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Patient Satisfaction and the Brazilian Family Health Program: The Role of Education and Income

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Abstract

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By Juliet Sheridan

Patient satisfaction has become an increasingly important concept as policy-makers, healthcare administrators, and theorists use measures of patient satisfaction to evaluate and reform healthcare systems. However, there is little research on determinants of patient satisfaction with primary care systems in the developing world. The goal of this study is to determine whether a relationship exists between education, income, and patient satisfaction and whether these demographic factors affect which benefits and problems that community members cite of the Family Health Program, the Brazilian primary care system in the summer of 2009. Surveys were administered to 293 caretakers of children under 5 years of age in Vespasiano, State of Minas Gerais, Brazil between June and August of 2009. Open-ended response to the questions "In general, how does the Family Health Program in Vespasiano benefit you and your family?"; "Have you had any problems with the Family Health Program in Vespasiano that you would like to share with us?"; and "Do you have any other information on the Family Health Program that you would like to share with us?" were coded thematically, and data on satisfaction, education, and income were cross-tabulated with these responses. Demographic factors were linked to the qualitative responses and also cross-tabulated with education and income. We found that education does play a significant role in patient satisfaction, although the same relationship is not true of income. Both education and income played a significant role in what specific problems and benefits users cited of the Family Health Program. These results can be used to not only tailor the Family Health Program more closely to the desires of the community but also to contribute to the literature on patient satisfaction for use both theoretically and when similar programs are instituted around the world.

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INTRODUCTION

A number of primary care systems have been implemented around the world in response to the Alma Ata Conference of 1978. To be effective, however, they must be utilized and accepted by the community. Patient satisfaction is one way to measure this acceptability. Patient satisfaction is, itself, a complex subject without a clear definition. For the purposes of this study, patient satisfaction will be defined as the difference between a patient's expectations of a healthcare encounter and their evaluation of the perceived reality of the encounter.

Very few studies address patient satisfaction with primary care systems, and even fewer examine patient satisfaction with primary care in the developing world (reviewed Atkinson and Haran 2005). If primary care systems are being implemented all over the world, then research into what makes them effective and acceptable to the communities they serve must be undertaken. It is not enough to institute a system of primary care; existing systems must be evaluated and their strengths and weaknesses taken into account when instituting similar systems around the world.

Also, patient satisfaction may be nurtured in a different manner in primary care systems, where emphasis is placed on more long-term interventions, than in acute care settings. In primary care settings the relationships patients have with medical providers become even more important when care is provided over a longer period of time, as higher levels of patient satisfaction increase compliance with medical advice and the probability that patients will return to the healthcare setting (Williams 1994).

Furthermore, the causal pathways through which demographic factors affect patient satisfaction are still relatively unclear (Sitzia and Wood 1997). The open-ended responses may more accurately reflect what community members truly value in healthcare, which in turn reveals

more about the standards by which they evaluate healthcare encounters and come to be satisfied or dissatisfied. If these responses vary by levels of education and income, they may form partial but concrete linkages between demographic factors and patient satisfaction, linkages that the current literature lacks (Sitzia and Wood 1997).

To address these needs, the goal of this study is to determine whether a relationship exists between education, income, and patient satisfaction and whether these demographic factors affect which benefits and problems of the Family Health Program community members cite. Open-ended responses to surveys administered in Vespasiano, Brazil were coded thematically, and quantitative data on satisfaction, education, and income were cross-tabulated. Demographic factors were attached to the qualitative responses and also cross-tabulated with education and income. Education does play a significant role in patient satisfaction, although the same relationship is not true of income. Both education and income played a significant role in what problems and benefits users cited of the Family Health Program. These results can be used to not only to tailor the Family Health Program more closely to the desires of the community but also to contribute to the literature on patient satisfaction for use both theoretically and when similar programs are instituted around the world.

LITERATURE REVIEW

The Brazilian Family Health Program

The Family Health Program (FHP) was created in 1994 as part of the Sistema Único de Saúde (SUS), the Unified Health System developed by the Brazilian government in 1988 in response to the Alma Ata conference's call to health for all in 1978. It is based on three principles: universal coverage, integral health care, and equity (Barros and Bertoldi 2008). The Family Health Program divides municipalities into numerous units, and these units oversee the provision of care to members of its community. Each unit has one Family Health Post, a clinic where patients are seen and the health teams are based. Health teams are comprised of at least one physician, one nurse, one nurse assistant, and six community health agents, responsible for approximately 3,000 community members (TCU Evaluation of the Family Health Program 2003). The community health workers (CHWs) initiate much of the direct patient contact, by visiting every home at least once a month to check on household health, monitor chronic diseases, and facilitate referrals between patients and the FHP Unit. CHWs also make appointments for community members and follow-up after clinic visits. The FHP has been very successful in reducing infant mortality rates (Aquino 2009, Macinko 2006, Macinko 2007) and has increased health coverage to approximately 60% of the population, up from 14% (Macinko 2007). Vespasiano, Brazil is a municipality in southeastern Brazil on the outskirts of Belo Horizonte, in the state of Minas Gerais.

Social Inequality and Health

Studies have shown that patient satisfaction varies by sociodemographic factors (Young, Meterko, Desai 2000). Measuring these sociodemographic factors operationalizes social inequality, and allows an examination of how inequality indirectly affects patient satisfaction.

Social inequality has been defined in numerous ways, but for the purposes of this paper, it will be defined as "the condition whereby people have unequal access to valued resources, services, and positions in the society" (Kerbo 1983). This paper will draw a link between social inequality and perceptions of the quality of care offered at the Family Health Post, the primary care service in Brazil. The research question this thesis will address is, "How does unequal access to valued resources affect a caretaker's satisfaction with government provided primary care?"

In this research, social inequality will be operationalized by two factors: education and income. These two factors are proposed causes of social inequality (Coburn 2000, Ross and Wu 1995), and are also two of the three factors most commonly used to calculate socioeconomic status. Both indicators are useful in measuring social inequality; by examining both, we may gain a greater understanding of the different pathways involved in affecting patient satisfaction (Cardarelli, Low, Vernon, Preacely, Baumler, and Tortolero 2009).

Education is a useful indicator of social inequality in that it usually is attained by adulthood, remains fairly stable over time, and is not responsive to changes in health or employment status that may skew results (Akin 1985). Education leads to differences in life opportunities that affect an individual's ability to get a job, income, and resources available throughout the life course (Ross and Wu 1995). Different levels of educational attainment determine an individual's position in social stratification and contribute to social inequality by selectively allocating resources like degree credentials, human capital, and employment.

Education does not address various components of social inequality like lifetime occupational attainment or lack thereof. It also does not necessarily strongly predict income or class status. A professor may be highly educated, but they may not have the same occupational

prestige or income that a doctor or a lawyer might have. Finally, education is not always meaningful when comparing small differences in education. The scale is fairly condensed, with a possible measurement range of twenty or thirty years, rather than the hundreds of thousands of unit differences possible in measuring income. Also, the difference between years of education may or may not have a meaningful impact on life outcomes depending on the context and educational structure of the country. For example, in the United States having ten versus eleven years of high school does not create a meaningful difference in life outcomes, but the difference between eleven and twelve years does; the achievement of a high school diploma is an important milestone that affects occupational opportunity (Cardarelli et. al 2009).

Income is another useful indicator of social inequality because it measures the resources that a family has at their disposal, which again reflects differential access to goods and services like high quality nutrition, health care services, and ways to offset the other direct and indirect costs of healthcare like transport, child care, and medications (Cardarelli et al 2009). Income may also not reflect actual lifestyle constraints, as temporary unemployment, a health crisis, and irregular sources of income may not actually affect a household's spending patterns even though income levels reflect a lower level of resource availability. Most studies measure household income as an indicator of health-seeking behavior (Gotsadze, Bennett, Ranson, and Gzirishvili 2000, McIntyre, Thiede, Dahlgren, and Whitehead 2005), while this study did not specify whether income was personal or household income.

Patient Satisfaction

Studies have shown that satisfaction with healthcare is largely determined by individual-level variables, rather than with the system itself (Hekkert et. al 2009). In this sense, a simplistic

definition of satisfaction is the consequence of a patient's expectations and evaluation of the healthcare provided based on those expectations: the difference between expectations and reality. In the 1950s, medical sociologists began to research the patient perspective of the medical encounter, as in the work of Parsons and Szasz and Hollender (Reviewed in Williams 1994). It was found that higher levels of patient satisfaction led to increased compliance with medical advice, which encouraged research on the subject for the next three decades. Patient satisfaction became even more important in the 1980's as a means of understanding and quantifying factors underlying consumerism in healthcare; increased competition in the provider market led to research in how patients made decisions about where to seek care (Williams 1994). Both of these perspectives are still important today.

Patient satisfaction is a hotly debated concept, one that does not yet have a widely accepted definition nor a clear set of causal factors that influence satisfaction. There are numerous theories, none of which completely or even largely explain the source of patient satisfaction. The most common are the value-expectancy model of Linder-Pelz, discrepancy theory, fulfillment theory, and equity theory (Williams 1994). Linder-Pelz's value-expectancy model of patient satisfaction frames patient satisfaction as the sum of five socio-psychological factors and processes: expectations, evaluation of occurrences, entitlement to an outcome, occurrences that actually take place, and interpersonal comparisons of this encounter with others of their own experiences with health care (Linder-Pelz 1982). In essence, patient satisfaction is a positive attitude that a patient's care has certain attributes and those attributes are evaluated positively (Williams 1994). Discrepancy theory defines satisfaction as the difference between what a patient expects and their evaluation of what occurs as a proportion of what they expect; fulfillment theory is similar, but defines satisfaction as the simple difference between what is

desired and what is received. Finally, equity theory defines satisfaction as a perceived balance of inputs and outputs, which introduces social comparisons to patient satisfaction (Williams 1994).

All of these theories include a component of what the patient expects or wants and a comparison and evaluation of those expectations with what actually happens. Because individual evaluative processes are largely the domain of psychology, this research will focus on how social and demographic factors affect patient expectations, and therefore how they affect patient satisfaction. Stimson and Webb outline three main areas of expectations that affect satisfaction with a medical service (Reviewed in Sitzia and Wood 1997). These three areas are expectations about the interaction with healthcare professionals, expectations about the action taken, and background expectations created through previous knowledge or experience. A patient's sociodemographic characteristics frame these mental processes and the creation of expectations of care and the evaluation of perceived quality. Education and income affect all three of these areas of expectation, and therefore they indirectly affect patient satisfaction.

Patient satisfaction has been increasingly taken into account when evaluating healthcare systems (Williams 1994). It is one way to measure perceived quality of care, which actually has more influence on health-seeking behavior and patient compliance than objective quality of care measured by physicians and nurses. Satisfaction is a proxy for acceptance, and community acceptance is pivotal for the success of any public health venture. Most patient satisfaction research has taken place in the developed world, primarily in the UK and US (Sitzia and Wood 1997). However, as governments of developing countries implement primary care systems in response to the Alma Ata conference of 1978, it is important to develop information on patient satisfaction with primary care services in the developing world. This satisfaction lends great

insights into ways that the program can be tailored to better serve the community and be more effective in linking government programs with community members.

Education and Patient Satisfaction

Education affects not only expectations of the interaction with healthcare providers, but also the course of the interaction itself. Studies have shown that in the doctor-patient relationship, patients value being "able to talk to the doctor" most (Vick and Scott 1997, Scott and Vick 1998). Studies have also shown that higher levels of educational attainment are related to higher levels and greater importance of agency and self-efficacy (Snibbe and Markus, 2005; Leganger and Kraft 2003; Bar-Tal and Bar-Zohar 1977). Bandura defines efficacy as "people's beliefs about their capabilities to exercise control over events that affect their lives" (Bandura 1989). Thus, not only do people with higher levels of education have a greater sense of efficacy, they also value that mastery over life events more than people with lower levels of education. Within the healthcare interaction, patients with higher levels of education and therefore higher levels of agency will be more likely to interact more assertively with the doctor, asking questions and negotiating their own treatment. This agency creates a sense of control over the situation; if then, the doctor does not respond in a way the patient thinks is appropriate, that control is lost. Patients of high levels of education who lose that control over the interaction may be more dissatisfied than patients with lower levels of education, because patients with lower levels of education have little expectation of control or agency in the interaction and are therefore more likely to accept what the doctor proposes and be satisfied. Other studies support the theory that higher-educated patients want to be involved in medical decision-making and that patient satisfaction is adversely affected when this desire is not adequately fulfilled (Wartman et. al 1983, Thompson, Pitts, and Schwankovsky 1993, Scott and Vick 1998).

Finally, education plays an indirect role in affecting patient satisfaction by affecting background expectations, health status before visiting the doctor (pre-clinic visit), and the resources available to patients. Background expectations are those expectations based on accumulated knowledge of healthcare over the years (Williams 1994). These expectations include all past provider visits, past illness and treatment experiences, and all evaluations of those visits. Background expectations are built on the past; any effect that education has had on past visits in terms of satisfaction will affect background expectations that patients bring into the current encounter. Education also plays a role in health status pre-clinic visit, one of the most important factors determining patient satisfaction (Sitzia and Wood 1997). Higher levels of education have consistently been linked with better health status (Ross and Wu 1995). Higher levels of education also affect health behaviors; highly educated people are less likely to smoke, drink, and do drugs, and more likely to exercise, eat nutritiously, and monitor their health more closely (Ross and Wu 1995). The other result of high levels of self-efficacy in highly educated people is an increase in positive health-maintaining behaviors, increased perceptions that a patient's health is under their control and can be changed for the better, and an increase in mental health (Bandura 1989, Gecas 1989, Bandura 1998). More highly educated people are more likely to have better health status going into the clinic, which predicts higher satisfaction upon leaving the clinic. Higher levels of education also relate to an increase in the resources available to patients. Resources can take the form of social support, which is another important determinant of better health (Ross and Wu 1995). Resources can also take the form of human and cultural capital, accumulated skills and knowledge regarding interaction with trained health professionals. More educated patients may be more comfortable around similarly educated

doctors and nurses, engendering familiarity and facilitating communication between provider and patient.

The impact of education on satisfaction is mixed, with the majority of the current research indicating that higher levels of education lead to higher expectations of the health encounter. Higher expectations may lead to greater disappointment and decreased levels of satisfaction. On the other hand, the role of resources available to those of higher education levels and the better health status of the highly educated also plays a role in increasing satisfaction. In order to understand patient satisfaction and healthcare encounters, it is important to understand how social inequality and demographic differences affect these evaluations of healthcare. Elucidating these pathways can help make primary care systems more acceptable to all strata of society and clarify mechanisms to increase utilization of public primary care systems.

Income and Patient Satisfaction

Brazil's Family Health Program is free at the point of use, but there are still numerous costs borne by community members seeking care. Some direct costs include both the cost of transportation getting to the FHP Unit clinic, medications prescribed, and the cost of child care (Akin, Guilkey, Griffin, and Popkin 1985). Some indirect costs include the lost income that could have been earned if the caretaker did not spend time in the clinic, the time spent waiting in the clinic, and time spent travelling to get medications (Akin et. al 1985). These costs affect utilization of health care services, especially in low-income areas.

In Brazil, health care expenditures still account for an important proportion of household spending, especially on medications. In general, the poor spend less on health as well as a smaller proportion of their income on health. On the other hand, the percentage of households spending more than 20% of household income on health and the percentage of households

spending more than 40% of their capacity to pay are similar across wealth quintiles (Barros and Bertoldi 2008). Cost is one of the most commonly measured determinants of patient satisfaction; as costs increase, patient satisfaction generally decreases (Ware, Snyder, Wright, and Davies 1983). Thus, if wealthier community members spend more money on healthcare, they may be less likely to be satisfied.

Expectations also play a role in linking income and patient satisfaction. Higher income community members have more resources available to them, leading to a wider comparison base and higher expectations for care received. In social psychology, Thibault and Kelley state, "people evaluate circumstances in relation to those they believe others achieve or in relation to those they have themselves experienced in the past" (1959). The reference group that a patient is a part of is important in creating the social context for comparisons. Income categories are one way that reference groups are formed, as higher income community members are more likely to compare themselves to others in similar economic situations.

In Brazil, of the households in Porto Alegre that spent money on health, more than 93% of the top two income quintiles sought care outside of the FHP (Barros and Bertoldi 2008). Thus, not only are higher income community members more likely to have some experience with private care, they are also more likely to compare themselves to other high income community members who also have access to and utilize private care. These comparisons raise the level of expectations that surround health care in general, and may lead to greater dissatisfaction when comparing public FHP clinics with private care. Also, private care is generally seen as better quality than public care (Mishima, Pereira, Matumoto, Fortuna, Pereira, Campos, Paula, and Domingos 2010). Higher income community members who have the choice to receive better quality private care may be less satisfied when they seek care from the public FHP post.

Additionally, there is some evidence that an increase in income actually increases the number of people who seek perceived better quality care; publicly available care is not generally perceived as of good quality (Akin et. al 1985). Medical care use is sensitive to perceived quality of care, as is satisfaction. If patients perceive the quality of care as poor, then they are less likely to be satisfied. (Akin et. al 1985). In essence, cost becomes a barrier to accessing private care that is perceived as of good quality.

Income is also related to other health-seeking behaviors that affect satisfaction. As stated earlier, community members with higher income have greater access to socially valued resources and are less likely to smoke, drink, and do drugs, and more likely to exercise, eat nutritiously, and monitor their health more closely (Ross and Wu 1995). Again, the higher a patient's health status is going into a visit, the greater satisfaction they have (Sitzia and Wood 1997). However, income and self-efficacy do not seem to have a relationship; people with higher incomes do not have associated higher levels of self-efficacy. Therefore, income may have less of an effect on satisfaction than education because of this difference in self-efficacy (Boardman and Robert 2000, Clark, Patrick, Grembowski and Durham 1995).

Both income and education privilege some members of a community by providing them with greater access to resources. As previously stated, greater access to resources leads to better health and increased satisfaction with healthcare. However, this privilege also leads to increased expectations regarding the quality of care offered, the quality of the healthcare interaction, and treatment options available to them. As the Family Health Program has limited resources, it is possible that these increased expectations may not be met, leading to decreased levels of satisfaction.

Atkinson and Haran (2005) addressed user satisfaction with the Family Health Program in Ceará, in northeastern Brazil. They measured both individual-level and district scale determinants of patient satisfaction in order to gain a broader conceptual understanding of what impact patient satisfaction in developing countries. They used three measures of user satisfaction: generalized satisfaction, perceived quality of a specific health event, and satisfaction with the Community Health Worker. In generalized satisfaction, which was measured most similarly to satisfaction in this study, socioeconomic factors were fairly influential in affecting satisfaction. In sum, however, the study's model only explained around 30% of the variance in patient satisfaction, which reflects the highly individualized nature of satisfaction and evaluation of health care. The role of income in patient satisfaction is quite unclear, but it is important to articulate for future policy decisions. Resource-strapped governments may need to institute fees for services, and an understanding of the relationship between income and satisfaction with healthcare is crucial for framing the fees in such a way that underlying social inequalities are not exacerbated and the population still has access to the services they need.

Few studies address patient satisfaction in developing countries, especially when compared to the sizeable literature available on patient satisfaction in the US, UK, and Canada, (reviewed Atkinson and Haran 2005). Also, the Family Health Program is a unique model of health care delivery in the developing world, as its emphasis on decentralization, primary care services, and high levels of success in lowering infant mortality rates and increasing the percent of the population with access to healthcare make it a viable option for application in other countries. Similar programs have been instituted in Peru, Bangladesh, Tanzania, and Uganda (Amaral, Victora, Leite, and da Cunha 2008).

It is especially important to measure patient satisfaction, both as an evaluation of quality but also community acceptability. High quality healthcare that is not utilized or is stigmatized is just as useless as poor quality care, and this research will begin to address community evaluations of the care offered by the Family Health Program.

The goal of this research is to examine the relationship between education, income, and patient satisfaction. It will also attempt to elucidate some of the causal pathways between demographic factors and patient satisfaction by utilizing open-ended responses to reflect what specific aspects of the Family Health Program the community values.

Significance

This research can be used to more effectively tailor the Family Health Program to the needs and desires of the community, as well as contributing to the broader theoretical literature on patient satisfaction in developing countries and primary care systems. This research is especially important for the Family Health Program as a means to evaluate its unique structure for use in other areas of the world. By understanding what benefits and problems the community perceives, appropriate resources can be put into strengthening pre-existing benefits and improving problem areas. Stratification of the problems by unit also reveals areas of improvement for specific units within the Vespasiano Family Health Program.

More broadly, examining demographic characteristics and how they affect satisfaction in the context of a developing country deepens the existing literature on patient satisfaction, and it contributes to a more complex elucidation of causal pathways between demographics and patient expectations. Applying the results of this study to increase patient satisfaction will increase the perceived quality of care provided, decrease community costs for private care in the long-run, and increase patient compliance with provider instructions. It can also connect aspects of patient

satisfaction that are important in primary care systems and frame needed reforms in policy and practice to maximize satisfaction while decreasing costs.

METHODS

Sample Population

The sample population was comprised of the primary caretakers of children less than five years of age in Vespasiano, Brazil between June and August of 2009. Respondents were taken from all 10 of the Family Health Program units in Vespasiano. Lists of all households were obtained from the units themselves, and proportionally allocated stratified random sampling was used, stratified by FHP unit (Mues, Resende, dos Santos, Ferreira, Leon 2010). The final sample population included 293 caretakers. Oral informed consent was requested of each subject before each interview. The study was approved by the Institutional Review Boards of Emory University (Atlanta, GA, USA) and the *Faculdade da Saúde e Ecologia Humana* (FASEH, Vespasiano, MG, Brazil).

Data Collection

All interviews were conducted in Portuguese at the caretaker's home or work using a semi-structured interview questionnaire. These questions were related to numerous aspects of the community experience of the Family Health Program, including health-seeking behavior, treatment options for diarrhea, and general perceptions of the program. In this study, three open-ended questions were utilized: "In general, how does the Family Health Program in Vespasiano benefit you and your family?; "Have you had any problems with the FHP in Vespasiano that you would like to share with us?; and "Do you have any other information on the Family Health Program you would like to share with us?". These questions were selected because they speak to general benefits and problems the community experiences in their own words. These exploratory questions tap into areas that the community feels is satisfactory or needs to improve without imposing outside assumptions about what is important. This study also

utilized close-ended responses on education, income, gender, age, and a quantitative measure of satisfaction with the Family Health Program.

Open-ended responses were translated from Portuguese into English by two medical students fluent in Portuguese and English and the English was verified by a native English speaker. All survey questions, both open-ended and close-ended were double entered into Microsoft Access 2000 by two separate staff and checked with Epi Info version 3.5.1 using the data compare feature.

Data Analysis

The responses from the three open-ended questions were then inductively coded into qualitative themes regarding the benefits and problems of the Family Health Program. All responses were read thoroughly and common themes were extrapolated based on frequency. Some themes within the benefits were satisfaction with household visits and attendance by health professionals. Some themes found in the problems category were lack of personnel and lack of resources. Definitions for each theme were created and then responses were re-read to code each response thematically with the theme definitions. Responses that spoke to multiple themes were recorded in all applicable themes. These qualitative responses were then coded into a binary format, in which a 1 indicated a response and 0 indicated no response. For example, if respondent cited a lack of personnel but did not mention poor quality of care, her response would be coded as a 1 in the lack of personnel theme and a 0 in quality of care. X^2, ORS regression, and comparison of means were used in the analysis. All statistical analysis procedures were completed using SPSS (Version 17.0, IBM, NY) and PASW (Version 18.0, IBM, NY). The data were approximately normally distributed except for age and income, which were transformed using a base ten logarithm. A $p < 0.1$ was considered significant.

Income was coded into three ordinal categories: 0-499 reales per month, 500-999 reales per month, and 1000 or more reales per month. Respondents who had irregular employment did not give a numeric value for their income and were grouped in the lowest ordinal category on income. Education was also coded into three ordinal categories. The first category encompassed responses coded 1 and 2, “Never been to primary school” or “Didn’t complete primary school”. The second category encompassed responses coded 3 and 4, “Completed primary school” and “Some secondary”. The final category included responses coded 5, 6, and 7, “Completed secondary school”, “some college”, and “completed college”.

RESULTS

The goal of this study was to examine the relationship between education, income, and satisfaction. The majority of the respondents were female, and the mean age was 34 years (Table 1). A little over half of the respondents had completed primary school or more education, while just under half had less than a full primary school education. Average ages for community members were computed based on completion of primary school. The average age of respondents whose highest educational attainment was primary school was 37.85 years, while the average age of respondents who completed more than primary school was 28.85 years. The comparison of these means was significant ($p<0.001$). The mean income was 705 reais per month, but half the respondents made less than 600 reais/month. Just over a majority of respondents were satisfied or very satisfied with the services of the FHP, and very few community members were actually dissatisfied with the FHP, indicating that the program is already evaluated fairly positively, or at least not negatively (data not shown).

The first step in clarifying the quantitative relationship between education, income, and patient satisfaction was to examine the bivariate relationship between the independent variables (education and income) and the dependent variable, satisfaction (Tables 2 and 3). When crosstabulated (Table 2), education and satisfaction did have a weak relationship (gamma=0.179, p=0.046). As education increased, satisfaction decreased. For example, in the lowest category of education, some primary school or less attained, the range between those respondents satisfied and dissatisfied was 63.9%. On the other hand, in the highest level of education, completion of secondary or any college, there was only a 47% difference between the rate of satisfied and dissatisfied community members. In summary, there was a significant inverse relationship between education and satisfaction; as education increased, satisfaction decreased.

To examine the bivariate relationship between income and satisfaction, these two variables were crosstabulated. Income did not have a significant relationship with satisfaction (p=0.987, Table 3). More respondents in the highest category of income were dissatisfied than in the other categories but they also had a higher number of satisfied respondents. There did not seem to be a clear pattern of association, and because it was not significant, no population variance seems to exist in these two variables.

To control for the effect of income on education, the variables were crosstabulated and income was added as a layering variable. Controlling for income partially clarified the relationship between education and satisfaction, but only for respondents in the lowest category of income (Table 4). In this analysis, as the level of education increased, the level of satisfaction decreased, and gamma indicated a moderate relationship (gamma=0.329, p=0.021). The other levels of income were not significant, but in all three levels of income the least likely to be dissatisfied were respondents in the lowest level of education, those who have not completed primary school. Controlling for income strengthened the significant relationship between education and satisfaction in the lowest category, but did not have as strong an effect on the other levels of income.

In order to control for the impact of education in the relationship between income and satisfaction, the same crosstabulation was run, with income taking the place of the independent column variable and education utilized as the layering variable. Controlling for education did not seem to clarify the relationship, or lack thereof, between income and satisfaction (Table 5). None of the analyses were significant, indicating that there may not be a population relationship between income and satisfaction. In all three categories, most of the response rates were fairly similar, with the middle income response rate being the exception. This middle income category

seemed to be the least likely to be satisfied, with the lowest satisfaction rates of all three categories. None of the gamma values indicated any more than a weak relationship among the variables; because the middle variable was so different in response rates from the first and third variables, gamma may not be as useful in articulating the pattern of the relationships.

In order to analyze the open-ended responses for elements of patient satisfaction, the responses were coded thematically into four benefits and four problems. Themes cited in the benefits category were health professional attendance, prevention services, household visits, and family-health focused care. Health professional attendance included responses that contained positive evaluations among users of the care received from a FHP health professional; this "attendance" could include attentiveness, friendliness, and courtesy, for example. The household visits theme included any positive comments relating to the visits made by FHP agents and community health workers to the home. The theme of prevention services included positive evaluations of prevention programs and disease management within the community. Finally, the family-health focused theme included responses that the FHP program is good for the needs of the respondent's family.

Themes cited in the problems category were a lack of personnel, lack of resources, challenges with access, and poor quality of care. The lack of personnel theme included perceptions from users that the FHP needed more doctors or specialists. The lack of resources theme included all responses regarding insufficient equipment, supplies, and services needed to provide care. Challenges with access were coded as problems users had encountered in utilizing services of the FHP, including difficulty getting an appointment, long wait times, and insufficient hours of operation. Finally, responses that included negative evaluations of the care provided by the FHP or its health professionals were coded as poor quality of care.

In order to determine whether meaningful differences in rates of benefits and problems cited by community members existed among different units, community response rates of benefits and problems were crosstabulated with unit location. Within the benefit themes (Table 6), a majority of community members in Celvia cited household visits as a benefit, almost double the response rate of the next unit, Vila Esportiva. Similarly, respondents in Morro Alto 3 were seven times as likely to cite prevention services as a benefit of the FHP as respondents in Jardim Da Gloria. A majority of respondents cited good attendance as a benefit in Vila Esportiva, Morro Alto 3, and Morro Alto 2, but only around a quarter cited good attendance as a benefit in Celvia and Oeste. Finally, family-focused health had similar differences. A third of respondents in Nova York cited family-focused care as a benefit, while none of the respondents in Morro Alto 3 cited the same benefit. There were significant differences among the units in which benefits were cited, especially in regards to household visits, prevention services, and family-focused health.

There were also similar differences among the units in problem response rates (Table 7). Morro Alto 3, Nova York, and Nova Pampulha had a majority of respondents cite lack of personnel as a problem, compared to Jardim da Gloria and Suely with less than 15% of community members citing lack of personnel as a problem. A third of respondents in Morro Alto 1 cited a lack of resources, almost four times the number of respondents who cited a similar lack in Suely. In Nova Pampulha, 39.3% of respondents cited difficulty accessing care, while 10.8% responded with the same difficulties in Celvia. Finally, 31.8% of users in Nova York said that the quality of care was poor, while 2.7% of users in Celvia shared that negative evaluation. The only significant analysis was the difference among units in community members citing lack of personnel, but difficulties with access approached significance. There were significant

differences among the units in which problems were mentioned, especially in regards to lack of personnel and difficulty with access.

In order to examine whether a relationship exists between education and income and what benefits and problems users cited, demographic factors education and income were correlated with the open-ended responses. There were differences in thematic response rates when stratified by education level (Table 8). While not significant, in general, as level of education increased, likelihood of citing a benefit of the FHP decreased and the likelihood of citing a problem increased. The relationship between level of education and citing a problem was stronger than the relationship between education and citing a benefit, indicating that level of education has more relevance in correlating with dissatisfaction than satisfaction. Lack of resources was the only theme in which the relationship was significant.

Level of income seems to have more of an impact on what benefits and problems respondents cite (Table 9) than it does on patient satisfaction (Tables 3 and 5). More respondents in the lowest level of income cited good attendance as a benefit of the FHP. In general, the relationships followed the same pattern as those of education; as the level of income increased the likelihood of citing a benefit decreased and the likelihood of citing a problem increased. A notable exception, on the other hand, is that as the level of income increased, likelihood of citing prevention as a benefit also increased. All of the analyses that examined income and the benefits and problems cited were significant, indicating that income has more of a population effect on the problems and benefits users cite than education.

To clarify the relationship between the level of education and the responses of community members, income was added to the crosstabulation as a layering variable (Table 10).

Within the lowest level of income, differences in benefit response rates based on level of education were examined; this analysis was the only level of income that resulted in significant effects. Within respondents whose monthly income was less than 500 Brazilian reais, the same pattern was found and strengthened; as level of education increased, the likelihood of citing a benefit (attendance and prevention services) decreased and likelihood of citing a problem (poor quality and lack of personnel) increased. Significant relationships were found in prevention services and poor quality. Controlling for income strengthened, and in two cases made significant, the relationship between education and the responses of users about the benefits and problems of the FHP.

To clarify the relationship between income and the response rates of users, level of education was layered in the crosstabulation of income and responses of community members (Table 11). Within the benefits, the relationships were all significant when controlling for the highest level of education. Controlling for education strengthened the relationships found at the bivariate level (the absolute value of gamma increased). The same pattern held for attendance as well: in the highest level of education, as level of income increased, the likelihood of citing a benefit of the FHP decreased. In contrast, the pattern switched for prevention services; in the highest level of education, as level of income increased, likelihood of citing prevention services as a benefit decreased in the trivariate analysis while the opposite pattern was true in the bivariate analysis (Tables 9 and 11).

Within the problems, controlling for level of education proved instructive when considering responses in the lowest level of education, completion of some primary school or less. Within this lowest category, the same patterns were found as seen in the bivariate relationship; as level of income increased, likelihood of citing a problem with the FHP also

increased. Controlling for level of education proves meaningful and significant for the highest level of education correlating with benefits that users cite, while it is significant for the lowest level of education in relationship to the problems users cite. The middle category of education does not seem to be as significant nor as clear in its relationship with the benefits and problems users cite.

DISCUSSION

The goal of this study was to determine whether income and education have an effect on patient satisfaction with the Family Health Program (FHP) and whether the benefits and problems that community members cited varied with their levels of education and income. Education did have a significant effect on satisfaction, while income did not have a significant effect in this context. There were also significant differences in rates of benefits and problems cited by caretakers among FHP Units. Finally, specific benefits and problems that community members cited did vary by both level of education and income.

Education and overall satisfaction with the FHP were correlated at both the bivariate and, when controlling for income, at the trivariate level. As the level of education increased, level of satisfaction decreased (Tables 2 and 4). When income was controlled for, this relationship grew stronger in the lowest category of income, and weakened in both strength and significance as level of income increased. This relationship may be due to the higher expectations that highly educated patients bring to healthcare encounters. Highly educated patients have greater levels of agency and self-efficacy (Snibbe and Markus, 2005; Leganger and Kraft 2003; Bar-Tal and Bar-Zohar 1977) and expect to exert more control over the interaction. Furthermore, more highly educated patients expect to be involved in medical decision-making (Wartman et. al 1983, Thompson, Pitts, and Schwankovsky 1993, Scott and Vick 1998). If both or either of these expectations are not met, they are more likely to evaluate the healthcare encounter negatively. These expectations, combined with the fact that public healthcare systems are largely perceived as of poor quality (Akin et al 1983), mean that highly educated patients have high expectations and are more likely to be disappointed in their healthcare. The impact of education on satisfaction is strongest in the lowest category of income; this relationship has not been published

before. This finding may be partially because patients in the lowest level of income have no recourse to private care if they do not want to interact with the public Family Health Program. These low income, highly educated community members have the same expectations as other highly educated patients, but without the resources to procure care in a private setting that may decrease usage of the FHP and therefore dissatisfaction. These community members may also be largely young and not settled in stable employment yet, and young people are more likely to be less satisfied with healthcare. The comparison of mean ages between primary and secondary educational attainment helps to control for the effect of age in the relationship between education and satisfaction, as some of the variation will be due to age. Unfortunately, because of the small sample size and ordinal data, it was not possible to include age in the data analysis.

On the other hand, income and satisfaction did not appear significantly correlated on either the bivariate or trivariate levels (Tables 3 and 5). This finding is supported by the literature that found little direct effect of income on satisfaction in Western settings (Fleming 1981, Linn, Linn, and Stein 1982). Very few studies actually examine the direct relationship between income and satisfaction (Hall and Dornan 1990); these studies examine indirect effects of income on satisfaction by tracing causal pathways and examining the role of expectations in satisfaction (Linder-Pelz 1982). Income does not seem to have the same effect on mastery and agency that education does; higher income patients do not necessarily want to be involved in medical decision-making like highly educated patients, and therefore have fewer opportunities for disappointment or unmet expectations. It may also be true that income is not relevant to evaluations of healthcare that is free at the point of service like the Family Health Program.

There were significant differences among the units in what specific benefits and problems were cited (Tables 6 and 7). These differences in both specific problems and benefits may

indicate underlying differences in resources, programs, and services available in the units. For example, Celvia had the highest rate of community members citing household visits as a benefit of the FHP. Perhaps, the community health workers in Celvia may have the best system for organizing and executing household visits. Morro Alto 3 and Nova York had the highest rate of community members citing lack of personnel as a problem and therefore may need more physicians. Morro Alto 1 had the highest response rate for lack of resources. Therefore, that unit may need more money, supplies, or medications. These differences in units provide a beginning point for an analysis of resource allocation across the units and a strengthening of the units and therefore the care they can provide; these differences may be instructive in looking at perceived problem areas or areas in which processes are exemplary and could be adopted in other units. There may also be population differences among the units that lead to these different response rates. For example, it is possible that if a unit is largely made of more highly educated community members, that unit as a whole may be evaluated less positively even if the care provided is exactly the same as in other units.

Differences in specific problems and benefits cited by community members did vary by education (Tables 8 and 10). Among all the specific problems cited by community members only the lack of resources had a significant relationship with education. As the level of education increased, the rate of users citing lack of resources as a problem also increased. By controlling for income, however, the relationship between education and the problems and benefits users cited was clarified (Table 10). The association between prevention, poor quality and education became significant in the lowest category of income in the trivariate analysis. In both prevention and poor quality, the strength of the relationship between the two themes and education increased when the confounding variable of income was controlled. The pattern that as level of

education increases, satisfaction with the attendance decreases is supported by the literature, in which higher education is related to lower satisfaction (Hall and Dornan 1990). This relationship may be due to the level of mastery that more highly educated community members wish to exert over the healthcare interaction, or it may be related to higher expectations of the interaction based on previous encounters or the experiences of their peers. Both of the problems, lack of resources and lack of personnel, followed patterns supported by the literature. As the level of education increased, the likelihood of being satisfied with the level of resources or personnel available increased. Both of the benefits, attendance and prevention services, also followed patterns supported by the literature; as the level of education increased within the lowest category of income, the likelihood of being satisfied with the attendance and prevention services also decreased.

Differences in problems and benefits cited also varied by income (Tables 9 and 11). In the bivariate analysis, attendance, prevention services, lack of resources, and lack of personnel all correlated with income either significantly or approached significance. Each of these themes may reflect different causal mechanisms. The first theme, attendance, varied inversely with level of income and was supported by the literature (Barros and Bertoldi 2008). As income level increases, the expectations of care also increase; if these expectations are not met, likelihood of being satisfied decreases (Mishima et al 2010). This decrease in satisfaction is echoed in the decreased response rate of attendance as a benefit of the FHP in the higher levels of income. Attendance may be a measure of the provider-patient relationship. The results found are supported by the literature (Scott and Vick 1997, Snibbe and Markus, 2005; Leganger and Kraft 2003; Bar-Tal and Bar-Zohar 1977), , in that higher income and more highly educated patients were less likely to be satisfied with the attendance of healthcare providers. Given that higher

socioeconomic status patients want not only to "talk to the doctor" but also value mastery over the provider-patient interaction it is unsurprising that highly educated and higher income community members were less likely to cite attendance as a benefit.

Interestingly, in the relationship between satisfaction with prevention services, the second benefit theme, and income, the pattern is reversed. As income increased, the likelihood of citing prevention as a benefit also increased. This finding is somewhat supported by the literature in which higher income patients also generally have better health and more access to preventive services (Ross and Wu 1995). This access, in turn, may translate into preventive services being more important to community members with higher levels of income.

The first problem theme cited, lack of personnel, may relate to expectations of higher income community members. Patient satisfaction is a result of an evaluation of the healthcare encounter based on what a patient expects or wants and includes an evaluation of the current experience with all accumulated healthcare encounters (Williams 1994). Thus, higher income and more highly educated patients may have more experience with high quality health care and a better standard of living. Interestingly, income only had a significant relationship with lack of personnel when education was not controlled for. Once the effect of education was removed from the relationship, the correlation was no longer significant (Tables 9 and 11). This finding indicates that income itself does not have an effect on citing lack of personnel; rather its relationship with that problem exists because income is affected by education, or another factor that is affected by education. The relationship between education and lack of personnel itself was not significant, indicating that more variables, like age, are at work in this relationship.

The final problem theme, poor quality of care, is actually a specific measure of patient satisfaction (Sitzia and Wood 1997). It is interesting that the percentage of community members who cited poor quality of care is actually higher than the percentage of community members who were dissatisfied with the FHP (Tables 2 and 7. This discrepancy could be because patients who were not satisfied with the quality of care still may have answered that they were satisfied or neutral on the overall satisfaction measure for fear of social disapproval. It may also be a reflection of psychological resignation to the only healthcare available. Also, patients in higher income categories may not use the FHP; they may be satisfied with the FHP as an abstract concept, but not find it of good enough quality to utilize themselves. Finally, this finding may also indicate that perceived quality of care is not as important a factor in patient satisfaction in this context and that other factors take precedence when evaluating the FHP in terms of overall satisfaction. As Akin noted (1985), public health systems are often perceived as being of poorer quality than privately obtained care in developing countries. This thematic code may reflect those tendencies, in which case the literature supports the general pattern that higher levels of education and income decrease the likelihood of being satisfied with the quality of the care provided at the FHP.

Some strengths of this research are the use of open-ended responses to operationalize causal pathways between demographic factors and patient satisfaction, the focus on a primary care system in a developing country that addresses a gap in the literature, and the combination of sociological and public health perspectives in theory and methodology. There are few studies that utilize open-ended responses in order to trace and operationalize causal pathways between demographic characteristics and patient satisfaction. By using an open-ended format, researcher bias is reduced because unprompted answers elucidate, from the caretaker's perspectives, what is

good and bad about the FHP rather than what researchers think should be important. Also, many patient satisfaction surveys take place within the context of hospitalizations and acute care settings in the developed world. On the other hand, this study focused on satisfaction with a primary care system in a developing country, which may have different determinants of patient satisfaction because of its long-term focus and less emphasis on acute medical crises and visible, immediate outcomes. Finally, this research is a synthesis of both sociology and public health approaches to this topic. This study is strengthened by a fundamental sociological emphasis on social inequality and a public health emphasis on locally based, quantitative measures of health. The end result is a novel approach to patient satisfaction and a deeper understanding of the social structures that affect the Family Health Program in Vespasiano, Brazil.

Some limitations of this study are the small sample size, ordinal data which prevented regression and an examination of causality, and a lack of clarity in the data regarding income. The population itself was small (N=2,102 households) and the sample size (n=293) is relatively small for quantitative data. Many of the results may have become significant given a larger sample size. The sample size also prevented multivariate crosstabulations because cell size dropped below acceptable levels. The lack of interval data also prevented more quantitative analysis using regressions. Using ordinal data, this study could only crosstabulate and examines correlation. Finally, when respondents were asked for their income, it was not clear whether researchers were asking for personal income or household income. This lack of specificity limits the underlying conclusions that can be drawn because the level of income given in the data may not be consistent or truly an indicator of socioeconomic status.

In the future, studies should structure the survey so that measurement of education is quantitative, in number of years of education. An index for patient satisfaction would allow for

greater specificity and regression analyses. Also, by asking specifically about the benefits and problems found in the exploratory open-ended responses, a more comprehensive picture about the perceptions of the FHP may emerge. Another direction for future research may be to examine the highest levels of education and income, those respondents making more than 1000 reais/month or who have completed secondary school or more. Often, this category did not fit with expected patterns, and it would be useful to investigate why their responses do not fit with the literature.

The results found in this study will be useful in evaluating and reforming the Family Health Program and programs like it around the world. The benefits and problems found in the open-ended responses can be used as guidelines for structuring programs in the future by indicating what the community finds valuable. This study also provided new insight into the pathways through which demographic factors affect patient satisfaction and the aspects of a primary care system that are commonly evaluated by users. These can be used as a foundation for further research into patient satisfaction theory and as concrete factors through which patient satisfaction may be influenced through policy decisions and resource allocation.

In conclusion, the causes of patient satisfaction still remain unclear and complicated. Education is an important factor in satisfaction, whereas income played a smaller role. Both factors, however, had significant relationships with what benefits and problems patients cited. Attaching demographic factors to these open-ended responses led to a clearer understanding of how demographic factors affect patient's evaluation of healthcare because community members value specific behaviors and services differently. This research unpacks some of the causal pathways between demographic characteristics and patient satisfaction, but more research must be done to truly identify the factors that link social inequality with patient satisfaction.

Additionally, Vespasiano policy-makers can use these patient responses to not only address differentials in the care provided among units, but also to structure the program so that it is more acceptable to the community. This acceptability is critical for optimal community maximization of the program and becomes even more important if this model is to be applied in other countries around the world.

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Table 1. Caretaker demographic characteristics. Vespasiano, State of Minas Gerais, Brazil 2009.

Characteristic	**N**	**%, mean ± s.e.**
Gender		
Female	238	94.0%
Age	253	34 ± 0.7
Education Level		
Never attended school or some primary school	126	43.0%
Completed primary or some secondary	90	30.7%
Completed secondary, some college, or completed college	77	26.3%
Income (Rs/mo)	293	705 ± 37*

* Median: 600

Table 2. Level of satisfaction stratified by level of education completed. Vespasiano, State of Minas Gerais, Brazil 2009.

Level of Satisfaction*	Some primary school or less**	Completed primary and some secondary school**	Completed secondary or more**
Satisfied	70.5% (86)	58.1% (50)	58.7% (44)
Neither satisfied nor dissatisfied	23.0% (28)	27.9% (24)	30.7% (23)
Dissatisfied	6.6% (8)	14.0% (12)	10.7% (8)
	n=126	n=90	n=77

*Gamma=0.179, p=0.046

** Because the percents are the proportion of community members whose response fit the thematic code, percentages will not add up to 100%. Percentages shown are column percentages.

Table 3. Level of satisfaction organized by level of income. Vespasiano, State of Minas Gerais, Brazil 2009.

Level of Satisfaction*	0-499 Reais/mo**	500-999 Reais/mo**	1000 or more Reais/mo**
Satisfied	64.8% (79)	59.3% (54)	67.1% (47)
Neither satisfied nor dissatisfied	25.4% (31)	31.9% (29)	21.4% (15)
Dissatisfied	9.8% (12)	8.8% (8)	11.4% (8)
	n=127	n=94	n=72

*P=0.987

**Because the percents are the proportion of community members whose response fit the thematic code, percentages will not add up to 100%. Percentages shown are column percentages.

Table 4. Controlling for level of income, percentage of satisfaction with the FHP stratified by level of education. Vespasiano, State of Minas Gerais, Brazil 2009.

Level of Income	**Satisfaction**	**Some primary school or less**	**Completed primary or some secondary**	**Completed secondary or some college**	**Gamma Value (p value)**
0-499 Reais/month					0.329 (0.021)
	Satisfied	74.3%	47.1%	61.1%	
	Neither satisfied nor dissatisfied	20.0%	35.3%	27.8%	
	Dissatisfied	5.7%	17.6%	11.1%	
		n=70	n=34	n=18	
500-999 Reais/mo					0.187 (0.245)
	Satisfied	61.5%	68.6%	35.3%	
	Neither satisfied nor dissatisfied	30.8%	22.9%	52.9%	
	Dissatisfied	7.7%	8.6%	11.8%	
		n=39	n=35	n=17	
1000 or more Reais/mo					0.029 (0.886)
	Satisfied	76.9%	58.8%	67.5%	
	Neither satisfied nor dissatisfied	15.4%	23.5%	22.5%	
	Dissatisfied	7.7%	17.6%	10.0%	
		n=13	n=17	n=40	

Table 5. Controlling for level of education, percentage of satisfaction with the FHP stratified by level of income. Vespasiano, State of Minas Gerais, Brazil 2009.

Level of Education	Satisfaction	0-499 Reais/mo	500-999 Reais/mo	1000 or more Reais/mo	Gamma Value (p value)
Some primary school or less					0.133 (0.425)
	Satisfied	74.3%	61.5%	76.9%	
	Neither satisfied nor dissatisfied	20.0%	30.8%	15.4%	
	Dissatisfied	5.7%	7.7%	7.7%	
		n=70	n=39	n=13	
Completed primary or some secondary					-0.187 (0.260)
	Satisfied	47.1%	68.6%	58.8%	
	Neither satisfied nor dissatisfied	35.3%	22.9%	23.5%	
	Dissatisfied	17.6%	8.6%	17.6%	
		n=34	n=35	n=17	
Completed secondary or some college					-0.176 (0.319)
	Satisfied	61.1%	35.3%	67.5%	
	Neither satisfied nor dissatisfied	27.8%	52.9%	22.5%	
	Dissatisfied	11.1%	11.8%	10.0%	
		n=18	n=17	n=40	

Table 6. Percentage of community members who cited benefits, stratified by FHP Unit. Vespasiano, State of Minas Gerais, Brazil 2009.

Unit Name	n	% of Respondents Citing a Household Visits as a Benefit*	% of Respondents Citing Prevention as a Benefit*	% of Respondents Citing Attendance as a Benefit*	% of Respondents Citing a Focus on Family Health as a Benefit*
Celvia	37	54.1%	27.0%	24.3%	13.5%
Vila Esportiva	32	28.1%	6.3%	53.1%	6.3%
Morro Alto 1	25	28.0%	24.0%	32.0%	20.0%
Nova Pampulha	28	25.0%	17.9%	50.0%	3.6%
Suely	38	23.7%	13.2%	31.6%	2.6%
Morro Alto 3	17	23.5%	35.3%	52.9%	0.0%
Morro Alto 2	30	23.3%	13.3%	50.0%	23.3%
Nova York	22	22.7%	18.2%	40.9%	31.8%
Oeste	27	22.2%	14.8%	25.9%	7.4%
Jardim Da Gloria	37	21.6%	5.4%	40.5%	18.9%
Total	293	28% (n=82) P=0.093**	16% (n=48) P=0.096**	39% (n=115) P=0.132**	13% (n=37) P=0.006**

*Because the percents are the proportion of community members whose response fit the thematic code, percentages will not add up to 100%. Percentages shown are column percentages.

**These p-values correspond to the significance test of the X^2 test used in crosstabulating the response rates among the units for each thematic category.

Table 7. Percentage of community members who cited problems, stratified by FHP Unit. Vespasiano, State of Minas Gerais, Brazil 2009.

Unit Name	N	% of Respondents Citing a Lack of Personnel*	% of Respondents Citing Lack of Resources*	% of Respondents Citing Difficulty of Access*	% of Respondents Citing Poor Quality of Care*
Morro Alto 3	17	64.7%	23.5%	17.6%	5.9%
Nova York	22	63.6%	22.7%	36.4%	31.8%
Nova Pampulha	28	50.0%	14.3%	39.3%	14.3%
Oeste	27	48.1%	11.1%	18.5%	11.1%
Morro Alto 2	30	40.0%	16.7%	13.3%	16.7%
Morro Alto 1	25	36.0%	32.0%	20.0%	12.0%
Vila Esportiva	32	34.4%	15.6%	31.3%	21.9%
Celvia	37	24.3%	10.8%	10.8%	2.7%
Jardim da	37	13.5%	10.8%	16.2%	18.9%

Gloria Suely	38	10.5%	7.9%	21.1%	13.2%
Total		35% (n=102)	15% (n=45)	22% (n=64)	15% (n=43)
		P=0.000**	P=0.322**	P=0.110**	P=0.168**

*Because the percents are the proportion of community members whose response fit the thematic code, percentages will not add up to 100%. Percentages shown are column percentages.

**These p-values correspond to the significance test of the X^2 test used in crosstabulating the response rates among the units for each thematic category.

Table 8. Respondents who cited benefits or problems with the FHP stratified by level of education completed. Vespasiano, State of Minas Gerais, Brazil 2009.

	n	**Some primary school or less***	**Completed primary or some secondary***	**Completed secondary or some college***	**Gamma Value (p value)**
Attendance	115	43.7% (55)	33.3% (30)	39.0% (30)	-0.092 (p=0.354)
Prevention	48	17.5% (22)	15.6% (14)	15.6% (12)	-0.052 (p=0.693)
Lack of Resources	102	10.3% (13)	20.0 (18)	18.2% (14)	0.231 (p=0.067
Lack Personnel	45	32.5% (41)	32.2% (29)	41.6% (32)	0.116 (p=0.255)
		n=126	n=90	n=77	

*Because the percents are the proportion of community members whose response fit the thematic code, percentages will not add up to 100%. Percentages shown are column percentages.

Table 9. Respondents who cited benefits or problems with the FHP stratified by income level. Vespasiano, State of Minas Gerais, Brazil 2009.

	n	**0-499Rs/mo***	**500-999Rs/mo***	**1000-3000Rs/mo***	**Gamma Value (p value)**
Attendance	115	43.3% (55)	41.5% (39)	29.2% (21)	-0.176 (p=0.07)
Prevention	48	13.4% (17)	14.9% (14)	23.6% (17)	0.218 (p=0.102)
Lack of Resources	102	9.4% (12)	19.1% (18)	20.8% (15)	0.306 (p=0.016)
Lack Personnel	45	29.9% (38)	35.1% (33)	43.1% (31)	0.184 (p=0.068)
		n=127	n=94	n=72	

*Because the percents are the proportion of community members whose response fit the thematic code, percentages will not add up to 100%. Percentages shown are column percentages.

Table 10. Controlling for level of income, the percentage of respondents who cited certain benefits or problems with the FHP stratified by level of education. Vespasiano, State of Minas Gerais, Brazil 2009.

	Level of Income**	**Some primary school or less***	**Completed primary or some secondary***	**Completed secondary or some college***	**Gamma Value (p value)**
Attendance	0-499 reais/mo	48.6% (35)	27.0% (10)	55.6% (10)	-0.127 (p=0.426)
Prevention	0-499 reais/mo	16.7% (12)	13.5% (5)	0.0% (0)	-0.394 (p=0.067)
Poor Quality	0-499 reais/mo	8.3% (6)	18.9% (7)	33.3% (6)	0.511 (p=0.015)
Lack Personnel	0-499 reais/mo	26.4% (19)	27.0% (10)	50.0% (9)	0.235 (p=0.176)
		n=72	n=37	n=18	

*Because the percents are the proportion of community members whose response fit the thematic code, percentages will not add up to 100%.

**Other levels of income tested were not significant and are not shown.

Table 11. Controlling for level of education, the percentage of respondents who cited certain benefits or problems with the FHP stratified by level of income. Vespasiano, State of Minas Gerais, Brazil 2009.

Level of Education	**Theme**	**0-499 Reais/mo**	**500-999 Reais/mo**	**1000 or more Reais/mo**	**Gamma Value (p value)**
Some primary school or less (n=126)					
	Attendance	48.6% (35)	41.5% (17)	23.1% (3)	-0.252 (p=0.115)
	Prevention	16.7% (12)	19.5% (8)	15.4% (2)	0.039 (p=0.854)
	Poor Quality	8.3% (6)	26.8% (11)	7.7% (1)	0.363, (p=0.073)
	Lack of Personnel	26.4% (19)	41.5% (17)	38.5% (5)	0.267 (p=0.110)
		n=72	n=41	n=13	

Completed primary or some secondary (n=90)					
	Attendance	27.0% (10)	41.7% (15)	29.4% (5)	0.117 (p=0.519)
	Prevention	13.5% (5)	11.1% (4)	29.4% (5)	0.251 (p=0.328)
	Poor Quality	18.9% (7)	8.3% (3)	5.9% (1)	-0.438 (p=0.110)
	Lack of Personnel	27.0% (10)	30.6% (11)	47.1% (8)	0.238 (p=0.207)
		n=37	n=36	n=17	
Completed secondary or some college (n=77)					
	Attendance	55.6% (10)	41.2% (7)	31.0% (13)	-0.343 (p=0.077)
	Prevention	0.0% (0)	11.8% (2)	23.8% (10)	0.702 (p=0.004)
	Poor Quality	33.3% (6)	11.8% (2)	14.3% (6)	-0.340 (p=0.198)
	Lack of Personnel	50.0% (9)	29.4% (5)	42.9% (18)	-0.024 (p=0.905)
		n=18	n=17	n=42	