with other members on the team (Mitchell et al., 2010; Oborn & Dawson, 2010; Van Der & Bunderson, 2005). The dominance of physicians’ knowledge and views creates a closed approach, in which physicians are reluctant to consider the perspectives or solutions of ACS. This closed approach may prevent physicians from learning the social context of diseases from ACS, or learning about local customs and values (Zanchetta et al., 2005). This may impact usuária outcomes as treatment plans and medical regimens may not be adhered to, due to the professionals inability to account for cultural and social barriers that usuária may face in
accessing medication or changing risk behaviors (Brownstein et al., 2011). Moreover, within a role in which physicians dominate, other the team members are unable to engage in equitable dialogue where they may challenge conventional wisdom and achieve significant breakthroughs in thinking and action to solve complex health problems (Lasker & Weiss, 2003; Quinlan, 2009). Sharing of knowledge and information across professional boundaries is central to trans-professional effectiveness (Mitchell et al., 2010).

Another significant barrier in transdisciplinary collaboration as reported in global literature is professionals’ lack of understanding of their different roles. Doherty & Coetzee (2005), in examining the relationship between nurses and CHWs in resource-poor settings in South Africa, found that nurses were unsure of the roles of CHWs and regarded them as a threat (Doherty & Coetzee, 2005). In unhealthy competitive situations it is not possible to have an effective referral system in place (Liu, Sullivan, Khan, Sachs, & Singh, 2011). This is because the threat is often associated with losing the consumer to the other professional, and that jeopardizes the referral making process (Doherty & Coetzee, 2005). Once engaged in a dialogue with CHWs, the nurses discovered that they were not a threat but rather help. They acknowledged that a CHW could be used as an extra pair of hands in a clinic, due to CHWs’ knowledge about the community and language. CHWs also earn the trust of the community, as a result of which they are able to motivate community members to avail themselves of offered health services. Some nurses did observe increases in service utilization with the greater involvement of CHWs in their clinic (Doherty & Coetzee, 2005). However, in Brazil the possibility of a lack of understanding between nurses and ACS is unlikely as the nurse supervises the ACS in their varying roles which is stipulated in the by laws of the Brazilian National Health Policy.
Regular and timely feedback from co-workers and supervisors on professionals’ performance can help overcome barriers to transdisciplinary collaboration and facilitate professionals’ willingness to integrate services. This is because feedback on the job has been shown to clarify professionals’ roles, which opens up territorial boundaries with the recognition that each professional in the team brings complementary expertise and knowledge (Doherty & Coetzee, 2005; Humphrey, Nahrgang, & Morgeson, 2007; Maru, Biwott, & Chenuos, 2013; Mitchell et al., 2010; Morgeson & Humphrey, 2008, p. 74). Feedback also allows professionals to guide their own behavior. Feedback on the professionals’ performance can motivate professionals to integrate services by learning or/and modifying certain elements of domain-relevant skills when performing usuária or community-level care (Coelho & Augusto, 2010).

Apart from sharing knowledge and skills across professional boundaries, professionals have been urged by policy makers and program managers to integrate usuária into the decision-making processes of their treatment, including care and risk management plans for HIV-positive individuals and usuária at risk for HIV (Chewning et al., 2012). Professionals ought to determine usuária preferences and explain to usuária the benefits and risks of a surgical procedure, medication, or diagnostic test (Barry & Edgman-Levitan, 2012; Burgess, van Ryn, Dovidio, & Saha, 2007; Luxford, Safran, & Delbanco, 2011; Robert, Waite, Cornwell, Morrow, & Maben, 2014; Stiggelbout et al., 2012). Such usuária involvement is part of a model of shared decision making. This involves the active engagement of usuária, who express their agreements with treatment plans that may be practical for them to adhere to (Stiggelbout et al., 2012).

The main determinant for usuária-Input is that the medical professional needs to relinquish their role as the single, paternalistic authority and become a more effective listener (Barry & Edgman-Levitan, 2012). Professionals are expected to communicate sufficient
information to *usuária* while showing compassion, empathy and responsiveness to *usuária* needs, values and preferences (Robert et al., 2014). Within the ethical and political guidelines of the Humane National Policy (*Política Nacional de Humanização*) of the UHS in Brazil, professionals are expected to be accountable to *usuária* by engaging with them in a horizontal, dialogic, and reciprocal manner (de Oliveira Moura et al., 2014). The professional is expected to address the *usuária* anxieties and have the consumers be co-creators in their own care (Garuzi, de Oliveira Achitti, Sato, Rocha, & Spagnuolo, 2014). This participatory engagement on an individual level encourages *usuária* to perceive themselves as equal members of the health care team (Barry & Edgman-Levitan, 2012). Thus, *usuária* may be empowered and feel encouraged sharing their insights and perspectives in the planning, implementation, and evaluation of the systems of care provided to them and their communities. This has the potential to mobilize communities to advocate for their own health care and for that of their families.

A professional’s ability to integrate *usuária*-input, risk management approaches, and care is contingent on the autonomy that their job grants, which is based in turn on an organization’s philosophy and policies and the professional’s specialization. Job autonomy is defined as the degree to which professionals feel they have the freedom to make self-determining decisions on how to do their jobs (Morgeson & Humphrey, 2008, p. 52). Professionals’ autonomy can be defined as: the ability to control how the task is performed (work-methods autonomy); or as the ability to make decisions at work (decision-making autonomy) (Morgeson & Humphrey, 2008, p. 52).

 Particularly within a health care environment, it is essential for professionals to be allowed the discretion to make decisions on their own than about being able to perform the actual task for *usuária* and communities (Lin et al., 2013). Both work-methods autonomy and decision-
making autonomy give professionals confidence that they are able to deal appropriately with a usuária or with the community’s issues (Coelho & Augusto, 2010). Autonomy also motivates and enables professionals to try new ideas and learn from the results, expanding their domain-relevant skills, which in turn can assist them with the integration of myriad services (Coelho & Augusto, 2010). Through this opportunity for personal growth at the professional’s own pace, autonomy can be viewed as a means of structural empowerment provided to professionals by their work organizations (Gregson, Nyamukapa, Sherr, Mugurungi, & Campbell, 2013).

It has been established that physicians have more autonomy than nonmedical professionals (Lin et al., 2013), due to the perception that medical and scientific knowledge is superior to experiential knowledge. Physicians and nurses are often allowed more discretion and participation in decision-making primarily due to their rigorous education in medical practices. In Brazil, ACS have reported having less autonomy than physicians and nurses when making decisions on how to provide usuária care primarily due to their fewer years of education and lack of medical training (dos Santos Pedrosa & Teles, 2001). However, autonomy offered to ACS permits ACS to potentially mobilize communities in accordance with community health issues and allows them to take appropriate action. It is also noted that professionals in health centers with high traffic have less job autonomy than professionals who are in health centers with less traffic. This is because community health centers serving larger populations typically have more formalized structures, which can reduce professionals’ autonomy (Lin et al., 2013).

It has been reported that community-based professionals, such as nutritional educators, appreciate the autonomy provided to them in offering nutritional advice to consumers based on the consumers’ living conditions (Dickin, Dollahite, & Habicht, 2011). However, community-based professionals have shown to require supervision from nurses and physicians to elicit
feedback on their work process and the means by which they engaged in health education. Without this feedback community-based professionals, including ACS, may have nothing to guide their behavior on. This curtails their motivation and learning, and limits their ability to integrate services (Coelho & Augusto, 2010).

Granting autonomy to professionals allows them to offer a wider range of activities through the use of diverse skills (Oldham & Hackman, 2010). This is called ‘skill variety’. The difference between skill variety and specialization is that the former reflects the breadth of behaviors and skills, whereas the later represents the depth of knowledge and skills necessary to perform a job (Humphrey et al., 2007). Jobs that offer professionals greater flexibility in deploying their skills can also offer them opportunities to decide how to address the needs of usuária. This has the potential to allow professionals to integrate myriad services. Having skill variety in a job is considered to engage workers, as they are able to explore and manipulate their environments and gain a sense of efficacy by testing, using and mastering skills (Coelho & Augusto, 2010). However, experimenting with a number of skills can contribute to work overload and can be overwhelming for professionals (Morgeson & Humphrey, 2008). To keep from the feeling of being overburdened, professionals should work in teams, where they can share their responsibilities with co-workers, consult about tasks that a particular professional is unable to perform, and allow for a form of supervision that ensures that professionals are successful in experimenting with new skills. Doing all this ensures that services are integrated in accordance with professionals’ skill mastery.
Overview of this chapter

A theory explains, predicts and allows an understanding of interrelated set of concepts, definitions and propositions that can guide the health promotion practices offered by healthcare professionals (Hayden, 2013, p. 2). Theories explain behavior and can suggest ways to achieve behavior change. A framework combines concepts from a number of theories and integrates them (Hayden, 2013, p. 2). Frameworks help us understand behavior based upon different factors at different levels, which one theory alone cannot do (Hayden, 2013, p. 2).

The theoretical framework (Figure 1) in this study is based on concepts from Cognitive-Behavioral Theory, Job Characteristics Theory, and Organizational Theory. The behavior in this study is the integration of three types of services - HIV prevention services, community mobilization, and civil registration. This chapter will discuss each component of the model and will show how concepts from the three theories above can together predict how Agente Comunitário de Saúde, physicians and nurses within transdisciplinary teams integrate services. Examples that illustrate these concepts have been taken from structured interviews with 30 ACS, 10 nurses, and 5 physicians. The interviews included questions on: their training; the knowledge/skills they use to promote observable consumer’s health behaviors; their transdisciplinary collaboration; their perceptions of their roles as professionals; and the organizational barriers they find. Further reference to the interviews can be found in the article “Community health workers in Brazil’s unified health system: A framework of their praxis and contributions to patient health behaviors” published in the Social Science and Medicine.

At the intrapersonal or individual level, concepts from Cognitive-Behavioral Theory (Nurius & Macy, 2008, p. 102) have been used to explain factors that influence professionals’
service integration behaviors. Factors include knowledge, attitudes, past experience, and skills (National Cancer Institute, 2005). Typically, Social Cognitive Theory (Bandura, 1989) is applied at the interpersonal level, since it explores the reciprocal interactions of individuals’ behavior, cognitions, and environmental factors. The theoretical framework in this study uses Cognitive Behavioral Theory to explain factors at the intrapersonal level that influence professional cognition in integrating services (behavior). At the interpersonal level, concepts from Job Characteristics Theory and Organizational Theory are used to expand on how environmental factors influence professional’s behaviors. Factors that impact behavior at the interpersonal level include the influence of co-workers and social norms that exist within professional groups (Simons-Morton, McLeroy, & Wendel, 2012, p. 50).

Job Characteristics Theory (Hackman & Oldham, 1975) and Organizational Theories, namely Modern Organizational Development Theory (Brown & Covey, 1987), and Structural Contingency Theory (Burns & Stalker, 1961; Lawrence & Lorsch, 1967), postulate that a professional’s social environment can influence their behavior. Job Characteristics Theory suggests that a professional’s behavior, e.g., integration of services, may be influenced by their proscribed roles and expected professional norms, which are established by virtue of a professional’s position within an organization (Oldham & Hackman, 2010). Organizational Theory suggests that a professional’s behavior can be impacted by their own perceptions, values, attitudes and beliefs about their organization’s environment, based on the organization’s climate, culture and capacity (Steckler, Goodman, & Kegler, 2002, p. 341). These factors provide an understanding of the presence or absence of behavioral supports or physical resources available to a professional, which can influence that professional’s feelings and behaviors with regard to integrating services.
Cognitive Behavioral Theory (CBT)

Cognitive Behavioral Theory is based on the premise that cognitions, emotions, and behaviors are inextricably linked, and that they continuously impact and influence one another (Nurius & Macy, 2008, p. 102). Cognitive theories, namely Self-Efficacy Theory (Bandura, 1994, p. 71) and Social Cognitive Theory (Bandura, 1989) suggest that behaviors are performed if individuals believe that they have the confidence in their ability to perform the behavior, and they have control over the outcome of the behavior (Baban & Craciun, 2007). Theory of Planned Behavior (Ajzen, 2011, p. 439) and Theory of Reasoned Action (Fishbein, 1979, pp. 65-116), focus on the environmental conditions or stimuli that induce and maintain behaviors (Regehr, 2001, p. 165). Cognitive Behavioral Theory combines these theories. It examines cognitive, behavioral, and social learning perspectives and explains functioning as a product of reciprocal interaction between personal and environmental variables (Hupp, Reitman, & Jewell, 2008, pp.
Simply, Cognitive Behavioral Theory has three assumptions: 1) cognitive activity affects behavior; 2) cognitive activity can be monitored and altered; and 3) desired behavior change can be affected through cognitive change (Nurius & Macy, 2008, pp. 105-106).

Concepts that inform Cognitive Behavioral theories inform the selection of individual-level factors in this study to predict service integration. The factors include: knowledge and skills; community familiarity; efficacy of the ESF team; confidence; and perseverance.

Icek Ajzen’s Theory of Planned Behavior (TPB) has been useful in predicting a wide range of behaviors and behavioral intention in healthcare professionals (Godin, Bélanger-Gravel, Eccles, & Grimshaw, 2008; Kiamco-Millman & Pinto-Zipp, 2013; Kortteisto, Kaila, Komulainen, Mäntyranta, & Rissanen, 2010). It is for this reason that key constructs of TPB (intention, attitudes, perceived behavioral control and subjective norms) have been incorporated into cognitive behavioral theory and have been applied in this study to predict service integration behaviors. According to TPB, intention is a cognitive representation of the action preceding the actual behavior (Ajzen, 2011, p. 439). Intention is a function of attitude towards the behavior, i.e., in this case, service integration. Attitudes about service integration are the professional’s positive or negative feelings about performing it (Hayden, 2013, p. 41). Such feelings are based on professionals’ perceived behavioral control, the extent to which they perceive that integration of HIV prevention services, community mobilization and civil registration is easy or difficult. The relationship between perceived behavioral control and actual behavior suggests that professionals are more likely to engage in service integration when they feel they have control over the behavior. Perceived behavioral control is influenced by both internal factors (i.e., the individual’s personal skills, knowledge & confidence) and external factors (i.e., dependence on co-workers and supervisors for information) (Baban & Craciun, 2007). Thus, perceived behavioral control is
determined by the perceived presence or absence of resources and opportunities, and the perceived ability of these to facilitate or hinder the integration of services.

Social Cognitive Theory (SCT) has also been used in several studies to predict a variety of health care professional intentions and behavior (Burgess et al., 2007; Eccles, Grimshaw, Walker, Johnston, & Pitts, 2005; Shoji et al., 2014). However, SCT has been shown to account for only a small-to-medium variance in behavior (Armitage & Conner, 2000). Nonetheless, SCT has been used in this study to guide the selection of individual-level variables, as it offers a comprehensive framework for understanding how a behavior, i.e. service integration, is initiated, monitored and maintained by health care professionals. The SCT concept of reciprocal determinism, which is incorporated into Cognitive Behavioral Theory, proposes that behavior is a function of the environment and person, all of which are in constant reciprocal interaction (Baranowski, Perry, & Parcel, 2002, p. 165).

The primary personal concepts of SCT that help us understand behavior include knowledge and skills, self-efficacy, and outcome expectancies. Knowledge and skills are preconditions to behavioral intent and to performance of the behavior (Crobsy, Salazar, & DiClemente, 2013, p. 165). It is relatively easy to teach people new information and thereby increase their knowledge (Hayden, 2013, p. 6). Without the skills or the ability to use that knowledge, it is almost useless. For instance, a professional may be knowledgeable about the effectiveness of contraceptive pills, but if he/she does not put his/her counseling skills to use, the consumer will not be fully aware of the point of using contraception. Therefore, the ability to integrate services when desired is influenced by having both knowledge and skills.

Self-efficacy is a professional’s confidence in their ability to perform a behavior (Bandura, 1994, p. 71). For example, a ACS reported in an interview she was often dismissed by
usuária on account of the usuária’s perception that the ACS lacked technical knowledge about
disease. The ACS explained in the interview that she demonstrated high self-efficacy as she
instrumentally works through this mistrust of usuária. The ACS reported an ability to win the
trust of usuária by showing empathy and in general educating usuária about the nature of their
work, including their knowledge of HIV prevention services and their ability to identify
symptoms of various ailments. By developing rapport and trust, the ACS was eventually well
received by usuária.

Outcome expectancies are perceptions of a professional’s outcome that will likely to
occur from performing a given behavior (Crobsy et al., 2013, p. 175). For instance, a
professional may have positive expectancies that the integration of social services, such as
provision of a food basket, with disease prevention may improve the usuária’s health and change
their eating habits.

SCT identifies key environmental variables that influence a behavior, i.e., service
integration, and that also model, reinforce, and make available physical and emotional resources
(Crobsy et al., 2013, p. 165). Modeling, known as vicarious capability, is the teaching of how to
perform a behavior (Bandura, 1989). For instance, Professional A, who has been unable to build
a rapport with service consumers, may observe Professional B, who successfully engages with
the same consumers. As Professional B models his/her counseling skills, with emphasis on active
listening and empathy, he/she is teaching Professional A how to practice these skills. Social
persuasion occurs when Professional B commends Professional A for successfully demonstrating
his/her own active listening skills and for carrying out dialogue with a consumer. If Professional
A does not demonstrate such skills, Professional B corrects him/her in a supportive and
constructive manner.
Once a professional such as Professional A is able to learn a behavior, his/her efficacy may be impacted by environmental constraints (Crobsy et al., 2013, p. 177). For instance, a professional’s goal may be to engage in HIV prevention services and family planning conversations with the usuária, but environmental factors may make it challenging to do so. For example, a female usuária reports that her male partner refuses to use a condom. Environmental factors, such as a lack of female condoms at the Básicas de Saúde clinics, and limited finances with which to purchase female condoms or birth control pills may influence the professional not to engage with usuária in discussions about family planning and HIV prevention. Other instances of how a professional’s environment enables or limits their ability to engage in a behavior, particularly service integration, will be explored through key concepts from job characteristics theory and organizational theories.

**Job Characteristics Theory (JCT)**

Job Characteristics Theory (JCT) (Hackman & Oldham, 1975) is used in this study to explain how a professional’s behavior, i.e. service integration, can be influenced by the tasks or activities assigned to them and the amount of discretion granted to the professional to work on these tasks or activities. According to JCT, job characteristics may impact service integration through motivational processes in the form of critical psychological states. JCT posits that the way specific jobs are perceived in relationship to five core job characteristics (task significance, task identity, skill variety, autonomy, and feedback) impact three particular psychological reactions to the job (Oldham & Hackman, 2010). These reactions, referred to as critical psychological states, are: to experience meaningfulness of work (extent to which the professional perceives his/her work as making a difference to others); to feel responsibility (extent to which the professional assumes responsibility for his/her work); and knowledge of results (extent to
which the professional is aware of the effectiveness of his/her work) (Hackman & Oldham, 1975).

The five core job characteristics as proposed by JCT are: task significance, or the extent to which a job impacts the lives of people in an organization or society in general; task identity, or the extent to which a job involves achieving a whole identifiable outcome; skill variety, or the opportunity for professionals to integrate a broad portfolio of skills and knowledge to deal with medical and socioeconomic needs of consumers; autonomy, or the extent to which a job allows the freedom, independence, or discretion to schedule work, make decisions, or select the methods used to perform work tasks; and feedback, or opportunity to receive reinforcement of one’s work or identify areas where the professional may improve (Oldham & Hackman, 2010).

The job characteristics used in this study are: usuária-Input; skill variety; feedback from the job; transdisciplinary collaboration; work-based autonomy; and decision-making autonomy. The job characteristics of task identity and task significance, as proposed by JCT, have not been applied in this study for reasons explained below. The purpose of this study is not to test job characteristics theory, but to apply concepts (such as, usuária-Input; skill variety; feedback from the job; transdisciplinary collaboration; work-based autonomy; and decision-making autonomy) to understand how the structure of a professional’s job can predict service integration. Task significance has not been used in this study, as it overlaps with key constructs from SCT, such as confidence and efficacy of the professional towards FHS teams. Task significance is the professional’s perception that his or her work improves the well-being of consumers, which is similar to the concept of outcome expectancies as described in the section on Cognitive-based theories (Thomas & Velthouse, 1990). Task identity has not been applied in this study, as it is referred to in the management literature as the building of a finished consumer product (Lambert,
Since health care service delivery is built on interactions and input from consumers rather than on the creation a tangible product, consumers input rather than task identity is considered a job characteristic here.

Service consumers input are an important job characteristic in health care delivery. Building such input into the professional’s job encourages the professional to listen to, respect and respond to the wants, needs and preferences of the consumer, so that services can be integrated in collaboration with the consumer in the way that best fits their circumstances (Levinson, Lesser, & Epstein, 2010). Brazilian usuária trust professionals who pay attention them (Otero-Sabogal et al., 2010). Given ACS’ tasks, in particular, door-to-door dissemination of HIV/AIDS-related information and advice on how households can access government benefits (such as housing, water, free medication, milk vouchers), ACS are known to establish good relationships with usuária. ACS, in the interviews that informed the survey under study, acknowledged that they exhibited a caring toward usuária, made frequent eye contact, and patiently listened to and inquired about usuária and their families’ wellbeing. Thanks to this communication style, ACS were able to integrate social services with health services by understanding the impacts of poverty, life stressors, family history and personal history on usuária’s health. For instance, a ACS told how it was necessary to acquire usuária trust by respecting their preferences. The ACS reported a case in which an adolescent girl showed early signs of pregnancy. The usuária was afraid of the outcome of her pregnancy test and requested that the ACS accompany her to the physician. The physician and the ACS informed the female usuária of her positive test results; the usuária requested the ACS not to disclose the results to her family members yet, which request was respected by the ACS. By ensuring that the needs, values, and preferences of the usuária are respected, ACS garner trust and respect from the
communities they serve.

Usuária-Input is also instrumental in evaluating the impact of the professional’s work (Coelho & Augusto, 2010). For example, a nurse reported that she was able to gauge the effectiveness of her work during subsequent household visits. On one household visit, the nurse counseled adolescent members of a family on the importance of condoms, and taught them how to use condoms. In a subsequent visit to the same household, one of those adolescents reported using a condom in a sexual encounter. The input provided by the usuária in using condoms after the nurse taught members within a household on how to use condoms contributed to the nurse’s knowledge of her work outcomes and further committed her to follow similar counseling strategies with other usuária.

A professional’s ability to integrate services in accordance with usuária input, risk management approaches, and care is contingent on the amount of autonomy granted by that professional’s job. Job autonomy is defined as the degree to which professionals feel they have the freedom to make independent decisions on how to do their jobs (Morgeson & Humphrey, 2008, p. 52). Professionals’ autonomy can be granted in two ways: a) work-methods autonomy, defined as the ability to control how the task is performed; and b) decision-making autonomy, defined as the ability to make decisions independently (Morgeson & Humphrey, 2008, p. 52). In a public health environment, it is important to allow professionals the discretion to integrate services, so that they can make decisions that deal with emerging health and social issues in their respective catchment areas (Lin et al., 2013). For instance, a nurse states that, while the targeted health issue as advocated by the municipality was dengue, her catchment area had a number of pregnant adolescents, so she fit her work plan to the need to counsel adolescents on sexual and reproductive practices.
In another interview, a recently trained ACS states that, at first, she provided a standardized form of health education to families, as dictated by her training. However, she quickly learned that, to be effective, she needed to integrate services by calling attention to communities’ living conditions, such as garbage thrown outside homes, which aggravated respiratory ailments in the catchment area. Optimally, by having a sense of control over what they can do and what they can accomplish with regard to the catchments area’s needs, professionals can deal with usuária issues and other challenges faced on the job (Griffin, Hogan, & Lambert, 2012). Job autonomy (decision-making and work-methods autonomy) allows the professional to feel that their job reflects their own input, instilling a sense of pride and accomplishment (Lambert et al., 2012).

Moreover, to integrate services, professionals need flexibility in deciding how to address the unique needs of usuária by trying new skills (Lambert et al., 2012). Trying and using different skills is called skill variety. Meta-analytic findings have demonstrated that using numerous skills in one’s work is challenging, yet having skill variety engages professionals and keeps them motivated (Humphrey et al., 2007) because skill variety offers professionals the chance to extend their skill set by exploring and manipulating services according to individual usuária and catchment area needs (Morgeson & Humphrey, 2008, p. 74; Oldham & Hackman, 2010). Professionals required to adhere to manuals may enter a state of learned helplessness, as they are unable to apply their own skills and abilities to consumers’ needs. For instance, one ACS stated that providing knowledge to consumers on health needs is not sufficient, professionals must also mobilize communities to know their rights. Within the interview, the ACS and nurses stated that within schools and churches, ACS and nurses held a community meeting at least once monthly to have usuária meet and talk to one another to find solutions to
public health problems. In addition, usuária were asked at these meetings to engage in simulation activities to enact preventive measures, such as preventing HIV transmission through the use of condoms.

As stated in the literature review chapter, Brazil’s primary health care is delivered by transdisciplinary teams (Mateus et al., 2008; Pinto, Wall, et al., 2012). Although each professional within the FHS team is trained according to each profession’s standards, these teams are characterized as transdisciplinary. This is because the professionals work together, using their individual types of knowledge to identify solutions for vulnerable communities by transcending disciplinary perspectives (Ellingson, 2002). For instance, in an interview an ACS on a visit to a household noticed sores on a usuária’s skin and consulted a nurse, who suspected it was leprosy; simultaneously another usuária visited the FHS physician, complaining of skin sores. At the weekly team meeting of FHS professionals, it was determined that the two suspected cases of leprosy lived on the same street. Collaboratively, the team did outreach in that neighborhood to determine if there were other cases of leprosy. The team (physician, nurse, and ACS) visited each household to determine whether other usuária had skin sores, and, as a result, the team collectively identified two more cases of leprosy. As a result of this outreach, on discovering the slightest spot or discoloring of the skin, usuária would contact the ACS to assess whether they had leprosy. Transdisciplinary collaboration, therefore, allows for a collaborative approach to problem solving that begins the process with data gathering from all members of the team and feeding that information back in a team meeting.

Transdisciplinary collaboration also allows for the recognition and appreciation of individual professionals skills and of expert knowledge that illuminates the need to integrate services to provide holistic care to usuária (Pinto, Wall, et al., 2012). Professionals educate one
another - i.e., ACS knowledge at the household level coupled with the medical knowledge of nurses and physicians - and so they elicit new approaches to consumer problems, and they contribute to problem-solving and decision-making processes in usuária cases. Therefore, transdisciplinary collaboration offers professionals opportunities for mutual support and morale building in cases where they may individually lack certain knowledge or skills (Ellingson, 2002).

**Organizational Theory**

Organizational theories, namely Modern Organizational Development Theory (Brown & Covey, 1987), and Structural Contingency Theory (Burns & Stalker, 1961; Lawrence & Lorsch, 1967) are used in this study to explain how professionals’ behavior, such as service integration, is influenced by the working conditions and availability of resources within, in this case, Brazil’s Sistema Único de Saúde (UHS – Unified Health System). Working conditions and availability of resources are impacted by the climate, culture, structure and capacity of an organizational system such as the UHS.

Modern Organizational Development Theory uses three concepts - organizational climate, organizational culture, and organizational capacity - to inform the development of the organizational norms and values that shape its environment (Steckler et al., 2002, p. 340). Organizational climate refers to individual and collective perceptions of an organization. Members’ shared perceptions, attitudes, and beliefs about the organization produce the overall organizational climate (Steckler et al., 2002, p. 340). The Brazilian national health system is organized around principles of universal access, comprehensiveness, decentralization, and community participation (Sampaio, 2012). The UHS was conceived as part of a struggle to restore democracy to Brazil (Paim et al., 2011). The implementation of community participation in the health system has been written into Federal Law no. 8142/1990, which mandates the
establishment of municipal health councils (Sampaio, 2012). The expectation is that community representatives within these municipal health councils will design health services and influence policy-making. The goal of this federal law is to counterbalance the power that had been traditionally concentrated in the hands of the medical personnel and corporations (Barnes & Coelho, 2009). Since the Federal Law no. 8142/1990 requires community participation in the public health system, the UHS climate is perceived as being collaborative and participatory (Sampaio, 2012). Transdisciplinary health teams are assumed, by virtue of their composition - ACS, nurses, and physicians - to allow for a climate where the usuária’s knowledge of the ACS is valued and incorporated into the medical decisions of physicians and nurses.

Closely related to organizational climate is organizational culture. Organizational culture is conceptualized as the deeper level of basic assumptions and beliefs shared by members of the organization, which operate instinctively (Steckler et al., 2002, p. 341). The difference between organizational climate and organizational culture is that the former is described as shared perceptions, whereas the latter is referred to as shared assumptions. Organizational culture forms the framework (schemata) for organizational behavior, as it shapes the way professionals make decisions. Structural Contingency theorists provide insight into how an organizational culture influences professional behavior through three concepts: formalized rules and procedures; division of labor; and hierarchy of authority (Hatch & Cunliffe, 2013, p. 92). Formalization involves the extent to which explicit rules, regulations, policies and procedures govern the organizational activities (Hatch & Cunliffe, 2013, p. 93). Indicators of formalization, such as rules and procedures, specify the job descriptions of the professionals and the hierarchy of decision-making within an organization, which is explored below.
Division of labor refers to the splitting of an organization’s work among employees, each one of whom performs a piece of the whole (Hatch & Cunliffe, 2013, p. 92). The division of labor between FHS professionals is determined by their respective expertise (knowledge and skills). The output of the team is the integration of services according to each member’s expertise, with the goal of providing comprehensive care to usuária. Within the FHS, ACS are considered the eyes of nurses, physicians and other medical specialists on the FHS team. ACS do outreach on a weekly basis by visiting houses within the catchment area to which they are assigned. As a result, ACS understands social and health issues faced by their communities. When conducting household visits they identify basic symptoms of diseases, counsel usuária about behavioral modifications, make medical appointments for usuária, and register families with the state. The nurses, besides supervising ACS work, offer basic medical consultation to usuária, perform physical exams, and engage in counseling usuária to modify their behavior. Within their catchment areas, nurses visit five to eight houses a week of usuária requiring medical attention, per the ACS’s advice. Nurses also manage the FHS teams. Physicians diagnose, treat and consult on complex cases. This division of labor according to the professionals’ knowledge and skills creates interdependence amongst professionals. Interdependence has the potential to increase the depth, breadth, and efficiency of knowledge exchange among team members, so that they may collaboratively agree on goals for usuária and catchment areas by tapping into relevant knowledge of their co-workers (Banai & Reisel, 2007).

Hierarchy is the distribution of authority within an organization. Hierarchy defines formal reporting relationships such that it maps the organization’s communication channel (Hatch & Cunliffe, 2013, p. 99). Centralization is the extent to which authority to make decisions concentrates at the top levels of the organization; in decentralization, decision-making is spread
across all levels in the hierarchy (Hatch & Cunliffe, 2013, p. 95). Typically, within the health care sector worldwide, physicians tend to make the final decisions on consumer care (Churchman & Doherty, 2010). However, UHS has been theoretically set up as decentralized, with the goal of transferring power from medical corporations and professionals to community constituents (Barnes & Coelho, 2009). A decentralized organization or system pushes authority and responsibility to lower levels of the hierarchy (Albers, Wohlgezogen, & Zajac, 2013). This means that professionals hired for their knowledge and expertise ought to have the discretion to use their skills and training and the flexibility to integrate services by experimenting to solve problems of usuária (Cotton & Hart, 2003). As suggested in the interviews, FHS professionals stated that decentralized decision-making took place within their health teams. Nurses, physicians, and ACS worked together within weekly meetings to respond quickly to shifting environmental demands. They also stated that they had productive conversations about the week’s accomplishments, and FHS team members received feedback on their performance. A supportive culture in which a professional can seek assistance from co-workers can facilitate the integration of services to deal with the myriad problems of usuária. Also, to have professionals consistently integrate services, organizations must regularly appraise their employees through formal and informal feedback channels on their performance level, and they must determine what to do to improve their performance (Kirinyet & Gachunga, 2013). This might include recognizing positive contributions of high-performing professionals and informing poor performing professionals of measures that need to be taken to improve their performance.

Studying the influence of organizational factors within UHS is important because, while it is endorsed as a decentralized system in which professionals practice transdisciplinary collaboration and engage in participatory decision-making, this may not be the case across all
municipalities (Dal Poz, 2002). Funding allocation of FHSs varies by municipality (Dal Poz, 2002). Funds are allocated according to FHS teams’ productivity, which is a function of ACS’ and nurse auxiliaries’ efforts in registering families in the program and documenting the services provided.

Depending upon the funding of the municipality, professionals may be understaffed and may lack other basic resources, including equipment, supplies, and medicines. Consequently, in cognitively appraising the match between task demands and available resources (human, material, and informational), professionals may find their ability to integrate services compromised. This is because a lack of resources distracts professionals’ attention from dealing with usuária needs and directs their energy instead toward acquiring resources (Rousseau & Aubé, 2010). For instance, a CHA reported that having to search for adequate space to deliver health education presentations particularly on rainy days, distracts their attention from engaging in health promotion. The need for tangible resources such as space and medication are important in order for professionals to integrate services.

**Integrated Framework**

This section will explore how concepts from the theories (Cognitive Behavioral Theory, Job Characteristics Theory and Organizational theories) have been integrated to study service integration. The model on page 45 determines the pictorial relationships between concepts from the three theories. Organizational theories, discussed earlier in this chapter, delineate how an organization arranges, manages, and operates itself, including centralization, formalization, and integration (Griffin et al., 2012). Conversely, job characteristics theory, tends to be limited in scope within an organization and is usually applied to a certain job within an organization (Griffin et al., 2012). Job characteristics invariably are determined by an organization’s structure.
Hence, there is a one-way relationship between organizational factors and job characteristics in the model. Moreover, since it is difficult for a single individual to alter an organization’s structure or hierarchy (Nadler, 1981), there is a one-way relationship between organizational factors and individual level factors in the model. Lack of resources or suboptimal working conditions, such as little or no peer support, may influence a professional’s individual confidence and efficacy with peers. There is a reciprocal relationship between job characteristics and individual level factors in the model, which will be explored below, while discussing the influence of transdisciplinary teams on professional’s confidence, and efficacy of peers within FHS teams.

Health care professionals evaluate their ability to integrate services (a behavior) according to their cognitions, which are shaped by their level of knowledge and skills, confidence, and perseverance and efficacy of team members. Health care professionals ought to have knowledge of treatments or socially based interventions that are efficacious and can be applied to the medical and social conditions of usuária. Information is simply lacking for a wide range of possible treatment options (Woodward, 2000). In many cases, information about health treatments or evidence-based interventions in social issues may be incomplete. Even when such information exists, it may not have filtered down to the professional (Woodward, 2000).

The professional may have the knowledge to deal with a usuária’s health problems, but the usuária may not comply with the medication, as he/she may not have funds to purchase the medication. Not being able to deal effectively with the usuária’s health problem can dampen the professionals’ confidence. However, professionals who attempt to solve usuária problems demonstrate perseverance by seeking assistance from colleagues or by finding solutions through self-directed learning. Upon solving the problem (such as finding cheaper alternatives of the
medication or applying for social assistance for the *usuária* so he/she can purchase medication), the professional’s confidence can be enhanced, and can potentially assist *usuária* with similar situations or conditions in the future.

Job characteristics theory postulates that professional’s work environment is not limited to the physical building or structure, but that it also includes intangible psychological and social components. Brazil’s UHS has transdisciplinary teams where peer support is provided by FHS colleagues who share and exchange information, tasks, and responsibilities. FHS team members consult one another about specific cases. Through the exchange of information, resources, and skills, FHS professionals are able to overcome individual and environmental shortcomings (Pinto, Wall, et al., 2012). For instance, during household visits, ACS pay attention to the social aspects of care and are able to inform nurses and physicians of the larger social context in which medical care should be provided and the social circumstances with which *usuária* can cope. Upon seeking advice and feedback from peers, professionals are likely to better their attitudes towards FHS teams (Pinto, Wall, et al., 2012).

Although autonomy is defined by job characteristics theory as granting professionals the discretion to make decisions regarding *usuária* care, the concept of autonomy does not limit collaboration but encourages it. If professionals are not able to work independently, apply their scope of practice, and engage in active learning, professional teams become inefficient, and their workloads become unmanageable. Feedback from service consumers who are integrating HIV prevention and social services is essential, as it allows professionals to listen to the concerns of *usuária* and to start with *usuária* where they are, depending upon their multi-layered needs.

It is important to study organizational-level factors within Brazil’s UHS, as the structure of FHS in each Brazilian municipality varies depending upon their funding allocation (Dal Poz,
While each municipality has the standard FHS team comprised of ACS, nurses, and physicians, municipalities with greater funding also include physical therapists, psychologists, dentists, and pharmacists, etc. In municipalities where funding is limited, professionals may be burdened with heavier caseloads. Furthermore, with heavier caseloads, professionals may not have the time to solicit usuária-input and/or engage in community mobilization activities. This may constrain service integration.

From an organizational stance, the lack of basic resources, including equipment, supplies, and medicines, can also place a strain on professionals’ ability to provide services. To counteract these difficulties, Cognitive Behavioral Theory emphasizes the need for professionals to persevere, seek feedback from co-workers, and make quick decisions by applying skill variety in addressing usuária and community needs.

It is important to note that the framework under study does not capture all elements that might predict service integration. Other variables, such as professionals’ job security, remuneration and job satisfaction, among others not incorporated in this framework, may come into play. Since the present study uses a secondary data, the choice of quantitative measurements is limited. It is worth noting, however, that no model or data could contain every variable that might influence service integration. This framework can be adapted and used in combination with other models that contain different variables, in order to understand a number of health practitioner behavior patterns, though not all.
Chapter 4: Methodology

Overview of this chapter

This section describes the methods used to answer six quantitative research questions. It includes the design of the study, an account of the data and the sample, and a description of the procedures. This section focuses on the analysis of the cross-sectional survey, including univariate analysis (observed frequencies, percentages, standard deviations and means); nonparametric tests such as Chi-Square Tests, and ANOVA with post hoc comparisons; multiple logistic regression analysis; and Structural Equation Modeling (SEM).

Research Questions

1) What are the associations between the three types of services that measure service integration - HIV prevention services, civil registration, and community mobilization?

2) What are the differences in service provision - HIV prevention services, community mobilization, and civil registration - across the three types of professionals (Agentes Comunitários de Saúde, nurses, and physicians)?

3) What are the differences in reported factors - individual-level, organizational-level, and job characteristics - across the three types of professionals (Agentes Comunitários de Saúde, nurses, and physicians)?

4) What are some of the demographic and job context factors associated with service integration of HIV prevention services, community mobilization, and civil registration?

5) What are some of the factors - individual-level, organizational-level, and job characteristics - associated with service integration of HIV prevention services, community mobilization, and civil registration?
6) What are the key demographic, job context, individual-level, organizational-level and job characteristic predictors of service integration?

**Study Design**

The present study uses secondary cross-sectional survey data from Brazil’s Family Health Strategy, a study conducted by Dr. R. M. Pinto. Data collection took place from 2008 to 2010. This study was conducted to examine the mechanisms through which professionals in the FHS teams delivered health-related services to racially diverse, low-income families in Mesquita, Rio de Janeiro and Santa Luzia, Minas Gerais, Brazil. Specifically, the study examined how FHS team members that include Agentes Comunitários de Saúde, nurses, and physicians educated community residents on prevention strategies and raised awareness of social, medical and environmental issues. In addition, the study studied FHS members’ perceptions of and attitudes toward their knowledge, skills and confidence, along with the characteristics of the job and the culture of Brazil’s Sistema Único de Saúde that could impact service integration.

**Human Participants Protection**

Human participant reviews have been completed by the Institutional Review Boards of Columbia University, New York and Universidade Católica, Rio de Janeiro.

**Sampling**

Due to a working relationship between Dr. Pinto and the Secretaries of Health in Mesquita and Santa Luzia, a list of all FHS professionals in the two municipalities was provided to Dr. Pinto. The study used a convenience sampling strategy. The study sampled 168 CHA, 62 Nurses, and 32 Physicians from 10 Unidades Básicas de Saúde clinics in Mesquita and 20 in Santa Luzia. The research team selected these BHU clinics based on their locations in distinct socioeconomic geographic areas.
**Recruitment**

In the data collected by Dr. Pinto, each BHU had at least one Physician (range = 1–2), one Nurse (range = 1–5), and one ACS (range = 1–23) were recruited. The average length of employment was 40 months (SD = 31; range = 4–156).

**Inclusion criteria**

The inclusion criteria were physicians, nurses and ACS who were hired by the FHS.

**Procedures**

**Survey Administration:** Using the list provided to Dr. Pinto, a master’s-level interviewer approached each potential participant and invited him/her to participate in the proposed interview. The interviewer explained the purpose and confidential nature of the interview. Participation was voluntary. Once an individual agreed to participate, the interviewer scheduled an appointment to conduct the interview. Interviews occurred in a private office. Prior to the interview, eight MA-level interviewers were trained in research methods and how to address potential situations in which FHS staff members might experience anxiety when answering questions. Participants were given an information sheet addressing their rights, risks and benefits, and confidentiality issues. No incentive was given to participants, as Brazil’s policy on research does not permit research participants to be given incentives. However, refreshments were provided to participants.

The interviewers offered to answer any questions prior to administering the survey. The survey was administered in Portuguese. The interview length ranged from 45 to 75 minutes. Approximately 85% of staff in all clinics participated.

**Data Management:** Password-protected mobile computers were used to administer the surveys as well as to download the survey into a password-protected database, DatStat Illume 4.6
(DATSTAT Illume, 1997). All data were kept in password-secured computer files, to which only relevant personnel had access. Similarly, there was no documentation that linked participants’ assigned ID numbers to the BHUs for which they worked.

**Measures**

The survey (Appendix A) included 118 questions: professionals’ demographics; familiarity with community; perceived success toward service integration; opinions about research; characteristics of their jobs; Evidence Based Practices (EBP); and transdisciplinary collaboration. Professionals had uneven reading and comprehension capacities. Dr. Pinto and his research team pilot the survey with only 42 professionals to see whether it was comprehensible to professionals. ACS had difficulty understanding questions that tapped their opinions and attitudes toward scientific research, and physicians found the survey too long. This input was used to correct for comprehensiveness and acceptability of the multidimensional survey. Survey questions were translated from Portuguese to English and iteratively back-translated into Portuguese (Brislin, 1970). To avoid errors in translation, the survey was pretested with ten professionals after it was back translated into Portuguese from English.

This dataset has been used in a prior study to examine associations between transdisciplinary collaboration, evidence-based practice, and the integration of primary care and public health services in Brazil’s Family Health Strategy (Pinto, Wall, et al., 2012). With the exception of demographics, job context, transdisciplinary collaboration, and familiarity with the community, identical variables have not been operationalized similarly in this study.

Below, each variable is described in terms of the construct that is being measured, as well as the approach taken to operationalize each construct. Variables that included composites comprised of more than one item were computed by reliability analysis using Cronbach’s alpha.
coefficient. The purpose of ascertaining the reliability of a scale is to find whether or not the items measuring the construct under investigation cling together in a consistent manner (Ho, 2013, p. 287). Cronbach’s alpha coefficients between 0.50 and 0.80 are thought to be moderate, while those exceeding 0.80 indicate that the scale being used is extremely reliable, meaning that the items comprising the composite variable are indeed measuring the same underlying construct, and therefore they have reasonable internal validity (Cohen & Cohen, 1983).

**Dependent Variables:** For the purposes of this study, service integration is conceptualized as the integration of HIV prevention services with two other types of social services: civil registration and community mobilization.

HIV prevention services were measured by one item, “I teach usuária how to prevent HIV and AIDS” (0 = No; 1 = Yes). In Brazil, FHS workers provide sexual health education to usuária to prevent the diagnosis and transmission of HIV. Physicians and nurses give talks at the BHU clinics on universal access to antiretroviral therapy; ACS and nurses teach usuária how to use condoms; the FHS team collectively teaches safe syringe practices, distributes condoms, and design media campaigns that encourage usuária to access free HIV testing through the BHU clinic (Golub et al., 2007).

Community mobilization is measured by one item “I help my usuária get involved in community activities” (0 = No; 1 = Yes). Community mobilization is done through the promotion of critical consciousness. This means that professionals facilitate critical dialogues on personal and community issues with community members. Based on these dialogues, professionals encourage consumers to develop strategies to take action against the prevailing health issue (Falavigna et al., 2013).
Civil registration is measured by one item, “I help my usuária attain documents, such as voter registration, working papers, birth certificate” (0 = No; 1 = Yes). Professionals assist usuária in claiming their citizenship by registering them with the state through documents such as birth certificates and voter registrations. These documents enable usuária to access medical and social services, which are restricted to individuals who are registered with the state (President’s Emergency Plan for AIDS Relief et al., 2008). The professionals also collect data on household-level demographics, treatment adherence, and risk behaviors.

**Independent Variables:** For the independent variables, some measures are scales whereas some are single-items. Measures for this study were chosen based on theoretical constructs discussed in chapter 3. In some instances, demographic and job context variables have been coded differently as per the analysis plan. Continuous data for demographic (age) and job context (caseload and FHS experience) variables have been used in the Structural Equation Model (SEM), because, when transformed into categorical data, dummy variables for each category had to be included in the SEM. As pointed out by Robert (2013), the inclusion of too many indicators makes it difficult to fit a model in the data (Ho, 2013, p. 432). Therefore, when possible, such as in the case of age, caseload, and FHS experience, where continuous data was able, age, caseload and FHS experience have been considered as continuous variables for the SEM.

Categorization of continuous variables is often necessary for descriptive purposes, allowing for a simpler presentation of the data. Converting a continuous variable into a categorical one will result in some loss of information, but it is often argued that, when there are three or more categories, the loss is small and is offset by a gain in simplicity and the avoidance of assumptions (Altman, 2005, pp. 708–711). For this reason, that age, caseload, and FHS
experience were the variables categorized in order to run descriptive statistics and perform the non-parametric tests (Chi-Square Tests; ANOVA with post hoc comparisons) and multiple logistic regressions. A synopsis of the variables is presented in Table 1 on page 73.

**Demographics**

- Participants’ ages were measured in years using four categories (1 = 20-30; 2 = 31-40; 3 = 41-50; 4 = 51 and above) when performing univariate analysis (frequencies and percentages), bivariate analysis (Chi-Square Tests), and logistic regressions. Age was considered a continuous variable for SEM, for the reasons provided above.

- Race included preto (coded as 1), branco (coded as 2) and pardo (coded as 3). Pardo is a broad classification used in Brazil to encompass mixed races, e.g., mulatto, and indigenous people, such as caboclos (Telles, 2004, p. 81).

- Gender was categorized as: male = 0; or female = 1.

**Job Context**

- Staff were categorized as: ACS = 1; nurses = 2; physicians = 3. In this study, nurse auxiliaries (n = 30) and nurses (n = 32) are combined into one-category: ‘nurses’. Due to the similarity of nurses and nurse auxiliaries work, including usuária assessment, monitoring of vital signs, promoting health and hygiene, and counseling usuária, the two categories have been grouped together (Silva-Costa, Rotenberg, Griep, & Fischer, 2011). Senior nurses orient and supervise nurse auxiliaries, in addition to performing administrative functions, managing personnel and procedures, and assisting seriously ill usuária (Silva-Costa et al., 2011).

- Caseload was measured by three categories (1= ≤ 250; 2 = 251-500; 3 = >501). For the SEM, caseload was a continuous variable, for the reasons provided above.
• FHS experience was measured as years working for the FHS (1 = ≤ 1 year; 2 = 1-5 years; 3 = 6-15 years). For the SEM, FHS experience was a continuous variable, for the reasons above.
• Commute was measured by the length of the professional’s commute to the job (0 = 0-10 minutes; 1 = 11-30 minutes; and 2 = > 30 minutes).
• Proximity to one’s job was measured with the question, “Do you live near your job?” and is a dichotomous variable (0 = Yes; 1 = No).

**Individual Factors**

Individual factors are operationalized by five measures - confidence, knowledge and skills, community familiarity, perseverance, and efficacy of FHS teams. These measures were coded on a 5-point Likert scale (0 = Strongly Disagree, 4 = Strongly Agree) in the cross-sectional survey data. However, after running descriptive statistics for familiarity with the community, perseverance, and efficacy of FHS teams, it was learned that the participants reported either agreeing (coded as 3) or disagreeing (coded as 1). For this reason, the initial five categories were collapsed into two (0 = Disagree, 1 = Agree). Familiarity with the community, perseverance, and efficacy of FHS teams are nominal measures, as they are dichotomous in nature. Confidence and knowledge and skills are scales.

• Familiarity with the community is a single item: “I know the latest news in my catchment area affecting usuária.”
• Perseverance is a single item: “I am committed to delivering the best services possible to the families in my catchment area even when they are difficult.”
• Efficacy of FHS teams was also a single item, “The existence of FHS teams has improved the quality of health in my catchment area.”
Confidence was a three-item composite (Cronbach α = 0.521): a. “I know exactly what my usuária needs are”; b. “I am able to make treatment plans which fit the needs and abilities of my usuária”; and c. “I am able to address usuária needs”.

Knowledge and skills was a ten-item composite (Cronbach α = 0.757): a. “I know how to ask appropriate questions to help my usuária discuss their health”; b. “I know how to ask appropriate questions to help my usuária discuss disease prevention”; c. “I know how to ask appropriate questions to help my usuária discuss health risks”; d. “I know how to ask appropriate questions to help my usuária discuss minimizing health risks”; e. “I know how to ask appropriate questions to help my usuária discuss their health prognosis”; f. “I know how to ask appropriate questions to help my usuária discuss the collateral effects of medications”; g. “It is important for me to reach the objectives determined by the families I serve”; h. “I have the tools necessary to make an assessment”; i. “I have the tools necessary to deliver health services to the families”; j. “I have the tools necessary to evaluate outcomes.”

Job Characteristics

Job Characteristics are operationalized by five measures – transdisciplinary collaboration, usuária-Input, skill variety, work-methods autonomy, and decision-making autonomy. The measures were coded on a 5-point Likert scale (0 = Strongly Disagree, 4 = Strongly Agree). However, after running descriptive statistics for work-methods autonomy and decision-making autonomy, it was learned that the participants either agreed (coded as 3) or disagreed (coded as 1). For this reason, the initial five categories were collapsed into two (0= Disagree, 1 = Agree).

- Transdisciplinary collaboration was a five-item composite (Cronbach α = 0.640): a. “I utilize other colleagues in deciding interventions”; b. “I have access to colleagues when I need help determining interventions”; c. “Team meetings are important for the discussion
of the families’ health problems”; d. “Team meetings are important for the team training in order to better plan families’ treatment”; and e. “I am able to refer my usuária to other medical services when necessary.”

- **Usuária-Input** was a four-item composite (Cronbach α = 0.627): a. “My usuária values and preferences are very important”; b. “My usuária goals are very important”; c. “My usuária and I work together to address his/her health needs”; and d. “With their help, I monitor usuária outcomes.”

- **Skill variety** is a three-item composite (Cronbach α = 0.620): a. “I am able to understand and use protocols to help usuária”; b. “I have the knowledge and the skills to bring together information from different sources to address my usuária needs”; and c. “I know how to use new information to change the way I treat my usuária.”

- A single item measured work-methods autonomy: “I can tailor my work based on the information I gathered from my usuária and from research.”

- Decision-making autonomy was measured by a one-item measure: “I am able to change or alter treatment based on changes in the needs of the usuária.”

Both work-methods autonomy and decision-making autonomy measures are nominal, as they are dichotomous (0 = Disagree; 1 = Agree).

**Organizational Factors**

Work conditions and work resources were measured by single items: “Do poor work conditions interfere with my ability to address the needs of my usuária?” and “Does lack of resource interfere with my ability to address the needs of my usuária?” respectively. The single items are dichotomous variables (0 = No; 1 = Yes).
### Table 1

**Summary of key variables and measures**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description (Cronbach's alpha)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demographics</strong></td>
<td>♦ Race, Age, Gender</td>
</tr>
<tr>
<td><strong>Job context</strong></td>
<td>♦ Staff, Caseload, FHS experience, Length of commute, Work proximity</td>
</tr>
<tr>
<td><strong>Individual Factors</strong></td>
<td>♦ Community Familiarity: One item; “I know the latest news in my catchment area affecting usuária”</td>
</tr>
<tr>
<td></td>
<td>♦ Perseverance: One item; “I am committed to delivering the best services possible to the families in my catchment area, even when they are difficult”</td>
</tr>
<tr>
<td></td>
<td>♦ Efficacy of FHS teams: One item, “The existence of FHS teams has improved the quality of health in my catchment area”</td>
</tr>
<tr>
<td></td>
<td>♦ Confidence: Three items ($\alpha = .521$); e.g., “I am able to make treatment plans which fit the needs and abilities of my usuária”</td>
</tr>
<tr>
<td></td>
<td>♦ Knowledge and skills: 10 items ($\alpha = .757$); e.g., “I know how to ask appropriate questions to help my usuária discuss their health”</td>
</tr>
<tr>
<td><strong>Job Characteristics</strong></td>
<td>♦ Transdisciplinary collaboration: Five items ($\alpha = 0.640$); e.g., “I have access to colleagues when I need help determining interventions”</td>
</tr>
<tr>
<td></td>
<td>♦ Usuária-Input: Four items ($\alpha = .627$); e.g., “My usuária and I work together to address his/her health needs”</td>
</tr>
<tr>
<td></td>
<td>♦ Skill variety: Three items ($\alpha = .620$); e.g., “I know how to use new information to change the way I treat my usuária”</td>
</tr>
<tr>
<td></td>
<td>♦ Work-based autonomy: One item; e.g. “I can tailor my work based on the information I gathered from my usuária and from research”</td>
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<tr>
<td></td>
<td>♦ Decision-making autonomy: One item, e.g., “I am able to change or alter treatment based on changes in the needs of the usuária”</td>
</tr>
<tr>
<td><strong>Organizational Factors</strong></td>
<td>♦ Work conditions: One item, e.g., “Do poor work conditions interfere with my ability to address the needs of my usuária?”</td>
</tr>
<tr>
<td></td>
<td>♦ Work resources: One item, e.g., “Does lack of resource interfere with my ability to address the needs of my usuária?”</td>
</tr>
</tbody>
</table>

**Hypotheses & Statistical Analysis**

The present study uses descriptive analyses (frequencies, means, and standard deviations), and hypothesis-testing model analyses by performing a series of non-parametric tests, multiple logistic regressions, and by fitting a structural equation model (SEM) as seen on page 81. For the descriptive analyses, non-parametric tests and multiple logistic regressions, data was analyzed using the IBM SPSS Statistics 22.0 for Windows. To fit the SEM, Mplus 6.1 was used as the software treats dichotomous outcomes as categorical rather than continuous.
Multivariate tests - logistic regressions and SEM - are the preferred statistical procedures in this study, as they allow for the simultaneous examination of the relationships of multiple variables (continuous and categorical), either observed and latent (de Andrade et al., 2013, pp. 383, 421). Diagnostic tests were used to identify sources of regression inadequacy. These include running descriptive statistics on the predictors, performing collinearity diagnostics to check for high intercorrelations among predictors, and examining outliers. Subsequent to the diagnostic tests, dichotomization of variables that severely violated a normal distribution was done. These variables include: efficacy towards FHS teams, perseverance, community familiarity, work-methods autonomy, and decision-making autonomy.

Although there was minimal missing data, pairwise deletion was used to address the problem of missing data when performing descriptive analysis, non-parametric tests, and multiple logistics. However, listwise deletions were used when fitting the SEM model, as pairwise deletion may cause estimation problems; a covariance matrix that is computed based on different numbers of cases have result in some estimates to be out-of-bound (Lei & Wu, 2007).

Below are the hypotheses for the six aims of this study. The data analysis plan has also been outlined, as per each hypothesis:

**Aim 1:** To examine associations between the three services that measure service integration, HIV prevention services, community mobilization, and civil registration.

**Hypothesis 1:** There is a strong, positive association between the three types of service: HIV prevention services; community mobilization; and civil registration.

**Analysis Plan:** Descriptive analysis in the form of frequencies and percentages were run to study how many professionals provided any of the three services or any combination of two services. Relationships between the dependent variables (three measures of service integration:
HIV prevention services; community mobilization; and civil registration) were evaluated using cross tabulations and by performing the Pearson Chi-square tests. Relationships were tested at the 5% level of significance.

**Aim 2:** To examine differences in service provision of HIV prevention services, community mobilization, and civil registration across the three types of professionals - ACS, nurses, and physicians.

**Hypothesis 2:** ACS, nurses and physicians will be similar in their engagement of HIV prevention services; ACSs and nurses are more likely to register *usuária* than are physicians; and ACS are more likely than nurses and physicians to mobilize communities.

**Analysis Plan:** Descriptive analysis in the form of frequencies and percentages were run to study the proportion of professionals (ACS, nurses, and physicians) that provide the three types of services - HIV prevention services, civil registration, and community mobilization. Differences between the three measures of service integration across ACS, nurses, and physicians were evaluated using cross tabulations and by performing the Pearson Chi-square tests. To examine specific differences between nurses and physicians, nurses and ACS, and ACS and physicians, the data was stratified according to staff category. Differences were tested at the 5% level of significance.

**Aim 3:** To examine the differences in the predictors of service integration - individual-level, organizational-level, and job characteristics across the three types of professionals.

**Hypothesis 3:** Physicians and nurses will report greater confidence, knowledge and skills than ACS. Physicians will demonstrate work-methods and decision-making autonomy than ACS and nurses. ACS will likely have greater community familiarity, perseverance and positive attitudes for FHS teams than nurses and physicians. ACS and nurses will engage in greater
transdisciplinary collaboration, incorporate higher levels of *usuária*-Input, and display greater skills variety than physicians.

**Analysis Plan:** Descriptive analysis in the form of frequencies, percentages, means, and standard deviations were run to study the proportion of the professionals perceptions of the asked individual-level and organizational-level factors, and job characteristics. To test differences between the professionals of service integration predictors, non parametric tests were used. For independent variables - efficacy of FHS teams, perseverance, community familiarity, work-methods autonomy, decision-making autonomy, work resources, and work conditions – that were nominal in nature, differences across ACS, nurses, and physicians were evaluated using cross tabulations and in performing the Pearson Chi-square tests.

To examine specific differences between nurses and physicians, nurses and ACS, and ACS and physicians, the data was stratified according to staff category. For independent variables that were scales (continuous in nature), Analysis of Variance (ANOVA) F-tests were performed. Multiple pairwise comparisons using a Tukey adjustment to control for Type I error at 5% were performed. Since there is a dearth of literature on how to operationalize service integration and its predictors, p-values ≤ 10% have been considered as trending toward significance.

**Aim 4:** To examine associations between the demographic characteristics and job contexts of service professionals and three services - HIV prevention services, community mobilization, and civil registration - used to measure service integration.

This aim called for two interrelated hypotheses that examined associations between service integration and demographics (Hypothesis 4a) and job context (Hypothesis 4b), which follows:
Hypothesis 4a: Female, pardo and older professionals will more likely perform each of the types of services.

Hypothesis 4b: ACS and nurses, professionals who live close to their workplaces and have a shorter commutes, have less FHS experience and heavier caseloads will more likely offer each of the three services.

Analysis for Hypotheses 4: Independent variables for demographics and job context were entered into two separate models for multiple logistic regression analyses. Logistic regressions were run to determine the relative influence of: (1) demographics and (2) job context on service integration as measured by three dichotomous outcomes - HIV prevention services, community mobilization, and civil registration. The purpose of running logistic regressions was to determine which of the predictors are statistically significant at the 5% level. Due to the dearth of literature on service integration and its predictors, p-values ≤ 10% have been considered as trending toward significance.

Odds Ratios were used to estimate and compare the magnitude of the influence of independent variables for demographics and job context on HIV prevention services, community mobilization, and civil registration. The c-index for each logistic regression was calculated to measure how well service integration could be predicted, and it ranges from 0.5 (poor prediction) to 1.0 (perfect prediction).

Aim 5: To examine associations between individual level factors, job characteristics, and organizational factors with service integration of HIV prevention services, community mobilization, and civil registration.
This aim called for three interrelated hypotheses that examined associations between service integration and individual factors (Hypothesis 5a), job characteristics (Hypothesis 5b), and organizational factors.

**Hypothesis 5a:** Professionals with greater confidence and community familiarity, higher levels of knowledge and skills, greater perseverance and greater efficacy of FHS teams will more likely do each of the three types of services, controlling for demographics, and job context variables.

**Hypothesis 5b:** Professionals that engage in greater transdisciplinary collaboration, incorporate higher levels of input from usuários, display better skills variety, and are given greater work-methods and decision-making autonomy in their jobs will more likely offer each of the three types of services, controlling for demographics, and job context variables.

**Hypothesis 5c:** Availability of resources and favorable work conditions result in the likelihood of the professionals offering each of the three types of services, controlling for demographics and job context variables.

**Analysis for Hypotheses 5:** Independent variables for individual-level factors, job characteristics, and organizational-level factors were entered into three separate models for multiple logistic regression analyses. Logistic regressions were run to determine the relative influence of: (1) individual-level factors; (2) job characteristics; and (3) organizational-level factors on service integration measured by three dichotomous outcomes - HIV prevention services, community mobilization, civil registration. Demographic and job context variables were considered as confounding factors. Confounding variables distort the true nature of a relationship between an exposure and an outcome variable. Adjusting for confounding variables is a standard technique, in which the effect of potential confounding variables is controlled in the
process of quantifying the strength of association between an exposure and outcome variable of study (Kleinbaum, Kupper, Nizam, & Rosenberg, 2013, p. 243).

The dependent variables have been coded in the sense that Category 0 maximizes the likelihood of not performing a service (HIV prevention, community mobilization, civil registration) whereas Category 1 denotes the likelihood of performing a service (HIV prevention, community mobilization, civil registration). Odds Ratios were used to estimate and compare the magnitude of the influence of independent variables for individual-level, job characteristics, and organizational-level factors on HIV prevention services, community mobilization, and civil registration. Statistical significance was determined at the 5% and 10% level. The latter was considered as trending as significant, due to a dearth of literature on service integration and its predictors. The c-index for each logistic regression was calculated to measure how well service integration can be predicted, and ranges from 0.5 (poor prediction) to 1.0 (perfect prediction).

**Aim 6:** To examine which predictors (demographics, job context, individual-level, organizational-level, and job characteristics) are associated with service integration (a latent construct).

**Hypothesis 6a:** Professionals with greater decision-making autonomy, perseverance and community familiarity, who have higher levels of knowledge and skills and engage in transdisciplinary collaboration, incorporate higher levels of usuária-Input, and have access to resources from work are likely to integrate services.

**Analysis for Hypotheses 6:** A SEM was fit to examine the common effect of predictors on service integration using Mplus 6.1. The purpose of the SEM is to describe, assess, and test hypothesized relationships between predictor variables - demographics, job context, individual factors, organizational factors, and job characteristics - and an outcome variable of service
integration, which is hypothesized to be a latent variable measured by three types of services, HIV prevention services, community mobilization, and civil registration.

In fitting the hypothesized model, estimation of the modification indices (MI) were run to examine any possible direct effects between the predictors and the three observed measures of service integration (above and beyond the effects through the latent service integrations variable). Subsequent to attaining the MI pathways of significant predictors of each measure of service integration were identified.

It is common in SEM to examine overall model fit (Bagozzi & Yi, 2012). When fitting models with categorical outcomes, SEM fit statistics - including the $\chi^2$ tests (and df ratio) and RMSEA were examined. The $\chi^2$ statistic tends to be over-sensitive to minor misfit with large sample sizes (Kelloway, 2014, p. 24). As a result RMSEA is used as the main SEM fit statistics. RMSEA values below .08 are considered satisfactory, and values and below .05 are considered a good fit. RMSEA takes into account the error of approximation in the population. It is a measure of discrepancy per degree of freedom, and is representative of the goodness of fit when the proposed model is estimated in the population (Browne & Cudeck, 1993, p. 136). Maximum likelihood estimation and percentage of variability explained by the latent variable - service integration - was used to assess predictive performance of the model.

In employing the aforementioned fit indices to evaluate the model fit, it is necessary to take into account the warning offered by Marsh et. al. (2004) regarding the use of these indices as an heuristic rule of thumb. The desirable cut off values may not work with various types of fit indices, sample sizes, estimators, or distributions (Marsh, Hau, & Wen, 2004). Therefore, in deciding upon the validity of a model, one should take into account the adequacy and interpretability of parameter estimates, model complexity and the substantive and theoretical
issues underlying the posited model (Marsh et al., 2004). Parameter estimates < 0.10 have been identified as significant and have been discussed. Moreover, the posit model under review has been built upon the work done by Pinto et al. (2002) who examined associations between transdisciplinary collaboration, evidence-based practice, and the integration of primary care and public health services in Brazil’s Family Health Strategy. Pinto et al.’s (2012) work has been accepted by public health scholars and published in the *American Journal of Public Health*, due to its medical significance in demonstrating how the use of evidence-based practice and transdisciplinary collaboration can facilitate the integration of primary care and public health services.

*Figure 3: Hypothesized Model*
**Power Analysis**

Statistical power is used in this study to determine the sample size $n$ needed to carry out the statistical procedures highlighted above. To determine sample size, the statistical power and alpha coefficient were set at 0.80, and 0.05, respectively, traditional levels for the social sciences. For this study, power analysis was derived from a statistical computer program, Power and Precision, after Borenstein, Rothstein, Cohen, Schoenfeld, Berlin and Lakatos (2001).

Power and Precision estimated that a sample size of 26 was required to achieve power at 0.8, alpha at 0.05, for the logistic regression analysis of HIV prevention services (a multiple outcome used to measure service integration) on knowledge and skills (a continuous predictor of service integration). The power analysis detects a change in probability of doing HIV prevention services from the value of 0.700, with the mean of knowledge and skills being 0.400 when knowledge and skills is increased to one standard deviation above the mean. This change corresponds to an odds ratio of 0.286. An adjustment was made, since a multiple regression of the independent variable of interest on the other independent variables (confidence, efficacy of FHS teams, community familiarity, and perseverance) in the logistic regression obtained an R-Squared of 0.100. Since the sample size estimates are lower than the number of participants in the present study, the available sample is expected to reveal significant effects.
Chapter 5: Results

Overview

The results of this study were obtained by using the statistical methods of data analysis described in Chapter 4. The results include descriptive statistics, Pearson’s Chi-Square tests of association, ANOVA F-tests, multiple logistic regression analysis, and Structural Equation Modeling (SEM).

Sample Characteristics of Professionals

Table 2a provides descriptive statistics (observed frequencies and percentages) on the demographic characteristics and job contexts of 262 professionals. The sample included: 169 (64%) ACS; 62 nurses (24%); and 31 physicians (12%).

Demographics: Of the 262 professionals, 123 were pardo (47%); 82 were branco (32%); and 54 (21%) were preto. The majority of the professionals were females (n = 214; 82). Average professional age was 33.60 (SD = 9.99, range = 20-70). One hundred and fifteen professionals (45%) reported their age as 20-30 years; 81 (32%) professionals stated their age was 31-40 years; 42 professionals (16%) reported their age as 41-50 years; and 19 professionals (7%) reported their age as 51-70 years.

Job Context: The majority of the professionals (n= 175; 67%) reported that they had 1-5 years of experience with the Estratégia Saúde da Família. Forty-three participants stated that they had less than one year of experience with the FHS (16%); and forty-four participants stated that they had between 6-15 years of experience with the FHS (17%). One hundred and thirty-three professionals (51%) reported that their caseload was ≤ 250 cases per month; ninety-one professionals (35%) reported their caseload was > 501 cases per month, and 14 professionals stated that their caseload was
between 251-500 cases per month (14%). Half of the professionals reported that their commute to work was 0-10 minutes (n = 129; 50%); 88 professionals (34%) stated their commute ranged from 11-30 minutes; and 43 (16%) reported their commute was over 30 minutes. The majority of professionals (n=186; 71%) reported that they lived in proximity to their work, whereas 75 professionals (29%) said they did not live in proximity to their work.

Table 2a
Demographics & job context (Total sample)

<table>
<thead>
<tr>
<th>Staff Category</th>
<th>N (262)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACS</td>
<td>169</td>
<td>64</td>
</tr>
<tr>
<td>Nurses</td>
<td>62</td>
<td>24</td>
</tr>
<tr>
<td>Physicians</td>
<td>31</td>
<td>12</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>54</td>
<td>21</td>
</tr>
<tr>
<td>White</td>
<td>82</td>
<td>32</td>
</tr>
<tr>
<td>Pardo</td>
<td>123</td>
<td>47</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>48</td>
<td>18</td>
</tr>
<tr>
<td>Female</td>
<td>214</td>
<td>82</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20-30</td>
<td>115</td>
<td>45</td>
</tr>
<tr>
<td>31-40</td>
<td>81</td>
<td>32</td>
</tr>
<tr>
<td>41-50</td>
<td>42</td>
<td>16</td>
</tr>
<tr>
<td>51-70</td>
<td>19</td>
<td>7</td>
</tr>
<tr>
<td>FHS experience</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 1 year</td>
<td>43</td>
<td>16</td>
</tr>
<tr>
<td>1-5 years</td>
<td>175</td>
<td>67</td>
</tr>
<tr>
<td>6-15 years</td>
<td>44</td>
<td>17</td>
</tr>
<tr>
<td>Caseload (per month)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 250</td>
<td>133</td>
<td>51</td>
</tr>
<tr>
<td>251-500</td>
<td>38</td>
<td>14</td>
</tr>
<tr>
<td>&gt; 500</td>
<td>91</td>
<td>35</td>
</tr>
<tr>
<td>Length of Commute</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-10 mins</td>
<td>129</td>
<td>50</td>
</tr>
<tr>
<td>11-30 mins</td>
<td>88</td>
<td>34</td>
</tr>
<tr>
<td>&gt;30 mins</td>
<td>43</td>
<td>16</td>
</tr>
</tbody>
</table>
Sample Characteristics by Professional Type

Table 2b provides descriptive statistics on the demographic characteristics and job context of each professional type. The table also provides results of Chi-Square tests of associations between the demographic and job context variables, and professional category.

Table 2b
Demographics & job context (Professional type)

<table>
<thead>
<tr>
<th></th>
<th>ACS N = 169 (%)</th>
<th>Nurses N = 62 (%)</th>
<th>Physicians N = 31 (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
<td>0.002*</td>
</tr>
<tr>
<td>Black</td>
<td>40 (24)</td>
<td>13 (21)</td>
<td>1 (3)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>42 (25.1)</td>
<td>22 (35)</td>
<td>18 (58)</td>
<td></td>
</tr>
<tr>
<td>Pardo</td>
<td>85 (50.9)</td>
<td>27 (44)</td>
<td>11 (35)</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td>&lt; 0.001*</td>
</tr>
<tr>
<td>Male</td>
<td>28 (17)</td>
<td>4 (6)</td>
<td>16 (52)</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>141 (83)</td>
<td>58 (94)</td>
<td>15 (48)</td>
<td></td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
<td></td>
<td>0.138</td>
</tr>
<tr>
<td>20-30</td>
<td>76 (45)</td>
<td>27 (44)</td>
<td>12 (39)</td>
<td></td>
</tr>
<tr>
<td>31-40</td>
<td>56 (33)</td>
<td>15 (24)</td>
<td>10 (32)</td>
<td></td>
</tr>
<tr>
<td>41-50</td>
<td>27 (16)</td>
<td>12 (19)</td>
<td>3 (10)</td>
<td></td>
</tr>
<tr>
<td>51-70</td>
<td>7 (4)</td>
<td>7 (11)</td>
<td>5 (16)</td>
<td></td>
</tr>
<tr>
<td><strong>FHS experience</strong></td>
<td></td>
<td></td>
<td></td>
<td>0.008*</td>
</tr>
<tr>
<td>≤ 1 year</td>
<td>27 (16)</td>
<td>8 (13)</td>
<td>8 (26)</td>
<td></td>
</tr>
<tr>
<td>1-5 years</td>
<td>123 (73)</td>
<td>37 (60)</td>
<td>15 (48)</td>
<td></td>
</tr>
<tr>
<td>6-15 years</td>
<td>19 (11)</td>
<td>17 (27)</td>
<td>8 (26)</td>
<td></td>
</tr>
<tr>
<td><strong>Caseload per Month</strong></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>≤ 250</td>
<td>131 (77)</td>
<td>2 (3)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>251-500</td>
<td>35 (21)</td>
<td>1 (2)</td>
<td>2 (6)</td>
<td></td>
</tr>
<tr>
<td>&gt; 500</td>
<td>3 (2)</td>
<td>59 (95)</td>
<td>29 (94)</td>
<td></td>
</tr>
<tr>
<td><strong>Length of Commute</strong></td>
<td></td>
<td></td>
<td></td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>0-10 mins</td>
<td>114 (67)</td>
<td>12 (19)</td>
<td>3 (10)</td>
<td></td>
</tr>
<tr>
<td>11-30 mins</td>
<td>47 (28)</td>
<td>30 (48)</td>
<td>11 (35)</td>
<td></td>
</tr>
<tr>
<td>&gt;30 mins</td>
<td>6 (4)</td>
<td>20 (32)</td>
<td>17 (55)</td>
<td></td>
</tr>
</tbody>
</table>
Demographics: There were statistically significant differences in the racial identity of the professionals (p-value = 0.002). The majority of the ACS (n = 85; 51%) and nurses (n = 27; 44%) identified as pardo. Whereas, the majority of the physicians identified as white (n = 18; 58%). A small proportion of physicians identified as black or Afro-descent (n=1; 3%), as compared to the ACS (n = 40; 24%) and nurses (n=13; 21%).

Statistically significant differences amongst the professionals were found in relation to gender. ACS (n=141; 83%) and nurses (n = 58; 94%) were predominantly female, whereas most physicians were male (n = 16; 52%).

There were no significant differences between the ages of the three types of professionals. A significant proportion of each professional type was between the ages of 20-30 years; 76 ACS (45%), 27 nurses (44%), and 12 physicians (39%). While there were a relatively small proportion of ACS (n = 7; 4%) and nurses (n = 7; 11%) within the range of 51-70 years, there were 5 physicians (16%) that fell into that range.

Job Context: There were significant differences in FHS experience amongst the professionals. The majority of the ACS (n=123; 73%), nurses (n=37; 60%), and physicians (n=8, 26%) had between one to 5 years of FHS experience. However, a significant proportion of nurses (n=17; 27%) had 6-15 years.

Statistically significant differences were found in caseload, length of commute, and proximity to work between the three professionals. The majority of ACS reported a caseload of ≤250 per month (n = 131; 76%). Conversely, a significant proportion of
nurses (n = 59; 95%), and physicians (n = 29; 94%) reported a caseload of >501 per month. Most ACS reported that they lived in proximity to their work (n = 169; 91%), whereas most nurses (n = 34; 55%) and physicians (n = 26; 84%) reported that they did not live in proximity to their work.

The length of commute to work varied per professional type. Most ACS (n = 114; 67.3%) reported that their length of commute to work was between 0-10 minutes. A greater number of nurses reported that their commute to work lasted between 11 to 30 minutes; and most physicians (n = 17; 55%) reported their commute to be work over 30 minutes.

Results for Hypotheses

Hypothesis 1: There is a strong, positive association between the three types of service: HIV prevention services, community mobilization, and civil registration.

Of the 262 professionals, 217 (83%) reported providing HIV prevention services to usuária, including provision of sexual-health education, promoting condom use, and HIV counseling and testing. Two hundred and twelve professionals (81%) stated they engaged in community mobilization by engaging usuária to identify and take social action against socioeconomic and political determinants of health. Of the total number of health professionals in this study, 118 (41%) reported doing some form of civil registration for usuária by ensuring that births, fetal deaths, marriages, divorce and deaths were registered with the state besides documenting health prognosis and amount of services offered by the professionals.

Pearson Chi-Square tests were conducted to examine the associations between the three types of services, indicating service integration (Table 3). Results revealed that community mobilization and HIV Prevention services (p-value = 0.008), and community
mobilization and civil registration (p-value = 0.002), respectively, were strongly and positively associations with one another. Ninety-one of the 262 professionals (38%) registered usuário, as well as offered HIV prevention services. Ninety-seven professionals (37%) mobilized communities and registered usuário. One hundred and eighty two professionals (70%) offered HIV prevention services and mobilize communities concurrently.

Table 3
Associations between three services that measure service integration

<table>
<thead>
<tr>
<th>HIV prevention Services</th>
<th>Civil registration</th>
<th>Community mobilization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Y (%)  N (%)</td>
<td>Y (%)  N (%)</td>
</tr>
<tr>
<td>HIV prevention services</td>
<td>217 (83) 45 (17)</td>
<td>91 (42) 125 (58)</td>
</tr>
<tr>
<td>Civil registration</td>
<td>91 (84) 17 (16)</td>
<td>108 (41) 153 (59)</td>
</tr>
<tr>
<td>Community mobilization</td>
<td>182 (86) 30 (14)</td>
<td>97 (46) 114 (54)</td>
</tr>
</tbody>
</table>

Boldface used to indicate significant effects with p-values < 0.10; * p < 0.05

Hypothesis 2: ACS, nurses and physicians will be similar in their engagement of HIV prevention services; ACS and nurses are more likely to register usuário than are physicians; and ACS are more likely than nurses and physicians to mobilize communities.

Table 4 shows frequencies and percentages of services – HIV prevention, community mobilization, and civil registration – offered by ACS, nurses, and physicians. It also shows results for Pearson Chi-Square tests for statistically significant differences between the services offered by professionals. Results indicate that there is a significant difference in civil registrations offered by ACS (51%) as compared to physicians (26%) and nurses (23%). Results also demonstrate that there is a significant difference in HIV prevention services offered by nurses (85%) and ACS (83%) compared to physicians.
Results also show that there is a significant difference in mobilization of communities by ACS (82%) compared to physicians (77%).

Table 4

<table>
<thead>
<tr>
<th>Services</th>
<th>N</th>
<th>ACS N(%)</th>
<th>Nurses N(%)</th>
<th>Physician N(%)</th>
<th>Overall Differences</th>
<th>ACS vs. Nurses</th>
<th>Nurses vs. Physicians</th>
<th>Physicians vs. ACS</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV prevention services</td>
<td>262</td>
<td>142 (83)</td>
<td>27 (16)</td>
<td>53 (15)</td>
<td>22 (71)</td>
<td>9 (29)</td>
<td>0.171</td>
<td>0.787</td>
<td>0.097†</td>
</tr>
<tr>
<td>Community mobilization</td>
<td>262</td>
<td>138 (82)</td>
<td>31 (18)</td>
<td>51 (19)</td>
<td>12 (77)</td>
<td>24 (23)</td>
<td>0.858</td>
<td>0.861</td>
<td>0.718</td>
</tr>
<tr>
<td>Civil registration</td>
<td>261</td>
<td>86 (51)</td>
<td>82 (49)</td>
<td>14 (23)</td>
<td>48 (77)</td>
<td>8 (26)</td>
<td>&lt;0.001*</td>
<td>&lt;0.001*</td>
<td>0.731</td>
</tr>
</tbody>
</table>

Boldface used to indicate significant effects with p-values < 0.10; * p < 0.05; † p < 0.10

Hypothesis 3: Physicians and nurses will report greater confidence, knowledge and skills than ACS. Physicians will demonstrate work-methods and decision-making autonomy than ACS and nurses. ACS will likely have greater community familiarity, perseverance and positive attitudes for FHS teams than nurses and physicians. ACS and nurses will engage in greater transdisciplinary collaboration, incorporate higher levels of usuária-Input, and display greater skills variety than physicians.

Table 5a provides descriptive statistics on predictors (individual, job characteristics, and organizational factors) of service integration as reported by the three types of professionals – ACS, nurses, and physicians. Table 5b provides results of the Chi-Square tests, and ANOVA F-tests run to examine significant differences in predictors across the professionals. Significant associations (p < 0.05, and p-values ≤ 0.10 have been considered as trending toward significance, due to the dearth of literature on this topic) have been discussed.

**Individual Factor**: The following individual level factors were used to predict service integration: confidence, knowledge and skills, efficacy of FHS teams, perseverance, and community familiarity.
While the majority of professionals tend to disagree about their level of confidence in providing services, ACS reported the least degree of confidence. Anova F-test results indicate significant differences in levels of confidence between ACS and nurses (F = 8.862; p-value = 0.003) and between physicians and ACS (F=15.905; p-value = 0.000). All three types of professionals perceived they had the desired knowledge and skills to offer all three services. However, ACS had a greater perception believing they had the knowledge and skills set to offer the three services, followed by nurses and physicians.

The majority of professionals (95%) agreed they were efficacious of FHS teams in that they perceived that the existence of FHS teams improved the quality of health in their respective catchment areas. A significant proportion of professionals (98%) agreed that they demonstrated perseverance by being committed to delivering the best services possible to families in their catchment area despite facing difficulty. ACS (n = 153; 91%), nurses (n = 54; 87%) and physicians (n = 26; 84%) agreed that they were familiar with the latest news in their catchment area, which would affect the families they serve.

**Job Characteristics:** The job characteristics used in this study to predict service integration included: transdisciplinary collaboration; usuária-Input; skill variety; work-methods autonomy; and decision-making autonomy.

ACS and physicians tend to agree that transdisciplinary collaboration, characterized by explicit access to colleagues, team meetings and frequent consultations, facilitate their tasks. However, nurses tend to disagree that transdisciplinary collaboration facilitates their work. The ANOVA F-tests reveal that there were significant differences
in nurses and physicians perceptions of transdisciplinary collaboration as facilitating their work (F = 3.120; p-value = 0.081).

Physicians tended to disagree that they incorporated *usuária*-Input in their work. Physicians also disagreed that they used a variety of skills in providing services to *usuária*. Nurses and ACS tend to agree that they incorporated *usuária*-Input in their work. Nurses and ACS also tend to agree that they used a variety of skills in providing services to *usuária*. The ANOVA F-tests revealed that there were significant differences between nurses and physicians (F = 3.998; p-value = 0.033); and between physicians and ACS (F=7.610; p-value = 0.006) in their ability to incorporate *usuária*-Input in their work. ANOVA F-tests also revealed a significant difference between physicians and ACS (F=8.105; p-value = 0.005), and physicians and nurses (F = 3.603; p-value = .061) in their ability to use a variety of skills in providing services to *usuária*.

A significant proportion of the professionals - ACS (n = 143; 85%), nurses (n = 55, 89%), and physicians (n = 28; 90%) agreed that they were granted work-methods autonomy, as they were able to tailor their work based on the information they gathered from their *usuária* and from research. A significant proportion of physicians (n = 29; 90%) as compared to ACS (n = 127; 76%) and nurses (n = 44; 72%) reported that they had decision-making autonomy. Chi-Square tests indicated that there were significant differences in nurses and physicians ($\chi^2 = 3.998; \ p-value = 0.046$), and ACS and physicians ($\chi^2 = 3.134; \ p-value = 0.077$) perceptions of their ability to change or alter treatment of *usuária* based on the needs of the *usuária*.

**Organizational Factors:** The two organizational factors used to predict service integration are work resources and work conditions.
Sixty-seven ACS (40%), 23 nurses (37%), and 11 physicians (35%) reported that lack of resources interfered with their ability to address the needs of usuária. Only a small proportion of ACS (n = 63; 37%), nurses (n = 22; 35%), and physicians (n = 7; 23%) agreed that poor work conditions interfered with their ability to address the needs of usuária.

Table 5a
Descriptive analysis of predictors across ACS, nurses, and physicians

<table>
<thead>
<tr>
<th></th>
<th>ACS N = 169</th>
<th>Nurses N = 62</th>
<th>Physicians N = 31</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Agree N (%)</td>
<td>Disagree N (%)</td>
<td>M (SD)</td>
</tr>
<tr>
<td>Individual factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidence</td>
<td>-</td>
<td>-</td>
<td>8.63 (1.744)</td>
</tr>
<tr>
<td>Knowledge &amp; skills</td>
<td>-</td>
<td>-</td>
<td>29.28 (4.523)</td>
</tr>
<tr>
<td>Efficacy of FHS teams</td>
<td>161 (95)</td>
<td>8 (5)</td>
<td>59 (3)</td>
</tr>
<tr>
<td>Perseverance</td>
<td>165 (98)</td>
<td>4 (2)</td>
<td>61 (1)</td>
</tr>
<tr>
<td>Community familiarity</td>
<td>153 (91)</td>
<td>15 (9)</td>
<td>54 (8)</td>
</tr>
<tr>
<td>Job characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transdisciplinary collaboration</td>
<td>-</td>
<td>-</td>
<td>16.60 (2.279)</td>
</tr>
<tr>
<td>Usuária- Input</td>
<td>-</td>
<td>-</td>
<td>12.26 (1.868)</td>
</tr>
<tr>
<td>Skill variety</td>
<td>-</td>
<td>-</td>
<td>8.16 (1.858)</td>
</tr>
<tr>
<td>Work-methods autonomy</td>
<td>143 (85)</td>
<td>25 (15)</td>
<td>55 (7)</td>
</tr>
<tr>
<td>Decision-making autonomy</td>
<td>127 (76)</td>
<td>40 (24)</td>
<td>44 (17)</td>
</tr>
<tr>
<td>Organizational factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work resources</td>
<td>67 (40)</td>
<td>101 (60)</td>
<td>23 (37)</td>
</tr>
<tr>
<td>Work conditions</td>
<td>63 (37)</td>
<td>105 (63)</td>
<td>22 (35)</td>
</tr>
</tbody>
</table>

M = mean; SD = standard deviation
Table 5b
Chi-Square Tests and ANOVA F-tests of predictors across professionals

<table>
<thead>
<tr>
<th>Predictors</th>
<th>N</th>
<th>ACS vs. Nurses</th>
<th>Nurses vs. Physicians</th>
<th>Physicians vs. ACS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>$\chi^2$, F</td>
<td>P-value</td>
<td>$\chi^2$, F</td>
</tr>
<tr>
<td>Individual factors</td>
<td></td>
<td></td>
<td></td>
<td>$\chi^2$, F</td>
</tr>
<tr>
<td>Efficacy of FHS teams$^a$</td>
<td>262</td>
<td>0.001</td>
<td>0.974</td>
<td>0.106</td>
</tr>
<tr>
<td>Perseverance$^a$</td>
<td>262</td>
<td>0.122</td>
<td>0.727</td>
<td>0.255</td>
</tr>
<tr>
<td>Community familiarity$^a$</td>
<td>261</td>
<td>0.795</td>
<td>0.373</td>
<td>0.179</td>
</tr>
<tr>
<td>Confidence$^b$</td>
<td>260</td>
<td>8.862*</td>
<td><strong>0.003</strong></td>
<td>2.191</td>
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<tr>
<td>Knowledge &amp; skills$^b$</td>
<td>260</td>
<td>0.103</td>
<td>0.749</td>
<td>0.539</td>
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<tr>
<td>Job characteristics</td>
<td></td>
<td></td>
<td></td>
<td>$\chi^2$, F</td>
</tr>
<tr>
<td>Work-methods autonomy$^b$</td>
<td>261</td>
<td>0.487</td>
<td>0.486</td>
<td>0.056</td>
</tr>
<tr>
<td>Decision-making autonomy$^b$</td>
<td>259</td>
<td>0.366</td>
<td>0.545</td>
<td><strong>3.998</strong></td>
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<tr>
<td>Transdisciplinary collaboration$^b$</td>
<td>248</td>
<td>2.146</td>
<td>0.144</td>
<td><strong>3.120</strong></td>
</tr>
<tr>
<td>Skill variety$^b$</td>
<td>260</td>
<td>0.672</td>
<td>0.413</td>
<td><strong>3.603</strong></td>
</tr>
<tr>
<td>Usuária-Input$^b$</td>
<td>261</td>
<td>0.002</td>
<td>0.966</td>
<td><strong>4.681</strong></td>
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<tr>
<td>Organizational factors</td>
<td></td>
<td></td>
<td></td>
<td>$\chi^2$, F</td>
</tr>
<tr>
<td>Work resources$^a$</td>
<td>261</td>
<td>0.147</td>
<td>0.701</td>
<td>0.023</td>
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<tr>
<td>Work conditions$^a$</td>
<td>261</td>
<td>0.079</td>
<td>0.779</td>
<td>1.603</td>
</tr>
</tbody>
</table>

$^a$ = $\chi^2$- tests were performed; $^b$ = ANOVA F-tests were performed

Boldface used to indicate effects with significant P-values < 0.10; * p < 0.05; † p < .10

Hypotheses 4

The aim of Hypothesis 4 (a) and (b) was to identify significant demographic and job context predictors of service integration measured by HIV prevention services, civil registration, and community mobilization. Statistically significant predictors with p-values of < 0.05, and <0.10 have been indicated in Table 6, which will be discussed below.
Hypothesis 4a: Female, pardo and older professionals will more likely perform each of the types of services.

The results revealed that the odds ratio for provision of HIV prevention services by black professionals or those who identify as Afro-descent is 0.425. Since the odds ratio is < 1, this means that the odds of a black professional or a professional who identifies as Afro-descent, not providing HIV prevention services (0 = No; and 1 = Yes) is 2.35 fold (1/ 0.425 = 2.35) compared to pardo professionals (p-value = 0.037). The odds of white professionals mobilizing communities are 0.43. Given that the odds ratio is < 1, the odds of a white professional not mobilizing communities is 2.33 fold (1/ 0.43 = 2.33) fold compared to pardo professionals (p-value = 0.025).

Hypothesis 4b: ACS and nurses, professionals who live close to their workplaces and have a shorter commutes, have less FHS experience and heavier caseloads will more likely offer each of the three services.

ACS have 10 times the odds of performing HIV prevention services, as compared to physicians (p-value = 0.027). The odds of a professional with a caseload of less than 250 performing HIV prevention services are 0.165. Since the odds ratio is < 1, this means that the odds of professionals with caseloads of less than 250 not providing HIV prevention services is 6.06 fold (1/ 0.165 = 6.06), compared to the odds of professionals with caseloads of more than 500 (p-value = 0.094) not providing HIV prevention services.

The odds of mobilizing communities by professionals who have less than one year of FHS experience are 0.281. The odds of mobilizing communities by professionals who have FHS experience between 1-5 years are 0.252. The odds of professionals with less than one year of FHS experience not mobilizing communities are 3.56 fold (1/ 0.281 = 3.56; p-value = 0.079), compared to professionals who have 6-15 years of FHS experience and do not mobilize communities. The odds of professionals with 1-5 years of FHS experience not mobilizing
communities are 3.97 fold (1/0.252, p-value = 0.033), compared to professionals who have 6-15 years of FHS experience and do not mobilize communities.

**Hypotheses 5**

The aim of Hypothesis 5 (a), (b) and (c) was to identify key individual-level factors, job characteristics, and organizational factors that predict the three measures of service integration. The odds ratios for these hypotheses were adjusted for potential confounding variables that include demographic and job context variables. Statistically significant predictors (p-values = < 0.05 and <0.10) are indicated in Table 6, and interpretation for each hypothesis follows.

**Hypothesis 5a: Professionals with greater confidence and community familiarity, higher levels of knowledge and skills, greater perseverance and greater efficacy of FHS teams will more likely do each of the three types of services, controlling for demographics, and job context variables.**

Knowledge and skills have a positive relationship with civil registration (exp(B) = 1.087), and community mobilization exp(B) = 1.133). This indicates that a higher level of knowledge and skills increases the odds that professionals will register usuária (p-value = 0.48), and mobilize usuária (p-value = 0.014). Confidence has a positive relationship with civil registration (exp(B)= 1.188). This means that, the higher the levels of confidence, the greater the odds that professionals will be performing civil registration (p-value = 0.088). The odds of professionals who are perseverant in providing HIV prevention services are 0.047. With the odds ratio being < 1, we see that the odds of professionals who agree to persevere performing HIV prevention services are 21.2 fold (1/ 0.047 = 21.2) compared to professionals who do not agree to persevere.

**Hypothesis 5b: Professionals that engage in greater transdisciplinary collaboration, incorporate higher levels of input from usuária, display better skills variety, and are given greater work-methods and decision-making autonomy in their jobs will more likely offer each of the three types of services, controlling for demographic and job context variables.**
The relationship between work-methods autonomy (0 = No; 1 = Yes) and HIV prevention services is negative ($\exp(B) = 7.342$). This means that professionals who disagreed that they were granted work-methods autonomy have greater odds of performing HIV prevention services as compared to professionals who were not given work-methods autonomy (p-value = 0.023). Skill variety has a positive relationship with civil registration, ($\exp(B) = 1.271$; p-value = 0.022). Professionals who use a variety of skills have greater odds of registering usuárias compared to professionals who do not use a variety of skills. Skill variety also has a positive relationship with community mobilization ($\exp(B) = 1.458$; p-value = 0.004). This means that professionals who use a variety of skills have greater odds of mobilizing communities than professionals who do not use a variety of skills.

**Hypothesis 5c**: **Availability of resources and favorable work conditions will result in the likelihood of the professionals offering each of the three types of services, controlling for demographic and job context variables.**

Organizational factors – including work resources and work conditions – when controlled for socio-demographics and job context – have no effect on any of the three measures of service integration.
Table 6a

Multiple logistic regressions for demographics & job context predictors

<table>
<thead>
<tr>
<th>Demographics</th>
<th>HIV Prevention Services</th>
<th></th>
<th>Civil Registration</th>
<th></th>
<th>Community Mobilization</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR</td>
<td>CI (95%)</td>
<td>P-value</td>
<td>OR</td>
<td>CI (95%)</td>
<td>P-value</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black vs. pardo (Ref)</td>
<td>0.425*</td>
<td>0.190 - 0.950</td>
<td>0.037</td>
<td>0.908</td>
<td>0.469 - 1.757</td>
<td>0.775</td>
</tr>
<tr>
<td>White vs. pardo (Ref)</td>
<td>1.116</td>
<td>0.484 - 2.575</td>
<td>0.796</td>
<td>0.657</td>
<td>0.363 - 1.189</td>
<td>0.165</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
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<tr>
<td>Male vs. female (Ref)</td>
<td>0.876</td>
<td>0.375 - 2.047</td>
<td>0.759</td>
<td>0.738</td>
<td>0.376 - 1.450</td>
<td>0.378</td>
</tr>
<tr>
<td><strong>Age</strong></td>
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<tr>
<td>20-30 vs. 51-70 (Ref)</td>
<td>0.439</td>
<td>0.094 - 2.057</td>
<td>0.296</td>
<td>1.066</td>
<td>0.385 - 2.954</td>
<td>0.902</td>
</tr>
<tr>
<td>31-40 vs. 51-70 (Ref)</td>
<td>1.177</td>
<td>0.225 - 6.150</td>
<td>0.847</td>
<td>1.212</td>
<td>0.426 - 3.447</td>
<td>0.718</td>
</tr>
<tr>
<td>41-50 vs. 51-70 (Ref)</td>
<td>0.776</td>
<td>0.140 - 4.318</td>
<td>0.772</td>
<td>1.394</td>
<td>0.454 - 4.283</td>
<td>0.562</td>
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<td><strong>Job Context</strong></td>
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<td><strong>Staff category</strong></td>
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<tr>
<td>ACS vs. physicians (Ref)</td>
<td>10.468*</td>
<td>1.298 - 84.407</td>
<td>0.027</td>
<td>3.244</td>
<td>0.506 - 20.80</td>
<td>0.214</td>
</tr>
<tr>
<td>Nurses vs. physicians (Ref)</td>
<td>2.335</td>
<td>0.769 - 7.093</td>
<td>0.135</td>
<td>0.668</td>
<td>0.232 - 1.923</td>
<td>0.455</td>
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<tr>
<td><strong>FHS experience</strong></td>
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<tr>
<td>≤ 1 year vs. 6-15 years (Ref)</td>
<td>0.867</td>
<td>0.230 - 3.263</td>
<td>0.833</td>
<td>0.555</td>
<td>0.213 - 1.443</td>
<td>0.227</td>
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<tr>
<td>1-5 years vs. 6-15 years (Ref)</td>
<td>0.525</td>
<td>0.183 - 1.511</td>
<td>0.232</td>
<td>0.727</td>
<td>0.347 - 1.521</td>
<td>0.397</td>
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<td><strong>Caseload</strong></td>
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<tr>
<td>≤ 250 vs. &gt; 501 (Ref)</td>
<td>0.165</td>
<td>0.020 - 1.356</td>
<td>0.094†</td>
<td>0.678</td>
<td>0.117 - 3.945</td>
<td>0.666</td>
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<tr>
<td>251-500 vs. &gt; 501 (Ref)</td>
<td>0.356</td>
<td>0.047 - 2.673</td>
<td>0.315</td>
<td>0.826</td>
<td>0.145 - 4.711</td>
<td>0.83</td>
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<tr>
<td><strong>Length of commute</strong></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>0-10 mins vs. &gt; 30 mins (Ref)</td>
<td>1.035</td>
<td>0.229 - 4.672</td>
<td>0.964</td>
<td>1.105</td>
<td>0.333 - 3.669</td>
<td>0.87</td>
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<tr>
<td>11-30 mins vs. &gt;30 mins (Ref)</td>
<td>1.726</td>
<td>0.529 - 5.637</td>
<td>0.366</td>
<td>1.669</td>
<td>0.603 - 4.625</td>
<td>0.324</td>
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<tr>
<td><strong>Work Proximity</strong></td>
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<td></td>
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</tr>
<tr>
<td>Yes</td>
<td>1.322</td>
<td>0.375 - 4.660</td>
<td>0.665</td>
<td>1.444</td>
<td>0.575 - 3.626</td>
<td>0.434</td>
</tr>
</tbody>
</table>

Boldface used to indicate effects with significant P-values < 0.10; * p < 0.05; † p < .10
**Table 6b**

*Multiple logistic regressions for individual, job characteristics & organizational factors controlling for demographic & job context predictors*

<table>
<thead>
<tr>
<th></th>
<th>HIV Prevention Services</th>
<th>Civil Registration</th>
<th>Community Mobilization</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Individual factors</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidence</td>
<td>1.169 0.898 - 1.522 0.246</td>
<td>1.188† 1.001 - 1.181 0.088</td>
<td>1.212 0.957 - 1.251 0.111</td>
</tr>
<tr>
<td>Knowledge &amp; skills</td>
<td>1.094 0.982 - 1.218 0.104</td>
<td>1.087* 0.974 - 1.450 0.048</td>
<td>1.133* 1.026 - 1.536 0.014</td>
</tr>
<tr>
<td>Efficacy of FHS teams</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Disagree</td>
<td>2.016 0.269 - 15.142 0.495</td>
<td>1.479 0.390 - 5.609 0.565</td>
<td>2.655 0.436 - 16.162 0.289</td>
</tr>
<tr>
<td>Perseverance</td>
<td></td>
<td>0.047* 0.004 - 0.549 0.015</td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td></td>
<td>0.723 0.102 - 5.106 0.745</td>
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<tr>
<td>Condition</td>
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<td>0.956 0.086 - 10.668 0.971</td>
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<tr>
<td>Community familiarity</td>
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<tr>
<td>Disagree</td>
<td>0.382 0.113 - 1.286 0.12</td>
<td>0.844 0.296 - 2.407 0.751</td>
<td>0.487 0.150 - 1.576 0.23</td>
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<td>Organizational factors</td>
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<td>Work Resources</td>
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<tr>
<td>No</td>
<td>0.703 0.246 - 2.008 0.511</td>
<td>1.145 0.527 - 2.484 0.733</td>
<td>1.652 0.617 - 4.421 0.318</td>
</tr>
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<td>Work conditions</td>
<td></td>
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</tr>
<tr>
<td>No</td>
<td>1.85 0.718 - 4.765 0.203</td>
<td>0.845 0.416 - 1.715 0.641</td>
<td>0.88 0.353 - 2.195 0.784</td>
</tr>
<tr>
<td>Job characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transdisciplinary collaboration</td>
<td>1.011 0.828 - 1.235 0.914</td>
<td>0.957 0.822 - 1.114 0.569</td>
<td>1.032 0.858 - 1.241 0.739</td>
</tr>
<tr>
<td>Usuária-Input</td>
<td>1.121 0.890 - 1.412 0.333</td>
<td>1.15 0.963 - 1.372 0.123</td>
<td>1.182 0.958 - 1.459 0.118</td>
</tr>
<tr>
<td>Skill variety</td>
<td>1.134 0.872 - 1.47 0.348</td>
<td>1.271* 1.035 - 1.562 0.022</td>
<td>1.458* 1.130 - 1.880 0.004</td>
</tr>
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<td>Work-methods autonomy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>7.342* 1.309 - 41.175 0.023</td>
<td>1.091 0.423 - 2.818 0.857</td>
<td>2.803 0.807 - 9.738 0.105</td>
</tr>
<tr>
<td>Decision-making autonomy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disagree</td>
<td>0.498 0.716 - 1.410 0.189</td>
<td>1.982 0.861 - 4.563 0.108</td>
<td>1.018 0.388 - 2.672 0.972</td>
</tr>
</tbody>
</table>

**Boldface used to indicate effects with significant P-values < 0.10; † p < 0.05; †† p < .10**

**Hypothesis 6**

The aim of Hypothesis 6 was to identify key predictors of service integration. Hypothesis 6 aimed to fit a structural equation model (SEM) to identify socio-demographic, job context, individual-level, job characteristics, and organizational-level variables that predict service integration (Hypothesized Model on page 81). While building the SEM, modification indices were examined to identify the presence of factor cross-loadings (i.e., a loading on more than one factor). Doing so can provide an understanding as to which key demographic, job context, individual-level, job characteristics, and organizational-level variables predict (1) HIV prevention services, (2) community mobilization, and (3) civil registration besides the latent
variable of service integration. Significant predictors with p-values of < 0.05, and < 0.10 have been indicated in Table 7, and interpretation follows.

**Hypothesis 6:** Professionals with greater decision-making autonomy, perseverance, community familiarity, and higher levels of knowledge and skills who engage in transdisciplinary collaboration, incorporate usuária-Input, and have access to resources from work are likely to integrate services.

The results indicated that the model, as shown on page 101, has 31 variables and a sample size of 230. Summary model fit indices for the structural equation model were $\chi^2 = 77.057$ with df = 72, yielding a $\chi^2$/df = 1.07 and a RMSEA of < 0.001. The Root Mean Square Error of Approximation (RMSEA) for the hypothesized model was 0.05. An RMSEA value of ≤ 0.05 signifies a good fit (Ho, 2013, p. 443).

Table 7 summarizes pathways to service integration. Results found that HIV prevention services are strongly and positively associated with community mobilization (B = 0.433; p-value = < 0.001) and civil registration (B = 0.477; p-value = < 0.001). Professionals who use HIV prevention services as part of community mobilization and civil registration are likely to integrate services. FHS experience and service integration are positive and are significantly associated with service integration, which means that, the greater the FHS experience of professionals, the greater the likelihood of their integrating services (B = 0.258 p-value = 0.060).

Confidence and knowledge and skills are positive and significantly associated with service integration (B = 0.322, p-value = 0.020; B = 0.448; p-value = 0.006, respectively). This means that a professional with a greater level of confidence is more likely to integrate services than one with a lesser level of confidence. Also, professionals with higher levels of knowledge and skills are more likely to integrate services than professionals with lower levels. Perseverance is also significant and positively associated with service integration (B = 0.237 p-value = 0.036). This means that, the greater the commitment of a professional to deliver the best services
possible to the families in the catchment area they serve, the greater the likelihood that that professional will integrate services.

Skill variety is positive and significantly associated with service integration (B = 0.355; p-value = 0.017), which means that professionals who use a variety of skills in providing usuária care are also likely to integrate services. Work-methods autonomy (B = -0.222; p-value = 0.097) is negatively and significantly associated with service integration. This means that those who disagree with work-methods autonomy (that is, with the idea being able to tailor their work based on information they gather from usuária and research) are less likely to integrate services. Decision-making autonomy (B = -0.237; p-value = 0.075) is negatively and significantly associated with service integration, which means the greater the ability of professionals to change or alter treatments based on the needs of the usuária, the less likely they will be to integrate

Based on modification indices, it was learned that perseverance was a strong predictor of the provision of HIV prevention services. Also, while the staff category of nurses and ACS was not significantly associated with the latent construct of service integration, it was found to be that these professionals were strongly associated with civil registration. Figure 4 reflects the SEM with the additional direct pathways identified using modification indices shown (with dotted arrows dotted). Parameter estimators of the predictors are also shown
Figure 4: Structural Equation Model

Dotted lines suggest the Modification Indices
Table 7
*Standardized estimated direct effects from fully adjusted structural equation model*

<table>
<thead>
<tr>
<th>Measures of Service Integration</th>
<th>Service Integration</th>
<th>B (SE)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV prevention services</td>
<td></td>
<td>0.461*</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Civil registration</td>
<td></td>
<td>0.433*</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Community mobilization</td>
<td></td>
<td>0.477*</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Predictors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACS vs. physicians</td>
<td></td>
<td>0.373</td>
<td>0.118</td>
</tr>
<tr>
<td>Nurses vs. physicians</td>
<td></td>
<td>0.043</td>
<td>0.814</td>
</tr>
<tr>
<td>Race: black vs. <em>pardo</em></td>
<td></td>
<td>0.012</td>
<td>0.92</td>
</tr>
<tr>
<td>Race: white vs. <em>pardo</em></td>
<td></td>
<td>-0.182</td>
<td>0.125</td>
</tr>
<tr>
<td>Male vs. Female</td>
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<td>-0.19</td>
<td>0.128</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td>0.15</td>
<td>0.236</td>
</tr>
<tr>
<td>FHS experience</td>
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<td>0.258†</td>
<td>0.06</td>
</tr>
<tr>
<td>Caseload</td>
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<td>0.05</td>
<td>0.736</td>
</tr>
<tr>
<td>Commute 0-10 mins vs. &gt;30 mins</td>
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<td>-0.122</td>
<td>0.595</td>
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<td>Commute 11-30 mins vs. &gt;30 mins</td>
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<td>0.219</td>
<td>0.237</td>
</tr>
<tr>
<td>Work proximity</td>
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<td>-0.085</td>
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<tr>
<td>Knowledge &amp; skills</td>
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<td>0.448*</td>
<td>0.006</td>
</tr>
<tr>
<td>Confidence</td>
<td></td>
<td>0.322*</td>
<td>0.02</td>
</tr>
<tr>
<td>Efficacy of FHS teams</td>
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<td>-0.073</td>
<td>0.536</td>
</tr>
<tr>
<td>Community familiarity</td>
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<td>0.153</td>
<td>0.177</td>
</tr>
<tr>
<td>Perseverance</td>
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<td>0.036</td>
</tr>
<tr>
<td>Transdisciplinary collaboration</td>
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<td>0.121</td>
</tr>
<tr>
<td><em>Usuária</em> -Input</td>
<td></td>
<td>0.033</td>
<td>0.819</td>
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<tr>
<td>Skill variety</td>
<td></td>
<td>0.355*</td>
<td>0.017</td>
</tr>
<tr>
<td>Work-methods autonomy</td>
<td></td>
<td>-0.222†</td>
<td>0.097</td>
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<td>Decision-making autonomy</td>
<td></td>
<td>-0.237†</td>
<td>0.075</td>
</tr>
<tr>
<td>Work resources</td>
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<td>-0.063</td>
<td>0.677</td>
</tr>
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<td>Work conditions</td>
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</tr>
<tr>
<td>R-square</td>
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<td>0.627</td>
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**Boldface used to indicate significant effects with p-values < 0.10; * p < 0.05**
Chapter 6: Discussion, Implications and Limitations

Overview of this chapter

Policymakers, professionals and researchers around the world have urged health professionals to move away from a biomedical model that insists on identifying and examining only medical outcomes. The integration of curative (medical) and care-related services is preferred, taking into account the social positions (e.g., age, sex, and race), environmental contexts (e.g., housing conditions, access to health services and food, etc.) and lifestyles (e.g., physical activity, nutrition, and smoking) of consumers and communities (Akhtar-Danesh, Valaitis, O’Mara, Austin, & Munroe, 2013). While the need for service integration has been established, a theoretical framework that identifies key predictors of service integration is lacking. Therefore, this study initiates a conversation on key predictors of service integration, as measured by HIV prevention, civil registration and community mobilization.

Brazil’s *Sistema Único de Saúde* was used in this study as a model for studying service integration, as it is a national system that uses transdisciplinary collaboration to improve the integration of health and social services. This study uses cross-sectional survey data from 262 professionals in Brazil’s *Estratégia de Saúde da Família*, including physicians, nurses, and *Agentes Comunitário de Saúde*. Professionals were asked for their perceptions of their individual capabilities, the characteristics of their job roles, and about the types of system-level support that facilitate or hinder their ability to integrate services. Using a series of tests, such as inferential (ANOVA F-tests, Chi-Square tests) and logistic regressions, and in fitting a Structural Equation Model (SEM), significant associations between the three services (HIV prevention, community mobilization, and civil registration) used to measure service integration were explored, and predictors of each of the three services and service integration were found. In this chapter,
explanations are offered of the varying proportions of the three services, as they are offered by ACS, nurses and physicians; of associations between the three services that measure service integration; and of key demographic and job context variables, individual-level factors, job characteristics and organizational-level factors that predict service integration and the three measures thereof. Policy, research and practice implications of the findings have been discussed. The limitations of the dissertation’s generalizability and of the measurements used to predict service integration have been discussed.

**Proportion of Professionals offering the services that measure service integration**

Results indicate that more nurses and ACS than physicians offered HIV prevention services and mobilized communities. Compared to physicians and nurses, ACS registered more families. The proportion of services offered by each professional demonstrates the need for integration of services by myriad professionals, given that one type of professional alone cannot offer all types of services.

As established in the literature review chapter, ACS and nurses in Brazil offer more disease prevention and community mobilization services than physicians do. Similarly, in this study, ACS and nurses were found to offer HIV prevention and to mobilize communities more than did physicians. ACS and nurses in Brazil have offered the following HIV prevention services to *usuárias*: teaching how to use condoms and how to get rapid HIV tests; engaging in dialogues to deconstruct stigmas attached to HIV/AIDS; and making household visits to offer counseling pre-and post-HIV testing (Falavigna et al., 2013; Oliveira, Cavalcante, Oliveira, Leite, & Machado, 2013). Specifically, nurses closely monitor the health of HIV-positive *usuárias*, in addition to supervising disease prevention activities that ACS implement (Zambenedetti & Both, 2013). Research has shown that nurses and ACS together discuss sexual and reproductive rights.
and HIV prevention practices with male and female usuárias in order to normalize the use of condoms (Maliska, de Souza Padilha, & da Silva, 2007). The need for discussions to normalize the use of condoms is important in Brazil; as women account for 83.1% of the total HIV infections in Brazil (Brazil Ministry of Health, 2011; Miranda et al., 2011; Okie, 2006). The feminization of the epidemic in Brazil presents a challenge to female usuárias as they struggle with their male partners to negotiate condom use.

The results also show that FHS professionals, in particular ACS and nurses, have stayed true to the founding principle of Brazil’s UHS, i.e., to encourage usuárias to get involved in community activities. As discussed in the literature review chapter, community mobilization within the UHS occurs in two forms: 1) inclusion of community constituents, namely, the ACS, in health teams that identify community health needs and relay them to medical professionals (nurses and physicians); and 2) within the FHS teams, professionals are expected to strategize how to resolve community health needs (Dowbor & Westphal, 2013; Hall & Taylor, 2003).

Amongst the three types of professionals, ACS are more adept at identifying the health needs of their territory’s population and at detecting health risks to usuárias. ACS learn this information by performing 150 household visits a month and, typically, by residing in the catchment area they serve. The knowledge on community lifestyles and practices helps to situate the ACS as a link between the usuária and FHS team members. ACS communicate to FHS team members what they see and hear in the community, so health activities can respond to catchment area health needs and to usuária lifestyles, practices, and living conditions (Costa et al., 2013).

FHS team members mobilize communities by engaging them in activities that enhance their knowledge of social determinants that impact their health. By imparting knowledge, FHS professionals facilitate dialogues with communities to how best to resolve health issues.
(Bellenzani, Santos, & Paiva, 2012). Having heard usuária in group conversations, the ACS then strategizes with them on how to create change in their communities. For instance, in a qualitative research study, usuária said that they were unable to maintain healthy diets due to the rising costs of vegetable and fruits. Usuária in partnership with the ACS suggested that this problem could be solved by planting community vegetable gardens in yards and at schools (Silva, Sena, Belga, Silva, & Rodrigues, 2014).

The literature also shows that nurses, in collaboration with ACS, mobilize communities by offering activities geared toward imparting health information and by encouraging usuária to practice health-promoting behaviors. Activities include: organizing aerobic and anaerobic exercises, school workshops on sexual and gender diversity and on healthy eating, teaching safe sex practices, etc (Silva et al., 2014). In a study conducted by Oliveria et al. (2013) it was suggested that community participation in health promoting activities was determined by usuária resources. It was reported that usuária found locations for health promoting activities and provided resources, such as a microphone, sound box or chairs, for the activities (Oliveira et al., 2013).

Study findings show that only a small proportion of each of the three professional types registered households. An important function of ACS and nurse auxiliaries within the FHS is to register household members with the state through birth certificates and voter registration forms. In addition, ACS and nurse auxiliaries are expected to collect data at the household level on socio-demographic information, births, deaths, symptoms of illnesses, disease incidence and immunization status of children (Magalhães et al., 2013; Moura et al., 2012). Fifty-one percent of the ACS and twenty-three nurses in the study registered households.
ACS visits each household in their catchment area monthly (up to 150 households), but for usuária who are ill, household visits are made twice a month. Visits are recorded by the ACS in a notebook signed by the usuária. Often, usuária are not found at home; the ACS then documents their visit by having a relative or neighbor sign their notebook (de Souza Ferraz & Nemes, 2009). It could be that not having to meet the usuária face-to-face keeps nurse auxiliaries and ACS from registering as many households as they might otherwise, and prevents them as well from assisting usuária in obtaining voter registration papers, birth certificates or working papers. It could also be that, with a particular catchment area at a particular time, there would be no new families to register, or that the families in that catchment area are knowledgeable enough about the process to register themselves.

**Associations between the three services that measure service integration**

Inferential findings (ANOVA F-tests and Chi-Square tests) show that community mobilization was strongly associated with HIV prevention services and civil registration. SEM findings show that professionals are likely to integrate HIV prevention services with community mobilization and civil registration.

Seventy percent of the sample in this study mobilized communities and offered HIV preventive services. Scientific evidence suggests that individual HIV/AIDS risk behaviors arise within the context of social and structural determinants (Dean & Fenton, 2010; Herman, 2011). For health professionals to offer HIV prevention services, it is necessary to contextualize sexual health education in relation to a host of sociocultural and economic factors that create HIV/AIDS vulnerability (Kippax, Stephenson, Parker, & Aggleton, 2013). Moreover, service consumers beliefs in myths and stereotypes about HIV/AIDS are likely to undermine their acceptance of biomedical information about HIV transmission and how to prevent it (Campbell et al., 2012).
Therefore, physicians and nurses must have community input - for example, from ACS - to become sensitized to prevailing attitudes and beliefs about HIV/AIDS within the catchment area to design appropriate treatment plans and health promotion activities (Pinto, 2013; Zanchetta et al., 2014).

Community mobilization and civil registration are strongly associated in this study, even though only 37% of professionals both mobilize communities and register families. In documenting household-level data, nurse auxiliaries and ACS are able to identify health and social indicators requiring immediate attention from other FHS team members (Magalhães et al., 2013). SEM findings suggest that HIV prevention services are also associated with civil registration. This could be explained by the fact that to access condoms, usuária must register with the FHS. This requirement controls the number of condoms withdrawn from Básicas de Saúde. Usuária may obtain 12 condoms each, per month; sex workers may each obtain 90 per month (de Souza Ferraz & Nemes, 2009).

**Predictors of service integration and the three services that measure service integration**

This section will discuss the inferential results (ANOVA F-tests and Chi-Square tests) that reveal differences across ACS, nurses and physicians in terms of individual-level factors, job characteristics, and organizational-level factors that predict: (i) the provision of the three services (HIV prevention, community mobilization and civil registration), and (ii) the integration of these three services. Significant predictors of the three services and service integration from the logistic regressions and SEM will also be discussed in this section. Interpretation of results will be discussed according to demographic and job context variables, individual-level factors, job characteristics, and organizational-level factors.
**Demographic and Job Context Variables**

In terms of demographic and job context variables, findings from the multiple logistic regressions suggested that ACS; professionals (nurses, ACS, and physicians) who identified as *pardo*; and professionals (nurses, ACS, and physicians) who had caseloads of more than 500 *usuária* were more likely to provide at least one of the services that measure service integration. The SEM results showed that greater FHS experience was a key predictor to service integration. FHS experience continued to be significant predictor to service integration when the three measures of service integration were considered categorical. Modification indices (MI) findings suggest that ACS and nurses were more likely to register *usuária* than physicians.

Results show that greater FHS experience may predict better service integration because professionals who maintain long-term relationships with *usuária* are likely to know of their needs and integrate myriad services accordingly. In delivering HIV prevention services, it is important for professionals to develop the trust of *usuária*, which occurs over an extended period of time. The longer the period of employment with FHS, the better professionals are able to identify community behavior patterns that can lead to disease transmission, and the faster they can act to curtail transmission to others. Moreover, professionals, in developing *usuária* trust over time can find ways to deliver HIV prevention services in a manner sensitive to local needs and lifestyles (Andrasik et al., 2014).

Professionals who identified as *pardo* had greater odds of offering HIV prevention services than black professionals or those who identify as Afro-descent. In Brazil, black Brazilians or those who identify as Afro-descent are reported to have worse living conditions and health status compared to whites (Fillenbaum et al., 2013). In a population-based survey, racial discrimination was found to have an inverse effect on perceived physical and mental health of
Brazilians who identified as black, Afro-descent or as *mulatto* (Pavão et al., 2012). It is possible that the racial discrimination faced by black professionals or those who identify as Afro-descent on account of *usuária* or FHS team members could disempower the professional, impacting their ability to offer services. The impact of a professional’s race on the service provision in Brazil has yet to be studied (Pinto, Wall, et al., 2012). Future studies should study racial differences amongst professionals and the relationships of those differences to service provision by virtue of their interactions with *usuária* and FHS team members.

*Pardo* professionals had greater odds of mobilizing communities than did white professionals. Physicians in this study were predominantly white. Although all members of the FHS team including physicians are expected to mobilize communities according to the Federal Law no. 8142/1990, the study findings point out that physicians may not be able to mobilize communities. A possible explanation could be physician’s perception that his/her job is strictly medical, and they may not feel as though they need to mobilize communities; the physician may believe that mobilizing communities is the function of ACS and nurses.

**Individual-Level Factors**

Results from the inferential tests (ANOVA F tests and Chi-Square) indicate that confidence was the only individual-level factor for which statistical differences were found between ACS and nurses, and between ACS and physicians. Results from the logistic regressions indicate that knowledge and skills and confidence were salient predictors of any of the three services that measure of service integration. It was found that higher levels of knowledge and skills increased the odds of professionals registering families and mobilizing communities, and that higher level of confidence also increased the odds of professionals registering families. The SEM results show that the following individual-level factors were key predictors of service
integration: confidence, knowledge and skills, and perseverance. In running MI when fitting the SEM, it was found, the greater the perseverance, the greater the likelihood of professionals offering HIV prevention services. Interpretation of the findings for individual-level factors follows.

The relationship between professionals’ perceptions of their skills and measures of competence (knowledge) has not been extensively explored in the literature (Hecimovich & Volet, 2012). Research points to a lack of a direct relationship between confidence and competence (knowledge) (Morgan & Cleave - Hogg, 2002); however, using confidence as a measure of competence may not be a reliable indicator (Stewart et al., 2000). This point can be substantiated in this study as ACS report the lowest level confidence but report the highest level of knowledge and skill attainment compared to nurses and physicians.

ACS, typically being residents of the catchment area in which they work, are closest to the usuária they serve and have greater knowledge of their community’s lifestyles, traditions, and culture than other member of the FHS team. In making household visits, they examine the impact of social practices, realities, and community events on health indicators (Rocha et al., 2013). ACS are also able to solicit more information on needs that are not necessarily medical in nature but that are unique to each family’s situation - such as family conflicts, lack of food, and the presence of domestic violence, sexual abuse, child neglect, and mistreatment of the elderly - by using their strong interpersonal skills and demonstrating compassion toward usuária (Sakata & Mishima, 2012; Zanchetta et al., 2012). In recognizing such needs through visiting households and through registering families, ACS are also able to mobilize communities by engaging in dialogues with usuária to resolve pressing issues that impact the wellbeing of the families and communities they serve. ACS are also instrumental in identifying the appropriateness of services
according to *usuária* needs. For instance, in a qualitative study performed by Sakata & Mishima (2012), an ACS in her interview recognized the presence of a house cat, carpet, unclean curtains and a damp wall as contributing factors to *usuária*’s asthma; without removing these items, the medication prescribed by the physician would be ineffective.

Although ACS are known to be knowledgeable about the living conditions in the communities they serve, their confidence has been reported to be the least of the three types of professionals. An explanation for their low confidence could be feelings of powerlessness to change social determinants that impact the health of *usuária*, such as poverty, unemployment, etc. (de Oliveira Gomes, Cotta, Cherchiglia, Mitre, & Batista, 2009). Although physicians and nurses also reported low confidence, their confidence levels were higher than ACS. The reason for nurses and physicians having relatively higher confidence levels than ACS could be that nurses and physicians perceive that the medical training they received was adequate enough to assist them in assessing the health needs of *usuária* in comparison to the experiential knowledge of the ACS.

It can be argued that physicians’ and nurses’ inability to build partnerships and engage in reciprocal dialogues with *usuária* could impact their confidence (Brownstein et al., 2011; Silva et al., 2011). Despite the proactive efforts of nurses in mobilizing communities, the literature points out that nurses continue to facilitate health activities by lecturing *usuária* instead of fostering discussions (Oliveira et al., 2013). Nurses may place less emphasis on group dialogues because of their professional training, which gives greater importance to medical knowledge. Moreover, nurses may lack the time to plan health promotion activities, due to their heavy caseloads, which in this study averaged 500 *usuária* per month. Nurses must also supervise ACS. Nurses’ lack of time could prevent them from building partnerships such as ACS do with *usuária,*
thus negatively impacting nurses’ abilities to integrate social services such as community mobilization within disease prevention services.

Perseverance is a salient predictor to service integration. Ninety-eight percent of the professionals in this study demonstrated perseverance, which is defined as professionals’ commitment to deliver services to usuárias despite having to face difficulties. Research shows that perseverance is necessary for the provision of HIV prevention services, which has been shown in the MI of the SEM findings. This is because FHS professionals are expected to be persistent in their preventive messages (get tested and use condoms) to usuárias who are at risk for HIV transmission.

A study by Santos et al. (2012) demonstrated that nurses struggle to make the decision to inform a usuária of his/her HIV status due to the fear of possible reactions of the usuária (Santos et al., 2012). It is necessary for health professionals to persevere by being receptive to the usuária’s state of convalescence, as well as helping usuárias and their families to work through the worries, anxieties, fears and insecurities that they may present as a result of the diagnosis (Medeiros et al., 2010; Santos et al., 2012). ACS are known to persevere by using empathy and jargon-free communication, local idioms, and storytelling to impart HIV prevention information (Mayfield - Johnson, 2011; Mukherjee & Eustache, 2007; Pinto, 2013; Pinto, da Silva, et al., 2012; Zanchetta et al., 2012). By consistently engaging usuária in friendly dialogues, ACS are able to develop usuária trust. Through open dialogues with usuária, ACS are able to identify risk behaviors that impacts a usuária’s health and encourages the usuária to minimize health risks by engaging them in risk management practices (Brownstein et al., 2011).
Job Characteristics

Results from inferential statistics point to significant differences between nurses and physicians in perceptions of decision-making autonomy, transdisciplinary collaboration, skill variety and usuária-Input. Statistically significant differences were also noted between ACS and physicians in their decision-making autonomy, skill variety and usuária-Input. Logistic regression findings revealed that skill variety and work-methods autonomy were salient predictors of any of the three services that measured service integration. Professionals who were likely to use a variety of skills had greater odds of mobilizing communities and registering families. Professionals who disagreed that they had work-methods autonomy had greater odds of performing HIV prevention services. The SEM results also found that professionals who disagreed that they had work-methods autonomy, and had decision-making autonomy were less likely to integrate services.

Transdisciplinary collaboration is the doctrinal and organizational cornerstone of the care-based model of the UHS that stresses the inclusion of social determinants of health in medical decisions made by clinical professionals (Rissardo & Carreira, 2014). Transdisciplinary collaboration is characterized by professionals working side-by-side, integrating diverse knowledge and solutions to deal with health problems that transcend individual disciplinary perspectives (Pinto, Wall, et al., 2012). Although the dataset in this study has been used by Pinto et al. (2012) to examine the effect of transdisciplinary collaboration on service integration, different results have been found here. In this study, measures of service integration and the combination of predictors used were different. Pinto et al. (2012) used the following predictors – transdisciplinary collaboration, community familiarity, research participation of professionals, demographics and job context – to examine their effect on service integration, as measured by
the provision of the following services: infectious disease, family planning, HIV prevention, and adherence to medication. In this study, service integration has been measured by the provision of HIV prevention services, community mobilization and civil registration through a number of individual-level factors, organizational-level factors and job characteristics. The interactions of a number of predictors in the regression model and the SEM might in this case have nulled the effect of transdisciplinary collaboration on the three services that measure service integration.

It could be argued that the professionals in the current study valued transdisciplinary collaboration, as a majority of them agreed that they were efficacious of FHS teams, which means that they believed that the existence of FHS teams improved the quality of health in the catchment area they served. In a qualitative study conducted by Bernades et al. (2010), FHS professionals acknowledged the utility of transdisciplinary collaboration because, within a team setting, the FHS professionals collectively discussed usuária care by suggesting preventive screenings and had discussed family planning initiatives and how to best approach pre-and post-HIV testing counseling with the usuária they served (Bernardes, Sousa Vilela, & De Azevedo Filho, 2012).

While professionals in this study were efficacious that the existence of the teams improved the quality of health in the catchment area, nurses, ACS and physicians perceived the value of transdisciplinary collaboration differently. Physicians and ACS tend to agree that transdisciplinary collaboration facilitated their work, whereas nurses tended to disagree that it did facilitate their work. Reasons for physicians and nurses differing perceptions of transdisciplinary collaboration could be explained by power differences between these two types of professionals, lack of clarity about their roles, their dissatisfaction with team meetings, and their heavy workloads, which will be explained below.
It could be possible that physicians and ACS value transdisciplinary collaboration as the physicians perceive the team meetings as being able to learn of the latest news impacting the catchment area they serve through the ACS. Conversely, ACS could use the team meetings as an opportunity to learn about the etiology of diseases and what they can do to better monitor and evaluate usuária’s health. Although this study suggests that physicians and ACS are receptive to transdisciplinary collaboration, research that examines collaboration between different types of FHS professionals underscore that physicians have been unclear as to the roles of ACS in the FHS (Santos et al., 2011). FHS team meetings are scheduled weekly, with the goal of training professionals on best practices, reviewing procedures, establishing protocols and standards, discussing care plans for usuária, and designing health campaigns (de Andrade et al., 2013). Professionals have reported that the goals of the weekly meeting are typically not adhered to. Instead, the meetings are structured around resolving administrative issues. Administrative issues include reviewing the work of the ACS and nurses assigning activities to ACS (Silva, Val, & Nichiata, 2010). As discussed in the theoretical chapter, the interviews with ACS, nurses and physicians that informed the cross-sectional survey used in this study suggested that nurses were displeased that meetings were not scheduled on a set day and time. The heavy workloads of physicians and nurses, as observed in this study, could negatively impact the time they have to meet with FHS team members and discuss usuária cases on a regular basis and in detail.

Research suggests that medical perspectives have dominated FHS team meetings. Physicians use technical language, talk to the FHS team members instead of talking with the professionals, and use few socio-affective expressions (de Oliveira Moura et al., 2014). ACS may not understand such language. The process can be disempowering for the ACS, who joins the team with the goal of educating FHS professionals on community health and social indicators.
and in designing programs aimed to improve the wellbeing of their community. Physicians’ and nurses’ lack of receptiveness could frustrate the ACS and undermine their confidence in their ability to offer services. Medical professionals have acknowledged that their training has not prepared them to work in teams (Bernardes et al., 2012). Hence, training curricula should be developed that target collaborative practices amongst the professionals.

Nurses and ACS may engage dynamically, as nurses oversee the work of ACS (Bernardes et al., 2012). However, nurses tend to be over-stretched; beside having an average monthly caseload of 500 usuária, they supervise ACS, engage in administrative paperwork, and participate in local and state conferences.

The ethical and political guidelines of the Humanization National Policy (Política Nacional de Humanização) of the UHS states that FHS professionals are expected to have usuária be co-creators in their own care by engaging with them in a horizontal, dialogic, and reciprocal manner (de Oliveira Moura et al., 2014). However, in this study it was shown that physicians tend to incorporate usuária-Input in clinical decisions less often than nurses and ACS do. Two plausible explanations for physicians’ exclusion of usuária from clinical decisions are: physicians not knowing how to engage usuária in a personable dialogue; and the heavy flow of usuária into the BHU. The literature further suggests that the high turnover of physicians in the FHS could disrupt a long standing relationship with usuária, and dissuade physicians from investing time in learning about the social aspects of usuária lives (Rissardo & Carreira, 2014). Nurses and ACS in this study admit that they incorporate usuária-Input. This could be because, in promoting healthy behaviors amongst usuária, it is important to adapt educational messages to usuária personal and ecological needs. Moreover, without usuária-Input, ACS and nurse auxiliaries may not be able to fulfill their job task of collecting data on usuária households.
In this study, nurses and ACS used greater skill variety, compared to physicians. Skill variety is also a predictor to service integration. It seems that the ACS and nurses in this study tended to register families, mobilize communities, and offer HIV prevention services to a greater degree than did physicians. To offer and to integrate these services requires the use of myriad clinical, interpersonal, and advocacy skills, along with empathy and compassion towards usuária.

Study findings also show that, the greater the decision-making autonomy given to a professional, the less likely that professional is to integrate services. In this study, physicians were seen to have more decision-making autonomy than nurses and ACS. It is interesting to note that physicians who have decision-making autonomy also offer the three services less than do ACS and nurses. The reason why physicians have greater decision-making autonomy could have to do with the perception that the medical knowledge of physicians is superior to the experiential knowledge of ACS and nurses.

Professionals who were not granted work-methods autonomy by the FHS were more likely to provide HIV prevention services. Moreover, SEM results suggest that professionals who had work-methods autonomy reduces the likelihood of integrating services. It could be argued that, while professionals may be open to learning about the application of research to their work, they may feel that what they have learned in the world of practice experience is much more salient than approaches recommended by research (Aarons et al., 2012).

Organizational Characteristics

A small proportion of professionals in this study felt that the lack of resources and poor work conditions interfered with their ability to offer the three services to usuária. Results from logistic regressions and SEM did not show that organizational factors predicted the provision of any of the three services that measured service integration or predicted service integration as a
latent construct. The reason perhaps that a greater number of professionals did not perceive that lack of work resources or poor work conditions interfered with their ability to provide services is the vagueness of the question. The wording of the questions that asked whether work conditions or lack of resources impact the professional’s ability to offer services were open-ended and could have been interpreted differently by professionals. With Brazil being a poorly managed system due to corruption, lack of governance and internal bureaucracy that delays the process of buying and delivering medications. As a consequence, professionals’ expectations of the UHS may not be high in terms of it providing a consistent supply of medical equipment or having accessible physical spaces in which to hold community meetings. Perhaps professionals perceived that questions on their knowledge and skills and confidence tapped into a limitation of their training. In addition, they could have perceived that the support system available at the team level could have been solicited with regard to questions regarding transdisciplinary collaboration. To probe further into system-level deficiencies, quantitative- and qualitative-level research instruments should include specific questions about the impact of a professional’s caseload, training, educational background as it might facilitate or hinder service delivery, and administrative duties delegated to professionals that may impact delivery of a number of health and social services.

**Limitations**

Although this study is an initiation of conversations about salient predictors of service integration, some limitations must be acknowledged. The author here plays the role of ‘outside researcher,’ as she is neither Brazilian nor has a working understanding of Portuguese. While having studied Brazilian culture and the theoretical context of UHS with the help of a translator, she may not have interpreted the findings holistically. However, Dr. R.M. Pinto and Dr. Zanchetta, who are Brazilian and have worked extensively on the UHS in Brazil, serve on her
dissertation committee. They have validated the interpretations of the findings. The author has also worked closely with a Brazilian masters-level student to understand publications in Portuguese on the FHS and UHS.

Recall and information bias may threaten the reliability of this study’s findings. Professionals who participated were asked to offer information about the past six months; their attitudes may since have changed, based on the challenges they have faced in their day-to-day work. Data was cross-sectional, making it impossible to determine the directionality of the predictors on service integration. A longitudinal design would allow for a more comprehensive understanding of the associations between variables of interest.

Six variables in the framework were single items; hence, no calculations of internal consistency could be made. The only alternative methods for obtaining reliability data of single-item measures would be through the use of test-retest or equivalent-forms approaches. However, both of these approaches would have required professionals to give their names on the surveys. Providing names would have violated confidentiality and damaged the credibility of responses, as professionals would have feared that authorities might have access to their responses.

A significant limitation of the study was that the precise meanings of phrases such as “HIV prevention services,” “work conditions” and “work resources” were open to interpretation by participants. The item on HIV prevention services inquired whether the professionals taught users how to prevent HIV, without a prior understanding of the activities professionals use to teach HIV prevention. Since the professionals were employed by the UHS, the author assumed that the FHS professionals executed activities as stipulated by the administrative documents from the National Program for Sexually Transmitted Diseases (STDs) and AIDS. The stipulated activities included: counseling usuária on the importance of HIV testing; educating usuária on
how to get tested; providing counseling pre- and post the HIV testing; designing health campaigns for disease prevention; distributing condoms; and teaching how condoms should be used (Brazil Ministry of Health, 2006). The study also asked participants whether lack of work resources and poor conditions interfered with their work. The question is vague and does not stipulate which work resources and poor work conditions the researchers are referring to. Stipulating what the researchers refer to as working conditions (such as cramped BHU, poor lighting, long hours, and low wages) and resources (no medical equipment, lack of support at the team level, lack of accessible records of families, lack of training, etc.) and their impact of service integration is worthy of study in the future, in order for system-level changes to be proposed.

The dataset under study is four years old. Although data was collected from 2008 to 2010, literature suggests that the UHS structure has not changed. The composition of FHS teams has changed, depending upon funding in specific municipalities that may allow for specialized professionals such as dentists, psychologists, physical therapists, etc. It is important to note that, from the time the data was collected, professionals’ perceptions may have changed.

When collecting demographic level information on professionals, their sexual orientation was not asked. In the context of HIV prevention, knowing the sexual orientation of professionals is important, as it may suggest manifestations of countertransference among them, which might prevent them from integrating services when working with transgender usuária. For instance, a professional who does not identify as gay or bisexual may have negative and/or ambivalent attitudes (e.g., that gay people should keep their sexuality to themselves or that being gay is unnatural) toward gay or bisexual clients (Spector & Pinto, 2011). As a result, professionals may
not discuss sexual risks with clients who engage in same-sex activity in the same way that they do with their primarily heterosexual clients.

Findings may not necessarily be generalized beyond the two municipalities - Mesquita, Rio de Janeiro and Santa Luzia, Minas Gerais - or to health teams that do not have compositions similar to the one under study. The study, however, offers an initial understanding of salient predictors of integration.

Finally, the present study uses data from a secondary analysis of the Estratégia Saúde da Família; the choice of quantitative measures is limited. Other variables such as professionals’ job security, remuneration, and job satisfaction, may come into play, but these were not addressed in the study conducted by Dr. Pinto and so have not been considered here. While this is a limitation to the study, it is noteworthy that no model or data could contain every variable that might influence service integration. The framework under study can be adapted in the future to examine the impact of other variables (such as, job security, remuneration, and job satisfaction) to determine its impact on professional service integration and to apply the framework across different types of chronic diseases.

**Implications to Practice, Policy and Research**

Health care professionals and other human service professionals strive to offer the highest quality care to consumers. Consumers who do not receive information on disease prevention relevant to their social realities may be at risk for transmission of various diseases including HIV, jeopardizing their own health and the health of their communities. Given that risk-taking behaviors for chronic diseases such as HIV exist within wider social and structural determinants such as poverty, lack of housing and lack of food supplies, disease prevention models ought to take into account key structural determinants of vulnerability and resiliency. To the author’s
knowledge, this is the first study that initiates a conversation about key predictors of service integration offered by transdisciplinary health teams comprised of ACS, nurses, and physicians.

The author’s motivation in studying service integration was driven by her practice work in Pakistan. Consumers in Pakistan are not guaranteed accessible health care, and those that do have access to basic health care units have been given ad hoc health care services inappropriate to their lifestyles. Although community members were officially integrated into primary health care teams by Community Health Workers (referred to as “Lady Health Workers” in Pakistan), health campaigns were initiated and designed solely according to clinical professional input. As a result, the campaigns did not reflect the needs of the communities, and the goal of the campaign to promote healthy behaviors in communities were not met, as consumers could not relate to the message.

Brazil recognizes Community Health Workers as official members of the health care team. In Pakistan, however, Lady Health Workers are still considered by physicians and nurses as allied health professionals. Brazil is unique, as a federal law recognizes ACS as full professionals and mandates that the FHS health teams collaborate with one another to integrate services. Findings from this study offers insights into global health systems, including that of Pakistan, in determining which professional job characteristics may be enhanced or modified through structural interventions to facilitate the integration of services offered by professionals. The findings can also enlighten health care administrators about individual-level factors that are salient for professional trainings that focus on how to integrate services.

**Policy:** Having an empirical base for asserting that individual-level factors (confidence, knowledge and skills, perseverance) and job characteristics (skill variety, work-methods autonomy and decision-making autonomy) were influential predictors of service integration has
significant policy implications. Implications identified are greater: collaboration across the Ministries of Health and Education; supervision of FHS teams; retention of FHS staff; and stronger governance models.

While the scope of this dissertation is not to test or develop training modalities, the findings do point out that professional trainings should focus on harnessing professionals’ confidence, perseverance, knowledge and skills, and ability to use different skills. The trainings should espouse principles of adult learning that include active learning such as problem-based learning and action learning sets to reflect real world practice. The dissertation demonstrates that, although Brazil purports to have a system that mandates its professionals to engage in transdisciplinary collaborative practices, this may not actually be happening. Brazil’s Ministry of Health ought to collaborate with its Ministry of Education to ensure that health professionals’ education fosters a willingness to collaborate with other members within the FHS teams, so as to synergistically drive integrated health workforce planning and policymaking.

Globally a number of schools of the health professionals including medicine, dentistry, nursing, osteopathic medicine, pharmacy and public health have begun to educate health professionals early in their education on inter-professional collaborative practice (Schmitt, Blue, Aschenbrener, & Viggiano, 2011). The goal of such education initiatives is to have current students and experienced professionals effectively work within and between professions, with consumers, families, and communities (Baker, 2010). However, in studying the health curricula of a number of schools, the author of this dissertation identified two main issues with the education initiative. Firstly, the content and process of inter-professional learning differs across different academic programs and is typically implemented independently to students of each health professional school. Therefore, the ability to practice collaborative skills within teams of
varying professional roles and demographic characteristics that emulate the real world setting is lacking. Emulating real life settings within the team can assist in developing perseverance among professionals who can practice situations that reflect upon the stress and time pressures of daily practice, and help them to withstand such work pressures with the assistance of colleagues.

Secondly the education initiatives have not included professional workers who have offered care on the front lines such as community health workers, nursing and home care aides. Community health workers experiential knowledge base is important to incorporate environmental and social determinants of health and prevention within individualized care. Inter-professional education should move beyond the medical profession to cross-sectoral collaboration to achieve broader determinants of health such as clean water, food security, better housing, etc, allowing for greater integration of services based on the needs of the consumers. A discussion of the trans-professional curricula imparted to health professionals during their enrollment in academic programs and in-service will be explored in the following section.

The findings further point out that the absence of work-methods autonomy and decision-making autonomy facilitated service integration. This means that greater governance models, structured protocols, and supportive management practices are required. There is a need for ongoing supervision and joint problem solving between supervisors and professionals. Currently, supervision is a top-down process where physicians monitor the work of nurses, and nurses monitor the work of ACS. While supervision to nurses is offered on a needs basis, ACS are required to be supervised regularly by nurses. Nurses as demonstrated in this dissertation are overburdened with heavy caseloads. Support for nurses, in the form of scaling their number in the FHS teams may be important to facilitate supervision of ACS.
While supervision and ongoing support is a finding of this dissertation to integrate services, it is important to contextualize both of these things in terms of transdisciplinary health teams. One of the benefits of a transdisciplinary team is to transcend professional boundaries so expertise between members of the team is shared openly to improve consumer health and health outcomes. Within this ultimate goal, supervision should be team based where a physician, nurse and ACS work together to observe the workings of the team in meetings and during their day-to-day practice. With a team-based supervision model, professional autonomy of physicians and nurses are compromised and can serve as an example to their supervisees as to how to engage in collaborative practice in order to share their respective expertise and integrate myriad services to achieve better outcomes. It is also important that independent supervision should be offered to professionals to ensure that they are being compliant with professional practice guidelines and ethics, and within the policies and protocols of employing bodies. With the recommendation for team based and independent supervision, governments, including that of Brazil, should mandate and evaluate ongoing supervision so application of professionals’ knowledge and skills and trans-professional competencies are mastered over time.

Coupled with supervision, there is a need for stronger governance to seek accountability of the professionals. For instance, the proportions of services offered by each of the three types of professionals’ highlights that civil registration, as a job task of ACS and nurse auxiliaries is not being fulfilled. As a result of families not being registered, usuária records may not be up to date and professionals, such as physicians and nurses at the BHU, may not have accurate data points for the usuária. Hence, stronger accountability measures need to be incorporated within supervision and reporting mechanisms to the municipal, state and federal level need to be monitored closely.
There is need for greater retention policies within Brazil’s UHS, particularly for physicians to stay within the FHS for longer periods of time. The reason is that by staying within the same FHS team they can build long-standing relationships with usuária to mobilize them to understand health risks and take appropriate action according to local needs. There is also a need to scale the number of physicians in the FHS teams as possibly one physician for an entire catchment area could end up spend their entire day providing clinical care. This would keep a physician from being present to witness community conditions. This, in turn, might prevent physicians from adequately integrating services as opposed to just rendering medical services.

**Practice:** This study has implications for professional and health care administrator practices. It initiates conversations on how health care administrators may facilitate professional involvement in service integration. Until now, no empirical evidence has been available to guide strategies to leverage professional integration of disease prevention services with social services. This study underscores the need for continual training to be delivered to professionals to improve their confidence levels, knowledge and skills, perseverance and ability to use different skills while delivering and integrating services.

The need to address complex health promotion and illness problems in the context of community factors calls for recognizing the limits of professional expertise, so professionals can leverage the expertise of other professionals to provide comprehensive care to usuária. In this study, professionals were efficacious of FHS teams, which suggest that they perceive that collaboration is beneficial for usuária care. Therefore, health care administrators should place greater emphasis to encourage FHS team members to share each other’s expertise to integrate services with the end goal being to offer comprehensive consumer and community-oriented care.
Diversity of expertise within FHS teams is important, so that clinical expertise (physicians and nurses) may be merged with experiential expertise (ACS and nurses) to solve community/population care issues. Diversity of expertise has the potential to help build effective teams. Conversely, stereotyping of professional roles and demographics can be a barrier to service integration. The clinical knowledge that medical professionals bring to the team is often seen as superior to the experiential knowledge of nurses and ACS.

As discussed in the policy section, it is necessary that professional trainings/education not only imparts clinical knowledge but focus on people-oriented management, stimulating dialogues, and developing trust among team members. FHS health care managers/administrator in addition to academic programs should be working together in tandem to implement curricula/trainings that focus on the facilitation of service integration vis-à-vis transdisciplinary collaboration. The development of curricula in academic programs and in-service training that focuses on transdisciplinary collaboration ought to include the input of community health workers and other professionals who are in the front line (social workers, nursing aides, mental health counselors) rather than medical professionals and educators. The purpose of including CHWs in the curricula design is to ensure that community-based skills are taken into account within the trainings/education initiatives that will facilitate service integration though a situational awareness of communities.

While the development of curricula with community voice is important, the curricula (academic and in-service) should focus on developing core competencies of transdisciplinary collaboration. Such competencies include improving communication amongst the team and with consumers to address status asymmetries, concerns with hierarchy, conflicting roles, interpersonal power and how to manage with conflict arising within the team. Strengthening
communication skills amongst professionals is important as it fosters an understanding on how professional roles and responsibilities complement each other in consumer-centered and community oriented care. Another key competency is to develop reflective skills so professionals can understand the stereotypical views of other professionals held by self and others. This is important because the stereotypes may affect the health professions interactions preventing one from sharing expertise and thereby impacting their ability to integrate services. Shared decision-making ought to be practiced by the FHS team members to decide on common goals for consumers and in maintaining regular dialogue are able to manage consumer plans. Using techniques such as call out and check back by team members within the educational initiative and in-service training will offer professionals an ability to develop a common language for team communication and ensure that the communication is well developed.

**Research:** Future research should test the framework proposed in this study with other chronic diseases, such malaria, leprosy and diabetes, to find if similar predictors are observed. These three diseases in particular force usuária to be registered with the state to access medical supplies to self-manage their diseases. Upon identification of these diseases, professionals must strictly monitor and follow up with the usuária. By virtue of the Ministry of Health’s priorities in terms of which diseases need to be monitored especially provokes favorable conditions for integration of services. Therefore, for diseases beyond malaria, leprosy and diabetes, the same predictors can be used to examine the integration of different services beyond community mobilization, civil registration, and disease prevention. Future studies also ought to determine the generalizability of the study findings by examining how other professionals in FHS teams, such as pharmacists, physical therapists, etc., integrate services.
In identifying measures of service integration, researchers going forward should conduct qualitative studies, in order to understand professionals’ unique roles in offering the services being measured. This study assumes that the professionals on FHS teams comply with national standards for HIV prevention services and civil registration. Although the survey was piloted with ten professionals prior to its administration, the researchers did not examine to what extent the services were provided or in what capacities professionals served.

While the scope of this dissertation was not to study training modalities of professionals, there is a need based on the dissertation findings to conduct a mixed methods study to understand in-service training and education needs of professionals to work within transdisciplinary teams and integrate services. There is an absence from the literature on specific training and supervision methods designed for helping providers acquire transdisciplinary competencies and integrate services. It is important that researchers going forward should study the effectiveness of a variety of training and supervision methods by linking specific activities to outcomes of consumers.

Given that organizational factors were not significant predictors assumedly due to the wording of the questions, there is a need to further examine the impact of system-level factors on professionals’ ability to integrate services. It is recommended that researchers examine the day-to-day running of FHS teams across municipalities, examining meeting minutes, assessments, reports, policies, intersectoral contracts, and inventory lists of medical equipment. Examining the day-to-day running of FHS teams will offer an understanding of varying cultures and climates across municipalities, which may not be standardized due to differences in funding. Accordingly, professionals’ ability to integrate services may be impacted, depending upon organizational level supports.
As a follow-up of this study, there is a need to design and implement a longitudinal study to examine relationships between the multi-level factors facilitating service integration and its consequences on consumer outcomes. This will assist in creating sophisticated evidence based guidelines for service integration.
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Appendix A: Instrument Item

PROGRAM FOR FAMILY HEALTH QUESTIONNAIRE TRANSLATED IN ENGLISH

Please mark an X in the most appropriate box or write the requested information on the line

A- DEMOGRAPHIC CHARACTERISTICS

1. Gender:
   ( ) M
   ( ) F
   ( ) M to F
   ( ) F to M

2. Age: ______________________________

3. Marital status:
   ( ) Single
   ( ) Partnered
   ( ) Married
   ( ) Separated
   ( ) Divorced
   ( ) Widowed

4. Ethnicity: _______________________

5. Race: _________________________

6. Highest degree you completed:       CTN: QSSCAT = EDUCATION
   ( ) High School Diploma
   ( ) Associate
   ( ) Bachelor’s
   ( ) Master’s
   ( ) Doctoral

7. Year completed highest degree? _____________

8. Your current position is:
   ( ) Secretary
   ( ) Janitor
   ( ) Agentes Comunitário de Saúde
   ( ) Nursing
   ( ) Nursing Auxiliary
   ( ) Psychology
   ( ) Social Work
   ( ) Physician
   ( ) Other (Specify) _____________
B- EMPLOYMENT (QSCAT = STAFF SURVEY)

10. Which unit of the FHS do you work for?

(  ) Maria Cristina
(  ) Sete Anões
(  ) Campo do América
(  ) Chatuba

11. Do you live near your job?

(  ) Yes
(  ) No

12. Length of commute:

(  ) 0-10 minutes
(  ) 11-29 minutes
(  ) 30-or more minutes

13. How do you get there? _________________________________

14. How many families do you serve? ______________________

15. Tell us in years _____ months______ the length of time you have worked for the FHS.

16. Have you had the same position since you started?

(  ) Yes (  ) No

17. If no, what is your position before? _____________________

18. How many hours per week do you regularly work in the FHS? ___________

CTN: QSSCAT = EMPLOYMENT

19. Do you provide HIV-related services?

(  ) Yes (  ) No  Explain:_________________________

20. I teach usuária how to prevent HIV and AIDS.

(  ) Yes (  ) No

21. Do you provide drug prevention services?

(  ) Yes (  ) No  Explain:_________________________

22. Do you provide services to formerly incarcerated individuals?

(  ) Yes (  ) No  Explain:_________________________
23. Do you provide suicide prevention services?

( ) Yes ( ) No  
Explain: ____________________________________________

24. In your current role do you provide services to persons living with HIV/AIDS? (READINESS AND CAPACITY INTERVIEW PART 2) #5

( ) Yes ( ) No

25. In your current role to what extent do you provide services to families affected by HIV? (READINESS AND CAPACITY INTERVIEW PART 2) #6

( ) A Lot
( ) Some
( ) A little
( ) None

C- CITIZENSHIP

1. Do you participate in the community movement?

( ) Yes ( ) No

2. If your answer is yes, for how long:

( ) less than a year
( ) between one and three years
( ) three to ten years
( ) more than ten years

3. Do you belong to an organization/entity?

( ) Yes
( ) No

3a. If yes, which?

( ) religious
( ) social movement
( ) neighborhood association
( ) conselho municipal
( ) other _____________________

3b. For how long? ( ) a year  ( ) between 1 and 3 years  ( ) more than 03

3c. Do you hold a position?  ( ) Yes  ( ) No

If yes, which? __________________________________________

3d. Do you participate in Conselho Municipal? ( ) Yes ( ) No
4. I help my usuária access the Child Protection Council.

( ) Strongly Agree  
( ) Agree  
( ) Disagree  
( ) Strongly Disagree

5. I help my usuária access other Conselhos and rights of citizenship.

( ) Strongly Agree  
( ) Agree  
( ) Disagree  
( ) Strongly Disagree

6. I help my usuária attain documents, such as voter registration, working papers, birth certificate, etc.

( ) Strongly Agree  
( ) Agree  
( ) Disagree  
( ) Strongly Disagree

7. I help my usuária get involved in community activities

( ) Strongly Agree  
( ) Agree  
( ) Disagree  
( ) Strongly Disagree

What Activities?

____________________________________________________________________________________
____________________________________________________________________________________

D – Participation in Research

1. Have you already participated in a research project?

( ) Yes   ( ) No

2. Were you interviewed for the research project regarding Agentes Comunitário de Saúde in FHS?

( ) Yes   ( ) No

3. How have you participated in research?

(a) Developing recruitment and program procedure   ( ) Yes   ( ) No

(b) Recruiting participants   ( ) Yes   ( ) No

(c) Developing interview questionnaires   ( ) Yes   ( ) No
(d) Developing services for participants that were evaluated? ( ) Yes ( ) No
(e) Preparing program manuals or other intervention or curriculum materials ( ) Yes ( ) No
(f) Developing data collection procedures ( ) Yes ( ) No
(g) Interviewing participants (in-person, over the phone) ( ) Yes ( ) No
(h) Collecting any other data (from records, by observing) ( ) Yes ( ) No
(i) Developing procedures for tracking and retaining participants ( ) Yes ( ) No
(j) Training interviewers or other people that were going to help with the study ( ) Yes ( ) No
(k) Supervising research staff ( ) Yes ( ) No
(l) Coding or entering data ( ) Yes ( ) No
(m) Analyzing the data ( ) Yes ( ) No
(n) Presenting study results at conferences or scientific meetings ( ) Yes ( ) No
(o) Presenting study results to agency, staff, leadership or board members ( ) Yes ( ) No
(p) Presenting study results to usuária or community participants ( ) Yes ( ) No
(q) Presenting study results through publications (writing articles) ( ) Yes ( ) No
(r) Writing proposals for funding ( ) Yes ( ) No
(s) Writing IRB Protocols/Informed Consents ( ) Yes ( ) No
(t) Other tasks: ________________________________ ( ) Yes ( ) No

4. I enjoy participating in research.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

Explain: _____________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

5. To participate in research takes too much time that I can use for other activities.

( ) Strongly Agree
( ) Agree
( ) Disagree

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6. The results of research can enhance my work.
( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

7. I would like to participate in other research projects in the future?
( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

E- PRIORITIES AND SUCCESS

1. Teaching usuária how to prevent disease should be a priority.
( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

2. Family planning and women’s health should be a priority.
( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

3. Prevention of HIV and AIDS should be a priority.
( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

4. Teaching usuária to take medications and following the instructions should be a priority.
( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

5. I achieve the most success at teaching your usuária how to prevent diseases, such as dengue, TB and hypertension.
( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree
6. I achieve the most success at teaching your usuária family planning and the importance of women’s health.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

7. I achieve the most success at teaching your usuária how to take medication and follow the doctor’s orders

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

I- Ability to examine case situation & identify uncertainties about how to best to assess, intervene, monitor.

9. I know exactly what my usuária needs are.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

10. I have access to the information I need to address my usuária needs.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

11. I have access to the resources I need to address the needs of my usuária.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

12. I take my usuária resources into consideration when determining how I provide services.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree
13. I am able to make treatment plans which fit the needs and abilities of my usuária.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

14. I am able to address usuária’s needs.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

15. Monitoring usuária progress is important.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

16. I have the necessary skills to monitor my usuária progress.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

17. I know how to ask appropriate questions to help my usuária discuss their health.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

18. I know how to ask appropriate questions to help my usuária discuss disease prevention.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

19. I know how to ask appropriate questions to help my usuária discuss health risks.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

20. I know how to ask appropriate questions to help my usuária discuss minimizing health risks.
21. I know how to ask appropriate questions to help my usuária discuss their health prognosis.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

22. I know how to ask appropriate questions to help my usuária discuss the collateral effects of medications.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

II - Transdisciplinary Collaboration

23. In your experience, how often are you able to use research to address your usuária needs?
Always       Often       Sometimes       Rarely       Never

24. It is important for me to reach the objectives determined by the families

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

25. I utilize other colleagues in deciding interventions.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

26. I have access to colleagues when I need help determining interventions.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

27. Please rank the following services in order of IMPORTANCE.
   _____ Education about disease prevention
   _____ Education about family planning and women’s health
   _____ Information about HIV/AIDS and HIV prevention
   _____ Educating about following medication regiments
   _____ Providing nutrition counseling

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____ Hygiene education, personal and house
____ Teaching the importance of making and keeping doctors appointments
____ Teaching the importance of getting vaccinated and keeping documentation
____ Informing families of the importance of filtering water

28. The following interfere with my ability to address the needs of my usuária?

<table>
<thead>
<tr>
<th>Issue</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor planning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of Resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of knowledge about the issue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor Work conditions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to other medical professional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of time</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Organicacao normativa</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal Skills</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other, please explain,_________________________________________</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

29. With additional training, I would be more successful at meeting the needs of my usuária

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

30. Team meetings are important for the team training in order to better plan families' treatment

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

31. Team meetings are important for the discussion of the families health problems

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

**IV- Ability to locate information pertinent to EBP question**

32. I can find the information I need to help my usuária

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree
V- Ability to analyze new EBP information

33. I know how to use new information to change the way I treat my usuária

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

34. I am able to understand and use protocols to help my usuária

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

VI- Ability to integrate evidence located from all sources

35. I have the knowledge and the skills to bring together information from different sources to address my usuária needs.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

IX- Ability to make a decision with usuária about how to proceed

36. My usuária values and preferences are very important

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

37. My usuária goals are very important

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

38. My usuária and I work together to address his/her health needs.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree
X- Ability to monitor what happens when the intervention is implemented

39. With their help, I monitor usuária outcomes

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

XI- Ability to modify chosen intervention based on information gained through monitoring process.

40. I can tailor my work based on the information I gathered from my usuária and from research.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

41. I am able to change or alter treatment based on changes in the needs of the usuária.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

42. I am able to equally address the needs of people of all ages.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

43. I am able to refer my usuária to other medical services when necessary

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

44. I have the tools necessary to make an assessment.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree
45. I have the tools necessary to deliver health services to the families

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

46. I have the tools necessary to evaluate outcomes.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

47. I know the latest news in my catchment area affecting usuária

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

48. On average, how often do you visit each of the families in the micro-area?

____________________ times per month.

49. The existence of FHS teams has improved the quality of health in my catchment area.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

50. I am committed to delivering the best services possible to the families in my catchment area even when they are difficult.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

F- Opinions about Research Participation (ATMAPS)

1. Researchers lie to participants about the risks involved in a study. (ATMAPS)

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree
2. Only the community should decide what research is needed. (ATMAPS)

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

3. Researchers ask research participants to answer too many questions. (PV)

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

4. Information I give to researchers about my usuária can be used against me. (ATMAPS)

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

5. Taking part in research makes usuária worry more about their problems. (ATMAPS)

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

6. Participating in research takes too much time. (ATMAPS)

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

7. Usuária participating in a HIV prevention study have a hard time understanding what will take place.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

**G- Opinions about Research Collaboration (CHAMPS PART 1)**

1. My willingness to do community work influenced my decision to collaborate in research.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree
2. My desire to share my experiences influenced my decision to collaborate in research.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

3. My willingness to make a contribution to my community influenced my decision to collaborate research.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

4. My desire to learn more about disease prevention influenced my decision to collaborate in research.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

5. My willingness to collaborate in research was influenced by the fact that I believe the benefits of participation outweighs the costs.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

6. I am willing to participate in research to learn more about research.

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

H - Future Research and Impact

1. Would you be interested in participating in a research project on prevention of HIV and teaching a specific curriculum for groups and families?

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

2. Do you agree that research related to preventing HIV is necessary for the community you work in?

( ) Strongly Agree
( ) Agree
3. Do you agree that the families you work with can benefit from a prescribed HIV prevention intervention that has demonstrated positive results in other communities?

( ) Strongly Agree
( ) Agree
( ) Disagree
( ) Strongly Disagree

4. What problems exist in your community that you would like to see studied?

_____________________________________________________________________________________
_____________________________________________________________________________________
_____________________________________________________________________________________

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