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Community and Provider Perceptions of Brazil's O Programa de SaúdedaFamilia In Vespasiano, Minas Gerais, Brazil

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ABSTRACT

Community and Provider Perceptions of Brazil's O Programa de SaúdedaFamilia In Vespasiano, Minas Gerais, Brazil

By Andrea Nicholls

Background: Under Brazil's universal public health care reform in the 1990s, the Family Health Program (O Programa de Saúde da Família, or the PSF) was implemented to reach populations with traditionally limited access to health care, using decentralized primary care units and home visits from community health agents. The program emphasizes prevention, health education and community participation.

Objective: The goal of this project is to identify and analyze patterns and differences between the perceptions and satisfaction levels of community members and PSF professionals and to identify ways in which the PSF can better serve communities.

Methods: We collected data from caretakers of children under five and PSF health professionals through written surveys from June to August 2009 in Vespasiano, Minas Gerais, Brazil. Caretakers were asked about their utilization and satisfaction with the PSF's diarrhea services and with the PSF overall; professionals were asked about diarrhea prevalence in the community, their job-related experiences and challenges, and their evaluations of various aspects of the PSF.

Results: Caretakers had high satisfaction levels with the PSF's services for child diarrhea and with their PSF experiences overall, but the PSF's diarrhea services were still being underutilized. Although both populations had favorable perceptions on the various aspects of the PSF, professionals generally had higher ratings than did caretakers. Caretakers had more positive perceptions of home visits and health agents than with the PSF units and unit staff.

Discussion: Although professionals had higher satisfaction levels with the PSF's diarrhea services than caretakers, other aspects of the PSF had varied satisfaction levels among caretakers and professionals. More comprehensive training for professionals, improved scheduling processes for patients and increases in funding for human and material resources at the PSF unit may increase satisfaction for both groups as well as improve utilization levels and health outcomes in the Vespasiano community.

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Table of Contents

REVIEW OF THE LITERATURE 10
The Brazilian Health System 10
Indicators of User Satisfaction with Health Systems 13
Users' and providers' Perceptions of Brazil's Family Health Program 19
Successes of the Family Health Program 21
AUTHOR'S CONTRIBUTIONS 24
INTRODUCTION 25
METHODS 28
Study Population 28
Caretakers 28
Health Care Professionals 29
Data Collection 29
Caretakers 30
Health Care Professionals 31
Data Analysis 32
Caretakers 32
Health Care Professionals 33
RESULTS 35
Population Characteristics 35
Caretakers 35
Health Care Professionals 35
Perceptions and Experiences with PSF 36
Caretakers 36
Health Care Professionals 37
Factors Contributing to PSF Professionals' Satisfaction 38
Professional and Community Differences 39
Caretaker Perspectives 40
PSF's Benefits 40
PSF's Problems 41
Recommendations for Improvement 42
DISCUSSION 43

PUBLIC HEALTH IMPLICATIONS 65
REFERENCES 62

Table of Figures

Figure 1: Changes in PSF coverage at municipality level, 1998 to 2008 13
Figure 2: Community-Reported Benefits of PSF 59
Figure 3: Community-Reported Problems with PSF 60
Figure 4: Community Members' Recommendations for Improving the PSF 61

Table of Tables

Table 1: Characteristics of Community Member Respondents 52
Table 2: Characteristics of PSF Health Professionals..... 53
Table 3: Experience of PSF among community respondents 54
Table 4: Training experiences among PSF health professionals 55
Table 5: Perceptions of FHP among health care professionals..... 56
Table 6:Health professional predictors of satisfaction with PSF services for child diarrhea 57
Table 7: Caretakers and Professionals' reported experiences with PSF services and activities 58

REVIEW OF THE LITERATURE

The Brazilian Health System

Brazil's health system has undergone many changes over time, corresponding with the changes in governments[2]. After the rule of Getúlio Vargas, the president,and eventually, dictator, of Brazil from 1930 to 1945, there was a period of nearly twenty years of democratically elected leadership. Then, in 1964 the military overthrew the government in a bloodless coup d'état[3].The new military dictatorship attempted to expand health care universally to Brazilians, in an attempt to legitimize the regime as well as to stimulate the private sector. In this period between 1964 and 1982, the military government took on more responsibility for the provision of health services. The centralization of health services and the unification of the social security system became two objectives of the military regime. Centralization consolidated resources and power to the central government and reduced decision-making power from the states and municipalities in health care policy and management. Under this centralization, social security was unified into a single institution, and social security benefits were even extended. However, this coverage was segregated and inequitable to the population as a whole[4]. Social security benefits were specific to a higher-earning sector of people in professional jobs, excluding workers in the informal sector, rural workers and self-employed workers from any coverage[5].

In the 1970s, Brazil's economy underwent a recession as a result of the military regime's excessive external and internal borrowing and neoliberal policies, modeled after U.S. policies.This had a large social impact, deteriorating the regime and creating space for criticisms and productive proposals for new systems of government[6]. The leftist

Sanitary Reform Movement (MSR) group was especially influential in initiating what would eventually be Brazil's present-day reformed health system. The MSR was composed of academics, health professionals and other reformers and had created an alliance around the impetus for health care reform.By the beginning of the 1980s, still under military rule and still under the ailing Brazilian economy, the ideas that had long been proposed by the MSR were suddenly considered viable, especially since those proposals would most likely lead to cutting costs[4].

The first free election for state governors since the coup took place in 1982, and the newly elected governors began adopting the "new" ideas: decentralization, universal and comprehensive care, and popular participation. The military regime finally collapsed in 1985, and in 1986 Brazil held the eighth National Health Conference, which was aimed at restructuring the health sector nationally. The new constitution of 1998 included the basic tenets proposed by the MSR: making health a right of the citizens and a duty of the state[4]. The Unified Health System (SUS) was finally signed into law in 1990, which transformed the health systeminto a largely public, federal, decentralized, participatory and comprehensive system[7].

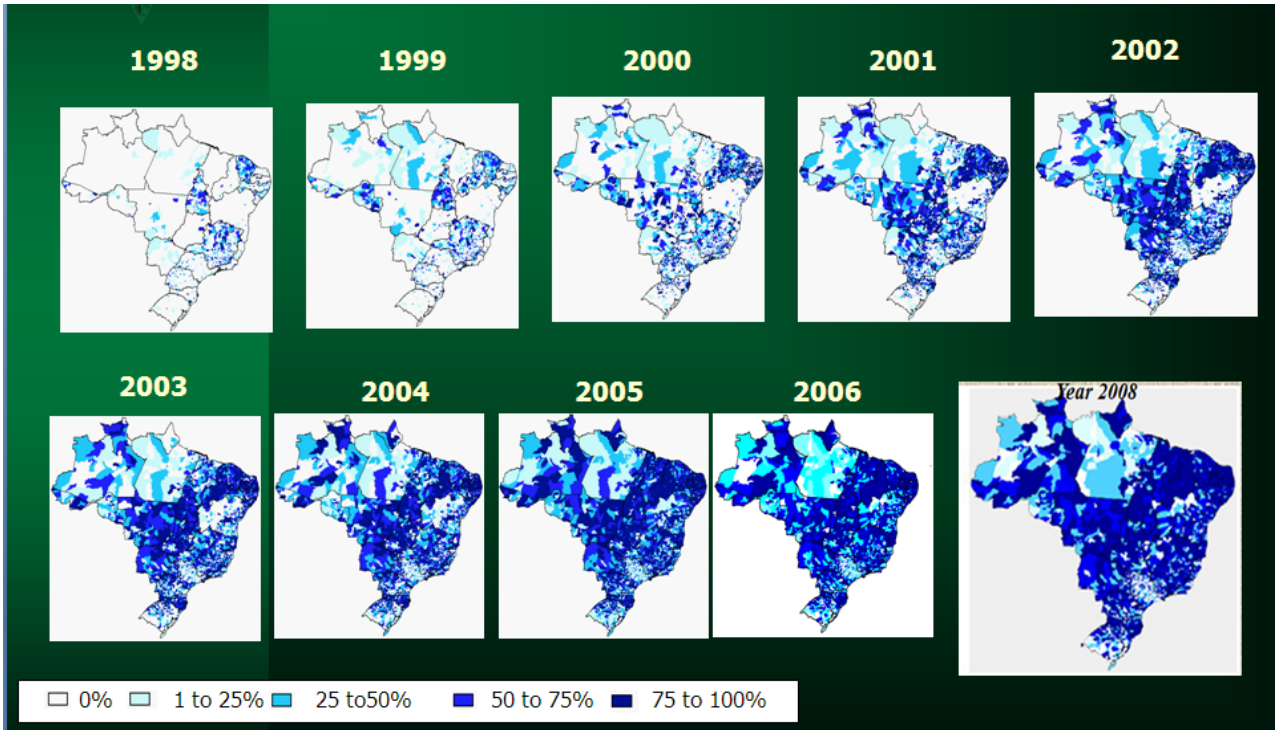
Brazil's SUS was implemented in a series of incremental adjustments and modifications in the design and operation of health policies. Brazil had already implemented the Community Health Worker Program (PACS) in 1991, which shifted focus from the individual to the family as a unit of programmatic health care. This program introduced the notion of hiring a greater number of health "agents" who did not need the extensive training that was required of doctors or nurses in order to provide primary and preventive services to families. Based on the successful experience of the

PACS, the Family Health Program (PSF) was written into law in 1994. The PSF's objective was to reorganize and decentralize the health system while also prioritizing areas with the least coverage and the greatest need[8]. Its aims were to humanize care, increase the ability to address the health problems of the population, and to be accountable for the necessary referrals to the higher levels of health complexity (secondary or tertiary care units, such as specialized clinics or hospitals) in order to ensure the continuity of care. In doing this, a priority was to mobilize the Family Health Units (primary care clinics) through Family Health Teams, which work with specific communities based on location. The teams are composed of at least one doctor, a nurse, a nurse aid and four-to-six community health agents[9]. Each team is responsible for 800 to 1,000 families in a given geographic area, covering about 4,000 people per team. The responsibilities of the teams include monitoring and evaluating the health of the population, providing primary care services, and referring patients to other levels of the system if needed, while also understanding the social processes in the communities and workingcooperatively on clinical, health promotion and risk reduction activities[9]. Although PSF was implemented in 1994, it began to gain momentum around 1998 and has expanded its coverage increasingly each year[1] (Figure 1).

It should be noted that health care in Brazil is not entirely public; it also incorporates the private sector, as the inherent competition is seen to be "a means of promoting quality and reducing costs"[10]. About 80% of Brazilian citizens depends on the government-funded SUS, while 20% pay for private, for-profit health insurance and medical service plans[1]. Those who choose coverage under the private health care sector must pay for services and/or health insurance,which ranges in the type of policy: group

practices, medical cooperatives, company health care plans, and traditional indemnity insurance make up the private health insurance plans[11]. The Ministry of Health oversees the national management of SUS, while private health services work under contract with the government within the framework of SUS. About 80% of inpatient hospitals are privately run, while about 75% of outpatient facilitiesare publicly run[12].

Figure 1. Changes in PSF coverage at municipality level, 1998 to 2008[1]



Indicators of User Satisfaction with Health Systems

It is important to understand health program satisfaction on an array of different levels or perspectives. The community or patient level is all too often overlooked or undervalued as a valuable indicator of health systems' overall performance, despite evidence pointing to its richness and complexity that could provide crucial information to

improve health systems[10,13]. Adding to the challenges of patient satisfaction measures, there is a lack of an operational definition of "satisfaction" in public health research, which in turn presents challenges in a standard measurement of satisfaction[12,13]. Sofaer and Firminger (2005) point out that it is important to distinguish the measures of satisfaction derived from the perspective of clinicians, which is common in patient satisfaction studies, and those that actually attempt to learn more from patients as to what "health care quality" and "satisfaction" means to them. Because the term "quality" is value-laden and culturally specific, there are bound to be differences not only between provider and patient perspectives and criteria, but also among different cultures with unique health care systems and delivery mechanisms[14].

There is also evidence that clinicians often disregard or become skeptical of the usefulness of patient satisfaction measures[15].For example, Atkinson and Haran (2005) argue that user satisfaction may notbe a useful tool for assessing health system performance, given its potentially wide margin for error and bias. This bias, they claim, generates falsely positive responses as a result of: social desirability or giving the researcher the "correct" answer; fear of personal reprisal (such as the loss of rapport from the providers or the limiting of care or quality of care) if the "incorrect" answer is given or a criticism is expressed; fear of reprisal of the health providers if criticism is expressed; cultural norms around expressing criticism; self-justification for their personal investments in the health care system; feeling a sense of gratitude or indebtedness to the health workers; indifference as to whether or not their input would be valuable;and the Hawthorne effect in which just asking the question raises a subject's satisfaction[15].

Sitzia and Wood (1997) point out that professionals are commonly opposed to deeming patient satisfaction measures as useful because they may feel that their own interests could be threatened, such as status, livelihood or professional standards. Professionals often assume that such research could uncover widespread dissatisfaction among the population of interest, although the opposite is usually true. They argue that the disregarding or reasoning away of patient satisfaction levels, however susceptible to biases as mentioned above, perpetuate the fundamental problem of a poorly understood meaning of "patient satisfaction"[16].

Schneider and Palmer (2002) argue that user perceptions and satisfaction of health care systems is a social rather than a technical phenomenon, and that it is the research tools, namely closed-ended surveys, used to evaluate such satisfaction levels among communities which create the susceptibility to bias because of their imposing and restrictive nature.Furthermore, depending on which methods are used to assess user satisfaction, the results can be highly varied. For example, Schneider and Palmer (2002) conducted research on South Africans' evaluations of health care system through closed-ended exit interviews at facilities, as well as focus group discussions with users. They found that the focus group discussions tended to elicit more negative responses from participants. Qualitative research tends to reap richer data around the dynamic and complex topic of community satisfaction with a health system, although the nature of qualitative research design limits the study from being generalized to the wider public. This type of research is highly context specific; in the absence of universal and explicit standardson measuring community satisfaction within a given health system, participants

usually compare their experiences with other health care services that they have experienced in their lifetimes[17].

Despite the difficulties encountered with patient satisfaction measures, there is a large amount of literature that attempts to address how patients rate their quality of care and what indicators might predict a high level of satisfaction. An individual's health status and health outcomes are significantly related to satisfaction; sicker patients and those with little symptomatic improvement over time are less likely to be satisfied with the health system[12,18-20]. Age is also significantly associated with satisfaction, as respondents over the age of 65 generally report higher satisfaction levels[12,21]. Other individual determinants, such as gender, ethnicity and socioeconomic status have not been consistently found to be predictors of satisfaction[12]. Factors that include a patient's experience at a health facility and/or with a health provider was found to explain only 10% of variation in satisfaction levels in a study in twenty-one European Union countries by Bleich, *et al.* "Patient experience" includes factors such as waiting times, the quality of basic amenities and communication with health care providers[13]. Patient-provider relationship and communication were found in several other studies to be important health service predictors of patient satisfaction[12,21-24]. This communication includes the discussion of a health condition and the causes of symptoms, the lack of unmet expectations, and the ability for patients to express their opinions[23,25]. Also significantly related to user satisfaction of health systems are factors of autonomy such as the patient's choice of hospital or provider[13,20].

Indicators of Providers'Satisfaction with Health Systems

Similar challenges are presented on the satisfaction and perceptions of health professionals because a health system's successes are usually measured through epidemiological data and not through the perspective of the health workers themselves. Although a slightly larger body of literature exists on health worker perceptions, it usually comes from a cost-benefit perspective in keeping the workers in country or improving health outcomes and not about their job satisfaction. Nonetheless, as Shattuck, *et al.* point out, a key constraint to achieving the Millennium Development Goals in developing countries is the absence of a properly trained and motivated workforce. Improving the retention of health workers is critical for improving health systems[25].

Many developing countries often experience a medical "brain drain" in the in rural areas as a result of the migration of skilled medical professionals who often move to urban areas or more developed countries. This creates a strain on the already strained health systems of low-resource regions with understaffed and often unqualified personnel. Furthermore, the cost of education of those professionals in their original communities does not see a return investment if they move away from those communities. This professional migration can increase the workload and stress levels of the staff that remains, which could affect the quality of care given to the community.Brazil, however, has defied this pattern by retaining much of its medical workforce in recent decades. Its investment in high quality medical education as well as research and development have created more opportunities and incentives for Brazilian health professionals to stay in the country and their own communities[25].

Some argue that the factors that would motivate health workers to stay in their original communities are primarily financial[24,25]. Although Brazil's health professional

retention rate is much higher than that of most countries[25], this does not also mean a complete satisfaction with the job or the national health system under which they work. Along with financial stability, workers globally cite other motivational factors such as career development, positive working environments, available resources such as equipment and supplies, clinical infrastructure and personal recognition and appreciation as important factors of job retention[23-25].

A health worker's ties to the communities in which they work are also very important determinants of the motivation and performance of health professionals. Workers' performance is associated with positive interactions with their clients. When health workers live and work in the same community, they are more likely to be motivated to provide good service and clients are more likely to appreciate that service. Health workers thus have a personal investment in clients because they want to gain their respect as esteemed and valued community members[25].

In Tendler and Freedheim's (1994) research on the dramatically improved health outcomes in the economically challenged state of Ceará, Brazil, they observed that health worker integrity has been a crucial element of creating a successful public health system. Health workers in Ceará as a whole had a unique level of commitment to their jobs, which was due in part to the Brazilian government's creating of a sense of prestige and "calling" around the jobs where there had previously been very little. In turn, the Ceará citizenry was also well-informed of the responsibilities of the health workers through massive public informational campaigns, thus creating a "watchful eye" and the trust on behalf of the community[26].

Users' and providers' Perceptions ofBrazil's Family Health Program

Although the evaluations of both user and provider satisfaction levels are important, a larger body of literature exists on the providers' satisfaction levels with the PSF in Brazil. A few notable examples exist, such as Ronzani and de Mesquita's (2008) research using household questionnaires with PSF users. Their findings showed that users have outstanding satisfaction levels with the community health agents, and that most are not engaged in any health-related activity other than simple consultations. One area of dissatisfaction with users is the lack of provision of specialized services in the PSF[27]. Our prior research has shown that users' satisfaction levels with the PSF were positively and significantly associated with perceived access to the family health units as well as the frequency of home visits by the agents[28].

Although wages were shown to be significant indicators for providers' satisfaction with their job and the health system overall[24,29], this indicator appears to be more complex within the health workers in Brazil. Community health agent salaries are considerably lower than those of nurses or doctors and, perhaps more importantly, rates of satisfaction with those salaries were lower. Wages were considered reasonable by 67% of doctors and 67% of nurses, but only 39% of community health agents considered their wages reasonable[30]. There appears to be variation not only in wages across different job classifications, but also in working conditions, relations with the community and team responsibilities, all of which may affect levels of satisfaction[31]. Health professionals overall also reported insufficient training for their daily responsibilities and deficient infrastructure in the PSF[32,33]. Tomasi*et al* (2008) found that PSF health agents were particularly more disadvantaged and less satisfied with their jobs than were traditional

primary health agents in Brazil.Community health agents working under the PSF are proportionately more largely female, younger, have fewer admissions requirements based on exams, have more precarious job arrangements, have less employment satisfaction, spend less time on the job, have larger workloads, and greater pay. It is interesting to note the fact that although the PSF community health agents are generally paid higher wages than those working in traditional health units, their overall job satisfaction is lower. Health workers under PSF showed worse self-perceived health statuses and reported having more medical appointments than workers not under the PSF[34].

A possible explanation for the discrepancy between workers' and users' satisfaction levels is the recent trend of contracting out the work of health professionals instead of direct employment by the government. In concordance with Brazil's "liberalization" of the economy, the government has begun to separate the once unified public services from public service providers and make them two separate entities. Within the SUS, this means the contracting out of health personnel to private companies, from hospital staff to PSF teams. Although this may alleviate the government of the resources required for human resources dealings, it also puts health workers in less stable work contracts, and more precarious access to benefits such as vacation pay, maternity leave, retirement benefits and bonuses[35]. The Brazilian Court of Audit's evaluation of the PSF even pointed out the difficulties facing the workforce in their precarious work contracts[8].Findings from Junquiera*et al* (2010) suggestthat workers under SUS are at a distinct disadvantage because the federal government is failing to take responsibility for the rights of health workers[35]. Another recent finding from our previous research suggests that community health agents were satisfied with their own job performance, but

identified external factors as challenges to working under the PSF, such poor infrastructure, lack of resources at the health units, insufficient government support for PSF and poor integration of the PSF with other health services[33].

Successes of the Family Health Program

Despite the variation in the satisfaction levels with the PSF, there is evidence that the implementation of the Family Health Program and the health teams has improved health outcomes in Brazil. In the first longitudinal study to assess the impact of the PSF on infant mortality at the national level, conducted by Mackino*et al* (2006), infant mortality rates were collected and analyzed along with PSF coverage.After controlling for variables such as state-level measurements of access to clean water and sanitation, average income, women's literacy and fertility rates, and the populations' access to health facilities and personnel, the researchers found that just a 10% increase in area coverage by the health teams resulted in a 4.6% decrease in the infant mortality rates. PSF coverage was found to be a significant contributor to improvements in infant mortality rates[36].

A study by Malta *et al* (2010) found evidence supporting the causal relationship between the extension of services and the reduction of infant mortality. The researchers found that avoidable infant mortality rates have decreased by 37% overall between 1997 and 2006. This was found to be attributable to the increase in the provision of health services, especially the increase in access to prenatal and postnatal care[37]. Aquino *et al* (2009) found similar results of the reduction of infant mortality with the increase of PSF coverage, with the added finding that the reductions of infant mortality wereeven more

dramatic in municipalities with an already higher mortality rate and lower human development index at the beginning of the study period[38].

There is a need to assess community perceptions and satisfaction with Brazil's O Programa de SaúdedáFamília (PSF) and compare them with health professionals' perceptions and satisfaction with the PSF, and to recommend ways to improve overall satisfaction with the program. The goal of this study is to identify and analyze patterns in the community perceptions of the PSF and the health professionals' perceptions of the PSF, based on the 2009 surveys conducted in the town of Vespasiano, Minas Gerais, Brazil. We plan to do this by addressing four specific aims. First, we aim to analyze community perceptions and satisfaction levels of the PSF with regards to acceptability, utilization of diarrhea services and access to care. Second, we will analyze PSF health care professionals' experiences and satisfaction levels with the PSF pertaining to job training, diarrhea care services and factors which predict satisfaction levels. Third, we will compare the patterns found between professional and community perceptions and satisfaction levels of the PSF.Finally, we will discuss ways to improve overall satisfaction with the PSF in Vespasiano.

Our results will have an impact on the continual improvement of the PSF's acceptance and utilization rates among communities, and will inform policy makers to give place to positive changes within the PSF for the benefit of both community members and health care professionals. This study will also provide an illustrative case study of community and health care professional acceptability of the transition from a private insurance-based health care system to a largely public, decentralized, universal health care system. Our results will also contribute to the field of literature regarding universal

health care, community health worker-based programs, health care quality and the usage of patient and provider satisfaction among professionals and users of health systems as valid measures of health system quality.

AUTHOR'S CONTRIBUTIONS

APN developed the study objectives, conducted the data analysis and drafted the manuscript. Katherine Mues and Lilian Perez developed the study protocol and survey instruments, managed field work and data entry, completed all data cleaning, and drafted separate community and professional manuscripts, respectively. Dr. Juan Leon oversaw the development of study objectives, protocol, survey instruments, data analysis, and manuscript drafting. Dr. José Ferreira oversaw all field work and data collection.

INTRODUCTION

After decades of private, insurance-based health care reaching a relatively small proportion of its population, Brazil implemented a new health care system in the early 1990s after a radical government reform. The Unified Health System (SistemaÚnico de Saúde, or SUS) aimed to provide universal health care coverage through a decentralized system with a focus on primary, preventative, family-based care. An important program functioning under the SUS is the Family Health Program (O Programa de SaúdedaFamília, or the PSF), which employs family health teams based out of primary health units that are intended to provide convenient primary care and health education to communities. Since the implementation of the program, health outcomes in Brazil over the past two decades have improved in areas such as infant and child mortality[36-40], infectious disease control[39], vaccination coverage[40,41] and reductions in malnutrition[40].

Although there is a substantial range of literature that reports on the PSF's impact on health outcomes in Brazil, fewer studies have evaluated overall program satisfaction from the community perspective or the health professional perspective. A study in two municipalities in Minas Gerais state found that community members had very favorable evaluations of the community health agents, yet community participation rates in health educational activities conducted by the health agents was still very low, and that PSF users actually preferred specialized clinics over the PSF units[41]. However, a separate study in Teresopólis, Rio de Janeiro state, found that caretakers of children had positive evaluations of the PSF, but they also reported infrequent community health agent home visits and poor access to PSF services[29]. Another study in Porto Alegre, Rio Grande do Sul state, found that PSF users are most likely to be of a lower socioeconomic status[42].

Finally, an exploratory qualitative study in Fortaleza, Ceará state, used in-depth interviews to identify PSF users' perceptions of home visits. Central themes that emerged from the interviews included professional-patient relationships, operational aspects of visits, and patient experience at health facilities. The study also found that increased negotiation and dialogue between professionals and users would improve home visits[43]. Despite these results, to date, there is still a very little published research the PSF's services overall, nor have there been studies to our knowledge which use a mixed quantitative and qualitative methods approach among community members, which can provide a more comprehensive understanding of population-level perceptions.

Previous research addressing PSF professional satisfaction levels have focused more on job satisfaction aspects rather than an evaluation of the program itself. A study in Teixeiras, Minas Gerais state examined PSF professionals' demographic profiles and some of the difficulties encountered at work. They found that community health agents and nurse assistants had a lower satisfaction with wages than doctors and nurses, and that transportation was the most commonly cited difficulty in realizing work duties[30]. A population-based study conducted across seven states and 41 municipalities compared the health status of community health agents working under the PSF and community health workers under the traditional health system. They found that workers under the PSF had lower job satisfaction, lower perceived health statuses and larger workloads, although they also received higher pay than those in the traditional system[34]. A qualitative study in Teresina, Piauí state, found that disagreements existed across PSF professional job categories with regards to work conditions, relationships with the community and job duties[31]. However, to date, there is still a need for published research on the perceptions

and satisfaction levels of health care professionals around their work experiences *and* on their own evaluations of the PSF's services.

To address the gaps in the literature on the PSF, the goal of this study is to identify and analyze patterns in the community perceptions of the PSF and the health professionals' perceptions of the PSF and to identify areas of improvement for both groupsin Vespasiano, Minas Gerais, Brazil. We collected data from community members through household surveys administered to primary caretakers of children under 5 years old in the Vespasiano municipality, and from surveys administered to professionals on the PSF health teams (doctors, nurses, nurse assistants and community health agents). The surveys included both quantitative and qualitative components regarding both groups' satisfaction with the PSF overall. We also focused on the PSF's services for diarrhea treatment and prevention as an indicator of other programmatic factors of the PSF. Our results will have an impact on the continual improvement of the PSF's acceptance and utilization rates among communities, and will inform policy makers to give place to positive changes within the PSF for the benefit of both community members and health care professionals.

METHODS

Study Population

Caretakers

Primary caretakers of children 5 years and younger covered by the PSF in the municipality of Vespasiano, state of Minas Gerais, Brazil, were interviewed from June to August 2009. Surveys were conducted in all 10 of the PSF unit coverage areas in Vespasiano: Celvia, JardimdaGlória, Morro Alto 1, Morro Alto 2, Morro Alto 3, Nova Pampulha, Nova York, Oeste, Suely, and Vila Esportiva. Lists of all households with at least one child 5 years or younger and covered by the PSF were provided by each PSF unit. The goal of the survey was to measure community perceptions of the FHP. Since this goal was broad and has not previously been measured in Vespasiano, a satisfaction prevalence of 50% was estimated. Three hundred and ten households were selected using proportionally allocated stratified random sampling, stratified by PSF unit. The sample size of n=310 households was calculated to obtain a precision of 0.055 around an estimate of user satisfaction with the PSF. This sample size adjusted for non-response (92% response rate, from the Brazilian census) and a small population (N=2,102 households). Each household was given both a sampling number between 1 and 2,102, and a household number, which identifies the house within each unit and micro-region. A sampling interval of 7 was calculated, and therefore every 7^{th} household within the population was selected and contacted to participate in the survey. Interviewers identified the primary caretaker of the child(ren) by speaking with the family members and neighbors. It was required that the caretaker be at least 18 years of age.

Health Care Professionals

The study participants for the health care professionalswere aged 18 years and older and working for the PSF of Vespasiano, Brazil between June and August of 2009. A total of 85 health care professionals from all of the Vespasiano PSF units were eligible for participation. All 85 of those professionals were identified and contacted, and a pilot test of the survey was conducted among five of them. Three professionals were lost to follow-up after the initial contact, and their response data were not included in the final data analysis. The final sample population included eight doctors, eight nurses, nine nurse assistants and 52 CHWs (n=77). Written informed consent was requested of each subject before each interview for both study populations.

Data Collection

Both the caretaker and the professional portions of the study followed the Declaration of Helsinki set of principles. Human ethics approval for both portions was granted by both the Emory University Institutional Review Board (Atlanta, GA, USA) and the *FaculdadedaSaúde e Ecologia Humana*at FASEH(Vespasiano, MG, Brazil). Surveys were conducted in Portuguese and administered by FASEH student research assistants. Surveys took place either at the respondent's home or place of work. Study questions were developed independently by the researchers and referenced from validated surveys[44]. All questions were pilot tested within the sample population and revised after review by the interviewers and authors.All surveys were double entered into a Microsoft Access 2000 database by separate data operators. The databases were then cleaned using the data compare feature of the Epi Info version 3.5.1 software program. Discrepancies

were documented in a Microsoft Excel error log, where the authors decided on a resolution for each discrepancy by referencing the survey source documents. Resolutions were applied to a master Microsoft Access 2007 database which was then locked and password protected.

Caretakers

Of the 310 respondents selected to be interviewed, contact was made at 292 households (94%). Contact was not made at 28 households because no one was home at each of the 2 to 3 attempts made. Of those contacted, 3 refused to participate, 3 were lost to follow up in subsequent attempts after making initial contact, and 33 were not eligible to participate, resulting in 253 completed surveys eligible for analysis. The overall response rate was 82% (253 of 310). Before the survey was administered to each individual, the purpose of the study was explained and writtenconsent to participate was obtained from each respondent. A copy of the study description and his or her rights as a participant was also given to each respondent. Each survey took about 15 minutes to complete.

The survey collected information on demographics, sanitation and hand washing, caretaker knowledge of diarrhea and actions during a diarrhea episode, diarrhea prevalence in the last 2 weeks, general perceptions of the PSF unit and community agents, perceptions of diarrhea care and prevention from the PSF unit and community agents, perceptions and evaluation of the Caderneta de SaúdedaCríanca (an informational booklet parents receive from the Brazilian government when a child is born), and knowledge and coverage of the rotavirus vaccine (including dosing dates).

The 2-dose Rotarix® vaccine was introduced to the Brazil routine child vaccination schedule in March 2006. The first dose is given at age 2 months, followed by the second dose at age 4 months[45]. The minimum age to receive the first dose is 6 weeks, and the maximum age to receive the second dose is 24 weeks.Using birth dates recorded from the CadernetadáSaúde, the authors determined those children who were fully eligible for the vaccine, eligible for one dose, or not eligible for either dose. Fully eligible children were at least 4 months old on the date of interview, had received their first dose of the vaccine at least 8 weeks before the interview, and were born after November 1, 2005 so that they were not too old to receive the vaccine when it was introduced into the routine schedule. Children eligible for one dose only were at least 2 months old and had received their first dose of vaccine less than 8 weeks before the interview. Non-eligible children were those who were born before November 1, 2005 so that they were too old to receive the vaccine once it was introduced in Brazil or those less than 8 weeks old at the time of the interview. All children in the household were considered in the recording of rotavirus vaccination status.

Health Care Professionals

Study questions not developed independently by the survey authors were referenced from the Integrated Health Facility Assessment Survey. These questions were related to health service quality, health provider communication practices, and problems encountered on the job. Each survey took approximately 30 minutes to complete. All health professionals working for the PSF in Vespasiano were included in the sample (N=85), including doctors, nurses, nurse assistants and community health agents.

Data Analysis

All surveys were double-data entered by two different data operators and cleaned using Epi Info version 3.5.1. Data from both the caretakers' and the professionals' surveys were analyzed using Statistical Analysis Software package (SAS), version 9.2 (SAS Institute, Cary, NC, USA).

Caretakers

Using SAS version 9.2, weights were calculated and applied to observations from each PSF unit to account for oversampling and under-sampling in some units, eligibility rates, and response rates. These weights were used in all descriptive statistics. Because responses about satisfaction levels were measured on a Likert scale, new dichotomous variables were created from the four caretaker satisfaction variables: PSF diarrhea services, PSF services overall, treatment of diarrhea by PSF clinician and diarrhea advice or care by PSF agent. The categories in each variable were collapsed into "satisfied/not satisfied" responses. Because we have explored predictors for caretaker satisfaction through logistic modeling in our previous research[28], we only analyzed caretaker descriptive information in comparison to the professional information, as well as a qualitative analysis on open-ended questions.

Open-ended responses were translated from Portuguese to English by the authors. The caretakers' responses to open-ended questions regarding their perceived benefits, problems and recommendations to improve the PSF in Vespasiano were analyzed first in a Microsoft Excel 2007 spreadsheet. After thoroughly reading through each of the responses several times, thematic codes were generated for the common responses and were assigned to the responses that reflected those codes. Some respondents had no

specific code designated to their responses because the content was either too generic or they did not respond. Others had one or more codes assigned to their responses because they mentioned several benefits, problems or recommendations. The codes were then added together according to each question and ranked from the most often cited code to the least. They were then converted into a graph format to reflect the common themes extracted from the qualitative responses of caretakers.

Health Care Professionals

Professionals' measures of satisfaction, like the caretakers' measures, were recorded on a Likert scale and were made into a dichotomous variable in the analysis stage. Descriptive analyses were conducted for all variables. Most measures of satisfaction were asked only to specific groups of professionals, therefore making a composite overall satisfaction variable for professionals impractical. Therefore, using the dichotomous variable of professionals' satisfaction with the PSF's diarrhea services as an outcome, logistic regression was used to model predictors of that outcome. The five independent variables included in the model were the professionals' monthly incomes, age, job category, number of trainings they experienced during their first year at the PSF and the variety of training activities used during their first year at the PSF. An α=0.05 was used to determine significant results. Several other potentially relevant predictors, such as medical supplies in stock at the health post[24], were not included in the model because they were only asked to certain job categories and the logistic model was intended to be applied to all health care professionals included in the survey.

Comparable questions about perceptions of PSF from both the professionals' and caretakers' surveys were analyzed and compared descriptively to one another. These

questions included: perceived accessibility of PSF, having ever given/received advice about diarrhea treatment, having ever given/participated in educational activities around diarrhea care, having given/received written information about diarrhea, having received training on/having used the Child Health Booklet, and overall satisfaction with PSF's diarrhea services. A statistical test was not employed to compare the two populations because the two groups could not be linked statistically.

RESULTS

Population Characteristics

Caretakers

To identify the demographic profiles of the caretaker respondents, the investigators first asked self-reported demographic questions for all caretakers (Table 1). The investigators found that most caretakers were female, with a mean age of 34 years, and most were the mothers of the children of interest, while other respondents included grandmothers, fathers, aunts, babysitters, great-grandparents, grandfathers, or adoptive family members. Most respondents reported being either married or cohabitating with a partner, while fewer respondents reported being single, divorced, widowed or separated. A majority of caretakers reported having very little education, either not having completed primary school or never having attended school at all. Few had any education beyond secondary school. Most respondents reported being regularly employed, with an average salary of 901 Brazilian Reais (BRL). In summary, most caretaker respondents were the mothers of the children of interest and were of a generally low socioeconomic status.

Health Care Professionals

We asked similar demographic questions to the PSF professionals in order to identify the demographic profiles of this study population (Table 2). Most professional respondents were community health agents, and nearly all respondents were female, with a mean age of 34 years. Respondents reported moderate to high levels of previous educational training. Some professionals have at least one additional job on top of their

PSF position, with a monthly income of 1426 BRL. Most professionals have had five years or less of work experience in the health care field before becoming a PSF professional. Overall, professionals have similar age, gender and marital status characteristics to the average caretaker respondent but have higher educational levels and monthly incomes.

Perceptions and Experiences with PSF

Caretakers

To assess the satisfaction levels with the PSF and usage levels of its diarrhea care services among community members, the investigators asked caretakers questions about their experiences with the various aspects of the PSF, asking for satisfaction ratings on a Likert scale (Table 3). A majority of caretakers expressed satisfaction with PSF services overall, as well as with being satisfied or very satisfied with their PSF community health agent. Most caretakers reported that their community health agent regularly visits their home at least once a month, while community health agents reportvisiting an average of twelve households per day (data not shown). Only a small proportion of caretakers had ever sought care for their child's diarrhea with the PSF, either at the PSF unit or with the community health agent. Among those who had sought care at the unit, the majority were satisfied with the diarrhea care services at the unit (responding that they considered diarrhea care services were good, very good or excellent). Of those who had sought diarrhea treatment and advice with their community health agent, nearly all reported satisfaction with the care and advice they received for their child's diarrhea. It should also be noted that a majority of caretakers reported satisfaction with the PSF services

overall, not specifically pertaining to diarrhea, and that these satisfaction levels were lower than the ratings for diarrhea services. Eight percent of caretakers reported that their child had experienced diarrhea in the past two weeks. Among those 8%, few caretakers sought treatment at the PSF unit and even fewer sought treatment with their PSF agent. The proportion of caretakers who sought diarrhea care with the PSF in the past two weeks was only slightly lower than the proportion of caretakers who had ever sought diarrhea care with PSF.While the PSF's diarrhea services receive generally high or very high ratings among caretakers, these services are still scarcely being used for diarrhea care.

Health Care Professionals

To assess professionals' satisfaction levels and perceptions of the PSF, we first asked questions about their experiences in training for their post at PSF (Table 4). Most health care professionals received less than one training session per month during their first year at PSF, and a few reported never having had any training. Others reported having receiving trainings at least once per month. For those who received trainings, many had more than one type of training activity, such as individual orientations, videos, lectures, meetings and workshops. Most professionals had received training on the use of the Caderneta de SaúdedáCrianç a (Child Health Booklet), which monitors a child's growth, development and vaccination record. Among those who had received any training, almost all said that their training was useful to their general work within the PSF. While most professionals are receiving training for their posts at PSF, and that a variety of different training methods are being utilized, it is important to note that this training may not be reaching all PSF staff.

We then asked the professionals questions about their perceptions on the PSF as a whole and its usefulness to the community in order to further assess their satisfaction and perceptions of the PSF (Table 5). Most had positive feedback on PSF's child diarrhea care services, rating them as good, very good or excellent. Because the supply of medications at health facilities has been found to contribute to provider satisfaction globally[22,24,33], we asked the PSF unit staff about the regular supply of drugs at the unit. Doctors and nurses reported that oral rehydration solution, rotavirus vaccine and antibiotics are normally in stock, althoughfew reported that anti-parasitic drugs are normally available at the unit.Among those who had used the Caderneta de SaúdedáCriança in their work, the majority felt that the booklet was useful for child diarrhea services at PSF. The majority of professionals also believe that PSF was created for the needs of the Vespasiano community, that users in the community are accepting of the PSF, and that the PSF has a positive impact on the community. Furthermore, the majority of PSF professionals believe that PSF is accessible to the community, and that PSF services are integrated with other health services in Vespasiano. Overall, professionals' general perceptions of the PSF in their community are high.

Factors Contributing to PSF Professionals' Satisfaction

To determine factors affecting PSF professionals' perceived satisfaction with PSF services for child diarrhea, the relationship between independent (demographic and programmatic) variables and professionals' satisfaction levels were explored through a multivariate logistic model (Table 6). The independent variables included in the model were demographic and programmatic factors including age, monthly income, job

category, frequency of trainings during their first year at PSF and number of different training activities utilized during their first year at PSF. A composite outcome variable of satisfaction with professionals' overall experiences with many components the PSF was not used because the other satisfaction-related variables were only asked to certain job categories, such as satisfaction with supervision, which was only asked to nurses, or satisfaction with training, which was only asked to community health agents. The unadjusted and adjusted results found no significant relationship between the predictors and satisfaction with diarrhea services at PSF. It should be noted for statistical purposes that a very small number of professionals responded that they were dissatisfied.

Professionaland CommunityDifferences

To compare caretakers' and professionals' satisfaction and perceptions of the PSF, we chose similar questions from both surveys to compare responses (Table 7). Professionals were much more likely than caretakers to say that they believed the PSF was accessible to the communities they served. Nearly all professionals reported that they normally give caretakers of children advice on diarrhea treatment, while very few caretakers surveyed said that they had ever received any advice on diarrhea treatment. Almost no caretakers reported that they had ever participated in educational activities about diarrhea (received individual orientations or participated in groups on child diarrhea) while most community health agents (the only professional category which was asked this question) said that they have given educational activities about diarrhea in the past month. Very few caretakers have received written information on diarrhea prevention, and almost no community health agents (again, the only professionals who

were asked this question) reported having given written information in the last year. No particular geographic zone or PSF unit stood out as having higher information distribution rates than others. The Caderneta de SaúdedáCriança had high usage rates among both professionals and caretakers; most caretakers regularly use the booklet (for either monitoring child growth or keeping track of child vaccination records), and most professionals have been trained on the Caderneta. General satisfaction with diarrhea services at PSF was generally high for both populations as well; most caretakers and most professionals reported high to very high satisfaction levels with the PSF's overall diarrhea care and services. Although there are discrepancies between caretakers and professionals in the particular activities around diarrhea, especially advice about diarrhea treatment and the distribution of written information about diarrhea, the two groups had agreement on overall satisfaction with the PSF's diarrhea services.

Caretaker Perspectives

PSF'sBenefits

To gain a better understanding of caretakers' satisfaction levels, we asked caretakers an open-ended question about how the PSF has been beneficial to them (Figure 2). Many respondents expressed that there had been some improvement in the PSF over time. The most commonly cited benefit was the availability and accessibility of the PSF staff (both the staff at health posts and community health agents). The ease in scheduling appointments with professionals at the health posts was also commonly mentioned as a benefit. Many talked about their experiences with the community health agents and regular home visits as a great aspect of the PSF. The good quality of pediatric

care and the good quality of educational materials on health topics were also frequently mentioned as benefits to the PSF. Other commonly cited benefits of the PSF included: exams (either in their quality, availability of different exam options, and fast lab results), the easiness of utilizing the PSF in relation to a private system, the availability of medications at the PSF health post, the good treatment received from PSF staff, a good focus on disease prevention, good quality of chronic disease care services, good vaccination programs and good quality of prenatal care services. Overall, quality of service and ease in accessing those services highlighted the many benefits mentioned by caretakers.

PSF's Problems

We also asked caretakers about any problems that they have encountered PSF in an open-ended format in order to better understand the reasons behind their evaluations (Figure 3). The most common problem cited by caretakers was the lack of doctors at the PSF units, including both general practitioners and specialists. Many reported that the process of scheduling appointments was difficult and problematic, although, as noted in the section above, the ease in scheduling appointments was also a very commonly cited benefit. The long waiting time for an appointment was also cited as a common problem, which could be related to the difficulty in scheduling appointments. A theme that surfaced in responses to this question was the caretakers' treatment by the PSF staff. Some expressed their dissatisfaction with being treated poorly by the staff at the health posts, as well as the general lack of trust between patients and doctors. Other problems mentioned by caretakers regarded their dissatisfaction with the PSF facilities and the lack of resources available, such as a lack of medications, slow turnaround time for exam

results, lack of urgent care services and poor quality of facilities and equipment at the PSF unit. Problems overall include themes of unsatisfactory staff-patient relations, the process of making appointments, and the lack of human and material resources available through the PSF.

Recommendations for Improvement

We asked caretakers about their recommendations for improving the PSF overall in order to collect community input in improving the PSF's services (Figure 4). Caretakers' most common recommendation was to have more doctors at the health posts. We also found that caretakers would like the PSF to implement an easier scheduling process for appointments at the health post. Many also recommended improvements in their interactions with professionals, such as: better staff-patient relationships, better attention from the staff at the health posts, better training of the staff in order to better address the community's needs and more home visits from community health agents and more educational information on health topics from the professionals. A few individuals made it a point to acknowledge the crucial role the government has in making the PSF a success, and would like to see better financial support from the Brazilian federal government. These recommendations reflect the problems cited in the section above, especially a lack of doctors, a difficult scheduling process and poor professional-patient relations.

DISCUSSION

The goal of this study was to identify and analyze patterns and similarities in the satisfaction levels and perceptions of the PSF among community members and health professionals in order to provide a comprehensive evaluation. We found that the caretakers of children had high satisfaction levels with the PSF's services for child diarrhea and with their experiences with the PSF overall, but that the diarrhea services were still underutilized. Furthermore, although both populations have generally favorable perceptions on the various aspects of the PSF, professionals generally had higher ratings than did caretakers. Finally, we found that caretakers had more positive perceptions of home visits and community health agents than they did with the PSF units and the professionals stationed there. These key findings will be discussed below and will be useful in finding ways that the PSF can better serve the Vespasiano community.

Few caretakers (20%) consulted health professionals at their health unit or with their community health agent when their children had diarrhea, despite generally high satisfaction levels among caretakers with both the diarrhea services and the PSF's overall services. At the time of the study, the two-week prevalence of diarrhea in children ages 5 and under was 8%, or twenty respondents (Table 3). Of these twenty caretakers, only five of them sought care through the PSF. Our findings of generally low utilization of the PSF despite high satisfaction levels are consistent with Ronzani, *et al.*'s findings that PSF users in Minas Gerais had very positive perceptions of community health agents, yet they had low participation rates in educational activities with community health agents[29]. Our finding of low utilization of diarrhea services implies a disparity between theoretical "coverage" and actual utilization of services.

Difficulties encountered in the process of scheduling appointments and the behavior of the PSF professionals toward the patients may also be deterrents to utilizing the PSF among caretakers. Respondents frequently reported the problematic process of receiving care at the PSF unit, many specifically citing the difficult and cumbersome scheduling process, the time spent waiting for the doctor once arrived at the unit, and the lack of doctors available at the unit (Figure 3). When asked about the problems with the PSF, one caretaker said: "I never take my child to the PSF unit because of the lack of doctors. I don't trust the PSF unit." Furthermore, some caretakers reported disrespectful treatment from the staff at the PSF unit. A good relationship between professionals and patients, along with accessible services, are associated with high satisfaction, which is a predictor of patient participation and health status[15].These issues could make PSF users feel negatively about the program and discourage them from deciding to seek care with the PSF in the future.

Caretaker demographics should also be considered when attempting to identify possible explanations of why the utilization of PSF's diarrhea services were so low[43]. Caretakers had generally low levels of education, which may also imply lower literacy levels (Table 1). Almost no caretakers reported having ever participated in educational activities about diarrhea, although most community health agents reported that they have conducted such activities within the past year (Table 7). Any written material involved in the activities therefore may have unintentionally excluded low-literacy groups. A further examination of which community members and which community health agents participated in educational activities could helpidentify where gaps exist in health

education and may also be helpful in developing more strategic tools for educating a broader range of adult caretakers on the prevention and treatment of diarrheal diseases.

The TCU Evaluation of the PSF (2003) found that a factor affecting utilization of the PSF is the widespread lack of understanding among the population of how the system worked. Many people perceived the PSF as indistinguishable from the traditional health system, therefore bringing a large number of cases directly to hospitals and specialized clinics which could have been treated more efficiently at the PSF's primary care units[46]. Caretakers in our study may have gone to hospitals directly for diarrhea care instead of the PSF units, although results imply that most caretakers are aware of the PSF units and have used them at some point in time.

Caretakers and professionals both had high satisfaction levels and favorable perceptions of the PSF; however, overall, professionals were more likely to have positive evaluation outcomes than the caretakers. Professionals had slightly higher satisfaction levels and were more likely to believe that the PSF was accessible to the community. Community health agents were also more likely to report having given diarrhea treatment advice and having conducted educational outreach activities than caretakers (Table 7).

Over-reporting on the side of the professionals should also be considered as a possible bias, as it may be a precautionary mechanism of protecting their jobs by reporting favorably upon their own job performance[30,31,34]. Just like the respondent biases that can come with patient measures of satisfaction[47,48], health care professionals may respond with similar biases in health systems evaluation surveys, especially when evaluations of their job responsibilities are concerned. Managerial conflicts of interest must therefore be taken into consideration when collecting self-reported evaluations and

satisfaction measures from professionals. The possible inflation of positive measures of satisfaction and performance of the PSF might have affected our results due to these potential conflicts of interest.

Caretakers had more favorable perceptions of the home visits and the community health agents than they did of their experiences at the PSF units and the professionals stationed there. This finding is consistent with the previous literature citing outstanding reviews of community health agents over other PSF professionals[29]. Caretakers were less satisfied with their PSF experience overall (61%) than they were with their community health agents overall (82%) (Table 3). Our qualitative results from the caretakers show that some of the most commonly cited benefits pertained to a function of community health agents (Figure 2), while the virtually all of the reported problems in the PSF had to do with their experiences at the health unit (Figure 3).

The range of benefits of the PSF reported by caretakers in our open-ended survey questions highlighted their interactions with the community health agents, such as the easy accessibility of the agents, the scheduling process for doctor's appointments with assistance the agents, the home visits, the educational health information disseminated by the agents and the ease in using the system when services are brought to the home. It appears that the quality of interaction between the agents and the community members instilled a strong sense of trust and amiability for the agents, which is supported by the literature[26,27]. "The agents are attentive and polite," observed one caretaker. "The agents really take care of us," said another. It was also evident from many individuals' responses that the services provided by the agent during the home visits tended to elicit positive reflections on caretakers' experiences, such as the delivery of medications, exam

results and vaccines, the scheduling of appointments, and home-based care. "Everything that we need, they bring to our house. The agents remind us of appointments and exam dates." Educational information on health topics (or "orientations") that the agents provide for members of the community with the intention of health promotion and disease prevention seems to be an effort of the PSF that many caretakers value: "I find the visits at my house really important. We need the orientation they give us." Overall, it seems that home visits from community health agents are a crucially beneficial aspect of the PSF among caretakers. "They make the appointments for us [and] give me the drugs I need. The agents always come by. I'm very lucky."

We also found through caretakers' qualitative responses that the problematic aspects of the PSF largely pertained to caretakers' experiences at the health units. The lack of doctors (including pediatricians and specialists) at the units was by far the most prominent complaint among caretakers, but other aspects of the units were also commonly cited problems, such as: the difficult process of scheduling appointments, waiting time, poor treatment by staff, lack of medications available and poor quality of service. This supports Atkinson and Haran's (2005) finding that pleasant professional-patient relationships as well as accessible and convenient health services are determinants of user satisfaction of health systems[15]. Any combination of the problems mentioned by caretakers can make PSF users reflect poorly on the system. One caretaker said, "There are no medicines, and sometimes when you go there some people don't respect you." "It hasn't been good because the service is too slow and there are not enough doctors," said another. It seems that the lack of doctors may be connected to the waiting time for an appointment and the waiting time at the unit. The disrespectful treatment perceived by

many caretakers can perhaps be addressed by including a behavioral component of professionals' training, which could encourage a more understanding relationship between health professionals and patients and promote more positive experiences for both groups. However, the issue of drug shortages needs prompt attention from the Ministry of Health in surveillance and stocking in order for the PSF to sufficiently continue providing quality health care in communities[6].

A major strength of our study was our robust sampling methodologies in both surveys. For the caretaker survey, our sampling frame was all individuals who were primary caretakers of children age 5 years or younger in Vespasiano who were covered by the ten Vespasiano PSF units. We can therefore say with certainty that our data are representative of the entire population of caretakers of children in the municipality. We also stratified the sampling frame by the PSF unit so that we surveyed an even distribution of selected individuals according to the population size of the unit coverage area while also capturing differences in coverage areas, such as socioeconomic status, population density, and proximity to the unit. In the professionals' survey, we were able to survey all PSF professionals in Vespasiano (n=77) from all four job categories, guaranteeing a comprehensive representativeness from the PSF professionals in the municipality. Additionally, potential interviewer bias was reduced by our standardized trainings given to all interviewers before the study and by recruiting interviewers who were Brazilian medical students residing in close proximity to Vespasiano. These interviewers therefore had a strong knowledge of health-related issues, as well as familiarity with the community and its local customs and norms.

A limitation of our study was that the self-reported answers received from both surveys may have introduced respondent bias into our results. The presence of unknown interviewers and foreign researchers may have led caretakers to believe that the researchers were connected with the PSF or the government, which could have influenced their responses. Another limitation to our study was our inability to achieve a statistically robust comparison between professionals and caretakers. Although developed contiguously, the professionals' survey and the caretakers' survey were completely independent and were not designed with the intention of being linked for a joint analysis, therefore limiting our comparisons between similar survey questions to only descriptive data (Table 7).

Our findings have several implications at the municipality, state, national and global levels. In Vespasiano, the results from our study provide important recommendations for improvement of the PSF from both health professional and patient perspectives. PSF units should shift their scheduling processes to giving the community health agent the ability to schedule appointments for community members, if they are not already doing so. There is also a need for the strengthening of information dissemination, which may start with an improved system for training of the professionals, especially the community health agents. Community members already have favorable evaluations of the health agents, and an improvement in training could yield a more informed population of the PSF's services available as well as a good understanding of preventative health care. At the state level, although our results from Vespasiano cannot be generalized to the broader population in Brazil or even the state of Minas Gerais, they can give us an idea of what might be happening in other areas of Brazil, especially in municipalities

with similar population sizes or demographics. At the national level, as the structure of the PSF is the same across Brazil (with a considerable amount of regional and local control[6]), a national strengthening of the professional development, with a focus on community health agents, may first be necessary before Brazil can expect widespread community participation. At the global level, our findings and the literature show that transitions in health system models can take time for populations to get used to, for professionals and patients alike. The flaws of the PSF highlighted in our findings are remediable, and as our qualitative results have shown, it appears that the PSF has already made improvements since it began. The positive evaluations of the new system have encouraging implications for other nations that undergo health reforms, especially such dramatic reforms as Brazil.

Brazil's transition to a universal, decentralized primary care health system for the past three decades has brought about vast improvements on health care access, health outcomes and a lesser burden on secondary and tertiary health care facilities. Although the PSF has been a key factor in making the Unified Health System in Brazil a success, there are still important aspects of the program that need improvement. We found that most caretakers of children did not consult the PSF when their children have diarrhea, and that the majority did not partake in health education activities with the community health agent. We also found that professionals working in the PSF Family Health Teams reported more positively on the PSF's services for diarrhea than do community members, although ratings are generally high among both groups. Finally, we found that caretakers' experiences with the home visits and community health agents are generally positive and beneficial, but that their experiences at the health units may need structural

changes in order to improve their experiences and their quality of care at the unit. Future targeted improvements in the PSF should include aspects of increased utilization of the PSF, improved training for PSF professionals, increased educational outreach in communities and a uniformly simple appointment-scheduling process. Additionally, our qualitative findings on the program's strengths and weaknesses from both groups will be useful in identifying areas of appropriate and feasible areas of improvement of the PSF, which can in turn improve the health outcomes of Brazilians, reduce health care costs to both patients and the state, and increase community acceptability of the PSF.

Table 1. Characteristics of Community Member Respondents[28]

	N*	%, mean ± s.e.
Age	**N=253**	34 ± 0.73
Monthly Income (in BRL)	**N=200**	901 ± 42
Educational Level	**N=253**	
Never attended or some primary	110	43%
Completed primary and/or some secondary	76	30%
Completed secondary or higher	67	26%
Gender	**N=253**	
Female	238	94%
Marital Status	**N=253**	
Single	37	15%
Married	104	41%
Living with partner (not married)	85	34%
Divorced, Widowed or Separated	27	11%
Relation to Child	**N=162**	
Mother	108	67%
Grandmother	29	18%
Father	10	6%
Other†	15	9%
Employment Status	**N=247**	
Regularly employed	200	81%
Freelance work	26	11%
Unemployed	3	1%
Don't know or refused	18	7%

*Categories have varying n's according to response rates

† Other relations to child include aunt, babysitter, great-grandmother, grandfather, adoptive mother or adoptive grandmother.

Table 2. Characteristics of PSF Health Professionals[33]

	N	%/mean ± s.e.
Age	**N=77**	34 ± 8.8
Educational Level	**N=77**	
Completed primary	5	6%
Completed secondary	44	57%
Technical training	12	16%
College or higher	16	21%
Gender	**N=77**	
Female	73	95%
Professional category	**N=77**	
Doctor	8	10%
Nurse	8	10%
Nurse Assistant	9	12%
Community Health Agent	52	68%
Monthly income (in BRL)	**N=77**	1426 ± 238.3
Prior health care experience	**N=77**	
Less than 5 years	67	87%
Additional job(s)	**N=77**	
1 or more	20	26%

Table 3. Experience of PSF among Community Respondents[28]

	N	%
Evaluation of PSF services overall	**N=252**	
Satisfied or very satisfied	154	61%
Don't know	10	4%
Evaluation of PSF agent overall	**N=227**	
Satisfied or very satisfied	186	82%
Frequency of PSF agent home visits	**N=241**	
More than once per month	62	26%
Once per month	109	45%
Less than once per month	33	14%
Rarely or never	37	15%
Ever sought care for child diarrhea at PSF unit	**N=252**	
Yes	59	23%
Ever sought care for child diarrhea with PSF agent	**N=252**	
Yes	44	17%
Evaluation of diarrhea services from clinician at PSF unit	**N=59**	
Good, very good or excellent	46	78%
Evaluation of diarrhea care/advice from PSF agent	**N=44**	
Good, very good or excellent	42	95%
Child had diarrhea in past 2 weeks	**N=252**	
1 or more child experienced diarrhea episode	20	8%
*Sought care for last diarrhea case at PSF unit	4	20%
*Sought care for last diarrhea case with PSF agent	1	5%

*The questions about seeking diarrhea care with PSF pertain only to the caretakers who reported diarrheal episodes in the past two weeks.

Table 4. Training Experiences Among PSF Health Professionals[33]

	N	%, mean ± s.e.
Amount of training sessions received in first 12 months at PSF	**N=77**	
None received	6	8%
Less than once per month	40	56%
One per month	13	18%
One per week	13	18%
Types of training sessions received	**N=66**	
Individual orientation	61	92%
Videos	43	65%
Lectures	63	95%
Meetings	47	71%
Workshops	18	27%
Other	4	6%
Were trained on Child Health Booklet	**N=66**	
Yes	47	71%
Felt that training was useful for general work at PSF	**N=66**	
Yes	64	97%
Medications normally in stock at PSF unit (doctors/nurses)	**N=16**	
Oral rehydration solution	10	63%
Rotavirus vaccine	10	63%
Antibiotics	10	63%
Anti-parasitic drugs	5	31%

Table 5. Perceptions of FHP among health care professionals[33]

	N	% Yes
Satisfied with FHP services for child diarrhea*	67	87.0%
PSF is created for the needs of the community	64	83.1%
Child Health Booklet is useful for child diarrhea services	32	82.1%
PSF is accepted by users	62	80.5%
PSF has a positive impact on the community	57	74.0%
PSF is accessible to community	52	67.5%
PSF services are integrated with other health services in Vespasiano	41	53.2%

*Rated FHP services for child diarrhea as "good," "very good" or "excellent"

Table 6. Health professional predictors of satisfaction with PSF services for child diarrhea*

Indicator	Unadjusted				Adjusted (N=72†)		
	N	OR	95% CI	P-value	OR	95% CI	P-value
Monthly Income	**N=77**	1.02	(0.97, 1.07)	0.5002	0.30	(0.07, 1.29)	0.1062
Trainings in first 12 months at PSF unit	**N=72**						
None	6	0.17	(0.01, 2.37)	0.1255	0.38	(0.07, 2.15)	0.2752
1 session total	40	0.47	(0.05, 4.33)	0.8320	0.90	(0.07, 12.56)	0.9385
1 per month	13	1.00	(0.06, 17.90)	0.4589	1.23	(0.03, 46.98)	0.9120
1 per week	13	1.00 (REF)			1.00 (REF)		
Variety of trainings††	**N=64**						
1-2 methods	12	0.75	(0.12, 4.62)	0.2138	0.52	(0.06, 4.21)	0.5359
3-4 methods	37	4.38	(0.65, 29.41)	0.0604	1.23	(0.03, 106.14)	0.0584
5-6 methods	15	1.00 (REF)			1.00 (REF)		
Job category	**N=77**						
Community health agent	52	0.19	(0.02, 1.67)	0.1367	>999.9	(0.00, >999.9)	0.5177
Doctor, Nurse or Nurse's Aide	25	1.00 (REF)			1.00 (REF)		
Age	**N=77**	1.05	(0.96, 1.15)	0.3060	1.11	(0.93, 1.31)	0.2456

*Satisfaction is based on *good*, *very good* and *excellent* responses to professionals' evaluations of PSF services and activities for childhood diarrhea.
†Sample size is smaller for the adjusted model because of missing values.
††Training activities include orientations, workshops, videos, lectures/classes or other types of trainings.

Table 7. Caretakers and Professionals' reported experiences with PSF services and activities

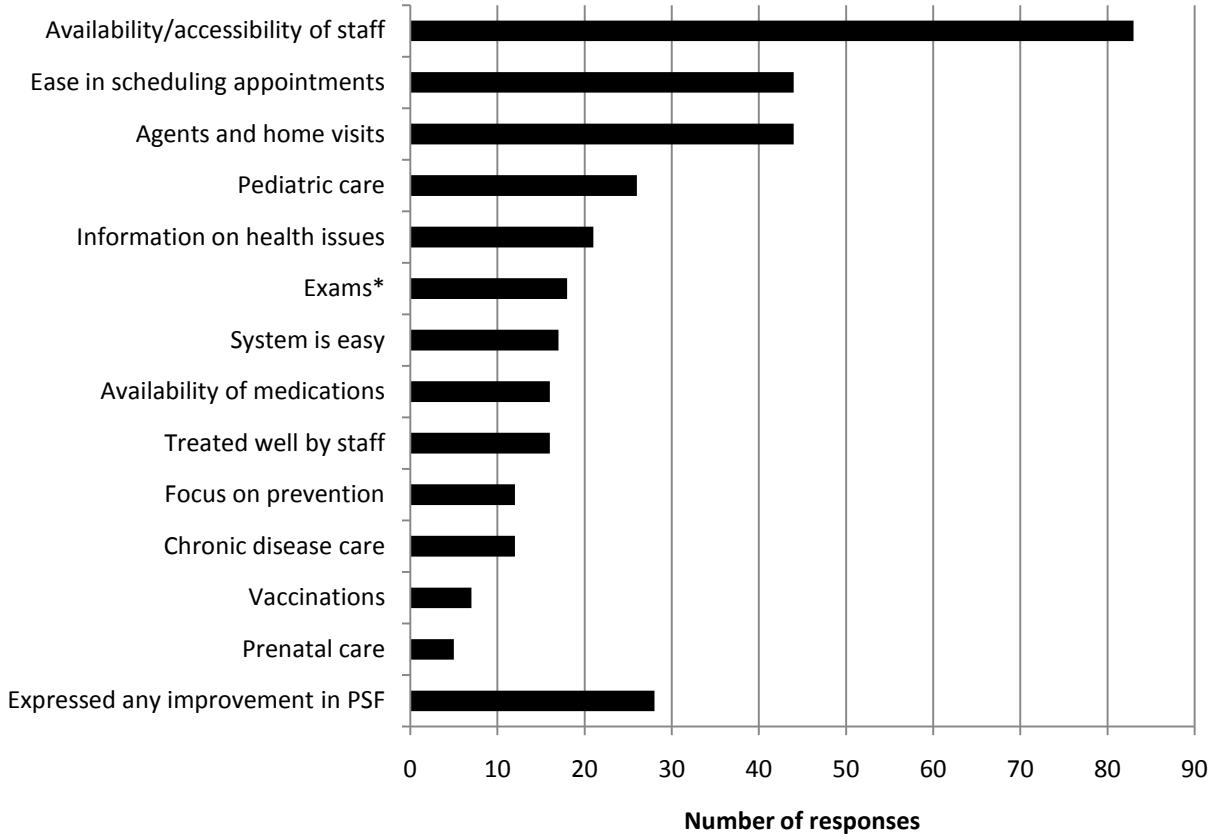
	Caretakers		Professionals	
	N	**%**	**N**	**%**
Accessible to the community	**N=232**		**N=77**	
Yes	192	47.9%	52	67.5%
Receive/give advice about diarrhea treatment	**N=252**		**N=76**	
Any advice	44	17.3%	75	98.7%
Educational activities about diarrhea*	**N=252**		**N=51**	
Caretakers ever participated; CHWs gave over past yr	5	1.9%	34	66.7%
Written information about diarrhea*	**N=252**		**N=52**	
Caretakers have received; CHWs gave over past yr	44	17.3%	2	3.9%
Child Health Booklet (Caderneta de SaúdedáCriança)	**N=236**		**N=66**	
Caretakers use booklet†; professionals received training on booklet	189	80.1%	47	72.1%
Satisfaction with PSF diarrhea services**	**N=103**		**N=77**	
Yes	85	82.5%	67	87.0%

*Questions on having ever given educational activities and written info on diarrhea were only asked to community health agents.

† "Use" includes monitoring of child growth and vaccination records.

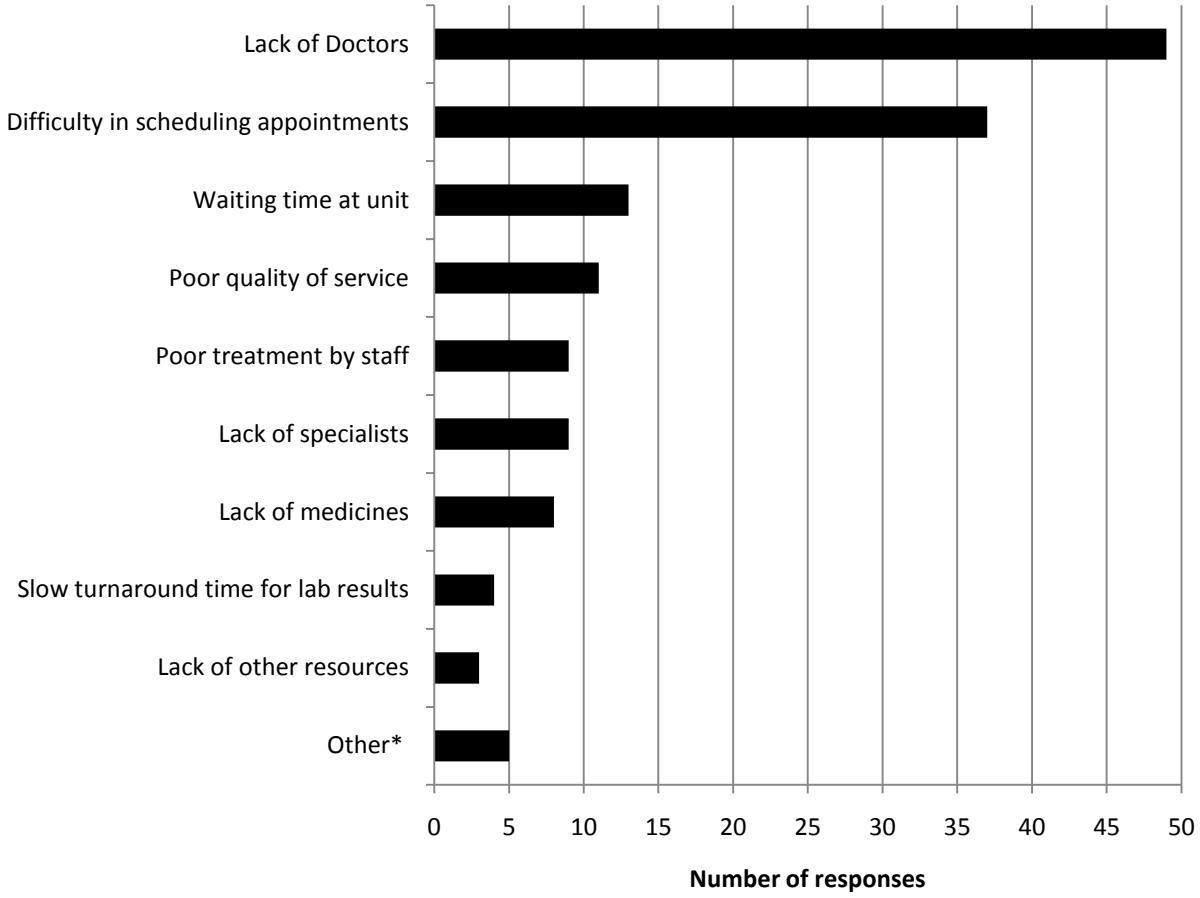
**The N is relatively small for caretakers because not all have ever sought diarrhea treatment with PSF. Variable for caretakers combines questions of satisfaction levels with services for controlling diarrhea at PSF unit, and satisfaction levels with advice given by community health agent.

Figure 2. Community-Reported Benefits of PSF



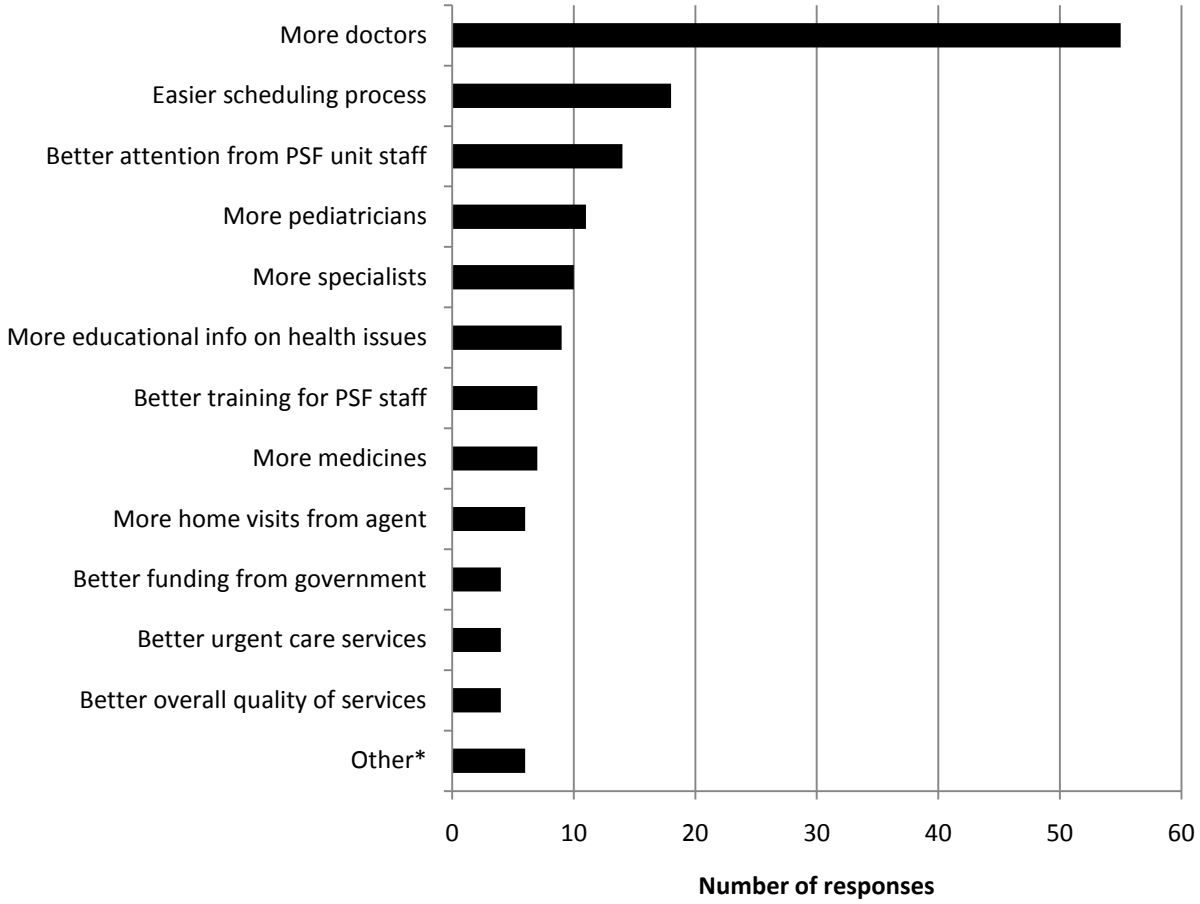
*Exams benefits include: availability of options, fast lab results

Figure 3. Community-Reported Problems with PSF



*Other problems include: Lack of urgent care services, poor quality of facilities at PSF unit, lack of trust in doctors, and unhelpfulness to community.

Figure 4. Community Members' Recommendations for Improving PSF



*Other responses include: better professional-patient relationships, better overall structure, and better facilities at unit.

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PUBLIC HEALTH IMPLICATIONS

Our findings have several implications for public health at the municipal, state, national and global levels.

- **Municipal**: The results from our study provide several important recommendations for improvement of the PSF in Vespasiano from both health professional and patient perspectives.
    - There is a large need in the community for more doctors staffed at the PSF units (primary care, pediatricians and specialists).
    - PSF units should give the community health agent the ability to schedule appointments for community members, if they are not already doing so.
    - A more reliable supply of medications would help improve the reliability of the PSF among both community members and professionals.
    - There is a need for the strengthening of information dissemination, which may start with an improved training module among community health agents. Community members already have favorable evaluations of the health agents, and an improvement in training could yield a more informed community on the PSF's available services as well as a good understanding of preventative health care.
    - Another aspect of professional training that could be improved is interactions with patients, especially among the professional staff at the units (doctors, nurses and nurse assistants). More respectful and understanding relations between professionals and patients can boost

satisfaction levels among community members and professionals alike, and may also increase the utilization of the PSF's services.

- **State**: Although our results from Vespasiano cannot be generalized to the broader population in Brazil or even the state of Minas Gerais, they can give us an idea of what might be happening in other areas of Brazil, especially in municipalities with similar population sizes or demographics.
- **National**: As the structure of the PSF is the same across Brazil (with a considerable amount of regional and local control [6]), a national strengthening of the professional development, with a focus on community health agents, may first be necessary before Brazil can expect widespread community participation.
- **Global**: our findings and the literature show that transitions in health system models can take time for populations to get used to, for professionals and patients alike. The flaws of the PSF highlighted in our findings are remediable, and as our qualitative results have shown, it appears that the PSF has already made tangible improvements since it started. The positive evaluations of the new system have encouraging implications for other nations that undergo health reforms, especially such dramatic reforms as Brazil.

HUBERT DEPARTMENT OF GLOBAL HEALTH

SIGNATURE FORM FOR NON-RESEARCH PROJECTS

This form is to be used for students who have chosen to write a Literature Review or Special Project and are not required to apply for IRB approval.

Attach a one to two page description of the project including general subject, hypothesis to be tested or question(s) to be answered, and lay summary.

Brazil's Unified Health System (SistemaÚnico de Saúde, or SUS) was implemented in the 1990s and was established to provide universal health care coverage through a decentralized system with a focus on primary, preventative, family-based care for all. An important program functioning under the SUS is the Family Health Program (O Programa de SaúdedaFamília, or the PSF), which employs family health teams based out of primary health units that are intended to provide convenient primary care and health education to communities. There is a need for published research on the perceptions and satisfaction levels of health care professionals and community members using a mixed quantitative and qualitative methods approach. The goal of this project is to identify and analyze patterns in the community perceptions of the PSF and the health professionals' perceptions of the PSF. The results from this project will inform the Ministry of Health and other policy makers for identifying areas which need improvements and moving toward policy changes within the PSF in Vespasiano. Positive changes in the PSF to better suit the community's needs will increase community participation and utilization of the PSF's services, reduce costs to the state and to patients, and therefore improve the overall health and well-being of the Vespasiano community.

In the summer of 2009, two former Rollins School of Public Health students and former members of our research group (Katherine Mues and Lilian Perez) collected data from caretakers of children aged 5 and under and PSF health care professionals through closed and open-ended surveys in from June to in Vespasiano, Minas Gerais, Brazil. Andrea P. Nicholls, the author of this project, did not conduct any of the field research and only conducted an analysis of the data after it had been de-identified, cleaned and entered into a Microsoft Access 2007 database.

I have read the attached information and verify that this project is not research and therefore <u>does not</u> need to be submitted to the Emory University Institutional Review Board.

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Signature of Thesis Advisor **Date**