Determining Chronic Disease Prevalence in Selected Communities Surrounding the Monte Llano Region of the Dominican Republic: Documenting and Responding to Epidemiological Transition

Jon Silver and Dana Sanderson. Health Horizons International. August 2010.

Abstract

Researchers conducted randomized screenings of blood pressures, blood glucoses, BMIs, as well as a short questionnaire for 419 participants in four communities. Prevalence of hypertension (defined systolic >160 mmHg) was statistically significant, at a rate of 16% compared to 11% nationally (p<.005). Obesity and diabetes rates were unremarkable relative to national numbers. Individuals identified as being in need of critical chronic disease management were later enrolled in HHI's chronic care management program. This study establishes a baseline for metabolic syndrome risk factor prevalence by which to evaluate the effectiveness of future chronic illness management programs.

Introduction

Health Horizons International (HHI) works to improve access to primary health care in underserved communities in the Puerto Plata province of the Dominican Republic, where thousands of Dominicans and Haitians lack access to health care due to economic, geographic, and socio-cultural barriers. The organization's model includes linking international medical service trips with trained, local community health workers in each of the communities it serves, to effectively address and improve local health problems. Over the course of three annual week-long trips, these teams work in four partner communities to provide preventive healthcare services, education, and treatment for both acute and chronic conditions.

In developing its community-based model for medical service trips, HHI noted a lack of epidemiological sickness and wellness data for the communities they serve. This limits medical teams' ability to plan for effective care delivery, and limits community health workers' ability to define the scope of their work. Although nation-wide public health data does exist, statistics may not be representative of marginalized communities that are historically, socially, and systematically considered illegitimate, transient, and/or not part of the majority population. This leads to an information gap between HHI's intervention model and the patients to whom they strive to provide continuous care. Additionally, the Dominican Republic's public health research efforts are reported to be in the lower intermediate quartile, placing further uncertainty in existing data, and highlighting the necessity for increased epidemiological research (USAID 2007).

According to USAID, the Dominican Republic as a whole finds itself at a turning point with regard to healthcare. The country is currently devoting its healthcare resources towards achieving health-related Millennium Development Goals, which deal primarily with infectious disease and childbirth-related mortality. However, partially due to the success of these programs, the country is actually in a state of epidemiological transition, where prevalence of infectious disease is declining and that of chronic non-communicable disease is increasing. As a response, HHI has moved into treating chronic sicknesses, like hypertension, in the four communities it is continuously serving. However, without knowing the actual prevalence rates of chronic illness, it is unclear how effective a chronic illness management program that combines community health workers with medical service trips would be.

Purpose

1) Determine metabolic syndrome risk factor prevalence in four communities of the Montellano region.
2) Lay the groundwork for an ongoing study of chronic disease in the region through future HHI research and its Community Health Workers Program.
3) Draw attention to the problems of untreated chronic disease in Montellano.

This research provides HHI with an epidemiological basis for its patient care model of chronic disease prevention and treatment. By collecting prevalence data on hypertension, diabetes, and obesity, it provides a baseline for assessment of the patients HHI has already begun treating, as well as means to inform future program planning. It will be available for review by future studies relating to these conditions, as well as be accessible as a reference guide for HHI's community health workers, medical service trip physicians, and collaborating organizations, doctors, and local clinics in the region.

HHI's is interested in developing a consistent research internship program, where they will be able to receive medical students and other interested individuals each summer. Interns will employ their skills and talents towards providing HHI with the data necessary for them to effectively improve community health in the region. HHI is a young not-for-profit organization running the first and only program in the region that links continuous medical service trips with a locally based community health workers program. This research project sets a precedent for future involvement in research, and will better position HHI to expand and assume increased capacity toward the effective treatment and education of communities in the Montellano region.

Methods

Data was collected via home visits, and via community-wide screening days held in public spaces such as churches and schools. HHI's medical service trips set up their temporary field clinics in this same way, so the research study was built on an existing paradigm. The researchers partnered with HHI's community health workers to ensure cultural sensitivity and appropriateness when collecting information. The researchers collected data in three communities, spending approximately two weeks in each. Surveys focused on risk factor and demographic data pertaining to heart disease, with questionnaire structure based on a review of the literature. Data collected included age, gender, marital status, family history of disease, exercise frequency, medications taken, and tobacco/alcohol use. Study participants also had biometric measurements taken, including blood pressures, blood glucose values, heights, weights, and waist/hip circumferences (Kahn, 2005 & AHA, 2009). After these descriptive statistics that summarize prevalence of heart disease risk factors were gained, the data were analyzed in comparison to the Dominican national statistics to create a metabolic syndrome profile of the Monte Llano region.

Results

Hypertension in the Campo
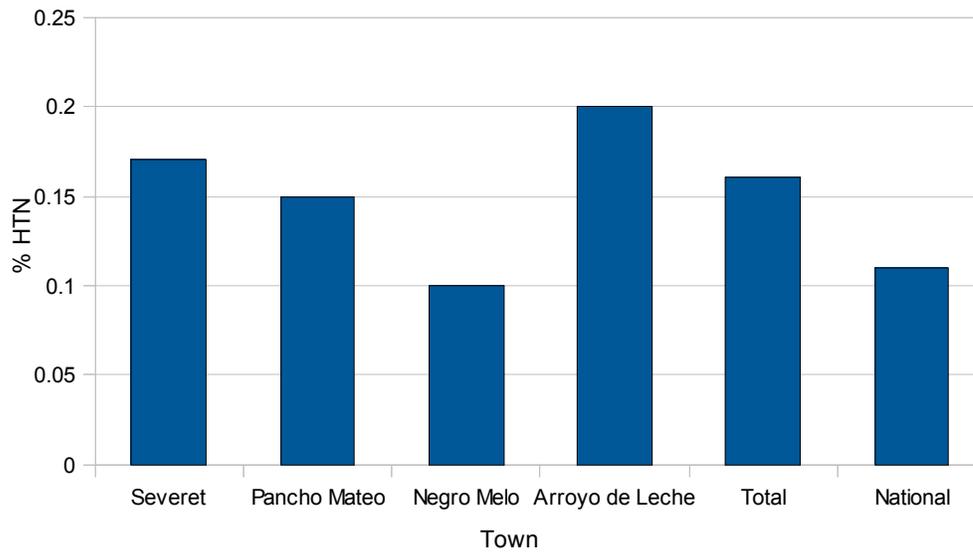
Z = 3.05, p = .0024

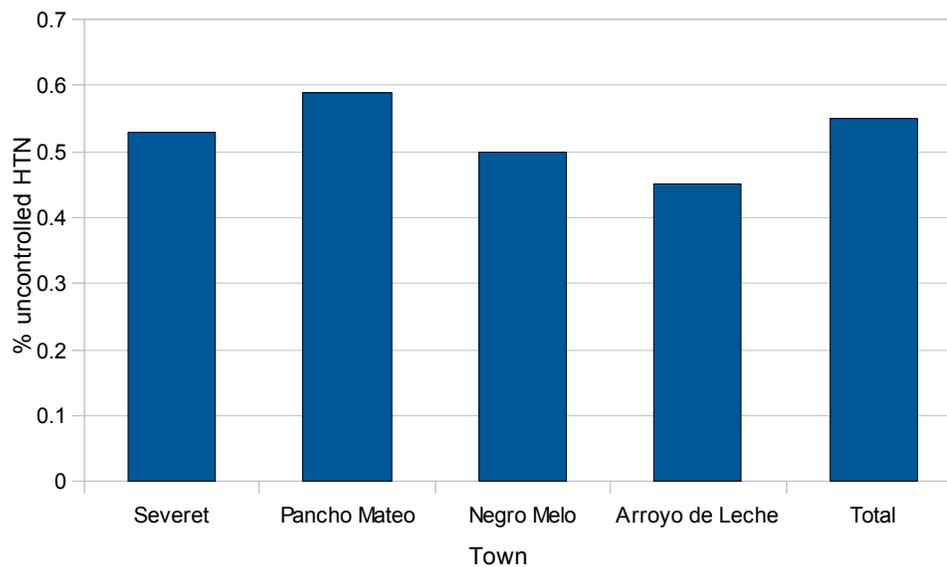| Community	Total population (estimated)	Sample size
Severet	300	100
Pancho Mateo	2,500	244
Negro Melo	85	21
Arroyo de Leche	200	54
Total	**3,350**	**419**

Notes:
Hypertension defined as systolic > 160mmHg, OR diagnosed and controlled with medication
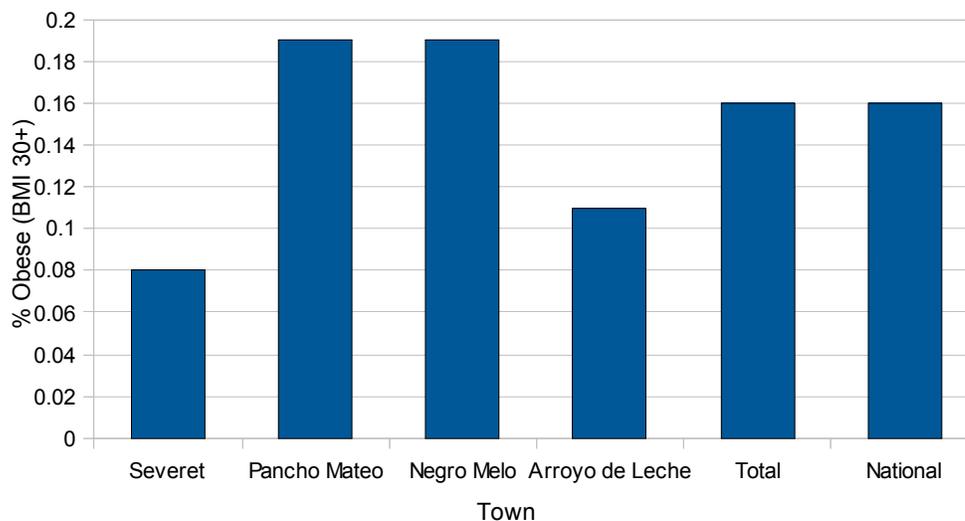
Source:
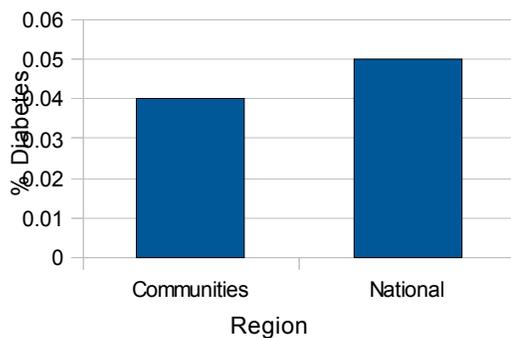For national HTN prevalence: WHO 1997, sample size 6,000.

Uncontrolled Hypertension in the Campo

Obesity in the Campo

Diabetes in the Campo

Note: Obesity and diabetes data, p>.05

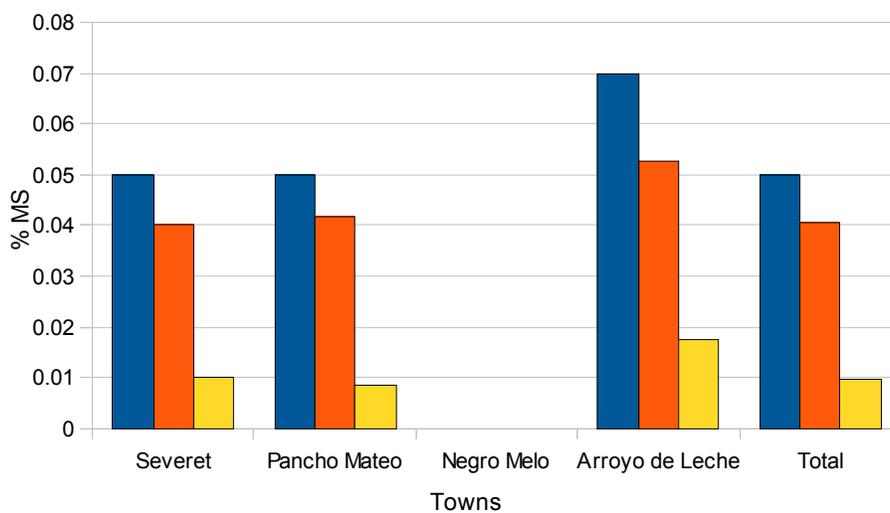## Prevalence of Metabolic Syndrome by Towns and Sex

Table: Metabolic syndrome defined in this case as BP > 130/85, Blood Glucose > 140 (not fasting), and Waist Circumference greater than 35 inches in women and 40 inches in men.
BLUE – Total, ORANGE – Women, YELLOW – Men.

Summarized Findings

Prevalence of hypertension as defined by a measurement over 140/90, was obviously much higher than the "high hypertension" used to compare to national statistics (systolic pressure > 160). By the conservative definition of hypertension, we found a prevalence of hypertension of 21% for all communities measured. 28% of diagnosed and medicated hypertensive patients had uncontrolled hypertension. While rates of diabetes appear to be relatively low, almost no one who has a diabetes diagnosis is well managed. Obesity does not appear to be a particularly specific problem for these communities, relative to national statistics. This suggests that the severity of the hypertension findings should be given credibility.

Correlation of Education Level and Hypertension in Pancho Mateo
18.5% 0 yrs education → **28.9%** w/hypertension
55.6% some primary education (1-8) → **23.7%** w/hypertension
25.9% some secondary or beyond → **15.8%** w/hypertension

Caveats – Study Limitations
It is important to note that study participants were not randomly selected from a rigorous statistical standpoint. Because the study was conducted during the work week and during the day, it is likely that there is an over-representation of a sedentary and generally nonworking population. In addition, home visits may have been overly geared towards family members of the community health workers and/or sicker members of the community.

Biometric data limitations included the fact that the large blood pressure cuff available was of questionable accuracy, so blood pressure measurements of obese study participants may be incorrect. Additionally, variations in amount of time from last meal for glucose measurements may have skewed the data.

It is also important to note that reporting on alcohol and tobacco consumption may be inaccurate. Education reporting in Severet is largely inaccurate because of Spanish vocabularly misunderstanding.

Recommendations for HHI
Generally speaking, hypertension is raised and largely unmanaged. Considering the relatively uninvasive nature of monitoring hypertension and diabetes, HHI community health workers seem well placed to support compliance, maintenance, and educate on the ways to live healthfully with these conditions. Perhaps monthly or bimonthly (2X/month) screening sessions and monthly education sessions would be feasible. The researchers flagged a number of individuals who appeared to be at particular risk of adverse events, as a possible first cohort of patients who could be managed with house calls. Community health workers in larger communities could be trained on glucometer, and could provide screening services. There is a possible role for A1C use, if funding is found for cartridges ($6/each). The relatively small number of diabetics encourages A1C use for their monitoring.

Overall, there is room for an increased role of education and awareness around metabolic disease, with obesity, diabetes, and heart disease addressed as a linked group of conditions..

Suggestions for future follow-up on this project include repeating the survey to observe efficacy of implemented programs, advancing a similar study in new communities, and ensuring case management for individual patients.