ABSTRACT

HEALTHCARE USE PATTERNS IN DOMINICA: ETHNOMEDICAL INTEGRATION IN AN ERA OF BIOMEDICINE

by Seann Dinnon Regan

The power and influence of globalization and the worldwide dominance of biomedicine profoundly impact ethnomedical practices throughout the world. However, ethnomedicine still plays a prominent role in providing medical care to many people. In Dominica, widespread ethnomedical knowledge and traditional plant use as well as a biomedical healthcare system with inadequate infrastructure combine to create a situation of medical decision making. This research investigates how Dominicans make healthcare use decisions and seeks to better understand the state of medicine in Dominica. The results of this research reveal a complex blend of medical practices in the everyday lives of Dominicans and support the notion that biomedicine and national healthcare campaigns could benefit from greater collaboration, understanding, and integration with ethnomedicine.
HEALTHCARE USE PATTERNS IN DOMINICA: ETHNOMEDICAL INTEGRATION IN AN ERA OF BIOMEDICINE

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DEFINITIONS OF KEY TERMS

**Biomedicine**: medicine and medical practice based upon biological agents and the germ theory of disease. Many types of disease are caused by infectious agents and microorganisms, and treated with chemical agents. The terms Western medicine, modern medicine, and biomedicine are often used synonymously, but the term Western medicine is more problematic because influences on biomedicine come from a variety of regional sources. Framing the discussion in these terms creates unwanted power relationships between either Western, and non-Western, or between modern, and old. Many medical practitioners of biomedicine consider alternative systems of thought as ‘old’ or ‘backward’. The inaccuracies and power relations that words such as Western and modern carry with them are problematic. In an attempt to move away from this type of framing, the term biomedicine is used throughout this thesis, except when quoting other authors that prefer different terms (Lindenbaum, & Lock 1993).

**Ethnomedicine**: traditional medicines, especially those of which the knowledge and practices have been orally transmitted over generations and centuries of time (Acharya, 2008). Ethnomedicine in this thesis refers to traditional Dominican medicine, as practiced and passed down through generations. It is knowledge of both African origin, and Amerindian origin. Although blended across the island. Bush medicine, backyard medicine, and traditional medicine are alternative terms for ethnomedicine, but will only be used when quoting other authors that prefer these terms. Bush medicine is also used when interviewing Dominicans unfamiliar with the term ethnomedicine.

**Etiology**: the science that deals with the causes or origin of disease, and the factors which produce or predispose a person toward a certain disease or disorder (Merriam-Webster, 2010).

**Humoral Theory**: a theory of how the body operates. Under this theory the body is divided into domains, or humors. These humors are often referred to as those described by the ancient Greeks as black bile, yellow bile, phlegm, and blood, however in Dominican ethnomedicine these humors can be described as hot, cold, stomach, and external. (Quinlan, 2004). According to humoral theory, the four humors need to be in balance to be healthy, an excess or deficit in one of them is what causes disease.

**Kalinago/Carib**: the Amerindian people who originally traveled up from the north coast of South America centuries before Columbus and still occupy a contiguous territory on the northeast coast of Dominica. The Kalinago influence on Dominican ethnomedicine is an important component of this research. Medical knowledge form Kalinago peoples and practices have been adopted into a broader part of the Dominican medical system (Honychurch, 1994)

**Medical pluralism**: characterizes a condition in which different traditions of medical practice, including biomedicine and ethnomedicine, are used within a society at the same time. Although it is seldom noted, people throughout the world combine medical practices from different
systems. This can be traditional Chinese medicine and biomedical practice in the United States, or ethnomedical practice and biomedicine in Dominica. This blending is more prominent and obvious where people still rely heavily on ethnomedicine, as is the case in Dominica.

**Pathophysiology:** a process of biological and chemical interactions with cells of the human body that result in the physical symptoms of disease; the alteration of cells, organs, or bodily tissues that results in a disease. Pathophysiology is the biological understanding of disease within the human body from which biomedicine is based (Merriam-Webster, 2010).

**Pan American Health Organization (PAHO):** an international public health agency working with issues pertaining human health and living standards of the people of the Americas. This international organization is part of the United Nations, and is the main group from which public health data are obtained throughout the Caribbean region.

**World Health Organization (WHO):** a group within the United Nations (UN) that acts as the coordinating authority on international public health (WHO, 2010). The World Health Organization is the primary global organization in public health, and it provides global healthcare ideas and policies. It is from WHO publications, meetings, and decisions that global health standards are set, these decisions determine foreign aid that will ultimately go to developing and improving public health infrastructure in countries such as Dominica.
CHAPTER 1
INTRODUCTION

The Commonwealth of Dominica is an island nation with a history of conquest and colonization. This complex history has been instrumental in the creation of a unique relationship between the people and the land. Harsh colonization, as well as the country's limited infrastructure and mountainous topography, have forced people to create highly localized medical practices emphasizing self sufficiency (Honychurch, 1994). Due to historical, cultural, and environmental factors, a complex system of medical pluralism has been created. Pluralism is used here to describe the competing and overlapping medical systems present in Dominica. There is no single medical system in practice, but rather an integration of biomedical and ethnomedical. People blend knowledge passed down from African practices, Indigenous Kalinago/Carib rituals, and the relatively recent influx of biomedicine. Local ethnomedical knowledge has been adopted from various traditions and it is not static, rather it continues to develop and transform. Individuals may primarily use biomedicine, ethnomedicine, or some combination of the two in different proportions. In this context, the research seeks to answer three primary questions: How are ethnomedicine and biomedicine currently conceptualized and understood? What sociocultural factors relate to the preference and utilization of ethnomedicine versus biomedicine? What are the issues of access to both biomedicine and ethnomedicine and how do these issues impact medical use?

Dominica is a member of the Lesser Antilles located in the Eastern Caribbean (Figure 3-1). It is the only Caribbean island with a formally recognized native territory. The 3,000 acre territory was officially established in 1903, although it is estimated that different groups of Amerindian people have lived here for several thousand years. The Kalinago's continual occupation of this territory has allowed for a strong influence of Amerindian tradition on the wider Dominican culture, with profound impact upon medical practice and knowledge. The transfer of knowledge of medicinal plants from the Kalinago population to the wider population is particularly important. This research focuses on the use of ethnomedicine across the island. The medical systems that Dominicans use incorporate Kalinago and African ethnomedical knowledge into one system, alongside biomedical practice. This research focuses on individuals
from both Afro-Caribbean and Kalinago heritage, and their understandings and uses of ethnomedicine and biomedicine and how these two medical systems are used. Similar to the blending of ethnomedical practice between African and Kalinago peoples, individuals blend the practice of ethnomedicine and biomedicine. Many Afro-Caribbean Dominicans have some Kalinago heritage, and many Kalinago have some Afro-Caribbean heritage. This blending of cultures has resulted in a pluralistic medical system that provides Dominicans with an extraordinarily high level of vibrancy in an era a biomedical dominance.

Dominica boasts having the highest per capita number of centenarians on the planet. Despite some of this being overzealous national pride, a formal international survey done in 2007 found a proportionally very high incidence of centenarians in Dominica. The same survey found perhaps the world’s oldest women, the late Elizabeth (Ma Pampo) Israel who passed away at the reported age of 128 (Ministry of Health, personal communication). Average life expectancy is also very high. Life expectancy at birth in 2001 was 75.33 years (Males: 72.39; Females: 78.41), which rivals that of the most developed countries (Census, 2001). In a land that is so economically poor, life expectancy and vitality are among the world's best. The statistics for life expectancy are even more dramatic when considering average medical expenditure per person in Dominica is only a fraction of what most developed countries spend. This points to the need for more research into the economic spending required of a purely biomedical model, as opposed to an integrated health model emphasizing multiple forms of medicine, both biomedical and ethnomedical.

Research money worldwide, primarily investigates the pharmacology of how chemical compounds within ethnomedicine interact with biological cells inside the human body, however far less research examines the use practices of ethnomedicine amongst individuals. Often outside researchers extract valuable knowledge from local peoples, a practice sometimes labeled biopiracy. In contrast, the current research seeks to understand how Dominicans use their medicine, how medical knowledge is passed from one generation to the next, what are the issues of accessibility that inform medical use, and how do Dominicans blend an array of medical influences into one system. The complex medical system at work in Dominica as well as lifestyle contribute to the longevity enjoyed by Dominicans, and thus are worthy of continued study. This research examines the causal factors that lead people to choose one medical system or another,
how Dominicans weigh benefits between ethnomedicine and biomedicine, and the relative accessibility of these medical systems. This research seeks to expand knowledge of medical use behavior and give these understandings and findings back to the Dominican people via continued communication with those practicing medicine on the island.

Ethnomedicine in Dominica is almost exclusively a system of botanical knowledge used as an at home remedy in the place of pharmaceuticals. Ethnomedicine in Dominica is generally not knowledge derived from experts of botany (Western or traditional) but rather a common baseline knowledge of herbal remedies (Honychurch, 1994). Ethnomedicine in Dominica is structured with relatively few medical experts. Individuals do not consult a bush doctor, or shaman, but rather ethnomedical knowledge is passed down through generations and is practiced across the population. This baseline knowledge of a medical system is atypical amongst ethnomedical systems of the world. Generally ethnomedicine practiced with considerable power held by few experts. Dominican medicine is known across the population, and exists as a system of knowledge that empowers local people.

This research attempts to understand more fully the reasoning and individual decision making determining healthcare use and practices. A three pronged research design, employing GIS, interviews, and key informant knowledge, is used to gain a better understanding of how local people understand biomedicine versus ethnomedicine and how people navigate these complementary and competing healthcare systems. Biomedicine is sometimes used alongside ethnomedicine as in the case of emergency care. Knowing the limitations of ethnomedical treatments for impact trauma, some Dominicans have been known to combine pain medicine derived from local plants with modern casts and bone setting. In contrast, biomedical practitioners often express concern over issues of cross toxicity, and negative drug-drug interactions (Dr. Andrews, Princess Margaret Hospital, personal communication).

The World Health Organization (WHO) defines health as “a state of complete physical, mental and social well-being, not merely the absence of disease” (WHO, 1948). This definition can be interpreted in different ways. The meaning of complete well-being is deeply rooted in culture. Perceived sickness to someone with a desk job in the United States may be very different than the sickness a banana farmer feels in the rural Caribbean countryside. The experience of the
sufferer is rooted in a political, economic, and cultural space that cannot necessarily be understood with biomedical proof or lack thereof. As illustrated in research by Hahn (1995), illness varies extensively across cultures and setting. Disease is often oversimplified as being a product of situation and environmental conditions. The framing of disease within only one perspective of how the body functions leaves out the presence and impact of multiple definitions of disease, and the possibility of differing mental constructions of sickness (Farmer, 1999). What it means to be healthy cannot be understood fully without first understanding the social situation and how a culture constructs definitions of disease (Baer, Singer, & Susser, 1997). In order to understand how ethnomedicine and biomedicine are practiced in Dominica, it is essential to first comprehend the Dominican cultural situation.

In Dominica, Kalinago, African, and European cultures came together to form a complex set of healthcare beliefs, practices, and issues. From this history current issues of how individuals utilize medicine manifest themselves. Disease and understandings of health systems are deeply influenced by a continually changing situation. Cultural influences change and the relative prominence of these three systems is in constant flux. While the medical knowledge from African practices and Kalinago practices have been thoroughly integrated into essentially one ethnomedical system the manner in which people choose between this ethnomedicine and biomedicine continues to be modified. Medicine is only one component of a whole system of knowledge and a way of living that that may be at risk. One issue of concern is as outside influences impact the island, and culture changes, valuable ethnomedical knowledge systems may be at risk. In order to gain insights into how health is manifest on the ground, those informed by a biomedical perspective need to communicate with those operating within ethnomedical understandings to better grasp reasons behind healthcare use (Singer, 1996).

The data for this study were collected primarily over seven weeks in Dominica during the summer of 2009. I returned to Dominica in March of 2010 for some follow-up work, particularly to present preliminary research findings to a group of local experts and to get their feedback. Results from this fieldwork represent a window into the healthcare practices and understandings in Dominica. However this research cannot tell the whole story of Dominican healthcare practices due to a small sample size of twenty-nine interviewees, and five key informants, and due to the relatively short duration of fieldwork. More modestly, the research aims to add
insights to the ongoing conversation about medical use practice in Dominica, and to suggest ways that healthcare professionals can learn more about competing and complementary healthcare systems. This research calls for more in-depth analysis of healthcare practices, and does not intend to extrapolate data to that of the entire population. Nonetheless, this research provides some important insights into issues of access, cultural barriers, and demographic indicators, and ideas for further research extending from this work are presented in conclusion.
CHAPTER 2
LITERATURE REVIEW

*Perspectives from Medical Geography, Anthropology, and Spatial Epidemiology*

This research draws on several academic fields to create a comprehensive investigation of healthcare access, medical use, and perspectives of medicine in Dominica. Ideas from geography as well as anthropology and epidemiology all contribute and add vigor to the research design. This research adopts techniques from the spatial perspective of medical geography focusing on ideas of diffusion and accessibility as well as qualitative techniques and concepts from health geography. In addition to geography and epidemiology, concepts and literature from anthropology are also central to this research. Scholars working in anthropology and the sub-discipline of medical anthropology pursue a significant portion of ethnomedical research. The current research links these often separate fields and thereby helps to fill a gap in the literature where spatial access can be informed by cultural perspectives on disease. Issues relating to healthcare are often examined from either the biomedical sciences, or social sciences. There is a need to begin to link ideas from these two fields; the current research into medical use practices in Dominica attempts this type of synergy (Mayer, 1994).

This study examines issues of culture, accessibility, and demographic variables, and how these correspond to medical use behavior. Modern social anthropologists have shed light on medicine as a cultural construction, emphasizing the importance and primacy of differing conceptualizations of health (Singer & Baer, 2007; Baer, 2004; Kleinman, 1980; Bastien, 1992). Much research has focused on populations that have migrated to Western nations. These populations often bring cultural understandings from their homelands that influence their conceptual framing of medicine in their newly adopted countries (Poss, 1998) These studies have shown how perceptions and understandings of disease can impact not only what medicines are used, but also etiology, pathophysiology, and the course of disease itself (Mitchell, 2001). Studies of ethnomedicine as practiced historically or by indigenous people are common in the literature (Acharya 2008; Balee, 2000; De Los Angeles et al., 2003). More work needs to be done on the linkages between ethnomedicine and biomedicine, and how these two systems can be further developed, understood, and integrated, to improve human health (Baer, 2001).
Current work in healthcare use and access is occasionally rooted in the sub-field of medical geography. This broad and often poorly defined discipline, ranging from disease ecology to critical health geography, forms the foundation for much of the spatial understandings of health. Medical geography generated many revolutionary tools that furthered the understandings into how health and disease varied across space. Medical geography was the first to develop geographic information systems (GIS). The first GIS were developed by Jonathan Snow in New York City to better understand how the environment had a significant role on public’s health (Meade, Florin, & Gesler, 1988). His initial study examined water sanitation issues and improper sewage disposal which was found to cause outbreaks of cholera. Before his analysis little was known about the linkages between sanitation and disease outbreaks. Research done within the discipline has focused on a scientific framework of direct cause and effect, with biomedical science and germ theory often being held as the only model on which to base study design (Bennett, 2005). However, researchers in anthropology as well as some medical physicians have judged this understanding of disease as a direct cause/effect relationship between host and infection to be incomplete. New perspectives were sought to investigate the cultural influences upon health and disease (Farmer, 1999; Hahn, 1995; Kleinman, 1980).

Interest in a more complete understanding of disease ecology, emphasizing not only bioscience, but also cultural factors, has grown recently. This is a response, at least in part, to the emergence of antibiotic resistance and poorly managed healthcare campaigns across the globe (Garrett, 1994). Poorly managed healthcare campaigns such as those leading to reemerging disease, and to microbial resistance, are not necessarily due to a specific lack of biomedical expertise. They are often due to inadequate understanding of cultural frameworks, and of how individuals on the ground understand disease (Kleinman, 1980). Individuals conceptualize disease differently depending on their culture and this impacts the use or misuse medicine. Backlash towards a strict biomedical model also came out of the social sciences. One claim is that spatial epidemiology and medical geography need to incorporate cultural sensitivity in the underlying theoretical framework (Kearns and Moon, 2002).

There are three representations of healthcare systems according to Kleinman’s pivotal work *Patients and Healers in the Context of Culture*. These three representations of healthcare are the professional, the traditional, and the popular. Kleinman uses traditional where I have
adopted the term ethnomedical for reasons stated earlier. Nonetheless Kleinman's three way conceptualization of healthcare greatly informs the current study. It forms the central framework for understanding differing medical practices in this research. The professional representation of health is the healthcare system organized and empowered by the state. Some research sees this as a problematic arrangement as medicine can be used as a means of coercion and a tool of suppression (Foucault, 1980). Biomedicine is the system that has been adopted by most national healthcare campaigns, and is effectively the professional healthcare sector around the world. Biomedicine also represents the more heavily commodified type of medicine, as biomedicine continues to be increasingly commodified, providing health to people has become more and more expensive.

According to Kleinman traditional medical systems of the world are those that are tied to ancient populations and rituals. However they continue to represent an important reality of healthcare today across both developed and developing nations. These traditional systems have fundamentally changed throughout the years, often incorporating biomedicine alongside traditional/ethnomedical knowledge (Kleinman, 1980). According to this framework, biomedicine was originally no different than ethnomedical practice. What separates biomedicine is its acceptance by the professional sector causing it to become dominant in the world system (Singer and Baer, 2007)

The popular healthcare system is the most important, yet the least studied. The popular medical sector is how people actually enact the other sectors (traditional and professional) of the healthcare system by choosing to go to a biomedical clinic or to seek other means of care (Kleinman, 1980). Popular medicine is how medicine is actually used and understood by individuals in their everyday lives. Where Kleinman uses the term popular, the current study uses the term medical pluralism to discuss the blending of medical practices and the decision making that goes on between traditional/ethnomedicine and professional/biomedicine.

This study is most concerned with the manifestation of popular medicine or medical pluralism in Dominica. Kleinman (1980) argues under his three pronged framework that it is individual people who ultimately make the decisions to use medicine. Foucault (1980), while not responding directly to Kleinman, critiques the professional medical system by claiming it can separate individuals from medical knowledge. This professional medical system ultimately gives
additional power to government entities and takes it away from individuals. Contrary to Foucault’s concern over medical power, Kleinman argues that it is still the people that chose to enact or empower a healthcare system. Individuals make use decisions between traditional, and professional medicine, these use decisions make up what is popular medicine, and represent medical reality. While these choices may be impacted by dominant political forces and social situation, Kleinman stills sees individuals as having a large degree of agency in how they enact medical knowledge.

Studies into healthcare practices typically take one of two approaches. These approaches are looking at healthcare practices etically, that is from an outsider’s perspective, or emically, attempting to view health as the study population does. There has been much debate on the subject of how to properly look at medical framing from inside of a group to which researchers do not belong, but this is the perspective that many geographers and anthropologists take to better understand cultural aspects of healthcare (Kleinman, 1980). With this limitation acknowledged, this thesis will attempt to access an insider perspective. In order to understand medicine as used and understood, this research interviews experts in biomedicine and ethnomedicine. Interviews with those practicing both forms of medicine, along with participant observation and home stays, provides a platform for in-depth understanding of medical use behavior and conceptualization.

Access to Healthcare

Diffusion is a central theme to much of geographic thought. When studying the spatial nature of healthcare, two types of diffusion are widely accepted: the diffusion of ideas, technologies, and practices, and the diffusion of infectious microbes, diseases, and bacteria (May, 1958). Diffusion is an idea used in my research into medical use practices in Dominica. Healthcare access and how individuals obtain medical services and knowledge impacts use behavior. Issues of disease transmission are not the subject of study, but inherently impact medical use practices. Past research into medical accessibility has helped frame the current study to incorporate interviewees from a broad geographic range. Cultural influences that are highly local have been shown to alter individual’s healthcare practices significantly (Meade & Gesler, 1988).
In a 2007 study done in northern England investigating causal factors of disease, location was shown to impact medical use behavior. There was an inverse relationship between proximity to healthy food, and the likelihood of obesity and subsequent health concerns. Individuals within certain neighborhoods formed different understandings of what was appropriate for good health. Interestingly, attitudes towards health were a major causal factor in disease prevalence. Individual ideas of what constitute healthy living and lifestyle are shown to be related to increases in mortality (Moon et al., 2007). One region’s conceptualization of health AND what is a healthy lifestyle was vastly different from another’s. The framing of diet and lifestyle practices led to different rates of obesity. Culture itself was shown to impact longevity (Moon et al., 2007). In the Dominican context culture and medical use seem to be profoundly impacted by regional identity. Location analysis of clinics is not enough to fully understand medial use patterns.

The structure of biomedical provisions is often critiqued on grounds of inaccessibility. In developing nations access is perhaps the most studied factor when discussing medicine (Adams & Hawkins, 2007; May 1958). Less often studied is the fact that this access may be more than simply geographical, but cultural and ideological as well. Dominicans constantly choose between biomedicine and ethnomedicine. This research focuses on the decision making between the two systems, and how access may impact this decision making. A more complete understanding of medical decision making can help to inform the issues of accessibility to medicine.

In Papua New Guinea, Mueller et al. (2001) investigated the spatial patterns of child growth in relation to several sociodemographic factors. They used spatial statistics and risk assessment amongst their techniques, but of more interest to the current study was how they incorporated existing data to support their findings, this technique was used in the current research. The New Guinea study used interviews but only was able to gain data from a small portion of the population. They supported this with a longer duration and wider scale study done by the government. The in-depth study was combined with datasets and calendars published by the earlier government study to see relationships between their study and the broader picture (Mueller et. al, 2001). This study emphasized causal links between health, traditional medicine, and the accessibility to healthy food. Children who had poor access to food were shown to have significantly stunted growth (Mueller et. al, 2001). Long duration data obtained from the
Mayer (1979) also focused on issues of accessibility. He examined the spatial relationships of cardiac arrest in the Seattle metropolitan area and found that ambulance response time, location within the city, and proximity to hospitals, were all factors contributing to myocardial infarction (heart attack). This initial study was done under a biomedical framework that paid little attention to how individuals frame disease. Follow-up research was done on patient behavior, and the research discovered that the reliability and tendency of heart attack victim to report the event varied depending on his/her own interpretation of what a heart attack was (Mayer, 1979). Research that incorporated interview location showed that these individual perspectives changed by geographic region, indicating strong local sub-cultures (Mayer, 1979). The follow-up research of the interviewees was able to inform the epidemiological model. This current research pursued in Dominica uses the tools of Geographical Information Sciences, as well as qualitative interview data, to understand people’s perceptions and behaviors in regards to healthcare use. The research relates the influence of geographic space upon healthcare access to that of data obtained from interviews discussing personal decision making.

Research being pursued on healthcare access and disease prevalence, such as Mayer’s (2000) study, is increasingly using GIS. Geographical Information Sciences have gained much support and have grown into an essential tool used within the medical field. GIS’s ability to manage spatial data has made it a common component to epidemiological research, with a majority of the work being done within developed nations with large budgets. Research examining healthcare access in developing countries does continue to grow. Much of this GIS oriented research involves straight line analysis, or oversimplified suitability analysis, which emphasizes access, transportation, and infrastructure (Hellweger, 2002). For example, proximity to services has been shown to have a strong positive correlation to whether or not females could acquire contraception source (Edsall, 2003). However accessibility and availability were not shown to correlate with use practices, indicating strong cultural barriers to medical use as well (Heard, Larsen, and Hozumi, 2004). Often the research investigating medical use within a framework of accessibility and availability leaves out essential influences of culture and religion, a problem to which this research responds.
Conceptualization of Disease

Medical geography typically emphasizes disease or healthcare access, and typically underemphasizes use and conceptualization of use. Despite this research gap, the public health discipline has pointed to precisely the use and conceptualization of medicine as a central problem in healthcare campaigns and an area requiring more research (Garrett, 1994). In Peru, during the effort to eradicate tuberculosis, local understanding of antibiotics was limited and not properly explained by health professionals. This caused individuals to misuse the drugs prescribed to them. In the Directly Observed Treatment Short-course (DOTS) campaign, drug resistant tuberculosis arose out of individual use/understanding of disease, and humans were effectively turned into Petri dishes for germs to grow more virulent and drug resistant (Garrett, 1994).

Medicine is too often thought of as parallel with laboratory science. Where laboratory science seeks truths and understanding out of controlled experiments, medicine in the real world must incorporate the human element. Disease itself is perceived differently across a variety of cultural groups, as Dominica illustrates. Different regions of the island have slightly different understandings and histories of medical use (Honychurch, 1994). By the late 1990s, work within the discipline of medical geography began to focus on the perceptions of disease landscapes. Disease was no longer thought of a simple object that had only a causal factor. It was interpreted by different people in different ways and thus manifested itself in multidimensional ways (Schaerstrom, 1999).

This research on Dominica attempts to understand the idiosyncrasies that arise in the way people understand healthcare. Differing individuals and groups view sickness differently. Kleinman (1980) pursued a study into how Chinese people view psychological disorders differently across generations. The younger generation, brought up in a time of biomedical prominence, placed psychological disorders within the realm of medical expertise. On the other hand, the older generation seemed to believe these ailments were outside of the medical system and should instead be dealt with by religious ceremonies involving meditation. The younger and more Westernized individuals believed the cure should be drug intervention, while older individuals believed in the power of mediation (Kleinman 1980). As this example illustrates, even in the same geographic space, the cultural attitudes towards medicine can be drastically different. This idea of age disparity is a central concept to the current research in Dominica. Many interviewees expressed concern that youth are disconnected from traditional knowledge.
Outside influences such as modern media and technology have been central to the island’s development over the last 50 or so years. Elders cite these outside influences as potentially harmful to knowledge systems including ethnomedical knowledge, and are concerned with the priorities of the youth.

In an attempt to gain further insight into how people actually use medicine, Vermeylen (2008) used a technique he termed the telling of life stories. He first used a more traditional method discussing views of commodification and economic values with the San people of Southern Africa. The plant discussed was the *Hoodia Gordonii*, which has appetite suppressant properties and tremendous economic value for use in diet pills. Vermeylen used a survey design in order to understand the perception of commodification by the San. The questions in the survey ranged from profit sharing agreements, to acknowledgement of the San’s pivotal role in development of medical drugs, to bio-piracy by outside groups. Not surprisingly the San people ranked a profit sharing agreement high. At first look it would seem as though so long as pharmaceutical companies paid for their services, the San people were content with an arrangement to use their plant knowledge. Follow-up research asked the interviewees to expand upon their beliefs by telling stories involving ethnomedicine and the picture was very different. When tribal members were asked to discuss the use of the Hoodia plant throughout their lives and reflect upon it, they identified using it as a sacred ritual, and no amount of economic value could be tied to it (Vermeylen, 2008). The initial survey design was rooted in capitalist oriented language and subject to a framework privileging economic return. This survey design only applied values to those things that would represent themselves economically, and not in other measures of value. This essentially left out those things deemed most important to the San. This understanding is important to the current work pursued in Dominica which encouraged participants to express medical practices that may not be commodified. The interview questions focus on more than the simple economic valuation of medicine.

Ethnomedicine in Dominica is not generally commodified, although it is valued for its health giving properties. In a world so driven by economic return it is often difficult to grasp different cultures interpretations of value. In an attempt to understand the knowledge of local ecological surroundings in southeastern Mexico, De Los Angeles et al. (2003) used a sophisticated ranking scale. This scale put values on morphological appearance, association, use,
and availability to better understand how traditional medical resources were valued apart from their economic value. The study emphasizes the importance of distance to plants as well as deeper spiritual and cultural uses of traditional medicine (De Los Angeles et. al, 2003). Both the study of the San and the study in Mexico were seeking to further understand traditional medical systems that are often not commodified and therefore poorly understood under economic valuation. Both of these studies served to inform the questions I asked Dominicans in regards to medical use, and perspectives of medicine.

A study into popular medical practices in Jamaica noted that over the counter (OTC) medicines, when combined with traditional popular medicine, complicated the healthcare system. Jamaicans applied understanding of ethnomedicine to OTC medicine; this resulted in many individuals not fully using biomedicine correctly (Glade and Reilly, 1993). The Jamaican case was similar to the abysmal failure of the Peruvian DOTS campaign, leading to outbreaks of resistant *Mycobacterium tuberculosis*. Whereas typical antibiotic therapy is doled out in a specific amount with specific time duration, bush medicine is often taken until one feels better. This disjoint between differing healthcare practices has contributed to the need for continued rounds of antibiotic therapy leading to microbial resistance in TB effects areas (Garrett, 1994). Central to the Jamaican study were the tendencies to apply traditional conceptualizations of healthcare procedures to biomedicine even after they had immigrated to the United States. Understanding the different conceptualizations of what constitutes medicine should impact how healthcare provisions are administered. Healthcare should not simply be making medicine available, but also understanding the local context in which the medicine is consumed (Glade and Reilly, 1993).

Decision making processes behind medical treatments are complex and historically structured (Kleinman, 1980). Ethnobotanical literature abounds with issues of indigenous rights and knowledge as a means of development. Much of this work involves specific plants and pharmacologically active cures (Costa-Neto, 2002). Less attention has been paid to larger scale use patterns of biomedicine versus ethnomedicine around the world, and even less so in the Eastern Caribbean. One of the most recent and informative studies of ethnomedicine in Dominica is Marsha Quinlan’s work done in a east coast village given the alias Bwa Mawego (Quinlan, 2004). Her work uses a long duration anthropological approach to ethnomedical
practices. She stresses that much of the ethnomedicine used itself is not what is unique. The use and ownership of medical knowledge, as well as how medical knowledge is transferred, is essential. How residents of Bwa Mawego use medicine, and conceptualize disease is the main subject of inquiry. The fundamental chemicals used for healing from a pharmacological perspective are often the same components in ethnomedicine as in biomedicine. What is perhaps unique to Dominica is the widespread use and knowledge of these medicines. Quinlan (2004) discusses some issues of the biomedical/ethnomedical reasoning by Bwa Mawegan individuals that go on in their village, but that can also be related to the wider Dominican people. Her research emphasizes concerns around public health that may arise when the two intersect. The logic of humors, such as “hot, cold, or neutral,” is used in the ethnomedical system of Bwa Mawego. These can be used and translated into biomedical cures. This research examines how people decide between ethnomedicine and biomedicine, how the differing conceptualizations and logic systems are blended, and how these differ across geographic space.
CHAPTER 3
DOMINICA: COUNTRY BACKGROUND

Historical Context

Dominica is the Northernmost Island of the Windward Islands in the Eastern Caribbean, and is a part of the Lesser Antillean Group (Figure 3-1). Its rugged topography, unique culture, and relative lack of outside development have created a place that in many respects maintains practices extending back hundreds of years. The native Kalinago name for Dominica is Wai’tu kubuli, meaning “tall is her body”, emphasizing the island’s extreme elevation, and rugged terrain. When the Spanish monarchy asked Christopher Columbus to describe Dominica he allegedly crumbled a piece of paper and threw it onto the table (Honychurch, 1994). Dominica was famously described by Dr. John Imray after his arrival in 1832 as “a dark, irregular mass of lofty mountains rising abruptly form the ocean, as if suddenly upheaved from the deep by some mighty convulsion of nature” (Clyde, 1980 pg. xi). The rough interior topography continues to influence life on the island to this day, making travel time consuming and challenging for many. While in many respects the island is relatively underdeveloped, the influence of forces from the outside should not be understated. Increased urbanization, dietary change, and lifestyle shifts are having profound impacts on many aspects of life. Equal to its physical landscape, Dominica’s human history has impacted medical use.
Arawak Indians were originally thought to have traveled up from central South America to the Caribbean Islands around 200 A.D. They were subsequently wiped out by a second wave of Arawaks around 1000 A.D. This second wave eventually became known as the Carib, or in Dominica, the Kalinago Indians. While the Carib term linguistically refers to cannibal, there is no evidence that the Carib/Kalinago were cannibals and this misnomer was perhaps due to a false interpretation of bones found surrounding Carib/Kalinago homes. Bones found outside the entrances to settlements may have been used as tools or as mourning rituals (Honychurch, 1994). While the rumors have been proven false, there may be no better justification for Christianizing a people than to find them practicing cannibalism. This line of thinking led many to support the colonization, and exploitation of the West Indian Islands.

Despite the rough terrain on Dominica, colonizers saw great economic potential. Plantation owners brought African slaves to work on cash crops primarily in the relatively flat areas close to the coast, from the 1600s until emancipation in 1834. Descendants of these African slaves represent the majority of the Dominican people today. Africans brought ethnomedical
beliefs and knowledge with them and incorporated these beliefs alongside Kalinago knowledge. The knowledge systems and practices of the Kalinago people are a major contributor to medical knowledge across the whole of Dominica today (Figure 3-2). Africans looking to escape slavery or persecution took refuge in the mountainous interior of Dominica. These early runaways called maroons became a part of an inter-Caribbean trading network that operated alongside European rule. Maroon traders were the epitome of self-sufficiency. Their escape from the slave plantations did not mean they were free from persecution once living in the island interior. There were centuries of struggle between different ethnic groups on the island, including between Kalinago and African peoples. Africans, Kalinago, and Europeans all lived within a finite space with finite resources and cultures were brought together. Although maroons were integrated with mainstream society after emancipation, the legacy of their self-sufficiency continues to resonate on the island and is an important element of rural medical practices today. Medical knowledge from African and Kalinago traditions has been combined alongside biomedicine into a pluralistic system of medical use. While there were certain periods of tremendous conflict between Europeans, Kalinago, and Africans, this history of cultural mixing was instrumental in the creation of the fascinating medical pluralism that is seen today.
Figure 3-2: Ethnomedicine for sale in Roseau

Ethnomedicine for sale in Roseau Dominica. This image represents ethnomedicine in a commodified form. Street side vendors like this one sell primarily to locals. Medicine is prepackaged, marked, and ready for sale costing between ten and fifteen EC, or approximately 3-5 USD. Only three blocks closer to the cruise dock, Ruins, a spice shop catering to tourists, sells herbs that sell for three times as much.

Photo by the author

Ethnomedicine

The period prior to colonization laid the groundwork for a strong local knowledge of medicinal plants. Unlike most of the other Caribbean Islands, Dominica has a native Amerindian population of Kalinago. The Kaliango survived colonialism and continue to eke out a living in relatively large numbers. Dominica is the only island of the West Indies to have an officially recognized native territory (Figure 3-3). The territory, located in the northeastern part of the
island has profound influence on local plant knowledge and medical use island wide. The knowledge of plant life from South America is especially prominent because important plant species were brought up the island chain with the Kalinago. Many plant species throughout the West Indies are similar to those found in South America (Honychurch, 1994).

Colonizers from England, France, and Spain all had influences upon the island as well. The French and British forces fought back and forth for control over the land with the French eventually succeeding to the British under the Treaty of Paris in 1783. While Britain officially owned the land there continued to be a few skirmishes until the early 1800s. The fighting back and forth between the British and the French occurred alongside an interior population of maroons and a Kalinago population that continued to use ethnomedical treatments. The colonial powers also left understandings of medicine behind. Germ theory had not yet become widespread, and biomedicine was not yet the dominant medical system. During the 1800s French and British medicine was informed by differing interpretations of humoral theory. These ideas left behind practices from both British and French practitioners. Uses of plants across the Caribbean islands are slightly different depending upon outside influence. A concoction for one aliment on a former British colony may be different from one on a former French or Dutch colony (Honychurch, 1994).

The imperial medical systems of both French and British doctors were imported to the island, but with so much conflict back and forth, as well as a strong desire of slaves to rebel against colonial medicine, ethnomedicine continued to thrive. Colonial doctors operated in an elite fraternity and prescribed treatments such as vomiting and bloodletting with little accountability, amplifying the hesitation to integrate outside medical practices (Clyde, 1980). A recent influx of two groups of immigrants has also had an influence on ethnomedical practice. Around 6000 Haitians now live in Dominica, and they have brought ethnomedical practices and beliefs. Chinese influence also continues to grow on the island. A large number of Chinese are now in the retail sector and Chinese herbs and remedies can be seen regularly throughout the shops in Roseau.
Colonial medicine

The practice of medicine in Dominica today can be traced back to the local Kalinago and African populations, but to colonial forces as well. The national healthcare system which was composed of primarily European physicians and professionals were in a constant state of flux throughout the period of colonization. Both English and French physicians worked on the island until the passing of the Act of 1784. This act was designed to increased English physician
accountability, but effectively forced French physicians from practicing medicine on the island. The underlying reasoning for this act was to ensure a higher proportion of British physicians to French, and to emphasize the supremacy of British medical thought. Clyde’s historical account of healthcare on Dominica notes how the British created rural clinics and a centralized medical center during the late 1800s. During this process of formulating a biomedical infrastructure, understandings of medicine were continually being reevaluated. British doctors began to bring new ideas of how disease spread into public health policy. Dominicans did not trust British doctors who represented a violent history of oppression (Clyde, 1980). New perspectives on what constitutes health were not always welcomed. The medical system the colonizers introduced was often a political machine used to further specific agendas. In Dominica, the passing of public health laws emphasized the superiority of British medicine over French medicine, but also sought to establish an efficient working population. Public health was a tool commonly used as a part of imperialism, and Dominica was no exception (Clyde, 1980).

British imperial medicine in its colonies was largely designed to ensure a productive resource in the form of a slave labor. The means of production were a top priority and the British medical system did not hide its reasoning. The mission of health officers was to maintain a populous that could efficiently produce crops in the harsh tropical climate. During this period crops from the West Indian islands were amongst the most valuable resources in the world. This extremely charged relationship caused harsh tension. Sick Dominicans would use ethnomedicine even when it was not effective rather than see a British or French physician. (Clyde, 1980).

Some of the first self proclaimed, but unofficial doctors to run public health campaigns on the island were those that could not find employment in their home country. They often deemed themselves fit to perform medical tasks if they had simply shadowed a physician for a few weeks. This overzealous medical practice created issues of trust between the population and biomedical practitioners. Thomas Atwood a prominent member of the British government’s healthcare system, was known to test various herbal remedies on his Dominican patients noting the effectiveness of cinchona bark, which had quinine for malarial abatement, and ipecacuanha which contained emetine used for the control of dysentery (Clyde, 1980). While some remedies proved effective his test subjects were the Dominican people and he paid little attention to possible negative effects. This kind of work would never get off the ground in today’s system of
medical malpractice and physician accountability, although we remember the relatively recent Tuskegee syphilis experiments.

During the 1930s healthcare access was still extremely limited due to poor road infrastructure. Dominican people needed to rely on local ethnomedicine. Highly local means of administering health was more a matter of necessity than preference. The national healthcare system moved from dispensaries, which were essentially drug cabinets located across the Island (which typically dealt with infections, such as helminthiasis) to health centers that were better equipped, in the 1930s. From the 1930s onward healthcare became managed more broadly and comprehensively across Dominica by trained biomedical professionals. The island was divided into regions that had rural outposts that would report to the central hospital, Princess Margaret which was built between 1953 and 1955 (Clyde, 1980). Access continued to be an issue for rural people until 1958 when a road finally connected the East and West Coasts. Even after the construction of this road it is still often quicker to get around the Island by boat, and roads often wash out and are unreliable.

Dominicans who were afraid of British medical practitioners frequently concealed disease. One notable disease that Dominicans attempted to conceal was Yaws. Yaws is a tropical infection of the skin caused by the *spirochete bacterium*, resulting in uncomfortable skin sores. The cure for Yaws is intramuscular penicillin, or antibiotics that are unavailable within ethnomedicine. Fear of colonial medicine and the widespread concealment of Yaws ironically pushed the British to the establishment of a municipal authority that would control sanitation, antibiotics, and public health. This series of events effectively put the charge of public health in the hands of the government, making it illegal not to consult with British medical practitioners. This illustration of the disjoint between the health professionals and citizens emphasizes the complex nature of medical practice in Dominica.

Population

Dominica has a population of approximately 69,625 individuals, with 35,073 males and 34,552 females. Dominica’s population is 88.8 percent African descent. The principal minority and central to ethnomedical knowledge are the 4,500 Kalinago Indians (PAHO, 2004). These population figures are changing as other ethnic groups move to the island for work. Large numbers of Chinese work on the island, and there are plans for a working community of 10,000
more. The large Haitian population that is active in agricultural production also continues to grow (Dr. Ricketts, Ministry of Health, personal communication). There are also marginal amounts of other ethnic groups.

While the Dominican population pyramid below shows rapid growth (Figure 3-4). This trend has been significantly offset by out-migration. Between 1990 and 2000 three to four thousand Dominicans migrated overseas, or approximately three to four hundred annually. During the same time period, annual births ranged between 1000 and 2000 (CEPAL, 2010). The population pyramid suggests a society with a large younger population. This leaves out the crucial component of out-migration that is common amongst Caribbean countries, and a process that typically involves young upwardly mobile individuals seeking opportunities abroad (CEPAL, 2010).

*Figure 3-4: Dominican population 2010*

![Dominica Population (2010)](image)

*Source: UN Development program*
There are dramatic inconsistencies between official macro level statistics and the ground level realities of living conditions in Dominica. Officially Dominica is plagued with persistent poverty. Census data classify 39 percent of Dominicans as poor, and 10 percent as indigent. Higher poverty is generally located in rural areas (Population and Housing Census, 2001). Unemployment in 2001 was at around 15 percent. While compelling, these statistics leave out important aspects of Dominican life. Dominica is economically poor, but much food and medicine is not commodified and is widely accessible. The system of local medicine and food allows even poor individuals to obtain basic needs.

Current health issues

According to many public health indicators Dominica is doing quite well. Communicable diseases are amongst the lowest in the Caribbean region, and life expectancy is high at 74.65 on the average. Compared with regional averages infectious diseases such as Dengue and Malaria are low (Census, 2001). A few outbreaks of waterborne illness such as Schistosomiasis have been recently reported but these are isolated events. HIV/AIDS prevalence is estimated to be around 1.5 percent, although there is some concern over true numbers as the national infrastructure does not have the capability to truly assess the situation (Dr. Ricketts, Ministry of Health, personal communication). Most of the current healthcare concerns are encompassed in the broad category associated with a fundamental lifestyle change. An area of primary concern is a rise in diseases associated with a change in dietary habits (Figure 3-5, 3-6, 3-7). Amongst these conditions, diabetes, hypertension, cardiovascular disease, and malnutrition, were singled out as the most concerning (PAHO, 2004). An international study done by the Pan American Health Organization found anemia to be a major problem, with 34 percent of Dominican children aged 1-4 suffering from the condition (PAHO, 2004). The same study found diabetes to be a major issue as it was the second most frequent reason for clinic visits. Cardiovascular disease, hypertension, and hypertension of the heart, were the three major causes of death since the 1990s (PAHO, 2004).

Dietary change has been cited as a major issue confronting Caribbean islands. Year after year the imports of food have increased. The main foodstuff being imported at an alarming rate is industrial broiler chicken. The consumption of meat has grown from a relatively uncommon part of the Caribbean diet to be the central protein component. Chicken consumption on the
nearby island of Barbados, is double that of per capita chicken consumption in the United States (Weis, 2003). Chicken was once a small portion of the diet, but has recently increased dramatically due to the low costs of production and transportation. Health experts worry that the increase in imported foods, high in saturated fats, salts, and sugars, are having deleterious effects on human health (Figure 3-5, 3-6, 3-7). The PAHO and the Caribbean Cooperation in Health (CCH) have both linked these dietary patterns to increases in obesity, heart disease, diabetes, high blood pressure, and stroke (Weis, 2003).

*Figure 3-5: Cases of diabetes in Dominica 1995 – 2006*

![Graph showing cases of diabetes from 1995 to 2006](image)

Data obtained from the Ministry of Health. Graph created by the author
Figure 3-6: Cases of malnutrition in Dominica 1995 – 2006

Data obtained from the Ministry of Health. Graph created by the author
**Figure 3-7: Cases of hypertension in Dominica 1995 – 2006**

![Graph of Hypertension cases from 1995 to 2006. The graph shows a linear trend with the equation $y = 15.28x - 30384$ and $R^2 = 0.475$.](image)

*Data obtained from the Ministry of Health. Graph created by the author*

**Current Structure of Biomedicine in Dominica**

The current biomedical healthcare system in Dominica is arranged in a hierarchical structure divided into seven health districts. These districts include Roseau, St Joseph, Grand bay, Portsmouth, Marigot, Castle Bruce, and La Plaine (Figure 3-8). Each of these seven health districts has its own health team. The main hospital in the Goodwill suburb of Roseau is the only location with secondary care and there is no tertiary care available in Dominica. Those in need of specialists or medical experts in neurology, oncology and other forms of tertiary care must find this off the island in other countries (Statistical Unit, Ministry of Health, personal...
communication). The National Health Informatics Unit and the Office of Epidemiology are also located in the main hospital where coordination between the health districts takes place. There are two district hospitals commonly referred to as cottage hospitals located in Portsmouth and Marigot, which serve as intermediaries between rural clinics and the main hospital. The total biomedical infrastructure consists of: 53 total offices, 45 local clinics, 7 regional offices, and the main Princess Margaret Hospital.
Figure 3-8: Health centers in Dominica

Within the seven health districts, there are three tiers of medical care. Tier three consists of small regional clinics, tier two consists of the district hospitals, and tier one the main hospital called Princess Margaret (Figure 3-9). Biomedicine is the primary perspective from which national healthcare campaigns are run. National healthcare campaigns are carried out in a hierarchical manner. Policy is created by the government, plans are designed at the Ministry of Health, and the central hospital executes campaigns which are then implemented throughout the second and third tier infrastructure. Biomedicine has begun to grow in influence even in the most remote regions of the island as the government recently passed laws requiring registered births. This has had the effect of bringing many people into contact and familiarity with biomedicine, although ethnomedicine remains a strong component of everyday life (Quinlan, 2004).
Figure 3-9: Three tiered structure of biomedicine in Dominica

Data obtained from the Ministry of Health. Map created by the author.
**Current Structure of Ethnomedicine in Dominica**

**Figure 3-10: Common ailments and ethnomedical treatments**

<table>
<thead>
<tr>
<th>Aliment</th>
<th>Latin Name</th>
<th>Common Name</th>
<th>Item used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache</td>
<td><em>Petiveria alliacea</em></td>
<td><em>kojouk</em></td>
<td>leaves</td>
</tr>
<tr>
<td>Cough</td>
<td><em>Hyptis pectinata</em></td>
<td><em>pachuri</em></td>
<td>plant stem</td>
</tr>
<tr>
<td></td>
<td><em>Pluchea carolinensis</em></td>
<td><em>tabak zombi</em></td>
<td>plant stem</td>
</tr>
<tr>
<td>Inflammation</td>
<td><em>Momordica charantia</em></td>
<td><em>koukouli</em></td>
<td>plant stem</td>
</tr>
<tr>
<td></td>
<td><em>Cocos nucifera</em></td>
<td>jelly coconut</td>
<td>endosperm/seed</td>
</tr>
<tr>
<td></td>
<td><em>Carica papaya</em></td>
<td><em>pawpaw</em></td>
<td>fruit</td>
</tr>
<tr>
<td>Stomachache</td>
<td><em>Zingiber officinale</em></td>
<td>ginger</td>
<td>rhizome</td>
</tr>
<tr>
<td></td>
<td><em>Psidium guajava</em></td>
<td>guava</td>
<td>leaves</td>
</tr>
<tr>
<td>Sprain</td>
<td><em>Pimenta racemosa</em></td>
<td>bay oil</td>
<td>oil</td>
</tr>
<tr>
<td></td>
<td><em>Boa constrictor oil</em></td>
<td>snake oil</td>
<td>oil</td>
</tr>
<tr>
<td></td>
<td><em>Cocos nucifera</em></td>
<td>coconut</td>
<td>oil</td>
</tr>
<tr>
<td>Cuts, sore</td>
<td><em>Cordyline terminalis</em></td>
<td><em>San dwagon, malivina</em></td>
<td>leaves</td>
</tr>
</tbody>
</table>

Abbreviated chart adapted from Quinlan (2004)

The medical system in Dominican is pluralistic. Ethnomedicine and biomedicine are combined and used by different people in different ways. There are not two distinct groups, one who uses ethnomedicine and one who uses biomedicine, most Dominicans use biomedicine and ethnomedicine in concurrence and the proportion of each varies between individuals. Although some use ethnomedicine almost solely, most interviewees still view biomedicine as a valuable option for catastrophic events such as massive trauma, broken limbs, or an illnesses not curable by ethnomedicine. The integration of ethnomedicine is locally variable in practice across the island, with different regions incorporating varying degrees of ethnomedicine into medical...
practice. While ethnomedicine is locally variable an instrumental study pursuing ethnomedicine in one Dominican village serves to paint a picture of how it is conceptualized across the island as a whole (Quinlan, 2004).

Quinlan (2004) takes a long duration anthropological approach to understanding ethnomedical use in a local context. Her work done in the village with the alias of Bwa Mawego, gives an essential foundation to how the body is understood in Dominican ethnomedicine. The body is understood in a fundamentally different way between Dominican ethnomedicine and biomedicine. Biomedicine is based on germ theory, microscopic infections, and genetics. Ethnomedicine in Dominica operates under the humoral theory of the body. The humoral interpretation was the dominant paradigm for interpreting disease prior to the advent of biomedicine, from Greek medicine, to colonial medicine, and is based on four body humors and the attempt to restore balance between these humors. Each of these medical lineages used humoral framing but in different ways. Ancient Greek humoral framing was based on black bile, yellow bile, phlegm, and blood and the balance of these four humors.

Dominican humoral framing is based upon creating balance between humors, but the ethnomedical tradition uses unique illness domains that resonate with Dominican medicine and culture (Figure-3-11). These domains are, “hot illnesses” “cold illnesses” “external illnesses” and “belly illnesses” (Quinlan, 2004). Dominicans often extend the concept of balance to all aspects of life. The idea of balance, and restoring balance was often brought up in interviewees I pursued. The categories of illness in humoral framing are in-part from derived from the aliment, and in-part derived from the cures used to treat them. For example those illnesses that are perceived to be cold are often cured with hot treatments (Quinlan, 2004). Examples of these illness categories can be seen in figure 3-11 adapted from Quinlan (2004).
Figure 3-11: Humoral framing in Dominican ethnomedicine

(Quinlan, 2004)
CHAPTER 4

METHODS

This thesis deploys ideas and concepts from epidemiology, anthropology, and geography, to create a well rounded investigation into issues of medical use and access in Dominica. Ideas from these three often separate fields are blended in an attempt to add rigor to the research design. This research uses quantitative interview data of medical use behavior, as well as qualitative data from interviews relating to medical preference. Transcribed quotes with key informants are also used to inform findings of interviews with medical users. Expert opinions from those within both the biomedical and ethnomedical communities add insight into medical use practice across the population. Linking these two separate research methods creates a study which examines actual use practices, and informs these results with knowledgeable expert opinions. Due to a relatively small sample size of twenty-nine interviews from which statistical analysis is done, data from key informants and secondary sources enhance the findings in myriad ways. Using expert interviews allowed for better understanding of the use behavior across the wider Dominican population, and secondary data from the Ministry of Health helped explain current disease trends. In order to gain real insights to the lived experience on the ground, long duration interviews were also used in order to probe deeper into understanding issues of medical decision making.

Ethnomedical knowledge throughout the world has been aggressively studied and subsequently commodified into pharmaceutical treatments. This process effectively moves ethnomedical knowledge into the realm of biomedicine. As commercialization of ethnomedicine increases it often places more emphasis on biomedical infrastructures to provide medicines to people around the world, and less upon local modes of delivery (Vermeylen, 2008). When biomedical prominence increases people lose power over their local means of giving health and begin to rely upon imported pharmaceuticals from faraway places. This issue is of growing concern in developed nations, but one that is especially significant in the developing world where finances are slim (Grinspoon, 2002). The current research examines how individuals in Dominica use ethnomedicine and biomedicine, and discusses how increased outside influences may impact the ability for local healthcare provisions.
This research employs GIS analysis of clinic location, interviewee home location, and population, to place interview findings in a geographic space. This study looks into reasons of healthcare use, access, preference between ethnomedical and biomedical systems, and how these decisions may be informed by geography. Long duration interviews and participant observation including home-stays, are used to understand healthcare use on a micro scale. Using interview data and analyzing the outputs of selected questions through statistical analysis, as well as qualitative analysis of in-depth interviews, the research answers the following three questions in regards to medical use in Dominica.

1) How are ethnomedicine and biomedicine conceptualized and understood?
2) What sociocultural factors relate to the preference and utilization of ethnomedicine versus biomedicine?
3) What are the issues of access to both biomedicine and ethnomedicine and how do these issues impact medical use?

Study Participants
The study population includes those currently residing within the Commonwealth of Dominica. Dominicans’ have a rich knowledge of local plant use, and ethnomedical treatments. Kalinago individuals were interviewed, but it should be mentioned that this research does not include those residing within the Kalinago territory on the Eastern Coast of the island (Figure 3-3). The current Kalinago chief is hesitant to allow outside research on medicinal plants due to concerns over biopiracy. This research was more concerned with the island-wide ethnomedical system. Interviews were not conducted within the indigenous territory but were conducted with individuals with Kalinago heritage residing outside of the territory. Citizenship was not a limiting factor for participation in this research as many rural farmers are foreign migrants from other Caribbean islands. The research population consists of primarily individuals of Afro-Caribbean heritage although several interviewees had a mix of both Kalinago and African roots. English is the official language on the island and constituted the majority of interviews. Some rural interviewees only spoke a French-based Creole dialect, and when this was the case an interpreter was present.
The participants for this study include twenty-nine interviewees between the ages of twenty-one and ninety-one, and six key informant interviews (Figure 4-1). This research benefits from long established contacts in Dominica by past research projects done through Miami University in Oxford Ohio. Past research has allowed for access to local experts and individuals that would have otherwise been difficult. From the foundation of collaborators through past projects, knowledgeable informants in the areas of healthcare, and ethnomedical knowledge were contacted. Contacts in the hospital and at the medical university in Dominica led to further connections with those in the medical field, as well as the wider population, and are the bases of this research.

Interviews were conducted across a wide geographic space both in urban and in rural areas to see differences in medical use across different environments (Figure 4-2). When possible the 29 user interviews were conducted in public open spaces, such as the public market or street side vending stalls, to limit undesirable power relationships that certain spaces may contain. Interviews with experts were usually in their office, or place of employment. Both interviews with experts and users use a semi-structured interview technique focusing on questions and answers, but allowed for the discussion to range over a variety of topics relevant to medical practice. In contrast to the survey design which asked interviewees about their personal experiences, key informants were asked about their understanding of the wider populations use/access to medicine. Key informants often ended up discussing some of their own medical history, but the discussion focused on a larger scale interpretation of biomedicine and ethnomedicine practiced on the island as well as issues influencing these two systems.

**Figure 4-1: Interview population**

<table>
<thead>
<tr>
<th>Age</th>
<th>Sex</th>
<th>Location of Interview</th>
<th>Location of Home</th>
<th>Home Location</th>
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<td>East coast near turtle bay</td>
<td>R</td>
<td>P</td>
</tr>
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<td>La plain</td>
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<td>Delices</td>
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<tr>
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<td>Morne daniel</td>
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</tr>
<tr>
<td>47</td>
<td>M</td>
<td>Roseau</td>
<td>Roseau</td>
<td>U</td>
<td>P</td>
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<tr>
<td></td>
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<tr>
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<td>Point michel</td>
<td>R</td>
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<tr>
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<td>Portsmouth</td>
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<td>Portsmouth</td>
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<td>Roseau</td>
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<tr>
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<td>Cochrane</td>
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</tr>
<tr>
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<td>F</td>
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<td>Trafalgar</td>
<td>R</td>
<td>N</td>
</tr>
<tr>
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<td>M</td>
<td>Roseau</td>
<td>Roseau</td>
<td>U</td>
<td>P</td>
</tr>
<tr>
<td>38</td>
<td>F</td>
<td>Princess M</td>
<td>Morne daniel</td>
<td>U</td>
<td>P</td>
</tr>
<tr>
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<td>M</td>
<td>Princess M</td>
<td>Goodwill</td>
<td>U</td>
<td>PS</td>
</tr>
<tr>
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<td>M</td>
<td>Roseau</td>
<td>Roseau</td>
<td>U</td>
<td>PS</td>
</tr>
<tr>
<td>61</td>
<td>M</td>
<td>Roseau</td>
<td>Fond cani</td>
<td>U</td>
<td>PS</td>
</tr>
<tr>
<td>19</td>
<td>M</td>
<td>Bells</td>
<td>Bells</td>
<td>R</td>
<td>N</td>
</tr>
</tbody>
</table>

Key:
- R = rural
- M = male
- U = urban
- F = female
- N = did not complete primary
- P = primary
- S = secondary
- PS = postsecondary
**Research Techniques**

This research uses a technique called the check list method; this method uses a pre-prepared list of questions to be asked, but in no particular order. This method follows a framework of topics, but allows for more fluid conversation (Robinson, 1998). The goal of the research is to delve deeply into people’s perception and use of medicine. To achieve this interviews use the ‘life story’ technique in which participants are asked to tell an event in which they used or came into contact with medicine. This technique adapted from Vermelyn (2000) is meant to identify values placed upon practices that may otherwise not be expressed in a traditional interview of questions and answer.

The GIS Analysis uses the software package ArcGIS version 9.2. This analysis focuses on the spatial representations of healthcare clinics, roads, and geographic features. Data for this analysis was obtained during fieldwork with a Garmin GPS receiver model GPSmap 60cx. This receiver was used to gather information about clinic location, and participant homes. These primary data obtained during fieldwork were combined with secondary data made available by the government of Dominica. Using the program DNR Garmin, developed by the Minnesota Department of Natural Resources, these data points were converted into usable point, line, and polygon features in ArcGIS. Census data and Ministry of Health data are also used in the current research to graph population and clinic placement across the island.
Figure 4-2: Interview locations

Data obtained from the Ministry of Health, and by the author. Map created by the author.
Analysis

The results for this study come from three forms of analysis: bivariate correlations of interview transcriptions derived from user interviews, qualitative analysis of key informant interviews, and geographic analysis. Correlations are used to test variables taken from interview transcripts against variables relating to healthcare use, access, and perspectives on medicine. The independent variables consist of a range of demographics in an attempt to understand the relationship that these demographic groups may have on different issues surrounding both ethnomedical and biomedical medical use. Correlations are run to see the degree of strength between two variables such as educational attainment, and use of ethnomedicine, or educational attainment and use of biomedicine. Correlations yield r values, corresponding to degree of predictability that independent variables, (education, age, etc.) have on variables of medical use. A Pearson's correlation coefficient of (0.01 and 0.05) is used to test numerous pairs of these variables for degrees of covariance (predictability) as diagramed by the following equation.

\[
\rho_{X,Y} = \frac{\text{cov}(X, Y)}{\sigma_X \sigma_Y} = \frac{\mathbb{E}[(X - \mu_X)(Y - \mu_Y)]}{\sigma_X \sigma_Y},
\]

A Pearson’s correlation coefficient is used to test for the dependence between two variables. In the current study these variable are medial use behavior (dependent), and demographic data such as education (independent). Pearson’s correlation is obtained by dividing the covariance of the two variables by the product of their standard deviations. E is the expected value operator, and cov is the degree of covariance. This equation developed by Karl Pearson, tests two variables for a linear relationship. In this study it is used to identify trends in medical use and the level of predictability of medical use that can be obtained from demographic information, in other words this can explain if certain demographic groups are more likely to use ethnomedicine, or biomedicine.

Interviews consist of 20-30 minute interviews from a sample of twenty-nine people drawn from the general population, as well as 45 minutes to 2 hour interviews with experts in the medical field. User interviewees gave verbal consent for the interview with the understanding that personal information would not be divulged. Names are kept separate from interview
response data and maintained in a secure manner. In order to look at differences across genders data was gathered from an even distribution of males (51.7%), and females (48.3%). Interviews for this research were conducted across a wide geographic space in both rural and urban environments in the southern half of the island, and in the northern town of Portsmouth (Figure 4-2).

Key informants from Princess Margaret Hospital, the Ross Medical School, and ethnomedical experts were interviewed on their understandings of healthcare use across the wider population. Written quotes taken from these interactions support and embellish the statistical findings. These longer duration interviews focus around ideas of medicine, access, perspective and culture in order to gain further insights into the experience of medicine in Dominican society.
Individuals seeking medicine make rational healthcare decisions. They balance finances, accessibility, and availability, alongside cultural practices, and spiritual beliefs. In Dominica where ethnomedicine and biomedicine exists alongside one another individuals must make decisions between the two. Dominicans weigh the need for hospital care alongside cost, and at home care alongside risk. While the medical decision making process for no two individuals is the same, some are more likely to enact biomedicine and others ethnomedicine, a typology of Dominican medicine can be drawn (Fig 5-1). If an aliment is thought to carry less risk and is known to be curable with home remedies, at-home ethnomedicine is the usual course of action. For example intestinal worms are known to be cured with *Chenopodium ambrosioides*, or *Aristolochia triobata* are two common ethnomedical treatments that have a solid history of effectively curing the aliment. Do to the relatively low immediate risk, and knowledge of effective treatment individuals will use ethnomedicine. If something carries higher risk such as childbirth, biomedical care in a hospital is generally sought out. In Dominica due to a previously high infant mortality rate all births must now be delivered in the hospital. This medical use decision making process also applies to illnesses or aliments that use a combination of biomedicine and ethnomedicine, and at home care versus hospital care. For example one interviewee with a broken bone went to the hospital but insisted on using ethnomedical pain killers alongside biomedical casts and physician care.
In contrast to many cultures around the world Dominicans are generally open and accepting of outside medical knowledge. While Dominica has had a difficult history with a many years of colonization, today Dominicans integrate cultures and practices from many influences. There is a strong comfort with diversity in many aspects of Dominican life and this is especially prominent when concerning medical knowledge and use. A main factor for the ease of integration may come from the disperse knowledge base of ethnomedicine and a history of integrating African practices with Kalinago. In many parts of the world shaman and traditional healers are at odds with biomedical practitioners. There are finite resources and both those in the ethnomedical tradition and biomedical tradition want to establish their practice as reputable. These two opposing sides often clash with one another for superiority and access to capital (Adams and Hawkins, 2007). In Dominica where ethnomedical knowledge is widespread this
does not occur. In fact, many within the biomedical field who feel overworked are happy that individuals can access treatments without physician assistance. This sentiment is expressed amongst those in public health profession as well, with the anecdotal worry of cross toxicity. Ethnomedicine is seen as valuable component to the overall medical system. Those practicing within biomedicine still express concern over the pharmacologic properties. This lack of knowledge only strengthens the argument for better integration.

*Use patterns*

Interview transcriptions show that the understanding of what is proper use differs greatly between individuals. The vast majority (79%) of respondents used ethnomedicine during the previous year (Figure 5-2). Use as defined for this research could have consisted of anything from drinking ethnomedicinal tea for a cold, applying topical ointment, or using any medicine the interviewee deemed to be bush/ethnomedicine. Biomedicine as defined for this study was described to participants as pills, over the counter medicines purchased from a pharmacy (OTCs), any medicine prescribed by a physician, or visits to facilities in the biomedical infrastructure.

Some participants are adamantly against biomedicine and use it only as a last resort. Still, nearly half of the interviewees used some form of biomedicine within the previous year. Data were also obtained with regard to medical use during the previous month. Interviewees used ethnomedicine more frequently as opposed to a biomedicine (Figure 5-2, 5-3). More striking than differences in use frequency, were the different behaviors associated with the two types of medicines. Biomedicine was used in a curative way after signs of sickness came on. Individuals generally wanted to use it at that moment and then stop using it when the illness had receded. Ethnomedicine was often used regularly and preventatively, and individuals would often use it when they were feeling well. Ethnomedicine was used with the idea that it could prevent health problems from occurring in the first place, and biomedicine was used with the idea of curing a specific ailment.
Figure 5-2: Medical use practice over the previous year (N=29)

Figure 5-3: Medical use Practice over the last month (N=29)
Those practicing ethnomedicine in Dominica do not regularly seek out shaman or bush doctors as seen in many other ethnomedical systems around the world (Adams, and Hawkins, 2007). Only a small percentage of respondents claimed to have consulted a formal figure of ethnomedical knowledge within the last year, and only one interviewee claimed to have consulted an ethnomedical expert within the last month (Figure 5-3). Instead of a hierarchy of ethnomedical knowledge, there is a baseline of knowledge that exists across the population. While there may still be relative experts such as an older naturalist with extensive plant knowledge, Dominicans generally do not seek out traditional healers. When ethnomedical knowledge is exchanged there is rarely talk of money. This comes in stark contrast to the highly commodified biomedical system on the island, and seems to contribute significantly to the decision making process. Portions of biomedicine such as trauma care, and HIV prevention are provided for by the government, but many aspects come with incremental costs, and any cost can be an issue for economically poor people.

**Perspectives on Medicine**

Question 1)

How are ethnomedicine and biomedicine conceptualized and understood?

“(You) just know from nature, from the winds, from the smell, from the feel” (Rural farmer knowledgeable in ethnomedicine expressing how medicine, food, and life are all one system, resides in Bells)

How individuals conceptualize the systems of both biomedicine and ethnomedicine is often different than actual use behavior. Dominicans practice ethnomedicine throughout the duration of being sick. Many interviewees claimed to make a large batch of ethnomedical tea and drink until it was gone even if they had begun to feel better. One interviewee described ethnomedicine as needing time to work: “you must use the bush medicine for a time so it can
build up in the body to be effective” (Rural female interviewee, resides in Delices). A strong preference for ethnomedicine can be seen across the interviewee population. Interviewees said they preferred to first seek ethnomedicine when in medical need. Despite a preference for ethnomedicine, more than a third admitted that biomedicine was more effective than ethnomedicine (Figure 5-4). So while preference for ethnomedicine seems to be ingrained and highly valued, when a severe sickness arises many see the need for biomedicine. This finding supports previous work done on the two tiered medical system of local ethnomedicine practiced in the home, and biomedicine obtained from a clinic (Quinlan, 2004).

Integrative medicine utilizing both ethnomedicine in conjunction with biomedicine best contributes to public health in rural impoverished places, but those in the biomedical profession are concerned with issues of cross-toxicity and accountability (Baer, 2004). Issues of possible drug-drug interactions are not well understood across the population. Even some biomedical practitioners demonstrated little understanding. For example a rural nurse encouraged residents to use whatever ethnomedicine they were using along with prescribed biomedicine. She did this without first validating the active ingredients in the ethnomedicine, or even acknowledging the potential for negative drug-drug interactions. This represents a separation of medical expertise, but also one where rural nurses are confronted directly with an ethnomedical system for which they were not properly trained. Many nurses within the biomedical infrastructure were trained off island in Cuba, or the United States. When rural nurses come back to practice, they are confronted with a very different medical reality than the one they were trained for.

The vast majority of interviewees claim that food and medicine are interrelated and part of one system essential for good health. A vendor of ethnomedical herbs in Roseau explained, “In addition to herbal remedies you must eat organic, your food is your medicine ya know.” This brings to mind the adage ‘you are what you eat’. While many in the United States would probably also respond in a similar way, emphasizing food as part of a healthy life, the nature of Dominican society truly means that food crops and ethnomedicine are grown next to one another and consumed together. A typical day for a rural Dominican includes drinking herbal tea and taking medicine often from one’s own garden. The connectivity of earth, food, and medicine is evident, and much stronger than the simple expression of ‘you are what you eat’. Medicine and cultivating medicine are a central part of Dominican culture. The emphasis on medicinal plants is
being challenged by imported and processed food. During several home stays around the island with Dominican families, I witnessed some striking contradictions. While interviewees stated that food is central to a healthy lifestyle, they consumed imported food, and fried chicken regularly. The Caribbean region as a whole has increased its consumption of chicken, and diets have shifted towards saturated fats and processed imported foods (PAHO, 2004).

As imports increase and diets change, the cultural understanding that food and medicine are part of one system may need to be rethought. The practices of using ethnomedicine alongside food are being challenged as fast food, packaged food, and commercialized food, increase on the island. Food imports have increased so rapidly that the adage that food and health go together with vitality and longevity may not have caught up with current behaviors. It may be at least in part rhetoric, or a residual belief no longer practiced regularly. Lifestyle diseases, such as those associated with a dietary shift take a long time until they show deleterious effects. The Dominican people may only be feeling the beginnings of the impact that a dietary change can have on a society. In the United States it is estimated that between $75 and $125 billion are spent annually on costs related to obesity related diseases (Young, 2010). During a discussion about food and medicine as an integrated system, a Medical Doctor in Roseau interrupted our conversation saying “but that KFC tastes so good.” KFC is a major fast food restaurant in the capital city and researchers as well as many public health experts have expressed concern in regards to the health consequences of these types of fast food diets (Weis, 2003).
**Figure 5-4: Perspectives of medicine (N=29)**

<table>
<thead>
<tr>
<th>Perspective of Medicine</th>
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</thead>
<tbody>
<tr>
<td>I use ethnomedicine preventatively</td>
<td>62.07%</td>
</tr>
<tr>
<td>I use biomedicine preventatively</td>
<td>6.90%</td>
</tr>
<tr>
<td>biomedicine is more effective than ethnomedicine</td>
<td>37.93%</td>
</tr>
<tr>
<td>I prefer to seek biomedical attention</td>
<td>34.48%</td>
</tr>
<tr>
<td>biomedicine is too strong for some sicknesses</td>
<td>34.48%</td>
</tr>
<tr>
<td>When sick I usually use ethnomedicine and if this does not work then seek biomedical attention</td>
<td>62.07%</td>
</tr>
<tr>
<td>When sick I will use biomedicine immediately</td>
<td>31.03%</td>
</tr>
<tr>
<td>Ethnomedicine is longer lasting</td>
<td>31.03%</td>
</tr>
<tr>
<td>have you become disillusioned with biomedicine</td>
<td>17.24%</td>
</tr>
<tr>
<td>Disease is caused by an imbalance</td>
<td>55.17%</td>
</tr>
<tr>
<td>Disease is caused by the environment</td>
<td>51.72%</td>
</tr>
<tr>
<td>Medicine and food are part of one system</td>
<td>89.66%</td>
</tr>
<tr>
<td>Ethnomedicine has intrinsic value</td>
<td>20.69%</td>
</tr>
</tbody>
</table>

**Question 2)**

What sociocultural factors relate to the preference and utilization of ethnomedicine versus biomedicine?

**Education**

Primary education is relatively high in terms of enrollment as it is mandatory between the ages of 5 and 16. While enrollment is mandatory, there should be a disclaimer in terms of the level of preparation primary schools provide for continuing education. A somewhat dated, but surprising study done in the late 1980s showed that educational prowess (those who were prepared to move onto secondary education) was only 28 percent of those tested (Metz, 1996). In the current research, interviewee educational attainment was correlated with biomedical preference. One out of 10 interviewees claimed that they had not finished primary school, which in Dominica ends with sixth-grade. This percentage represents only those who did not complete
education in the national educational system. Home schooling and other forms of education were not included. The majority of those interviewed completed at least primary education, with almost half finishing secondary school, and a quarter completing some form of tertiary education. The rates shown in the interview group are not consistent across Dominica. The survey population included several working in the medical field and those who had obtained education overseas hence the high level of educational attainment. Few Dominicans are able to attained higher education due to high costs, and lack of proper preparation. While students successfully passed classes and were allowed to graduate, they often fall short on the type of standard testing that is required for higher education on global standards (Metz, 1996).

This research hypothesized that education and occupation may significantly influence medical decision making and medical use patterns. Occupation did not show any statistical significance, but education was correlated with a wide set of questions all showing a preference for Biomedicine (Figure 5-5). Those who obtained college or professional education are positively correlated with a preference for biomedicine (r=.688, p=0.05). As the degree of formal education increases preference for biomedicine does as well. This strong correlation between educational attainment and biomedicine is expressed with several other indicators. When sick seeking biomedical attention immediately (r=.587), as well as using biomedicine over the last year (r=.639). These findings show a strong positive correlation between Western education and a preference for biomedicine. This does not necessarily explain causal factors directly, but does point to interesting trends between education and medical use behavior.

Formal education in Dominican society generally means education within a Western oriented model, and often involves overseas education at the higher level. One participant, a medical doctor at the Princess Margaret Hospital, understood education to be intrinsically linked with Western lifestyle and medical choice saying, “that there are a few issues pertaining to medicine on the island, the more educated you are the more likely you are to use biomedicine”. She went on to say, “but of course there is different types of education, like traditional knowledge and so on.”

Of eight interviewees with higher degrees, three had obtained medical degrees. One was from Ross Medical University in Portsmouth and two were off the island in the United States. One interviewee with tertiary education obtained a law degree from the United Kingdom. In all
of these scenarios it may not be the actual education, but rather the extended time exposed to and immersed in another culture, a culture that emphasizes biomedicine.

*Figure 5-5: Educational attainment and biomedicine*

<table>
<thead>
<tr>
<th>College or professional education</th>
<th>Pearson Correlation</th>
<th>N</th>
</tr>
</thead>
<tbody>
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<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td>N</td>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>

| When sick I will use biomedicine immediately | Pearson Correlation | .587** |
|                                              | Sig. (2-tailed)     | .001   |
| I prefer to seek biomedical attention       | Pearson Correlation | .688** |
|                                              | Sig. (2-tailed)     | .000   |
| Biomedicine is more effective than ethno/medicine | Pearson Correlation | .313   |
|                                              | Sig. (2-tailed)     | .099   |
| Used biomedicine month                     | Pearson Correlation | .373*  |
|                                              | Sig. (2-tailed)     | .046   |
| Used biomedicine year                      | Pearson Correlation | .639** |
|                                              | Sig. (2-tailed)     | .000   |

*. Correlation is significant at the 0.05 level (2-tailed).
While there is a strong correlation between a higher level of educational attainment and biomedicine, the correlation between lower educational attainment and ethnomedicine is not so clear. Biomedicine is used by both those with higher degrees, and those with less formal education. There is a strong preference for biomedicine amongst those with advanced degrees, but no significant correlation exists between less educated individuals and ethnomedical use. This may in part be due to a small sample size, but perhaps it is due to how ethnomedical knowledge is taught, not in a classroom but throughout life. Dominicans generally learn about ethnomedicine derived from plants, animals, insects and marine life through practice. One Dominican described it as a way to live your life through experience. “I learned about medicine from the family, from my father, bush medicine around so no not really formally but I just remembers always knowing about it. My Grandmother was a bush doctor you know” (Rural farmer, living in Morne Cani)

Those with lower educational attainment tend to view ethnomedicine as being more than simply curative. A physician at the medical university emphasized this by saying “there is still a lot of mysticism in regards to healthcare, bush medicine is no not magical but rather it is a part of a system that is seen as inherently Dominican and therefore good. This is great to be proud of Dominica but often limits what we in the hospitals are trying to accomplish”. Those with less formal education had some disillusionment with biomedicine (r=.444). They were also more likely to lose trust in biomedicine (Figure 5-6). Disillusionment of biomedicine may be in part due to cultural barriers and availability of biomedicine. One interviewee claimed frustration with the availability of doctors saying that the “doctor not around” and that it “took too long for the pills.” She was suffering from issues surrounding her menstruation, but did not feel comfortable discussing this with the biomedical doctor. She claimed to have stomach aches and be bedridden for days. When she went to the clinic she said the medicine they gave her did not work. After only one attempt with biomedicine she gave up and she now does not trust biomedicine, but continues to use ethnomedicine even though her problem persists.

Formal education in Dominica is primarily based off of the British educational system. Many schools on the island are run via religious affiliation formed under church organizations and import a world perspective from abroad. The structure and style of teaching in many of these schools follows a Western logic which does not usually emphasize ethnomedical knowledge
(Metz, 1996). General Science is taught in Primary Schools but ethnomedicine is not formally taught at school. Biology and biological concepts are introduced in Secondary School, but home remedies are generally learnt as person goes through life in an informal setting (Personal Communication, Roseau).

Due to economic constraints, few Dominicans are able to move onto post-secondary school after they have completed secondary school. The University of the West Indies (UWI), Ross University, Princess Margaret Hospital School of Nursing, and the Teacher's Training College are four main post-secondary institutions operating on the island. Few Dominicans see these as a realistic possibility. Per capita GDP is around five to six thousand dollars and a year university education seems utterly unattainable to most (Metz, 1996). While attending the Dominican State College is more affordable, students still emphasize the desire for overseas education. This is even more unattainable with the added difficulty of visa applications, and even higher costs of tuition. Although scholarships do exist, only a minority of students get them. While educational attainment correlates strongly with biomedicine, the relationship is better explained by accessibility, higher economic status, perspective on disease, and integration into a Western lifestyle.
Figure 5-6: Educational attainment and ethnomedicine

Correlations

<table>
<thead>
<tr>
<th></th>
<th>None formally preprimary</th>
<th>Disillusioned with bio medicine</th>
<th>Ethnomedicine has intrinsic value</th>
</tr>
</thead>
<tbody>
<tr>
<td>None formally preprimary Pearson Correlation</td>
<td>1</td>
<td>.444*</td>
<td>.386*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.016</td>
<td>1</td>
<td>.218</td>
</tr>
<tr>
<td>N</td>
<td>29</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Disillusioned with bio medicine</td>
<td>.444*</td>
<td>1</td>
<td>.218</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td>.016</td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>29</td>
<td>29</td>
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<tr>
<td>Ethnomedicine has intrinsic value</td>
<td>.386*</td>
<td>.218</td>
<td>1</td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td></td>
<td>.039</td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.257</td>
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<tr>
<td>N</td>
<td>29</td>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>

*. Correlation is significant at the 0.05 level (2-tailed).

Generational Differences

“It is one thing to say trust me try this, and another to have grown up with parents and grandparents using it to cure, and learning about it directly.” Vendor of ethnomedical herbs discussing the difference between formal education and learning though doing, working in Roseau.

The interview population spans individuals from many age groups to identify trends across generations. These data are complemented by an in depth study with a family spanning three generations. Questions pertaining to medical use include interviews with participants ranging from 20 to 101 years of age. The main variable showing statistical significance across
generations is how ethnomedicine and biomedicine are conceptualized amongst the elder population (Figure 5-7). These data are supported by the cross generational family study. Ethnomedicine is valued as having a “mystic” quality amongst the older population. This belief is not present amongst any of the younger generation interviewed. In fact, one respondent in the youngest demographic group of 18-30 mentioned the lack of spiritual basis for ethnomedicine, “on Dominica medicine is not spiritual you don’t find that here, maybe in Haiti, but not here.”

*Figure 5-7: Perceptions of medicine*

**Correlations**

<table>
<thead>
<tr>
<th></th>
<th>Over 70</th>
<th>Ethnomedicine has intrinsic value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Over 70</strong></td>
<td>Pearson Correlation</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.048</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>29</td>
</tr>
<tr>
<td><strong>Ethnomedicine has intrinsic value</strong></td>
<td>Pearson Correlation</td>
<td>.370*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.048</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>29</td>
</tr>
</tbody>
</table>

*. Correlation is significant at the 0.05 level (2-tailed).

Generational trends can be seen in a preference for biomedicine as well. While not statistically significant, the younger population used slightly more biomedicine over the last year. Ethnomedicine was used in all generational groups over the time period of one year emphasizing its universal acceptance across the population. Medical use is relatively high for both medical systems over a year long period, showing that data from this long of a time period does not tell us much about medical use differences and medical preference (Figure 5-8).
One explanation for the younger interviewees using more biomedicine could be that they were primarily urban residents. Several were located in Roseau and thus may have been influenced by setting more than age. Two interviewees within this group also fell into the category of post secondary education perhaps impacting their preference for biomedicine. Medical use behavior is not influenced by only one factor there are a host of contributors. The trend of youth not valuing the traditional knowledge of Dominica is expressed as a concern by several key informants. A procurer of medicinal herbs who was worried about the younger generations desire to learn about medicine stated “the youth are not coming to learn about herbs much at all, they think it is silly and old.” Supporting this sentiment, the participants interviewed from the younger demographic group used only small amounts of ethnomedicine over the last month, however they also use little medicine overall as would be expected of a younger and healthy group (Figure 5-9). Older generations as to be expected, use more medicine overall but of interest was the high usage of ethnomedical amongst the older population. When the time
frame was only a month long all of those interviewed in the age group 50-70 used ethnomedicine. The study group over 70 only consisted of two individuals so these data are left off of charts 5-9, and 5-8.

Key informants believed that the trend in youth not using ethnomedicine would have been more striking had the interview population included children. Unfortunately that was out of the legal scope of the current research. As one key informant put it: “The younger folks are influenced by the TV, and they want to live like they do on TV” (Public figure in Roseau). Influence from the outside world and modernization impacting traditional knowledge systems has been found elsewhere (Davis 2001, Balée 2000). In Dominica the concern is primarily over the youth losing interest in traditional knowledge. If this happens some believe that the knowledge will be lost forever. According to experts on the island lifestyles choices portrayed in the media do not lead to real world return. The realities on the ground are far separate from what is portrayed as a realistic lifestyle on television (Mr. McCarthy, Personal Communication, Roseau).
**Figure 5-9: Use of medical service by age over previous month**

To better understand the intricacies of medical use between generations a case study of a family that spanning three generations is used. Three primary members, the eldest daughter of thirty two, mother of sixty three, and the grandfather who was one hundred and one, were all interviewed several times. This cross generational study is used to understand generational conceptions of disease, use patterns, and how medicine is valued. The family resides in a medium size village (<1500 people) that is away isolated from the coast, and close to the heavily forested island interior. This environment offers the opportunity to investigate medical practices on a micro scale and examine them in depth. Generational differences are striking between the eldest member of the family, the middle-aged mother, and the daughter. The daughter who was born in Dominica was given the opportunity to seek education abroad. Her studies took her to the

\[
y = 0.4x - 0.278 \\
R^2 = 0.895
\]
United Kingdom, and over the last 7 years she has been back and forth between Dominica and London with long stretches of time living in London. Her overall interpretation of ethnomedicine is that it is important culturally, but really doesn’t do a whole lot. She drinks ethnomedical/bush tea and enjoys the taste of a few varieties but does not hold much stock in its medicinal value. She values biomedicine and uses it when sick as well as encouraging her family to use it.

The mother, born in the 1950’s, views ethnomedicine as important for health and a valuable part of the culture. She does see it as having some significant value aside from its curative properties. She is very knowledgeable about ethnomedicine and believes it to be important, “we make our food and wine and medicine right here, right from the yard”. The mother believes in the preventative nature of ethnomedicine. She regularly prepares ethnomedical tea in the morning, and we would sip a concoction consisting of dandelion, lemongrass, and ginger while we talked. The oldest member of the family mentioned how valuable ethnomedicine was. Referring back to a time when he had to walk a full day to get into town to sell his produce, and a time when all he used was ethnomedicine. He believes that all that you need to stay strong and healthy is ethnomedicine. At the time of my interview he had several medical conditions that required treatment with prescribed biomedical pills. He suffers from cataracts disease, and uses some biomedicine to help. He takes the biomedicine at the urging of his family members and he still thinks that his long life is due to his lifestyle and nutrients and medicine from the earth. Many in the older generation believe that ethnomedicine embodies something more than that which is purely curative. Ethnomedicine is described as inherently Dominican and therefore having real value, as being a part of a bigger integrated system. The eldest family member is concerned that the youth do not see this aspect of ethnomedicine.
Question 3)

What are the issues of access to biomedicine and ethnomedicine and how do these issues impact medical use?

Accessibility and Medicine

“There is doubt across much of the population with trust, effectiveness, and things, and if their first experience is (with) a poorly run Princess Margaret hospital what can you expect” (Medical Doctor, Roseau).

The framework of accessibility, affordability, availability, and quality of care, is used to understand how individuals obtain their medicines. Interviews discuss issues of accessibility with a semi-structured format following a general outline of questions. Just over half of interviewees have access to a personal transport (Figure 5-10). This leaves almost half without transportation when public services were not running. Several live on rural roads where no regular buses run. Issues of cost are also prevalent with about twenty percent voicing some concern over the prohibitive cost of biomedicines (Figure 5-10). In contrast to the difficulty gaining access to biomedicine, participants express the relative easy accessibility of ethnomedicine. “If you live with your food and herbs and medicine growing around you, you can be in balance” (Rural interview Pig Farmer Grand Fond). More pointedly, all but one of the rural residents believes ethnomedicine to be more easily attainable than biomedicine. Biomedical infrastructure in Dominica is hierarchical, whereas ethnomedicine is more diffuse. With limited economic resources in which to dispense medicines, a shortage of physicians, and lack of clinical expertise, biomedicine's hierarchical infrastructures are not able to adequately provide healthcare to the entire population. Data from interviews show that a significant percentage of individuals cannot get to biomedical clinics.

Ethnomedicine is used significantly less in Roseau, but the city is still connected to the rural environment by a social network. Ethnomedical herbs are regularly brought in by relatives and friends from the country. One Roseau resident explained how his family living in the country brings him dasheen, plants, tea, and herbal remedies. These things he said “you don’t get in town”. Ethnomedicine is more widely grown in rural areas than urban areas due to the lack of
good clean land, scorching heat, pollution, and the concretization of Roseau. The trend of quickly expanding urban centers has had detrimental impacts on the connection that individuals have with the land and local knowledge systems in many parts of the world (Stark 1984, and Zhao 1999). A vendor of local remedies in Roseau explained that the city is not a healthy place, and she could not depend on it for her herbal teas and medicines: “The city is all concrete, and makes you hungry, it dries you out and makes you thirsty, in the forest you are a part of nature and she will protect you”. While ethnomedicine is more easily accessible in rural areas, it is sometimes difficult to prepare. Some concoctions are a simple tea of herbs boiled in water, but some salves take much longer to prepare and therefore present obstacles to use.

*Figure 5-10: Issue of accessibility*

<table>
<thead>
<tr>
<th>Issues of Accessibility</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Own a transport/have access to a transport</td>
<td>58.62%</td>
</tr>
<tr>
<td>Biomedicine is too expensive</td>
<td>17.24%</td>
</tr>
</tbody>
</table>

It was hypothesized that the use of biomedicine would correlate with educational attainment, but this research shows that it may not by the educational level, rather the more integrated lifestyle that explains biomedical preference. A higher degree of educational attainment is related to a more integrated lifestyle with better connections to the infrastructure of biomedicine. Individuals with higher education also have luxuries associated with financial status such as access to transportation. There is a trend in the availability of transportation and use of biomedicine (r=.422, with a p value of 0.05), meaning those who own a car are more likely to utilize biomedicine. There is a strong correlation between level of formal educational attainment and transportation, (r=.519, with a p value of 0.01). This strong relationship indicates that those with a higher education may also experience luxuries that would allow for access to biomedicine, and the inverse can be said about those with less education.
**Figure 5-11: Education and transportation**

Correlations

<table>
<thead>
<tr>
<th></th>
<th>Own a transport/have access to a transport</th>
<th>College or professional education</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own a transport/have access to a transport</td>
<td>Pearson Correlation: 1</td>
<td>.519**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed): .519**</td>
<td>.004</td>
</tr>
<tr>
<td></td>
<td>N: 29</td>
<td>29</td>
</tr>
<tr>
<td>College or professional education</td>
<td>Pearson Correlation: .519**</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed): .004</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>N: 29</td>
<td>29</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed).**

**Figure 5-12: Biomedical use and transportation**

<table>
<thead>
<tr>
<th></th>
<th>own a transport/have access to a transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>used biomedicine</td>
<td>Pearson Correlation: .422*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed): .023</td>
</tr>
<tr>
<td></td>
<td>N: 29</td>
</tr>
</tbody>
</table>
Affordability

The prohibitive cost of biomedicine is a common concern in developing nations (Adams, and Hawkins 2007). Biomedical procedures provide care and save lives, but these services are costly. Given the choice, individuals usually enact the medical system that comes with the least financial burden (Kleinman, 1980). While not as significant as access, almost twenty percent of interviewees claim that biomedicine is too expensive to use. Ethnomedicine is seen as essentially free. Although an interesting juxtaposition can be seen between the rural and urban environments. Ethnomedicine in the capital city is increasingly targeted towards the tourism industry. Dominica is known for its natural beauty and traditional culture. Several businesses have tried to capitalize on the tourist market by selling ethnomedicine. In Roseau ethnomedicine is becoming commodified, and this trend seems likely to continue. In fact many on the island hope to develop an export market for ethnomedical remedies. Despite the enthusiasm for the economic possibilities of an export market for ethnomedicine, many fear that outside influences may erode some of the very characteristics that make Dominica healthy and sustainable.

Ethnomedicine was historically exchanged for free or in a barter system. This process has changed, and ethnomedicine in the main city of Roseau has increased in price due to outside demand. Local venders interviewed are concerned that they may not be able to keep up with this demand, causing them to grow ethnomedicine with pesticides and in small scale monocultures. The trend of increased price is not universal across the city as most of the local population does not purchase ethnomedicine from the higher end shops. There is also concern over land quality around the city. As the capital city has become more and more polluted, local venders say that they will no longer pick medicine from the area around the city. A woman in town worried about the quality of her herbs saying it is too polluted to collect them in town. “I don’t collect herbs from the side of roads, or where there is pesticides and bad things are about.” She went on to say, “it’s not safe to collect just around I only collects herbs from the garden, or yard of someone I trust, or from the forest. The forest is always good, but not in town.”

The cost of biomedicine in Dominica is partly subsidized by the government and initial days of a hospital visit are covered by the national consolidated fund. This fund established a system of user fees for costs associated with the hospital. It set up funds set up for children, prenatal women, and those with communicable diseases. However certain ailments such as
diabetes, circulatory issues, and those requiring longer stays are not covered. Interviewees express concern about costs associated with hospital visits.

Availability

Interviews with those in the medical field are often difficult as Dominica is a small country with much gossip, and people want to protect their reputation. A rural nurse expressed fear that if she said anything bad about the medical infrastructure it would be put in the local newspaper. Conversely, those on the receiving end of medical care are all the more happy to complain. With these biases in mind, a few striking trends come out of interviews with respect to the availability of medicine.

The most compelling finding is physicians’ infrequent visits to rural clinics. Doctors only visit some of the rural clinics every two weeks making the lag time for biomedical care very long. Nurses and healthcare workers can aid in a number of areas but are unable to prescribe much needed drugs to rural people. A rural nurse explained to me the difficulty of managing a rural clinic that had only the most basic medicines. Medicine cannot be prescribed without a doctor’s approval, and waiting for doctors to visit rural clinics caused several interviewees to lose trust in the biomedical system as a whole. When weighing the benefits of the biomedical system that is slow and costly many instead choose ethnomedicine. This is not necessarily the fault of biomedical doctors’ with only 4.6 for every thousand people they are simply stretched too thin (PAHO, 2004). Adding yet another dimension to this lack of availability is the prescriptions that needed to be filled. Rural clinics do not stock all of the medical drugs that physicians prescribe. It is not uncommon that medicine will have to be picked up in Roseau. This creates three difficult hurdles in order to receive some forms of biomedicine for rural people.

When urban and rural differences are looked at in terms of ethnomedical and biomedical use, an obvious trend can be seen. Rural residents utilize far less biomedicine than urban residents and use significantly more ethnomedicine (Figure 5-13, 5-14). This may be due to the issues that rural inhabitants have in accessing biomedicine. The difference between urban and rural medical use is more pronounced over the previous month (Figure 5-13). This difference between month long and year long duration could be explained by a cultural shift in how people use ethnomedicine. Those in the rural environment use it more frequently, perhaps with the thought of prevention in mind. These use patterns show that while ethnomedicine is a prominent
part of the Dominican culture, it seems as though the framing of how to use ethnomedicine is changing as more people move to urban environments.

Figure 5-13: Urban versus rural medical use during the previous month
Figure 5-14: Urban versus rural medical use during the previous year

Urban versus rural medical use during the previous year

![Bar chart showing urban versus rural medical use during the previous year with categories for Ethnomedical and Biomedical.]
CHAPTER 6

CONCLUSION

A former Chief Medical Officer at Princess Margaret Hospital in Dominica and now the Assistant Director-General of the World Health Organization, Dr. Carissa Etienne expresses concern over issues impacting health in developing countries. She states them as: “the current world financial crisis, the food crisis, climate change, epidemiological transition, population changes, globalization, and health delivery issues” (Douglas, 2008, pg 1). Her thoughts into the situation of healthcare in rural areas are supported by the current research. Dr. Etienne also lamented that: “As a result of this food crisis, there is decreasing availability of food but also increasing prices. In Dominica we are relying more and more on imported foods. Because of this food crisis, there is a risk that we are going to see under nutrition to children, that indeed as food becomes more expensive and less available, the food that people can afford becomes high fat and high sugar foods. Therefore obesity which is already becoming a problem and which now has emerged as a sign of poverty, we are going to see increasing levels of obesity” (Douglas, 2008, pg 1).

While wide ranging, Dr. Etienne’s comments resonate with specific findings in this current research. There is a growing concern over the importation of food, culture, and lifestyle to the West Indies. As more goods are imported, local knowledge systems decrease in value (Weis 2003; Singer and Baer 2007). These imported foods are literally engineered to trick the human mind into wanting more and more. Overconsumption of these high sugar-fat-salt foods is the key factor causing obesity in the developed world (Kessler, 2009). Health issues of diabetes, hypertension, and heart attack all represent ailments on the rise (Fig 3-5, 3-6, & 3-7). Caribbean nations are at risk of becoming “consuming appendages of North America” if they do not reevaluate local resources (Consensus and Economic Development in the Caribbean, 2000, p. 13). Key informants interviewed in this research echo this concern over imported goods and the risk of losing traditional knowledge.

From interviews conducted in the field and in depth interviews with key informants this research reveals several medical use patterns. Rural interviewees use ethnomedicine more frequently than their urban counterparts, as a shift towards urbanization increases. Those with
higher levels of formal educational attainment tend to favor biomedicine. This can in part be explained by a lifestyle that privileges biomedical knowledge. Experts in the biomedical profession express continued concern over the framing of ethnomedicine and the understandings people have of ethnomedical cures. Physicians express concern over the rise in chronic diseases associated with a change in diet and lifestyle. All of these findings point to an overall cultural shift that is impacting ethnomedicine and health profoundly.

This research investigates the complexities of medical decision making. Examining clinic location in relation to population is not enough to tell the whole story of medical use behavior. Issues of accessibility due to physician availability, poor infrastructure, and perceived costs are ever-present. Cultural factors of fear, trust, and education, also play significant roles in medical use. Spatial analysis of clinics often privileges complex models, GIS, and algorithms (Mohan, & Laad, 2010; Popick et al., 2009). While research pursued in this manner is very useful for spatial analysis, it does not fully explain the lived experience on the ground and cultural factors at play and how individuals actually enact their healthcare system. The health landscape in Dominica is shifting rapidly as outside cultural influences are absorbed by the population. The current research contributes to the literature that is bridging the gap between spatial analysis and identifying cultural factors that contribute to medical use behavior. This research shows that medical use behavior cannot simply be summed up by access to clinics; rather it depends on a multitude of factors.

This research indicates a medical system in transition. Dietary habits are changing, imported and highly saturated foods are on the rise, there is concern over the loss of botanical knowledge of medicines amongst the youth, and links to the city seem to correlate with biomedical preference. The trend in traditional knowledge being lost is lamented across the wider population from farmers to fishermen. Medical knowledge represents only a portion of this cultural shift away from local knowledge systems. With imported goods on the rise, cultural influences of ever-present television around the island, and an increasingly large Diaspora, ethnomedical knowledge and traditional culture are at risk.

Ethnomedical practice still constitutes the main health resource for those individuals who reside in rural areas and is vital to good public health campaigns (Bastien, 1992). Like most people worldwide Dominicans receive medical attention at home as the first line of defense
Ethnomedicine in Dominica is not generally practiced in place of biomedicine as a whole, rather as a system that uses local remedies and knowledge to supplement costly imported pharmaceuticals (Fig 5-1). Collaboration of ethnomedicine with those practicing in the biomedical framework has been shown to benefit both those in the biomedical profession and individuals seeking access to healthcare (Grinspoon, 2002; Farmer, 1999; Johannessen, 2006).

Without the baseline knowledge of ethnomedicine from which to gain access to treatment, rural Dominicans with little economic power may be shut out of medical care completely. Biomedical institutions are important components to an effective medical system, but they come with a heavy economic burden (Bastien, 1992). A large portion of the gross domestic product of Dominica is in the governmental sector. Of this the third largest consumer of resources is healthcare, which consumes over ten percent of the total recurrent budget (PAHO, 2002). These high costs are primarily due to the purchasing of drugs in the pharmaceutical industry, the very sector that ethnomedical treatments supplement.

Additional resources are needed for rural education of HIV AIDS, condom distribution, education on food consumption, and other healthcare issues. If the Dominican people become more and more reliant upon expensive biomedical treatments for everyday diseases, other public health sectors will suffer (Dr. Ricketts, personal communication). Those within the biomedical field recognize the need for support from the institutions of ethnomedicine and at home care. The nature of Dominican ethnomedicine is its distribution across the broader population. While this may provide some insulation from the loss of traditional knowledge as a whole, if the younger generation does not carry on the knowledge some fear it will be relegated to books of botany and botanical medicine instead of being actively used. If Dominica’s baseline ethnomedical knowledge is forgotten not only will potentially undiscovered cures be lost to science, but the reliance upon imported pharmaceuticals will likely increase and place greater pressure on an already cash strapped medical infrastructure and Dominican people.
REFERENCES


APPENDIX:

IRB
MIAMI UNIVERSITY
APPLICATION FOR APPROVAL OF RESEARCH INVOLVING HUMAN SUBJECTS

COVER PAGE

A. PROJECT PERSONNEL

☐ ☐ ☐ ☐ ☐ ☐
Faculty Staff Undergraduate Graduate

Principal Investigator(s) (PI’s) Full Name, Department and UNIQUE ID Date completed CITI &

Practicum _______ Seann Dinnon Regan regansd completed CITI 02/27/2009
Practicum completed 03/31/2009

Faculty Advisor (if PI is a student) and Department Date completed CITI &
Practicum _______ Thomas Klak Geography klakt completed CITI April 2007

Other Personnel who will interact with subjects Date completed CITI

______ N/A

B. CONTACT INFORMATION FOR PI

Campus or Postal Address(es) 235 Shideler Hall

PI’s E-mail’s Address regansd@muohio.edu Phone 206-465-5533
C. PROJECT TITLE

Medical Use Patterns in Dominica, Understanding Medical Syncretism

D. FUNDING SOURCE  Department of Geography Workshop If external, OARS

Proposal Approval Form Number

E. PROJECT DATES June 12th 2009-August 30th 2010

F. TYPE OF APPLICATION - NEW PROTOCOL REVIEW

G. Does this project make use of any of the following special types of subjects and/or locations?

Please mark an “X” on the appropriate line:

- [ ] Research with Children
- [ ] Research with Prisoners
- [ ] Research with Pregnant Women and Fetuses in Utero
- [ ] Research in Public Elementary and Secondary Schools
- [X] International Research
- [ ] Research in VA Hospitals
- [ ] Research Conducted with Clinical Populations in which HIPPA Applies (e.g. Medical, Psychiatrist)
- [ ] Internet Research
- [ ] Drug Research in Human Population (FDA Regulated)

H. INVESTIGATOR’S ASSURANCE STATEMENT

I have read Miami University's policy concerning research involving human subjects and I agree to:

1. Accept responsibility for the ethical conduct of this research study,

2. Obtain approval from the Institutional Review Board or Departmental Review Board prior to changing any procedures,

3. Report to the IRB any complications, adverse reactions or unexpected effects on subjects,
4. Submit an Application for Approval of Continuing Projects within one year, or sooner as specified in the approval letter, describing the current status of the project.

Principal Investigator(s) _____ Date 04/28/2009_____

Faculty Advisor  __________________________ Date 04/28/2009
Research Description

1. Purpose The proposed research will explore the perceptions and conceptualizations of healthcare use in the Commonwealth of Dominica. There is a gap in the literature that recognizes both individual perceptions and public health facility location. This research will attempt to inform both of these stakeholders on the conceptualizations of medicine within the greater population of Dominica. This research will build on a body of work emphasizing the value of local sustainability, as pursued by Dr. Tom Klak and his students in the Department of Geography at Miami University.

2. Subject Population The subject population will be the larger population residing in Dominica currently, but will not include the Kalinago tribal area on the Eastern Coast. The tribal people constitute a vulnerable population subject to a differing set of regulations for research and will not be pursued by this research. The research population will include the larger Dominican people who while generally economically poor, have a rich knowledge of local plant uses. Primarily Afro-Caribbean individuals exist across the island, and typical industries are farming, agriculture, and tourism. The industrial and economic outlooks for Dominica according to the World Bank and IMF are bleak, however what is of interest to the PI is how Dominicans use local medicines that may not show up in an economic feasibility study. Dominica has a complex history of conquest and struggle between several colonizing forces; it is the hypothesis of the PI that this presence has had a drastic influence on public healthcare across the island and how biomedicine is perceived. Public health campaigns rely on accurate information in regards to use patterns, and it is the aim of this study to add to the body of knowledge on healthcare use practices of Dominicans. English is the official language on the island and while other languages are spoken interviews will take place in English and therefore not rely on a translator. All participants will be asked for their age at the beginning of the interview and subjects will include only those over the age of 18. Interviews will also include those over the age of 65.

3. Recruitment and Selection of Subjects Subjects will be recruited through, a snowball method relying on contacts made throughout the island by past and ongoing projects associated with Miami University. The snowball method will link contacts already made on the island to individuals that would not otherwise be easy to contact. Over the last several years an ongoing project associated with Miami University is a study into farmer coping methods due to the loss of a preferential trade agreement with the United Kingdom. This study pursued by Dr. Tom Klak in the Department of Geography and several graduate students will be the basis for contacts on the Island. While the previous (and ongoing) study linked directly to farmers, many other contacts were made in government and other industries as bananas are an integral part of Dominican life. While this potentially may lead to emphasizing a shared perspective, the researcher understands this and to triangulate data, will organize these interviewees according to locations across the island.

4. Potential Risks and Discomforts A moderate possibility of discomfort among the subject population may arise from the discussion of issues of health/healthcare. While I am not specifically interested in the details about illness and disease, this information could come up during the conversation. Information obtained from the subjects could potentially contain sensitive information in regards to health and healthcare practices and will therefore need to be kept confidential. Participation in the study will be entirely voluntary and the choice of responding to particular questions will be made explicitly clear to subjects through verbal consent document and a written document explaining the study that I will give to
the subject at the beginning of the interview, and that they will keep. Subjects can choose not to talk about the specific details of their medical history. All information gathered will be treated as confidential. If any undue stress or anxiety does occur the PI will refer the subject to a healthcare professional.

5. Potential Benefits This study has potential long term benefits to the subject population and the government of Dominica. It has long been documented that public health campaigns do not always line up with people’s perceptions, and that campaigns could be better informed by research into attitudes and healthcare practices. Negative outcomes often arise due to the inconsistencies between public health official’s understandings and the population’s understandings of medicines. The larger contribution will be to a growing body of literature on the subject of traditional herbal medicine and conceptualizations of these medicines. Results from the study will be made available to the government of Dominica as well as to any individuals involved in the study or interested in outcomes.

6. Informed Consent

I request a waiver to the requirement to document informed consent in writing. This is a cross-cultural setting in which written consent would be a detriment to obtaining permission to participate.

I will pursue and obtain consent from participants by reading the script that is found attached. My understanding of the empirical context suggests that it would be awkward for some individuals discussing medical practices to be asked to sign a formal consent form. I believe this would be seen as a deterrent to many potential participants. There should be little hesitation on the part of most individuals to participate in this research. This technique was used last summer, as well as during recent fieldwork in March and we had no problems using the verbal method. Interviewees seemed very comfortable and open to working with us on continuing projects.

I would like to request that I obtain section 3 D. consent from each participant by reading the script and getting their verbal consent.  I will also leave them with a copy of the script with all of the contact information said that they can follow up later if they would like.

7. Exempt Status Request

Exempt status is not requested.

8. Research Procedures and Methods The subjects will be engaged in an interview with the PI and will last for approximately 20 minutes. These interviews will be semi-structured and will cover a range of questions on issues of medical use and practices. These questions are listed on the attached sheet. Interviews will be semi-structured with a combination of both preset questions, and open-ended key points in order to provide additional insights that the researchers cannot anticipate beforehand. There may also be topics that emerge from the interview setting that the researchers can pursue in context. However, the format of the interviews will work from a framework of general questions. See interview schedule below for these questions. Spatial data will also be gathered using GPS units to understand the spatial representation of healthcare use, however this information will not link directly to subject names. As Dominica is a relatively small island a risk exists even when names are kept confidential. To avoid this information collected will be extrapolated across a larger population. As opposed to viewing individual practices that data will show general trends that exist on the island. Each interviewee will be interviewed once for approximately 20 minutes, and this will be the extent of their participation in the
study. There will be no compensation of the subjects. There may be the exchange of coffee/beverage during the interview process to engage interviewee.

9. Research Location
The research will occur in the Commonwealth of Dominica, and will range across much of the Island in order to gain insight into the nature of healthcare use nationwide. Dominica represents a unique location for this research as it is a relatively undeveloped nation in the Eastern Caribbean. Dominica is approximately 300 square miles of rugged terrain lying at 15°25’N by 61°20’W. The Dominican topography, culture, and history have all been instrumental in the creation of a syncretic understanding and utilization of healthcare. Research will be pursued from five villages across the island (Bwa Mawego, Portsmouth, Grand Fond, Marigot and Roseau) to understand phenomena across a large geographic space. Connections made from previous trips to the island have established contacts in these villages. Interviews will take place at a neutral sites designed to limit researcher/subject tension. These sites could include homes, streets, public places, and national parks. The PI will take precautions to create a private setting within public spaces. Interviews in public places will be done in a one on one basis, and done in secluded areas to avoid interruption and eavesdropping. Upon completion interviewee responses will be coded and names kept in a separate location from interview transcripts.

10. Procedures for Safeguarding Confidentiality of Information
The information obtained during this study will be kept in confidence. Interview and survey forms will be coded with aliases and a code sheet will be kept securely in a separate location. All field notes and study material will be kept in the PI’s office under lock and key for the duration of the project. At the very least, notes will be retained for at least three years after any publication of the results of the research. In order for participants to gain information in regards to the study as contact may be difficult overseas, information will be made available through the Ministry of Forestry/Ministry of Health, where permits for this study and materials will be held.

11. Deception
There will be no deception in this research project.

Interview Schedule

Possible interview questions may include:

**Background**

Basic demographic questions including age, ethnicity, occupation

**Practices**

How long has it been since you last visited a clinic?

How long has it been since you last visited a traditional healer?

What sickness do you treat with drugs from the pharmacy?

What sickness do you treat with herbal remedies?

What role do traditional medicines play in your life?

What role do pharmaceutical drugs play in your life?
How do you learn about traditional medicine?

How do you learn about Western/bio medicine?

Do you use medicine preventatively or only when you feel sick? How often?

How do you distinguish between food and medicine, do you?

How far away is the nearest clinic/hospital?

Do you own a car/transport?

Participation and Informed Consent
Hello:

My name is Seann Regan. I am an MA student in the Department of Geography at Miami University.

I would like to invite you to participate in a research study on healthcare practices and use patterns in Dominica.

For this research study, I would like to ask you about 15 short questions about medical use, and how you make decisions between Western and traditional forms of medicine. Your answers will be confidential. Only I will have access to the responses. Your name will not be associated with your responses in any published reports from the research.

Our discussion should take approximately 20 minutes. Your participation is voluntary and you may withdraw from the discussion at any time or refuse to answer any questions that make you uncomfortable. You will not be asked to do anything that exposes you to risks beyond those of everyday life. The benefit of the study, scientifically, will build on a body of work that attempts to better understand healthcare practices, potentially leading to improved public health campaigns.

Are you willing to be interviewed in this research study? (yes or no)

If you have further questions about the study, please contact me, Seann Regan at (206-465-5533) or my graduate studies advisor Prof Tom Klak at (513-529-4049, klakt@muohio.edu). If you have questions about your rights as a research participant, please call the Office of Advancement of Research and Scholarship at Miami University, 513-529-3600 or email: humansubjects@muohio.edu.

Thank you for your participation.