Assessing Community Health in a Tz'tujil Maya Village upon the Reconstruction of Hospitalito Atitlán

INTRODUCTION

Hospitalito Santiago Atitlán operated on the southwestern shore of Lake Atitlán in the Guatemalan province of Sololá until 1990 when a massacre of thirteen Tz'tujil Maya at a nearby military base precipitated its demise.[1] The small hospital featured an operating room, fifteen bed ward, emergency room, dental clinic, and community health promoter training program to abate malnutrition and tuberculosis in the lakeside village of Santiago Atitlán and the surrounding hamlets. Abandonment of the hospital (catchment area population > 45,000) following the massacre left the predominantly indigenous community with inadequate access to medical care in the midst of the political violence and socioeconomic desolation of the Guatemala's ongoing civil war. In 2002, six years after the signing of the Peace Accords, community leaders in Santiago Atitlán established a grassroots organization named *K'aslimaal* ("Life" in the Tz'tujil Maya dialect) dedicated to the reconstruction of the Hospitalito. Owing to the cooperative effort of *K'aslimaal*, the local government, and two American non-profits, the Hospitalito reopened on April 1, 2005. The Hospitalito strives to reduce crucial barriers to care for the residents of Santiago Atitlán (known as Atitecos), with the specific intent to lower neonatal and maternal mortality rates, fill the need for in-patient and emergency care, and supplement insufficient primary care services in the community.

This study is the product of a partnership between the Hospitalito and a University of Pennsylvania graduate student group called the Guatemala Health Initiative (GHI). The objective of GHI is to strengthen clinical activities and community health promotion in the resource poor community served by the Hospitalito through the provisioning of community health research, personnel, and material support. In an effort to encourage continuity of engagement, GHI serves as an organizational structure to propagate the cumulative knowledge and initiatives of successive participants to better serve local health needs vis-à-vis its support of the Hospitalito and allied community health efforts.

Valid and reliable measures of health inform an evidence base for the effective implementation of health services and provide data necessary to evaluate of the impact of health promotion services.[2] The lack of descriptive measures about the local burden of disease and general factors affecting health in the catchment area of the Hospitalito motivated the conception of this study. Hospitalito physicians and community leaders verified that collecting survey data about health status and health access would produce useful background information about illness in the community to help outline priorities for and track changes in community health over time.

METHODS

The methodology of this study balances distinctly compelling yet competing approaches to conducting health survey research. One premise is that an ethnographically informed and participatory study design is necessary to ensure the relevance of topical focus

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[1] Perera V. 1993. *Unfinished Conquest: The Guatemalan Tragedy*. University of California Press: Berkeley. pp 211-215.

[2] Murray CJL, Lopez AD, Wibulpolprasert S. 2004. Monitoring global health: time for new solutions. *BMJ* 329: 1096-100.

and cogency of questions in the context local culture and parlance.[3] Taking this premise one step further, a participatory approach in study design enhances local valorization of the study results because it empowers local actors to impact the production of knowledge about their community. At the same time, a standardized survey instrument developed and refined by the World Health Organization offers the benefit of enabling cross-sectional comparability of health measurements over time and place. The *World Health Survey* (WHS)[4] presents a sophisticated survey tool with a validated methodology; however, a contrast of this instrument's strength is its removal from and incongruity with the local setting.

The first step in developing the interview questionnaire was to gather input from local community health professionals, Hospitalito physicians, and community leaders about the kind of health-related questions they prioritize. I then gauged their interest in the sections of the WHS and adapted its structured interview format for local use. The survey instrument channeled community input at conceptual, topical, and lexical levels. Lastly, the survey was piloted in twenty interviews over a five-day period and necessary adjustments were made.

The final survey is composed of over 200 open- and closed-ended questions organized into the following sections: (i) sociodemographic characteristics, (ii) household questionnaire and health risk factors, (iii) burden of disease, (iv) mortality, and (v) health system access. A sixth section is dedicated to collecting information about local awareness and perceptions of Hospitalito Atitlán.

Time of survey administration varied from 45 minutes to four hours. Oftentimes the survey questions elicited rich accounts, ranging from detailed descriptions of the experience of illness and difficulties accessing health care to broader narratives about the local history of political violence and the struggle to raise a family in poverty. The qualitative data associated with each interviewee's responses was transcribed, although in-depth elaboration on the qualitative data is not within the scope of this paper.

The community of Santiago Atitlán is divided into seven neighborhoods (*cantones)* with somewhat distinctive characteristics. A representative sample of the population of Santiago Atitlán was approximated by conducting interviews in each neighborhood according to its proportion of the total population (30,821).[5] Surrounding communities that fall within the same municipal boundaries but lie apart from the seven main neighborhoods are not included in the survey.

Six Hospitalito volunteers and a K'aslimaal committee member administered the survey in conjunction with three bilingual Spanish-Tz'tujil interpreters. Data collection occurred from July to September 2004 – a four-month period within the first six months of the Hospitalito's reopening. The interviewer-interpreter teams interviewed one family member aged eighteen years or older in each participating household. Subjects were given the opportunity to be interviewed in Spanish or Tz'tujil. Results of 208 surveys were initially transcribed on custom data collection sheets and then entered into SPSS statistical package for analysis.

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[3] Puertas B, Schlesser M. 2001. Assessing Community Health Among Indigenous Populations in Ecuador with a Participatory Approach: Implications for Health Reform. *Journal of Community Health* 26: 133-47

[4] World Health Survey. http://www.who.int/healthinfo/survey/instruments/en/index.html. World Health Organzation. Accessed on January 15, 2006.

[5] Calculations based on 2004 Census of Santiago Atitlán. (Pachichaj: 4681, Xechivoy: 4456, Panúl: 4781, Tzanjuyú: 4671, Panaj: 8269, Panabaj: 2294, Tzanchaj: 1669).

SIGNIFICANCE AND LIMITATIONS

This study's purpose was to assess the healthcare needs of the lakeside community served by Hospitalito Atitlán. The information gathered in this survey will inform local community health professionals, Hospitalito physicians, and community leaders to help direct future healthcare decisions in Santiago Atitlán and does not purport to represent a wider population.

While the sample represents a proportionate number of Atitecos from each neighborhood, it does not comprise a random sample within these neighborhoods. The lack of a household level map made it impractical to randomize households in advance of going door-to-door. During daylight hours interviewer-interpreter teams canvassed neighborhoods on foot without a systematic approach to household selection. A limitation of this study includes a presumed sample bias at the household level as well as definite selection bias within households. The high percentage of female respondents reflects the fact that Atiteco men are more commonly away from the home during daylight hours. The consideration that about three of every four households chose not to participate introduces another form of sample bias. A possible threat to internal validity stems from the study's reliance on participant self-report about occurrences in the past.

Questions of a sensitive nature were not asked of all participants. As an example the question – "Have you ever experienced domestic abuse or violence?" – was not asked of a woman in front of her husband.

Language and culture are likely barriers to adequate categorization of self-reported illnesses as they are interpreted from Tz'tujil to Spanish to English. Although interpreters were present for all interviews conducted, they were trained for the purposes of the survey only and were not proficient in formal interpretation techniques. Additionally, disease characterization differed between respondents and interviewers; as an example, "*aplem*" was often described by Atitecos as a spiritual disease with physical manifestations that approximate the Western diagnosis of asthma. For the purposes of this survey it was necessary on many occasions to take a reductionist approach to the categorization of interviewees' richly descriptive responses.

RESULTS OF COMMUNITY HEALTH ASSESSMENT

Section 1: Sociodemographic characteristics

Questions in Section 1 elicited sociodemographic information about the individual interviewees. Results include the following:

- Sixty-eight percent of the respondents were female.
- Respondents ranged from 18 to 82 years of age with a mean 41 (σ=14).
- The primary language of the vast majority of respondents (94 percent) is Tz'tujil[6], with the remainder consisting of Cakchiquel (4 percent), Spanish (2 percent), and other Mayan languages (1 percent).

[6] Tz'tujil and Cakchiquel are subclassified as Quichéan-Mamean languages in the greater Mayan language family. Among the 23 Mayan languages with over 4 million native speakers, seven Quichéan-Mamean

- Over half of those surveyed speak Spanish fluently (54 percent), although a large disparity exists between females reporting Spanish fluency (68 percent) relative to males (24 percent). Still almost half of the males (47 percent) report speaking moderate Spanish. Approximately one-fifth of the total respondents speak no Spanish (9 percent) or very little Spanish (12 percent).
- Among those surveyed 13 percent report competency in reading Spanish. In converse to the gender dichotomy in Spanish fluency, the proportion of males with competent reading skills is three times greater than that of females. The vast majority of respondents do not read Spanish (70 percent) or read very little Spanish (13 percent).
- In relation to marital status, most interviewees have spouses (71 percent) or live conjugally with partners to whom they are not officially wed (12 percent). A minority of those surveyed are single (7 percent), widowed (7 percent), or divorced/separated (2 percent). One-tenth of female respondents are widowed compared to only 1 percent of males.
- Nearly two-thirds of the male interviewees and over three-fourths of female interviewees have not received any formal education. The breakdown of the 27 percent of respondents with a formal education is as follows: (i) 0.5 – 3 years: 48 percent; (ii) 4 – 8 years: 30 percent; (iii) 9 – 12 years: 22 percent.
- The respondents have an average of four children (range 0-11; σ=2.5), one deceased child (range 0-22; σ=2.3), and 0.2 stillbirths (range 0-17; σ=1.3).
- See Table 1 for occupations of respondents.

TABLE 1: OCCUPATIONS (n=208)

Occupation	Frequency	Percentage
Artisan	77	37%
Domestic	72	35%
Agriculture	20	10%
Commerce	19	9%
Construction	5	2%
Day labor	3	1%
Fisherman	3	1%
Other	9	4%
TOTALS	208	100%

Section 2: Household questionnaire and health risk factors

- The average household size of the respondents is 5.5 members (range 1-17; σ=2.5).
- Not including kitchen and bathrooms, the average household has 2.1 rooms (range 0-11; σ=1.4).
- Floors most commonly are made of cement (75 percent), although some respondents have tile (13 percent) and earthen (12 percent) floors in their homes.

languages predominate throughout the Highlands of Guatemala. Gordon R. (ed) 2005. Ethnologue: Languages of the World, Fifteenth edition. Dallas: SIL International.

Most homes have metal sheet roofs (83 percent). A minority of respondents have cement (14 percent) or wood (2 percent) roofs protecting their homes.

- The source of drinking water for 80 percent of households is Lake Atitlán, almost exclusively through taps supplied by the municipal water pump. Among the households that rely on the unfiltered lake water, sixty percent do not treat or boil the water before drinking. Meanwhile, twenty percent of the households purchase purified drinking water.
- Before eating raw tomatoes in the majority of households (85 percent) it is customary to wash them with tap water that is not treated or boiled. A small portion of households (14%) treats or boils water used to wash tomatoes to be eaten raw.
- Bathroom facilities and the corresponding sewage disposal used in the households include (in decreasing order of frequency): toilets that flush to unsealed pits (41 percent); latrines with septic tanks (30 percent); toilets with septic tanks (22 percent); and latrines with unsealed pits (9 percent). Only one percent of households do not have bathroom facilities.
- To make corn tortillas – the staple of the Tz'tujil diet – one-half of the households use a *comal* (traditional metal cooking plate) set on rocks over an open fire, while 46 percent use a wood burning stove. Four percent use a gas or electric stove to make tortillas even though 18 percent have such stoves (usually used for other cooking purposes).
- Fully one-half of the households do not have a chimney to remove the smoke of firewood from the house or kitchen annex. Four percent of the households who responded denied using firewood inside the house.
- Most respondents eat fruit and vegetables every day (37 and 25 percent, respectively) or "more or less every day" (57 and 68 percent, respectively).
- Exposure to infectious diseases infrequently present or not endemic to Santiago (such as malaria, dengue, and some sexually transmitted infections) is low, as only nine percent of respondents have stayed outside of Santiago for more than 30 days in the past year.
- Among those surveyed, 14 percent are aware that they are exposed to hazardous chemicals such as pesticides while working.
- To dispose of inorganic garbage such as plastic or junk food wrappers 63 percent of households use the municipal garbage truck, while 23 percent carry such waste out to the fields.
- In relation to sense of security, 44 percent of respondents do not feel safe walking alone in their neighborhood after 9 pm.
- A small minority of interviewees reports smoking cigarettes or rolled tobacco frequently (2 percent) or occasionally (4 percent).

Section 3: Burden of disease

- *"What health problems or diseases affect your family now or recently?"* For this question a maximum of three responses was recorded for each respondent. Some respondents did not provide any information. The responses, which were derived through free elicitation, have been placed into appropriate illness categories presented in Table 2.

TABLE 2: RECENT ILLNESSES IN THE FAMILY (n=208)

Illness Classification	Frequency	Percentage
Gastrointestinal	75	18.2%
Headache	59	14.4%
Acute respiratory	55	13.4%
Musculoskeletal	50	12.2%
Chronic pulmonary	35	8.5%
Infectious Disease (General / other)	27	6.6%
Dermatological	20	4.9%
Genitourinary	18	4.4%
Psychological	18	4.4%
Cardiovascular	17	4.1%
Neurological	11	2.7%
Diabetes	5	1.2%
Dental	2	0.5%
OB/GYN	2	0.5%
Cancer	1	0.2%
Other	16	3.9%
TOTALS	411	100%

- *"What are the three most frequent health problems or diseases in Santiago?"* The responses, which were derived through free elicitation, have been placed into appropriate illness categories presented in Table 3.

TABLE 3: COMMON ILLNESSES IN THE COMMUNITY (n=208)

Illness Classification	Frequency	Percentage
Gastrointestinal	122	36.7%
Headache	42	12.7%
Acute respiratory	37	11.1%
Infectious Disease (General / other)	21	6.3%
Chronic pulmonary	19	5.7%
Musculoskeletal	13	3.9%
Diabetes	12	3.6%
HIV/AIDS	11	3.3%
Malnutrition	8	2.4%
Cardiovascular	7	2.1%
Psychological	7	2.1%
Dermatological	5	1.5%
Cancer	4	1.2%
Substance Abuse	4	1.2%
Genitourinary	3	0.9%
Neurological	3	0.9%
OB/GYN	2	0.6%
Other	12	3.6%
TOTALS	332	100%

- *"What are the three most severe health problems or diseases in Santiago?"* The responses, which were derived through free elicitation, have been placed into appropriate illness categories presented in Table 4.

TABLE 4: SEVERE ILLNESSES IN THE COMMUNITY (n=208)

Illness Classification	Frequency	Percentage
HIV/AIDS	40	15.8%
Gastrointestinal	39	15.4%
Chronic pulmonary	32	12.6%
Cancer	29	11.5%
Diabetes	26	10.3%
Acute respiratory	11	4.3%
Cardiovascular	11	4.3%
Neurological	11	4.3%
Musculoskeletal	8	3.2%
OB/GYN	7	2.8%
Headache	5	2.0%
Psychological	5	2.0%
Substance Abuse	5	2.0%
Dermatological	2	0.8%
Malnutrition	1	0.4%
Other	21	8.3%
TOTALS	253	100%

- In all, 17 percent of the interviewees reported that a doctor diagnosed them with parasites or worms in the previous year; 28 percent took medicines for parasites purchased at a pharmacy without a prescription or supplied by a doctor during the same time period. Only two percent took medicinal plants or traditional remedies to treat parasites. Of the respondents who received medicine for parasites, treatment was initially sought at the following locations:
  - (i) pharmacy – 31%
  - (ii) government health system – 17%
  - (iii) non-profit clinic or hospital – 10%
  - (iv) private physician – 8%
  - (v) traditional healers/midwives – 0%
  - (vi) other (including store and family) – 33%

- When asked to recall episodes of diarrhea in the past year, 16 percent of the respondents claimed to have experienced an episode of diarrhea that lasted more than three days, and 13 percent took medicines for diarrhea (of at least three days duration) purchased at a pharmacy or supplied by a doctor. Among those reporting a prolonged episode of diarrhea, 19 percent had blood in their stools at the time. More respondents used medicinal plants or home remedies for diarrhea (5 percent) than for parasites. Of the respondents who purchased or were prescribed medicine for diarrhea, treatment was initially sought at the following locations:
  - (i) pharmacy – 30%
  - (ii) government health system – 8%

(iii) non-profit clinic or hospital – 3%
(iv) private physician –5%
(v) traditional healers/midwives – 0%
(v) other (including store and family)– 43%

- Among the 22 percent of respondents who report suffering a serious injury that limited their activities, 80 percent received treatment for the injury. The most commonly reported mode of transportation to the site of treatment was walking (36 percent), followed by other (25 percent), non-firefighter automobile (17 percent), firefighters (11 percent), and boat (11 percent). The fact that traditional bonesetters treated over half these patients, oftentimes paying house visits, provides insight into why one-fourth of the interviewees did not walk or take motor transportation to the site of treatment. Besides visiting traditional bonesetters (51 percent) care for serious injuries was most commonly sought from private physicians (14 percent) and the government hospital hours away by boat and automobile in Sololá (5 percent).
- A high proportion of the interviewee population appears likely to fulfill biomedical criteria for experiencing major depressive episodes or suffering from major depressive disorder[7]. The cross-cultural permutations that complicate the application of psychiatric diagnosis in Santiago Atitlán are taken up in the discussion. Nonetheless, 56 percent of the respondents experienced excessive sadness the majority of the time for several days over the past year. Among these respondents 22 and 54 percent, respectively, report feeling two or all three of the following symptoms: (i) decreased energy or tiredness all the time, (ii) a loss of interest in most things that normally bring about joy, and (iii) a loss of appetite.
- Alcoholism (23 percent), drug addiction (1 percent), or both of these substances (4 percent) exist in over one-fourth of the interviewees' families.
- About one-fifth of the respondents (17 percent) report witnessing a violent crime or other type of violence.
- At least 18 percent of the interviewees have experienced domestic abuse or violence, although the question was not asked or not answered due to its sensitivity in 19 percent of the interviews.
- Nine percent of interviewees report that a physician has diagnosed them with asthma, and likewise nine percent report having been treated for asthma. Just over one-third of respondents diagnosed with asthma received treatment for their condition in the prior two weeks. A query for the experience of asthmatic symptoms during the past year (not associated with flu or fever) presented to all respondents probes for the following: (i) attacks of wheezing or whistling breath, (ii) a feeling of tightness in the chest, and (iii) an attack of shortness of breath that began without obvious cause. This symptomatic proxy for detecting further cases of asthma does not suggest the existence of many undiagnosed cases among interviewees. Only 10 percent experienced all three symptoms in the past year, while 18 percent report experiencing two.
- Of the four percent of respondents who report a physician diagnosis of diabetes, only half received treatment in the previous two weeks. To measure the possibility

[7] Diagnostic and Statistical Manual of Mental Disorders - Fourth Edition. 1994. American Psychiatric Association. Washington D.C.

of undiagnosed cases of diabetes, all respondents were asked if they experienced the following three symptoms of the disease in the past year: (i) frequent urination in large quantities, (ii) constant urge to drink liquid between meals, and (iii) a sensation of burning feet. Three percent of respondents answered affirmatively to all three symptomatic proxies, and fourteen percent answered affirmatively to two.

- A physician previously informed one-tenth of those surveyed that they had high blood pressure. Seven percent of the respondents report having taken a treatment for the condition, among whom about one-fourth (24 percent) had taken medication during the past two weeks. The blood pressure measurements of 158 respondents reveal a high rate of hypertension in the community (see Table 5).

TABLE 5: HYPERTENSION (n=158)

Systolic (mmHg)	*Frequency*	*Percentage*	*Diastolic (mmHg)*	*Frequency*	*Percentage*
< 140	125	79%	<90	130	82%
140 - 159	19	12%	90-99	17	11%
160 - 179	8	5%	100-109	8	5%
≥ 180	6	4%	≥ 110	3	2%
TOTALS	158	100%	**TOTALS**	158	100%

Section 4: Mortality

- Information about mortality in the community is presented based on the number of children to which the respondents' mothers gave birth.

TABLE 6: SIBLINGS (n=196)

Gender	Status	Mean	Range	Std. Dev.	Sum
Male	Total born	3.48	0-9	1.9	689
Male	Living	2.64	0-7	1.7	517
Female	Total born	3.68	0-12	2.2	733
Female	Living	3.01	0-8	1.7	589

- Of the total number of respondents' sisters who died, 5 percent died while pregnant or during childbirth. This statistic does not account for the age of mortality, and therefore the mortality of women of child-bearing age is greater than 5 percent.
- Of the total number of respondents' siblings who died, 7 percent died as a result of injury or violence. The reported cause of violent death was murder/war (58 percent), accident (37 percent), and suicide (5 percent). The high occurrence of uninvestigated murders during the protracted civil war makes it difficult to separate the two categories.

Section 5: Health System Access

- A respondent or a respondent's child under 12 years old was ill in the 30 days prior to the survey (39 percent), between one month and one year prior (30 percent), more

than one year prior (22 percent). The remainder report never being ill or could not recall.

- For the reported episodes of illness 77 percent of the respondents (or respondents' children) received curative care. The breakdown for the first site of treatment and mean rating of treatment quality is presented in Table 7.

TABLE 7: FIRST SITE OF TREATMENT AND MEAN RATINGS[8] (n=146)

Primary site of treatment	**Frequency**	**Percentage**	**Rating** 1=Very Bad 5=Very good	**Based on *n* responses**
Private physician	31	20%	3.8	31
Non-profit clinic or hospital	29	19%	3.6	27
Government health system	24	16%	3.2	22
Pharmacy	18	12%	3.7	18
Private nurse	4	3%	*4.0*	5
Traditional healer	3	2%	*3.3*	3
Traditional midwife	0	0%	-	-
Other (incl. store and family)	45	29%	3.9	40
TOTALS	154	100%	3.7	146

- After the illness began the duration of time elapsed until receiving treatment was more than one week in forty percent of the cases and under 24 hours in 18 percent of the cases.
- Among the cases for which a medicine was prescribed (79 percent), all of the medications were not acquired 11 percent of the time. Reasons for not acquiring all of the medicines include lack of money (54 percent), inability to find medicines (39 percent), and not thinking that all prescribed medicines were necessary (8 percent).
- After visiting the primary treatment sites listed in Table 4, some respondents sought other means of treatment. Table 8 presents treatment sites where treatment was sought. Respondents could list multiple additional sites of treatment.

TABLE 8: SECONDARY SITES OF TREATMENT

Secondary sites of treatment	**Frequency**	**Percentage**
Private physician	10	21%
Non-profit clinic or hospital	5	10%
Government health system	7	15%
Pharmacy	7	15%
Private nurse	3	6%
Traditional healer	0	0%
Traditional midwife	0	0%
Other (incl. store and family)	16	33%
TOTALS	48	100%

[8] The starred (*) ratings are based on an insufficient number of responses. Furthermore, the ratings as a whole reflect perceptions of quality, which may be influenced by many factors beyond curative impact (such as whether expectations for service were met).

- The respondents who did not seek care for the episode of illness or who ranked the quality of care "bad" or "very bad" report the following reasons for their lack of treatment or poor quality of treatment: lack of money (48 percent), not sick enough to need care (16%), inadequate medicine or equipment (10 percent), and poor competence of health care provider (8 percent). [9]
- Among those with children under 10 years old, 9 percent report that their youngest child has not received any vaccinations.
- Of the respondents with a child under five years of age, the vast majority (97 percent) visited a doctor, nurse, or traditional midwife for a pregnancy check. The frequency of visitation was as follows: > nine times – 19 percent; six to nine times – 33 percent; four to five times – 27 percent; two to three times – 19 percent; one time – 1 percent. More than half (53 percent) went to a traditional birth attendant for the check, while others went to a non-governmental clinic (16 percent), a governmental clinic (11 percent), or a private physician (6 percent).
- A minority of mothers (45 percent) were informed about the signs of pregnancy complication and what to do should they have occurred. The traditional midwives had a better record than the average with 52 percent informing the mothers about the signs of danger.
- Most mothers gave birth to their child at home (75 percent). The next most common site of child delivery was the government hospital (10 percent) in the provincial capital, Sololá. Private physicians only delivered 3 percent of the babies among those surveyed (with a child under five years of age). The births were attended to mostly by traditional midwives (73 percent), followed by physicians (16 percent), and nurses (11 percent).

Section 6: Hospitalito Atitlán

- The majority of those surveyed (88 percent) report having heard of Hospitalito Atitlán, or Clínica Santiaguito as it was known before closing in 1990. All of those reporting awareness of the Hospitalito also knew that it recently reopened.
- In all forty percent of the respondents report not knowing whether the Hospitalito attends to patients during nights, weekends, and festival days in case of an emergency.
- The majority of interviewees (80 percent) believe that the Hospitalito should charge according to the economic capacity of the family; in other words, they favor a sliding payment scale. The remainder believes it is more just if everyone pays equally in exchange for the same service.
- The majority (71 percent) of interviewees agree that the Hospitalito's cost structure is fair and appropriate, while about one-fourth claim it is too expensive.
- Respondents report that the closest kin whom they are aware sought care at the Hospitalito since it reopened include: (i) the respondent himself/herself – 10 percent, (ii) a family member – 26 percent, (iii) a friend – 6 percent. The

[9] Respondents could choose more than one response. The percentages above are per response rather than per respondent.

respondents rate the quality of care received (either first-hand or second-hand) as very good (35 percent), good (55 percent), regular (6 percent), bad (1 percent), very bad (three percent).

DISCUSSION

The results of this community health survey highlight areas of particular need for improving health in Santiago Atitlán.[10]

Gastrointestinal disease: the most common health problem

Diseases of the gastrointestinal tract account for the greatest burden of illness in Santiago Atitlán as measured by perceived frequency in the community and reports of recent household illness. Household risk factors relating to contamination of drinking water and food supplies are consistent with widespread fecal-oral transmission of disease. The survey suggests that about half of the respondents drink unpurified tap water pumped directly from the lake. At the same time, sewage from half of the respondents' households in this sloping lakeside community enters the ground without containment, and about a quarter of the respondents dispose of their garbage in the field. Evidence that in the previous year physicians diagnosed about one-fifth of the respondents with parasites and one-fourth took anti-parasitic medication corroborates suspicion that the water supply and poor sanitation contribute to poor health in the community.

In terms of the role of the medical system in attending to gastrointestinal disease, it should be noted that Atitecos appear more likely to visit a pharmacy, store, or turn to family support for their problems than the healthcare systems. Even then, the data reveal some substantial differences in health seeking behaviors and practices between parasitic and diarrheal disease. In relative comparison parasitic disease more commonly elicits a visit to a healthcare professional and medical therapy, while a prolonged episode of diarrhea is more regularly managed outside of the healthcare system. Seeking care outside of the healthcare system does not appear to be a result of the perception that the conditions are not severe enough to merit medical attention. Gastrointestinal disease ranked second to HIV/AIDS in terms of health problems perceived to be of greatest severity in the community.

The perceived severity and rumored prevalence of HIV/AIDS

In the community there is great concern about HIV/AIDS. The severity of the disease has been made known through health awareness campaigns by the government and non-profit organizations. Additionally, a few isolated stories exist in Santiago Atitlán about individuals and one family in particular who died as a result of the virus. The awareness

[10] On October 5, 2005 just after the completion of the survey a mudslide interred a wide swathe of the Panabaj neighborhood of Santiago Atitlán. The mudslide covered the front side of the Hospitalito with eight feet of mud, buried hundreds of surrounding homes, and killed around 1000 of its neighbors. The Hospitalito staff helped spearhead the emergency medical response in coordination with international civil and government medical relief groups. As a result of the mudslide the Hospitalito has changed locations to the other side of town. The mudslide created new healthcare needs particular to the displaced population, and it disturbed social and ecological processes affecting health in the community. Nevertheless, it is safe to assume that many of the basic health issues that faced the population prior to the disaster persist.

campaigns and anecdotes combine to boost HIV/AIDS to the forefront of health concerns among Atitecos. The resources dedicated to promoting HIV/AIDS awareness have not been met with an attempt to gauge the scope of the problem within the community. The mobility of Atiteco men – twenty percent of whom stayed overnight outside of Santiago for more than 30 days in the past year – suggests that it is not unreasonable to be concerned about the levels of HIV/AIDS in the community. Meanwhile, the only information about the prevalence of the virus in the community circulates by way of rumor. The availability of voluntary testing or an epidemiological analysis of the virus would bring more light to substantiate or relieve Atitecos concern about an illness that they consider to be the most severe in the community.

Chronic pulmonary and acute respiratory disease: exploring an environmental risk

The only other health problem besides gastrointestinal disease in the top five ranking for reported household frequency, perceived frequency, and perceived severity is chronic pulmonary disease. Additionally, acute respiratory infection ranks as the third most common health problem in terms of reported household occurrence and perceived frequency. Risk factors relating to open fire cooking and inadequate ventilation appear likely to relate to the degradation of immune function of the respiratory tract on top of chronic particulate and gaseous toxicity.

About half of those surveyed cook their tortillas over a fire on the ground of their kitchen. Women particular incur damage to their lungs because they are usually responsible for cooking tortillas daily in kitchens without a chimney or adequate ventilation. The other half of the respondents have wood burning stoves with chimneys to help ensure cleaner air quality in the homes. Further studies may reveal the benefit of a community health measure to relieve a primary environmental source of toxicity to the respiratory tract.

Mental health problems: a hidden epidemic in Atitlán?

It is alarming that thirty percent of interviewees responded in the affirmative to all four symptomatic questions consistent with the diagnostic criteria for an episode of major depression. Responses to these questions commonly alluded to the history of political violence, health problems, difficulty obtaining necessary health services, poverty, substance abuse, domestic violence, and mortality due to war, accident, or homicide. Indeed, one-fourth of those surveyed claim to have an alcoholic family member and one-fifth of those surveyed witnessed a violent crime or experience domestic abuse in their households.

The significance of the survey measure of major depression is complicated by incongruities between the biopsychiatric diagnosis of the condition and its lived experience locally. In the local setting psychological aspects of depression often recede in significance when compared to somatic forms of the disease. For example, one woman responded to a question about her mental health by explaining… "The back of my head hurts, as does my stomach and my back. I feel completely fatigued, inanimate, and dreary. I am often tired and feel a heat within." Medical help is often sought for the symptoms of embodied aspects of depression while the attendant psychological issues are generally not breached in a medical domain.

Mental trauma often relating to violent wartime experiences and the estimated 1500 disappeared Atitecos underlies the recurrent indications of more severe mental health

problems in the community. One woman's story exemplifies the mental stress of witnessing traumatic events and its enduring consequences.

> All of the pain didn't arrive at the moment they killed my husband. It was horror that impacted me in that moment. At two in the morning they forcibly entered the front door to kidnap him. He tried to resist so they shot him dead in front of our baby and me. From there began the headaches, lack of energy, and worries. I stopped eating, rarely slept or left my house. At night I still wake up suddenly and re-experience the death of my husband. For years I stayed up all night, fearing that they would come for my children or me… This not only happened to me, it happened to many.

The survey itself on occasion turned into sessions resembling therapy. In many cases we were seen as the first medical professionals eager to ask questions relating to the respondents' experiences with mortality. We would listen to cathartic narratives about traumatic events and their enduring affect on health and wellbeing. It became clear that the availability of culturally appropriate mental health services would greatly benefit the community. While discussions of violence related to the armed conflict were suppressed for many years out of fear, many respondents seemed appreciative of the opportunity to tell us their stories in detail. Many Atitecos would clearly benefit from the chance to recount their agonizing past and ongoing struggle in a therapeutic setting.

Inadequate treatment of chronic disease

The survey reveals poor continuity of treatment for chronic disease in Santiago. The majority of respondents who had been diagnosed with asthma or diabetes did not receive treatment in the preceding two weeks. In the case of hypertension the data indicates that the lack of treatment is in equal parts a problem of unrecognized cases and a failure to sustain treatment. In all only two percent of the respondents had taken medications for hypertension in the prior two weeks as compared to blood pressure measurements suggesting twelve percent of the respondents had Stage 1 hypertension and nine percent had Stage 2 hypertension[11]. Altogether, the chronic diseases explored in this survey appear to be poorly managed in the community. With the development of treatment education programs and the availability of affordable drugs, the Hospitalito has the opportunity to provide continuity of treatment for chronic disease.

Role of the Hospitalito in reducing crucial barriers to health system access

The main barrier to care identified in this study of Santiago Atitlán is the cost. Certainly only a subset of those surveyed had the resources to visit a private physician. While government services in the village are either free or inexpensive, the range of services offered is minimal. The Hospitalito is positioned to play a key role in expanding access to

[11] Stage 1: systolic blood pressure 140 to 159, or diastolic blood pressure 90 to 99 mm Hg. Stage 2: systolic blood pressure > 159, or diastolic blood pressure > 99 mm Hg. Chobanian AV, Bakris GL, Black HR: The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: The JNC 7 Report. JAMA 2003 May 21; 289(19): 2560-71

health care services in the community through the institution of a sliding scale payment system. The majority of those surveyed agree with the Hospitalito's current practice of adjusting payments based on a formula to measure the economic capacity of the patient's family. Lowering the cost of treatment for the impoverished will help to overcome a primary barrier of health care access.

Another key offering of the Hospitalito to extend healthcare access in the community is the availability of 24-hour emergency care; however, at the time of the survey the availability of this service was not widely known. For serious musculoskeletal injuries the Hospitalito will offer a biomedical option of treatment in a field that is currently dominated by traditional bonesetters. The survey results suggests that a partnership between bonesetters and the Hospitalito may prove fruitful for bridging mutually beneficial forms of knowledge and experience in the treatment of acute musculoskeletal injury.

Access to the prenatal care of traditional midwives, physicians, or nurses is nearly universal in Santiago Atitlán. Still less than half of the survey respondents received information to aid in the recognition of pregnancy complications. Prior to the Hospitalito there was no adequate emergency service available for complicated births. The formation of a partnership between the Hospitalito and traditional birth attendants – to disseminate knowledge of the signs of danger and awareness of the availability of emergency care – presents an opportunity to improve the quality of maternal health services in the community. Additionally, such a partnership may help to boost vaccination rates.

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