AT WHAT COST?

IN SEARCH OF AN EFFICIENT MODEL OF RURAL HEALTH

IN THE DOMINICAN REPUBLIC

By

JUSTIN ROSS PETERSON

A Thesis Submitted to the Honors College

In Partial Fulfillment of the Bachelors degree
With honors in

Interdisciplinary Studies

THE UNIVERSITY OF ARIZONA

May 2010

Approved by

Dr. Wayne Decker
Department of International Studies and External Affairs

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Abstract:

Health care is one of the most salient issues in contemporary society. To a large extent, the delivery is a reflection of the social values, the political will, and the financial resources of a nation. The Dominican Republic has a unique set of challenges around which a unique health delivery system has evolved. This paper first explores the history and structure of the health care system. Focusing on rural communities, it then reviews the challenges to health including shortages of medical personnel and supplies, high maternal mortality, challenges in the water and sanitation sectors, and cultural prejudice. Finally, it offers solutions that are derived from successful programs employed internationally, always held to the standard of culturally and financially feasible in the Dominican context.

Statement of purpose

This thesis represents the culmination of the last four years of learning and the convergence of my three disciplines, Spanish, Public Health, and International Studies, into the question, what health care delivery programs work best in Hispanic countries? I narrowed this question to rural health in the Dominican Republic because my exposure in the country offers insight and a point of reference. In reviewing the health care system of the Dominican Republic as well as other regions, I discovered moieties that can be applied to the health care system in the DR given the reality of limited resources of our imperfect world.

Methodology:

The contributions of this thesis come from two sources: literature review and testimony of health professionals with experience in the Dominican Republic. First, I read books, looked at articles from scholarly journals, and reviewed databases to understand the situation of the health care system in the DR, focusing on rural regions. Second, health care professionals were contacted and interviewed to enhance my understanding of the real-life challenges faced in the country. After reviewing the problems and obstacles of the system, I undertook a review of external rural health systems in search of solutions that may be applied to the Dominican system given its political, cultural, and financial circumstances.

Figure 1: Dominican Republic in the Caribbean and Flag

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Part I: The Dominican Health System

A. Health in transition

Widely recognized as a "developing nation," the Dominican Republic (DR) is currently experiencing what many public health analysts call the epidemiological transition. The transition occurs as the burden of disease in less developed countries changes from communicable diseases to chronic diseases. First, disposable income of a nation increases. Second, people consume more processed foods and spend more on health care. Third, over time communicable diseases subside while chronic diseases rise as a percent of the national burden of disease.[1] A profile view of the DR bears all the hallmarks of the epidemiological transition such as significant declines in mortality due to communicable diseases (figure 1 below) and rates of mortality in children under five (figure 2 below). Knowing that infectious disease is the number one cause of child mortality, we can see from these statistical data strong improvements in awareness and

Figure 2[2]:

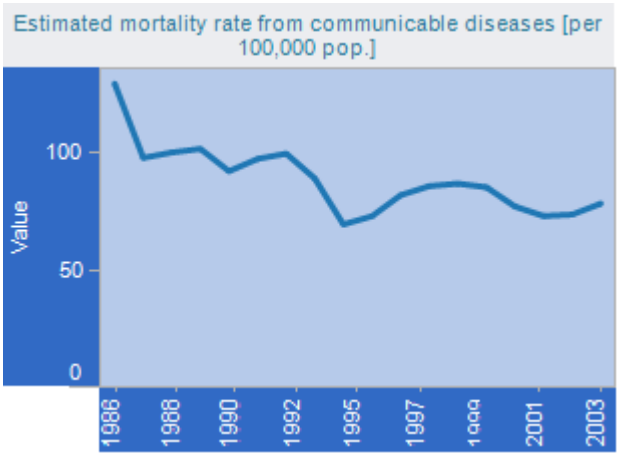
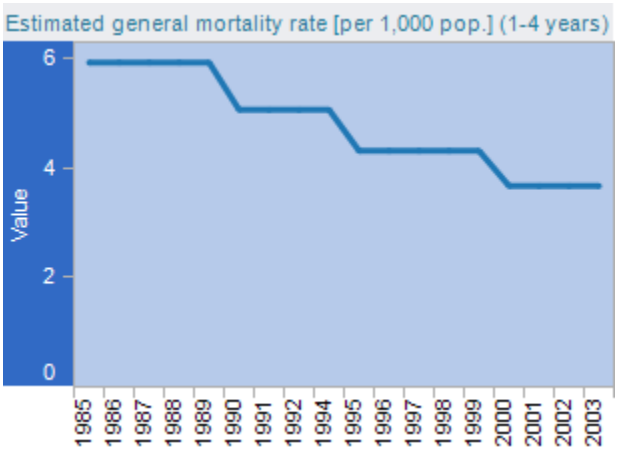


Figure 3[3]:



[1] Omran, A. (1971). The Epidemiological transition: a theory of the epidemiology of population change. *The Milbank Memorial Fund Quarterly*, *4*, 509-538.

[2-3] Indicator Trend Chart. (2010). *Pan American Health Organization*. Retrieved (2010, April 12) from http://new.paho.org/hq/index.php?option=com_content&task=view&id=2200&Itemid=1910.

Figure 4[4]:

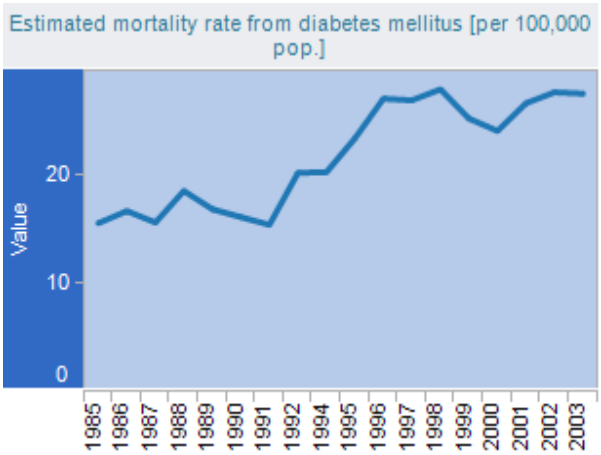
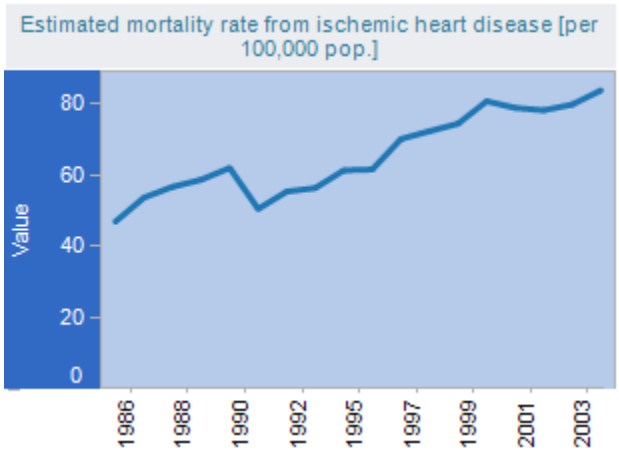


Figure 5[5]:



control of infectious disease. Even more striking are the charts of chronic disease that steadily rise as infectious disease falls. As more spend money on the "golden arches" or pass time playing BINGO (sedentary activities), chronic diseases such as ischemic heart disease (figure 3 above) and diabetes mellitus (figure 4 above)—ones having a strong correlation with lifestyle—have increased. While the success in controlling communicable diseases is encouraging, the DR finds itself still beleaguered by diseases of the developing world (contagious pathogens) and now more than ever with those of the developed world (chronic conditions). In effect, they have a "double" burden of disease.

As the epidemiological transition plays out, the Dominican Republic has seen significant change in health policy. Heralded and supported by the World Bank and following the example

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[4-5] Indicator Trend Chart. (2010). Op. Cit.

of many Latin American countries, the DR restructured its health system.[6] Frustration ran high among Dominicans over poor standards and cost of care. According to a 1991 Demographic and Health Survey, sixty percent of respondents who had reported a serious injury in the last month did not seek medical attention, primarily due to economic reasons. Glassman continues to discuss how the reforms were significantly a response to popular demand for change, with widespread belief that the health system offered unsatisfactory coverage, unequal distribution of resources (concentrated in the capital), as well as understaffed and inefficient institutions contributing to the movement.[7] So entrenched had been the disillusionment toward the care, those patients from the public sector who could afford it accepted public-sector doctor referrals to the doctors' own private practices instead of continuing with government-sponsored health care.

To bring about these reforms, the Comisión Presidencial para la Reforma y Modernización del Estado, later called the Consejo Nacional de Reforma del Estado (CONARE), lead the process with input from the Pan-American Health Organization, the Dominican Social Security Institute, and a few other governmental and nongovernmental committees. An Executive Commission for Health Sector Reform (La Comisión Ejecutiva para la Reforma del Sector Salud) was also organized in 2001 to help coordinate priority goals and objectives. This committee recommended the following reforms, which the legislature passed shortly thereafter. The first law passed was the General Law of Public Health which established the leadership, financing, and insurance responsibilities between the Secretaría de Estado de Salud Pública y Asistencia

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[6] Organización Panamericana de la Salud. (2002). Análisis de la reforma del sector de salud en la subregión de Centroamérica y la República Dominicana. *Iniciativa Regional de Reforma del Sector de la Salud en América Latina y el Caribe*, 1-51.

[7] Glassman, A., Reich, M., Laserson, K., & Rojas, F. (1999). Political analysis of health reform in the Dominican Republic. *Health Policy and Planning*, *14*(2), 115-126. http://heapol.oxfordjournals.org/cgi/reprint/14/2/115.pdf.

Social (SESPAS) and the provincial governments, among a host of others things. Second, the legislature passed laws governing the reforms of the national pension system and social security system, which establishes a security fund for illness, non-work related accidents, and maternity medical expenses.[8]

B. Demographics of the DR

Over 9,650,000 people inhabit the DR as of July 2009.[9] Over the years, health has improved for many of these Dominicans, especially urban dwellers. Two oft-referenced measurements of the health of a nation, life expectancy and infant mortality rate, suggest improvement in the overall health of the Dominican people. In 2000, the average life expectancy was estimated at sixty-seven years and infant mortality registered at forty per 1000 live births with an additional sixty percent under-registration of deaths.[10] Nine years later, average life expectancy had risen to seventy-three years of age and infant mortality had fallen to twenty-six deaths per 1000 live births.[11] However, these trends are not necessarily representative of equal gains for all Dominicans. In fact, health, wealth, and residence are inextricably intertwined.

Rural inhabitants are one such group that does not receive health care opportunities found in urban centers. Thirty-one percent of the population resides in these rural areas.[12] They are the citizens who typically seek health care primarily in emergencies, thereby precluding preventative medicine. Moreover they are the citizens for whom barriers of travel and expense make

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[8] Organización Panamericana de la Salud. (2002). Análisis de la reforma del sector de salud en la subregión de Centroamérica y la República Dominicana. *Iniciativa Regional de Reforma del Sector de la Salud en América Latina y el Caribe*, 1-51.

[9] CIA Factbook. (2010, March 04) *Central America and Caribbean :: Dominican Republic*. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/geos/dr.html.

[10] Pan American Health Organization. (2010). Health situation analysis and trends summary. Retrieved (2010, March 27) from http://www.paho.org/English/DD/AIS/cp_214.htm.

[11] CIA Factbook. (2010, March 04). Op. cit.

[12] CIA Factbook. (2010, March 04). Op. cit.

healthcare an inaccessible luxury, according to Carol Doane, RN, the President of a U.S.-based non-profit called Partners in Rural Health in the Dominican Republic (PRHDR).[13]

Another disenfranchised social group is women. Fortunately, women have seen significant progress in the choices they make with their bodies; note the decline in fecundity from 7.4 to 2.7 children per women over the years 1990 to 1996. Not surprisingly, this same source estimated sixty-four percent of women use/have used some type of contraceptive.[14] Notwithstanding these improvements, the DR has a long history of patriarchy that remains alive and well in many areas of society. For example, women do not enjoy the same opportunities as men. The Gender Empowerment Measure, produced by the United Nations Development Programme, scored the DR 0.55 out of 1.0 and ranked the nation sixty-four out of 109 countries measured.[15] The measure reviews the number of women in legislative, managerial, and professional positions, as well as the income disparity between men and women in the same positions. Discrimination can be seen in the subtleties of salary disparity but also more obviously when some employers have been known to enforce pregnancy tests to avoid hiring pregnant women.

Going from bad to worse, racism and strong undercurrents of prejudice against Haitian immigrants and their descendents run deep in Dominican culture. This social cleavage, estimated at 800,000 residents, comprises a significant percent of the abject poor.[16] They are primarily landless laborers who immigrated either permanently or seasonally to perform

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[13] Doane, C. (2010). Personal Interview. 12 Mar 2010.
[14] Maternal Mortality in 2005. (2005). WHO. Retrieved (2010, April 1) from http://www.who.int/whosis/mme_2005.pdf.
[15] Human Development Report 2009. (2009). *United Nations Development Programme*. Retrieved (2010, April 6) from http://hdrstats.undp.org/en/countries/country_fact_sheets/cty_fs_DOM.html.
[16] Simmons, D. (2010). Structural violence as social practice: Haitian migrant workers, anti-Haitianism, and health in the Dominican Republic. *Human Organization, 69*(1), 10-18.

domestic work and labor in construction or agriculture, especially the sugar cane fields of the border provinces of the DR like Dajabón and Pedernales. Because many Haitian workers did not secure a permanent residence in the DR, shanty communities, called bateyes, were established by their agricultural employers to house them. Bateyes also served to reinforce Dominican antipathy toward Haitians, by isolating them from Dominican neighborhoods. These work-sponsored living quarters became slum settlements in which families now reside. Meanwhile sugar production and exportation have steadily declined since the 1980s.[17] This economic change has hit the Creole-speaking immigrants hardest, resulting in high unemployment and further reducing Haitian immigrants' ability to maintain minimum levels of good health.

C. Profile of the health system:

The health care structure is organized on three levels: national, provincial, and local. To coordinate health services, the SESPAS sits as the managing body on the national level. In 2001, the health reform committee reviewed SESPAS and created five sub-secretaries within SESPAS that oversee different aspects of the public health system. The reforms of 2001 simultaneously created a provincial level of organization, Offices of Provincial Health (Direcciones Provinciales de Salud or DPS) are responsible for providing collective health on the local level.

While the health sector is governed centrally by SESPAS, significant autonomy lies in the hands of provincial health agencies. These provincial health agencies manage the financing and insurance of the populations within their jurisdiction. Moreover the breadth of the new social protection system allows for more than health care; it expands into protection against

[17] CIA Factbook. (2010, March 04). *Central America and Caribbean :: Dominican Republic*. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/geos/dr.html.

unemployment, disability, workers compensation, and care for the elderly.[18] The Dominican system of Social Security provides highly subsidized health care to citizens with copayments graded according to income. Along with the structural reforms, SESPAS has moved away from the curative health care strategy and more into the proactive promotion of preventative medicine.[19] Dr. Violeta from SESPAS also notes that institutional focus has shifted internal policy to contributing factors of health (i.e. malnutrition, pregnancies spaced too closed together, stress) on both the individuals and group levels.

Four-hundred and seventy-four of the 1099 "ambulatory establishments" (primary care facilities) are located in rural villages. One-hundred and twenty-six more institutions are specialized (secondary care facilities) and forty-two specialized hospitals (tertiary care) comprise the three levels of health care[15]. The government's SESPAS offices are responsible for overseeing the nearly universal health care infrastructure by covering approximately seventy-five to eighty percent of the population in which patients can go to clinics and hospitals staffed by physicians and nurses on the government payroll.[20]

Beyond the government provided health system, the DR has a robust and attractive private health care infrastructure, for those who can afford it. In addition to a number of private clinics, many NGOs operate throughout the island, many of which offer humanitarian assistance.[21]

Part II: Challenges Facing the Dominican Health System

[18] Violeta Garcia, Ysabel. (2005, October 5). Nuevo Modelo de Redes de Atención en Salud, Taller Plan Básico de Salud y Gestión de Riesgos. Santo Domingo.
[19] Violeta Garcia, Ysabel. (2005, October 5). Op. cit.
[20] Glassman, A., Reich, M., Laserson, K., & Rojas, F. (1999). Political analysis of health reform in the Dominican Republic. *Health Policy and Planning*, *14*(2), 115-126. http://heapol.oxfordjournals.org/cgi/reprint/14/2/115.pdf.
[21] Pan American Health Organization. (2010). Health situation analysis and trends summary. Retrieved (2010, March 27) from http://www.paho.org/English/DD/AIS/cp_214.htm.

D. The standard of care

The decentralized nature of the Dominican system makes newly implemented reforms slow to take effect in common practice. To begin with, response to local concerns, accountability to national standards and change in general move literally and figuratively bureaucratically. Nurse Doane describes a lack of oversight and response to the health needs of rural villages.[22] Through her experience with PRHDR traveling to and treating rural Dominicans, she describes a setting in which the only medical outpost near the small villages she semiannually visits simply lacks the medications to treat the common illnesses (such as hypertension) of the local population. These rural residents are caught in the middle of the epidemiological transition, suffering both infectious and chronic diseases, especially diarrhea and diabetes. What's more, this decentralized structure of oversight adds to a culture of complacency, which may contribute to a lack of motivation to improve service and the health system.

E. Medical personnel

One of the problems that the DR faces is staffing rural clinics with educated medical personnel. The WHO records that as of 2000, there were nineteen physicians and eighteen nurses per 10,000 patients.[23] Further investigation from the WHO notes the density of physicians and nurses rank above average for comparable countries of the region: Jamaica nine and seventeen, Nicaragua four and eleven, Honduras six and thirteen, Mexico twenty and nine, respectively. The issue is less numbers than an equitable distribution of the professionals. A long standing problem, the government has already enacted law requiring all new medical

[22] Doane, C. Personal Interview. March 10, 2010.
[23] World Health Organization. (2008). Core Health Indicators. Retrieved 2010, March 23 from http://apps.who.int/whosis/database/core/core_select_process.cfm?country=dom&indicators=healthpersonnel.

graduates to serve (with pay) in a government sanctioned facility for one year. These typically are rural facilities or less-desireable institutions within the city. Though rotating new physicians into rural areas has improved the rural doctor shortage, it leaves a permanent vacuum of experienced physicians in rural and public institutions.

F. High maternal mortality

SESPAS understands it has plenty of room for improvement in maternal mortality. In 1999 it carried out a study that suggested sixty-one percent of maternal deaths considered were preventable.[24] While this maternal mortality datum reflects partums in urban centers, the need for national improvement is exceptional and will therefore be considered both in rural and urban settings.

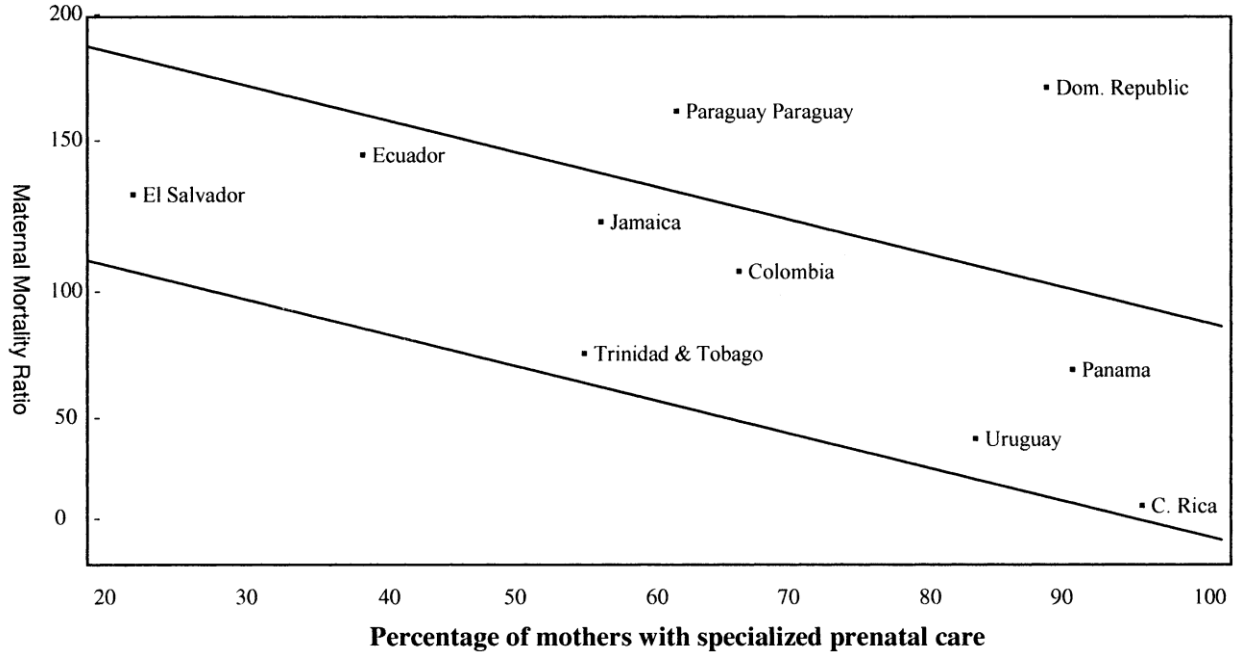
The most recent statistics available on maternal mortality in the Dominican Republic come from the World Health Organization (WHO) in 2002, documenting the maternal mortality ratio at 150 deaths per 100,000 live births.[25] Such high numbers in a country that has high rates of hospital delivery (ninety-seven in 1997) and attended by proper staff is anomalous. The figure on page 15 illustrates the unusually high ratio of maternal deaths given the high percent of care given by specialized perinatal care by juxtaposing the intersection of these statistics with those of comparable regional peers.

Miller et al investigated the peripartum conditions of various health care centers. His multidisciplinary team concluded that "facilities are overcrowded and understaffed, with inexperienced residents overseeing care provided by medical students, interns, and nurses".[26] Within these institutions, staff morale was low, overworked and suffering from compassion

[24] SESPAS. Sistema nacional de vigilancia de la mortalidad maternal. Santo Domingo, DR: SESPAS 1999.
[25] Maternal Mortality in 2005. (2005). WHO.
[26] Miller, S., Cordero, M., et. al. (2003).

fatigue. In the rural regions, doctors were known to be absent altogether during the delivery of some babies.

Figure 6: Percentage of mothers with specialized prenatal care vs. Maternal Mortality Ratio[27]



Source: Cáceres 1996.

To correct the problem, National Norms of quality care were adopted by a national oversight committee. Notwithstanding, researches have continued to find breaches in quality care, as in the article offered by Cerda.[28] Here, twenty-eight maternal deaths were reviewed and in all but 8 medical staff did not follow the protocols of the National Norms. The problem is not a lack of codified protocols but rather a systemic inattention to the National Norms.

G. Access to safe water

[27] Miller, S., Cordero, M., et. al. (2003). Quality of care in institutionalized deliveries: the paradox of the Dominican Republic. *International Journal of Gynecology and Obstetrics*, *82*(1), 89-103.

[28] Cerda R., Realidad de la mortalidad maternal en República Dominicana: factores de riesgo con mayor incidencia. Santo Domingo, DR: SESPAS, 1999.

Unsafe storage of water is a significant source of diarrheal sickness, and a leading cause of morbidity in rural Dominican Republic. There are several routes of contamination including: inadequate fecal sanitation leading to direct contact with water sources, unsuccessful hand sanitation after defecating then handling water (containers), and using contaminated sources of water. To date, water dependent pathogens pose a significant health threat to rural Dominicans, especially children. The under 5 mortality figure remains unacceptably high with 141 deaths due to diarrheal infections, according to the Pan American Health Organization's 2004 report.[29] The WHO notes that this represents twelve percent of deaths of the children-under-5 mortality indicator and goes on to show that this is higher than the regional average of ten percent diarrheal deaths among the under-5 mortality rate.[30]

According to the Joint Monitoring Programme (JMP), seventy-nine percent of Dominicans have access to improved water sources.[31] Improved water sources are ones that are piped or covered, preventing exposure to vermin and contamination with feces and therefore more likely to give potable water. While seventy-nine percent is laudable, it also reflects an unnecessary source of disease. In its current state, the most common method of securing safe water among rural Dominicans is through buying bottled water (36%)[*], with the next most common being piping it directly into a residential spigot (31%). The JMP goes on to note, some Dominicans still have barriers to safe water sources and therefore resort to collecting surface

[29] Organización Panamericana de la Salud. (2008). Indicadores básicos de salud. Retrieved (2010, March 21) from http://new.paho.org/dor/index.php?option=com_content&task=view& id=25&Itemid=135.

[30] World Health Organization. (2006). Mortality country factsheet 2006. Retrieved (2010, March 17) from http://www.who.int/whosis/mort/profiles/mort_amro_dom_dominicanrepublic.pdf.

[31] WHO/UNICEF. (2010). Improved drinking-water sources. *Joint Monitoring Program for Water Supply and Sanitation*, Retrieved from http://www.wssinfo.org.

[*] Bottled water may be safe; it depends upon the source of the water.

water from ponds, lakes and streams (5.4%). These exposed water sources pose significant risk and are the collecting grounds for various disease agents.

Access to safe water cannot guarantee an interruption in the pathogen cycle noted in figure 7 of page 18. Rather than access, poor storage practices and hygiene habits more frequently contaminate potable water which is then ingested. Trevett et al. detail the abundance of contaminated storage containers which recontaminate the safe water before ingestion.[32] In this instance, it is the consumer that is also the inadvertent polluter as a result of inadequate container cleansing practices and personal hygiene.

Table 1: Improved and Unimproved Water Sources

Drinking water source	
Improved	Unimproved
> Piped into dwelling, plot or yard	> Tanker truck
> Public tap/standpipe	> Bottled Water*
> Tubewell/borehole	> Small cart with tank/drum
> Protected dug well	> Unprotected dug well
> Protected spring	> Unprotected spring
> Rainwater	> Surface water (stream, lake, irrigation channel)

H. Sanitation

SESPAS reported that in 2004 and 2005, children under 5 years old mortality ratio due to diarrheal infection was 4.7 and 3.7 percents, respectively; these numbers are considerably lower

[32] Travett, A., Carter, R., & Tyrrel, S. (2004). Water quality deterioration: a household study of drinking water quality in rural Honduras. *International Journal of Environmental Health Research*, *14*(4), Retrieved from https://dspace.lib.cranfield.ac.uk/bitstream/1826/2829/1/Water%20quality%20deterioration%20a%20study%20of%20household%20-2004.pdf

than the twelve percent that the WHO suggests.[33] The high number of infections is frequently due to poor sanitation conditions. Using improved sanitation facilities is an important step to reducing diarrheal morbidity because they prevent parasite infections from transmitting at the first stage, feces-to-vectors (see "sanitation" in figure 6 below). Overall, ninety-two percent of Dominicans regularly use effective sanitation facilities.[34] However the figure drops to eighty-seven percent in rural areas. These facilities include flush, pour flush, and improved latrines, see Table 2 on page 19. Flush latrines have a hydro-mechanism built in and use water to move the feces. Pour flush latrines will have a bucket of water nearby and need the user to pour water into the latrine to move the feces along. The improved latrine is the more common of the in rural regions (fifty-four percent of Dominicans use it) and consists of a simple a dug pit, kept relatively dry, and covered when not in use. The repository has a ventilation tube which reduces the presence of noxious smell.

While there is quite a range of sanitation methods and facilities, all of which break the cycle of fecal contamination, it is estimated 7.1% of rural Dominicans still rely upon open/bush defecation.[35] This number represents a significant danger to their health and those with whom they make contact. Significantly, unsanitary defecation practices are common in Haitian bateyes. In one study, five of the six bateyes surveyed did not have latrines, leaving residents to

[33] Indicadores Básicos de Salud: 2008. (2008). *Organización panamericana de salud*. Retrieved (2010, April 21) from http://new.paho.org/dor/index.php?option=com_content&task=view&id=25&Itemid=135.

[34] WHO/UNICEF. (2010). Improved sanitation facilities. *Joint Monitoring Program for Water Supply and Sanitation*, Retrieved from http://www.wssinfo.org.

[35] WHO/UNICEF. (2010). op. cit.

use nearby rivers, fields and ravines.[36] Open source defecation attracts disease vectors and enables the spread of many human parasites to spread to nearby human hosts.

Figure 7: Points of Interruption of Fecal Contamination

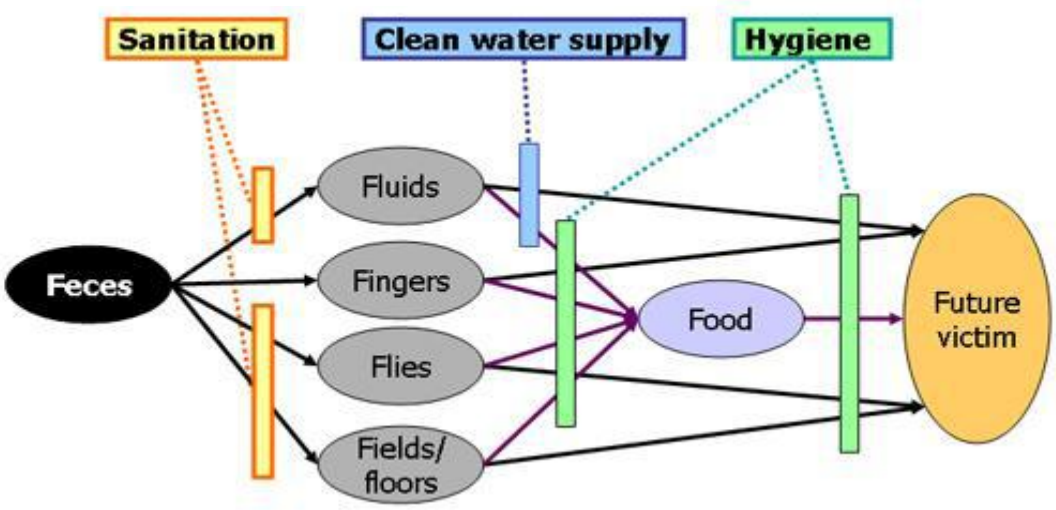


Table 2: Improved and Unimproved Water Sources[37]

Sanitation Facilities	
Improved	Unimproved
> Connection to public sewers	> Service or bucket latrines
> Connection to septic systems	> Public latrines
> Pour flush latrines	> Open latrines
> Simple pit latrines	> Open source defecation
> Ventilated improved latrines	

[36] Simmons, D. (2010). Structural violence as social practice: Haitian migrant workers, anti-Haitianism, and health in the Dominican Republic. *Human Organization*, *69*(1), 10-18.

[37] World Health Organization. (2010). *Access to improved drinking water sources and to improved sanitation (percentage)*. Retrieved from http://www.who.int/whosis/indicators/compendium/2008/2wst/en/.

Beyond fecal contamination, both urban and rural areas suffer from poor waste management. Regular trash collection agency is viewed as a luxury by many. Though collection does occur in many municipalities, oftentimes it occurs infrequently, or sometimes not at all. The result is giant trash piles on the sidewalks and rurally, in the rivers and ravines. These trash piles represent hazards to health, being feeding grounds for rodents and stray domestic animals alike. Beyond boosting rodent and vagabond animals, street trash enables flies and disease carrying pests like mosquitoes and cockroaches to proliferate.

I. Anti-Haitianism

Former Dominican President Hipólito Mejía once said, "If we ask ourselves what best symbolizes extremes of poverty in the country, I think that all of us would mention conditions in the bateyes".[38] The situation in the 500-odd bateyes is grave, in part because antipathy toward Haitians is generalized and their suffering is not given a national voice. The zeitgeist is that the country has no obligation to care for illegal extra-nationals. However, what many Dominicans fail to consider is that as these bateyes have become breeding grounds for communicable disease, which then spreads to Dominican populations.

The State Enterprise Commission (CREP), which oversaw the privatization of the state-owned sugar plantations, surveyed 220 bateyes and found thirty-two percent lacked access to drinking water, sixty-six percent lacked proper sanitation facilities, sixteen percent lacked access to medical services, and thirty had no access to schools.[39] Similarly, many Dominican-born Haitians have found it difficult to be treated in the health care system they are entitled to. The

[38] Quoted in Movimiento de Mujeres Dominico-Haitianas, *Solidaridad con la lucha de la minoría Dominicana de ascendencia Haitiana por la ciudadanía y la justicia*, Santo Domingo, MUDHA, 2001, p. 21.

[39] MUDHA, 2001. Op. Cit.

important points can be inferred from the case of anecdotal case of Doña Maria, as told by the anthropologist David Simmons.

> *By the time Doña Maria finally visited a clinic for the chronic pain in her left breast, her diagnosis was essentially a death sentence: stage-three breast cancer. Her efforts to receive a diagnosis and care were compromised by a number of factors. Though born it the Dominican Republic, the poor, middle-aged Haitian woman had never been issued a birth certificate. Without this document, she could not register for school as a child, nor could she claim Dominican citizenship. An essentially stateless woman—because she had no Haitian passport either—and undocumented worker, she lived under the constant threat of forcible deportation, imprisonment, or worse. More insidiously, without a birth certificate and passport she could not visit appropriate health care facilities in Santiago, the next large city, because of a chequeo (police checkpoint) between her community and the city. To risk attending the clinic to diagnose and treat her cancer meant risking her freedom. Unfortunately, doña Maria's case is more the rule than the exception for Haitians in the Dominican Republic.*[40]

The systemic disenfranchisement occurs in a few key ways. Laboring extra-nationals are in practice not offered work contracts, and therefore cannot apply for normalized immigration/residency. Without residence papers, the threat of deportation keeps Haitians separate and withdrawn. What's more, these immigrants who live in a hostile culture and often poorly speak Spanish are not able to go to the authorities when their pay is less than what Dominican nations receive for the same work. The resulting vulnerability and economic poverty leads to "poverty of health". Haitian bateyes often lack potable water, electricity, waste disposal and tend to be epicenters of malnutrition and diseases like tuberculosis, HIV, Dengue, and malaria.[41] Of particular concern, bateyes are spatially removed from Dominican life, making access to health services a significant barrier. Notwithstanding the expense and distance, 76 of respondents in one batey (7 km to the clinic) had received medical attention, according to Simmons.

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[40] Simmons, D. (2010). Structural violence as social practice: Haitian migrant workers, anti-Haitianism, and health in the Dominican Republic. *Human Organization*, *69*(1), 10-18.

[41] Simmons, D. (2010). Op. cit.

Part III: Solutions

In the previous part, problems facing rural health were discussed. In Part III, successful solutions are suggested. The standard for successful here is determined both by sound theories tested in studies and by real-world implementation.

D. Standard of care

The New England Journal of Medicine reported modest improvement in health care outcomes in a study that tested quality of care through pay-for-performance incentives and public reporting.[42] All hospitals in the two-year study employed voluntary public reporting; however the 207 of 613 hospitals that also used pay for performance showed a stronger rate of improvement than public reporting alone. After differences in baseline performance and other characteristics were adjusted for, pay for performance was associated with 2.6-4.1% improvement in quality outcomes.

In the same way, a system of incentives and penalties will encourage medical teams to improve the standard of care. Public reporting, on the other hand, will probably not improve performance because internet use is not as commonly used in the DR as fully developed nations and so the public will not likely seek out reported results. SESPAS should organize an *Improvement Committee* that would review the performance and outcomes of each province and set goals for improvement for each provincial health system. The committee should then recommend objectives based on the needs of the province and review progress of the objectives on a quarterly basis. Provincial health officials will be responsible for setting goals for local

[42] Lindenauer, P., Remus, D., Roman, S., & et. al., . (2007). Public reporting and pay for performance in hospital quality improvement. *New England Journal of Medicine, 356*(5), 486-96.

health centers, in tandem with local health centers; penalties should be stipulated and incentives presented to encourage improvement. One recommended incentive is giving salary raises or annual bonuses based on accomplishing goals. The *Improvement Committee* should commission independent reviewers to assess the performance of medical staff and audit reported outcomes. Finally, the reviewers should be employed nationally in order to maintain equal standards of care.

E. Medical personnel

Earlier the problem of staff shortages in the DR was discussed. One model of effective medicine is Cuba's system. While many aspects cannot be replicated in societies beyond Cuba's shores, the DR can learn many lessons about improving health in a cost-effective way. For example, Whiteford and Branch make the point that one of the reasons Cuba has eradicated polio, controlled malaria and dengue, and reduced child and maternal mortality to rates on par with highly developed countries is because "…medical personnel are responsible for the health in neighborhoods in which they know and treat the people who live there".[43] Here the solution is twofold.

First, induct into medical schools a set number of doctors who will commit to returning to their rural villages and take up medical posts there. Setting quotas on medical candidates committed to rural work is already practiced in the Caribbean. Whiteford notes Cuba's way of increasing doctors committed to rural health in a school called Escuela Latinoamericana de Medicina. This free medical school accepts applicants from humble background, educates, and commissions the graduates to practice medicine in underrepresented areas of their home

[43] Whiteford, L., Branch, L. (2008). *Primary health care in Cuba*. Lanham: Rowman & Littlefield Pub Inc.

countries. This type of selective induction is feasible for the DR and builds a cadre of rural and experienced physicians instead of relying upon inexperienced recent graduate students to fill rural positions.

Second, the DR must educate rural doctors about health improvement techniques. Adding modules of public health into medical education (during the summer, before/after/woven into their medical year) will bring an understanding of how to improve health by preventing disease, not just treating it. While regular doctors understand this, public health educated and prevention educated physicians appreciate and practice it more. Certain diseases such as malaria have an endemic presence and can be hedged by distributing bed nets in the locale. Increasingly, lifestyle conditions such as hypertension are burdening the health care system. In part, a sedentary lifestyle contributes to this increase. Checkers, dominoes, bingo and other games are commonly seen on the sidewalks of villages as a pastime. Doctors need to understand the importance of preventing these chronic conditions. After doctors accept their role as agents of change of behavior in their patients' lives, they can personally and through health counselors help villagers make better health decisions that will avoid the chronic condition and save the government a lifetime of maintenance medications.

F. Maternal Mortality

Economic penalties and incentives would be the most effective solution to the current epidemic of failing to follow National Norm protocols for maternal care. The said recommendation might fall upon the *Improvement Committee*, especially in the national district. Inspecting officials should inform rural/peripheral institutions of these standards and subsequently fine physicians who are found to have not been present or found a replacement for

their station. In addition, standards of cleanliness and order are crucial components for goals that should be set for maternal care facilities. Overcrowded and dirty facilities have poor standards of care, leading to poorer health outcomes.[44]

De Brouwere et. al. compare the situation of maternal mortality in developing countries today to developed countries when they had similar ratios of maternal death.[45] Their findings reveal a pattern in morality reduction. First studies are conducted that reveal high and preventable mortality. Second policy makers decide upon a course of action. In Scandinavia, trained and experienced midwives were popularized; in the US, obstetric care in hospitals became the norm. Third, greater resources were committed to maternal care and puerperal techniques improved (e.g. aseptic care). In rural provinces, the problem in maternal mortality is experienced, accessible care. Therefore an important goal to improve maternal care in rural institutions would be ensuring doctors and on-call doctors are available at all times. An alternative to training additional doctors and in circumstances in which doctors are scarce, rural clinics should certify midwives who can attend the birth of laboring mothers. De Brouwere noted the US example of Mary Breckinridge, a midwife in 1925 who showed that her network of trained and permanent midwives had a lower mortality ration (68:100,000) as compared to the nearest doctor (800:100,000).

G. Water safety

[44] Miller, S., Cordero, M., et. al. (2003). Quality of care in institutionalized deliveries: the paradox of the Dominican Republic. *International Journal of Gynecology and Obstetrics*, *82*(1), 89-103.

[45] Brouwere, V., Tonglet, R., & Van Lerberghe, W. (2002). Strategies for reducing maternal mortality in developing countries: what can we learn from the history of the industrial west. *Tropical Medicine and International Health, 3*(10), 771-82.

Solutions to water storage contamination revolve around purifying water and eliminating contact between consumer hands and the water to be consumed.[46] Doctors should interview patients that have been diagnosed with water-borne pathogens and find out if the patient likely has access to potable water. If not, physicians should prescribe water purifying devices as available or techniques (like boiling) when other options are not available. When clinicians are confident patients are safely accessing safe water, they should prescribe buckets and containers to reduce safe water contamination. One suggested tool for transporting water from a yard spigot to the dwelling is the improved bucket (Fig 8). The improved bucket eliminates the ladle, has a covered lid to reduce environmental and animal contaminants, and allows direct deposit from the water source. For storing larger quantities of water (more practical in rural homes of the DR), an excellent way of reducing storage contamination is using storage containers that have lids and a tap on the bottom instead of ladled containers.

Figure 8: The improved bucket

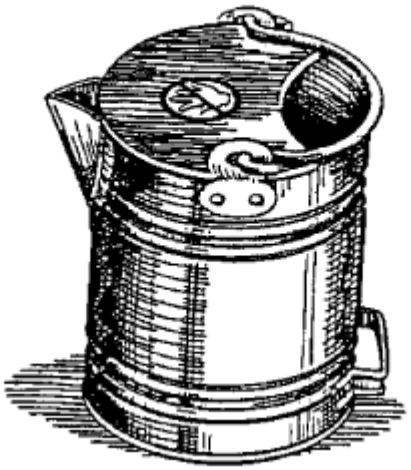

Figure 9 below exemplifies a water storage container that is clear, and therefore allows UV light to pass through. UV light has important microbe killing properties. It does not use a potentially contaminating ladle or encourage water contact with the hands because of the spigot

[46] Roberts, L., et. al. (2001). Keeping clean water clean in a Malawi refugee camp: a randomized intervention trial. *Bulletin of the World Health Organization*, *79*(4), Retrieved from http://www.scielosp.org/scielo.php?pid=S0042-96862001000400003&script=sci_arttext&tlng=en.

Figure 9: Improved Water Storage Container

at the base of the container. Teaching users to wash the bottle inside and out would minimize the chance of storage contamination.

For the 80% of the population with access to safe water, improvement will come by learning to store the water hygienically. The strategy for doing this is basic: doctors and/or nurses of local clinics will teach patients who seek medical attention for water-borne pathogens about key concepts of sanitary water storage. Later, clinicians and/or public health officials must follow up by visiting the patient in order to address problems of implementation. In addition, public health practitioners should include water sanitization and hygiene in a health unit they present to students in junior high and high school.

As far as access, these water storing containers are not easily found in rural areas of the Dominican Republic, where their hygienic need is greatest. The ministry of health needs to make them commercially available by subsidizing the cost of the containers, or if funds permit, dispensing the containers for free. Local pharmaceutical dispensaries or clinics should stand as points of access for the containers. Finally, by doctors and public health officials "prescribing" their use to persons who seek treatment for diarrhea and suspected waterborne pathogens and the government subsidizing their cost, these containers can effectively and sustainably reduce contamination of safe water and reduce diarrheal infections.

H. Sanitation

In the rural villages of the DR, 13% of the population cannot count on improved sanitation facilities. The threat to health is significant this situation causes. It is recommended that the SESPAS rapidly meet the needs of this disadvantaged group. First, identify the individuals in rural settings most at risk for incurring infections from unimproved sanitation. Then the government can seek out national or international NGOs willing to build improved sanitation facilities and subsidize the materials used for construction. Increasingly, governments are avoiding expensive contracts and turning to specialized NGOs to get it done cheaper. Mercer et. al. document one such health care program operating in Bangladesh.[47] By offering some money to NGOs, the SESPAS maintains control over which villages see improved facilities built and can monitor improvements in sanitation.

Additionally, NGOs need to counsel the recipients of improved sanitation facilities about the importance of sanitation and hygiene as well as how to upkeep the new facility. Moreover, the government of the DR must ensure counseling on hygiene and sanitation is at a minimum to persons treated for diarrheal infections.

I. Anti-Haitianism

With water sources in bateyes so motley, the best strategy for improving water health is teaching water purification techniques. In David Simmon's study of 6 bateyes, only 51% said they purified their water while 49% did not know.[48] In an environment markedly riskier than any other on the island, there has never been a greater need for water sanitation practices. In the

[47] Mercer, A., Khan M. H., Daulatuzzaman, M., & Reid, J. (2004). Effectiveness of an NGO primary health care programme in rural Bangladesh: evidence from the management information system. Health Policy and Planning, 19 (4), doi: 10.1093/heapol/czh024.

[48] Simmons, D. (2010). Structural violence as social practice: Haitian migrant workers, anti-Haitianism, and health in the Dominican Republic. *Human Organization*, *69*(1), 10-18.

face of statistical results revealing 72% of respondents (all adults) did not purify the water for children (five and under), it is no surprise diarrheal rates in bateyes have been estimated to be double the national average.[49] Owing to the limited funding of SESPAS plus cultural bias against the Haitian immigrants, interested NGOs may be the most realistic answer to educating this Haitian population.

Doña Maria's story recounted above is not remarkable and represents the watershed effects of failing to secure a birth certificate. To break the cycle of fear and withdraw, Haitian women should seek to give birth in clinics and hospitals in order to receive birth certificates for their children in order to ensure privileges of nationality for their children. When infants are born outside of these institutions, mothers and midwives should seek immediate recognition of the live birth and claim citizenship under jus soli.

J. Community interface

SESPAS can learn another important lesson from Cuba's public health system: how to community educate and advertise. Whiteford and Branch note the obvious advantage Cuba has in this realm; since most forms of media are state controlled, Cuba doesn't have to compete with private agencies for space, and can arrange the right price[14]. While such is not the case on Hispaniola, a public education campaign informing the public on issues from wearing seatbelts and anti-tobacco messages to daily recommended exercise promotions and not letting children play in stagnant water (for the rural areas). Many businesses choose to use their walls or walls of

[49] Yanguela, Argelia 1999 Bateyes del Estado: Encuesta Socioeconomica y de Salud de la poblacion materno-infantil de los Bateyes Agricolas del CEA. Santo Domingo.

other buildings as advertising space. This technique can be employed for public health/service messages.

Beyond media campaigns, one important tool that every government counts on is the public school curriculum. By weaving health and hygiene units into the educational program of Dominican youth, starting in primary school, public health officials can engage young people at an impressionable period of their lives and bring about lasting change. In public health, there is no silver bullet. Change occurs slowly as attitudes change. The best way to change attitudes is a multi-pronged approach of teaching sanitation like hand washing after toileting, then teaching hand washing before preparing meals and before enjoying them. Then it is contingent upon the government to ensure satisfactory water supply quality. The figure below illustrates the points of contact upon which public health and education professionals need to focus their campaigns and teaching goals.

Part IV: The Synthesis

In a world of limited resources, the best outcomes often carry the highest price and are simply not within the scope of the system. Such is the case in the Dominican Republic. Given the reality of limited resources and therefore limited medication, medical supplies and even limited personnel, optimal health outcomes can only come by eliminating as much as possible preventable disease and concentrating funds in other areas. Only through the marriage of public health and medicine can first-world health outcomes be managed at a sustainable price. Education is the keystone in the gateway of good health.

K. The national level

Importantly, good health is a product of good governance. SESPAS has an important role to play in cultivating good health. First, it should review the most significant challenges in each province and set goals for improvement. It should then offer incentives and penalties for success and breaches in minimum standards. An independent agency should audit public hospitals and clinics. Secondly, SESPAS should bring NGOs into the DR and subsidize material costs of building improved sanitation facilities. It should also subsidize the cost of water storage containers for patients that report diarrheal infections.

L. The provincial level

Provincial governments should set goals with local governments and follow up quarterly. The provincial government will also give rewards and penalties for accomplishing objectives.

M. The local level

Physicians need to be educated not only about treatment of disease but also about prevention of disease. The government and medical schools should jointly ensure medical students have public health integrated into their medical education. Emphasis on preventing chronic diseases should be made and the physicians role as a counselor of health. Medical schools should also set aside a certain number of seats each year to doctors who are committed to rural medicine. It is recommended the government subsidize medical education to doctors willing to commit to a certain number of years in public rural clinics. Additionally, public health physicians should be employed by SESPAS to offer training to rural physicians in rural settings.

In these rural clinics, there should be a health counselor on staff to advise referred patients about water purification techniques, healthy diet, the importance of exercise in daily life, and disease prevention. Clinics or nearby pharmacies should offer water storage containers at

discounted prices so as to ensure availability. Moreover clinic counselors should set health goals and follow up with patients regularly to check on their progress in improving/maintaining good health.

Public health also has a role to play in public education. As part of students' curriculum, students should have a health unit in which a teaching savvy public health official tours at different schools and teaches students about various topics in public health. Hand washing, water and food-borne illness, proper sanitation, etc. are all themes appropriate to the health unit.

In conclusion, when considering an effective model of health care in rural settings, one might mistakenly suppose a barrier between the village and the city exists or that urban centers will not take part in the discussion. Nothing can be further from the truth. Rather, quality health care in rural settings is a reflection of the political will, often from the capital, to make it happen. This is what Wakerman calls a "visionary political leadership".[50] Australia serves as a good example of a country with thirty-three percent of the populace in areas defined as rural and whose government has organized an infrastructure to support a disperse network of physicians.

The first step of improving rural health is in carrying out a comprehensive needs assessment. This is what I have done, to the extent available—through statistics and published journal articles. However, the rural countryside would benefit from a more tailored needs assessment, similar to the one realized by Allen et. al.[51] In their 2007 publication on rural health in Australia, the researchers interviewed both relevant health care professionals and community

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[50] Walkerman, J., Humphreys, J., Wells, R., Kuipers, P., & Jones, J. (2009). Features of effective primary health care models in rural and remote Australia: a case-study analysis. *Medical Journal of Australia, 199*(2), 88-91.

[51] Allan, J., Ball, P., & Alston, M. (2007). Developing sustainable models of rural health care: a community development approach. *Rural and Remote Health, 7*(818), 1-13. http://azilliad.library.arizona.edu/illiad/pdf/778885.pdf.

members about the health care strengths and weaknesses. While hiring independent researchers to carry out this function may be an undue burden upon the resources of SESPAS, replacing this responsibility with a less critical function of a qualified SESPAS employee is within the scope of real-world options. Such a needs assessment falls closely within the current strategic agenda item of organizing and structuring. One of the ubiquitous problems that all nations will significant rural populations have is finding enough physicians to relocate to the hinterlands. Finding enough doctors is difficult and medical training itself is expensive in time and resources. In these settings, an efficient health model, one that meets both costs and needs, will diversify the scope of practice among health care professions by subsidizing training opportunities relevant to rural practice. Moreover, health care technologies will be more comprehensive in these regional centers furthering the physician's scope of practice.

The Cuban health system shares many of the same characteristics and challenges as the Dominican system. Both are island nations with a Latino cultural heritage and limited resources to distribute to its people. Both governments have decided to make health care a service provided to all; although each country has gone about delivering it differently. Notwithstanding, many important health indicators are markedly different between the two nations.

Rural communities will differ significantly according to the size of the town, its proximity to cities, borders, the climate and the culture of the community. A strong health model will receive community feedback and information/statistics to better meet the needs of the community. Austrailia's rural health model demonstrates this principle in action.

Effective health policy cannot be achieved without incorporating the many players of the health care system into policy making. Rather than continuing the undue influence of lobbying

from wealthy interest groups, SESPAS needs to bring patient representative groups into the policy making process, reflecting the Dutch neo-corporatist model. In this model, special interest groups ranging from disease-specific associations to more encompassing federations of associations will invited or selected to give input when health policy is being considered. SESPAS will invite agencies that have close relevance to the issue under consideration and receive input from the as to effective policies and the needs of the people. Only by receiving much feedback can government policy most effectively help the people.