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CUBA'S MATERNAL-CHILD HEALTH

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Abstract

The purpose is to elucidate the differences between the Cuban and United States (U.S.) maternal-child health delivery systems by providing a descriptive, retrospective evaluation based on a convenience sample of data gathered through observations with Cuban public health officials, including physicians, nurses, and citizens. U.S. and Cuban data were analyzed using available United Nations data. In Cuba, there are several programs that contribute to excellent maternal-child health outcomes. Two health interventions for the mother and child are regarded as "hygiene" and include the maternity home and vaccination program. Maternity homes provide comprehensive, residential care for at-risk mothers until the onset of labor. An inclusive vaccination program provides continued support to the mother and child post-delivery. In contrast, the U.S. system lacks the two preventive comprehensive healthcare programs noted in the Cuban system that focus on hygiene, in the form of the maternity home for at-risk mothers and vaccination preventive care.

Resumen

El propósito de este artículo es aclarar las diferencias en sistema de atención a la salud materno-infantil entre Cuba y los Estados Unidos. A partir de una evaluación descriptiva y retrospectiva que se basa en una muestra conveniente de datos, que fueron recogidos a partir de la observación con funcionarios de Salud Pública de Cuba, incluidos doctores, enfermeras y ciudadanos. Los datos sobre Estados Unidos y Cuba se analizaron a partir de la información disponible en Naciones Unidas. En Cuba existen dos programas que contribuyen a lograr excelentes resultados en términos de salud materno-infantil. Existen dos intervenciones de salud para la madre y su hijo que son consideradas "de higiene", estas son, el hogar materno y un programa de vacunación. Los hogares maternos ofrecen cuidados de salud completos y atención en residencia para las madres consideradas en riesgo hasta que comiencen los dolores del parto. Por otra parte un abarcador programa de vacunación continua post parto a disposición de la madre y el recién nacido. En comparación, el sistema estadounidense carece de programas preventivos y abarcadores como se destaca en el sistema cubano, el cual se concentra en la higiene a través de los hogares maternos para madres en riesgo y la vacunación preventiva.

Cuba's Maternal-Child Health

Maternal-child health and immunizations are considered leading health indicators ("Core Health Indicators," 2008). The Millennium Development Goals (MDGs) target maternal-child health, including immunizations, maternal morbidity, maternal mortality, and infant health (*The Millennium Development Goals Report*, 2010). Signed in 2000, these goals represent a worldwide partnership among all 189 member nations that are striving for better health globally (*The Millennium Development Goals Report*, 2005). The member nations target 8 goals with 21 areas measured by 60 indicators ("The MDGs: Challenges and Opportunities," 2009). Maternal-child health encompasses a wide range of health indicators, including maternal mortality rate, infant mortality rate, neonatal mortality rate, under 5 mortality rate, infant birth weight, and vaccination rates. The four MDGs related to this study include Goal 3: Promotion of gender equality and empowerment of women, Goal 4: Reduction of child mortality, Goal 5: Improvement of maternal health, and Goal 6: Combating diseases. However, all Millennium Development Goals impact maternal-child health in some manner ("Millennium Development Goals," 2010).

Maternal-child health is a vital indicator of health because it is representative of those vulnerable within societal populations (Ward, 2011). The United States (US) considers maternal-child health (including vaccinations) within a medical model that is contained within an intervention-based context, whereas Cuba considers maternal-child health as part of the public health system (e.g., Maternal-Child Health Program) and defines it specifically as a hygiene issue where prevention and health promotion activities are woven throughout the public health response (Moliner, 2002; Pelosi, 2010). The purpose of studying the differences between the U.S. and Cuban health care delivery systems is to determine if different approaches to, and activities within a health care system are related to maternal-child health outcomes.

Cuba is an island nation located south of Florida in the Americas that has a gross domestic product (GDP) significantly less than the United States (US) ("Gross Domestic Product," 2011); however, as we shall see, many of Cuba's health indicators surpass those of the US. Despite the geographic proximity, the two countries have strikingly different health outcomes where even with limited resources Cuba's health care system reports better health indicators.

Purpose of the Evaluation

The purpose of a program evaluation is to highlight strengths and weaknesses and suggest changes for policies and funding (Stanhope & Lancaster, 2008). In any evaluation, the potential for policy implications in health care may be useful to federal planners of the U.S. healthcare system. This evaluation's purpose is to discern the differences between the Cuban and U.S. health systems related to maternal-child health. It will yield qualitative and quantitative data that reflects available information related to hygiene measures in Cuba and the traditional medical model in the US, in addition to the effect on morbidity and mortality rates. The ultimate purpose of the evaluation is to seek information to answer the question, "What are the differences between Cuba and the U.S. in maternal-child health delivery systems when considering differences in wealth, information access, and isolation?"

Maternal-child health, gender equality, and diseases are a MDG priority in global health. With 2015 as the target year to improve MDG disparities, the U.S. financial assets should reflect better health outcomes; however, Cuba has better outcomes with fewer financial reserves.

Whereas health costs in Cuba are government funded, the individual consumer primarily funds health care costs in the US. The per capita expenditure on health care in the U.S. of \$8,680 (based on 2011 data) surpasses the per capita spending in Cuba of \$405 (based on 2012 data) (Centers for Disease Control and Prevention, 2014; World Health Organization, 2014). The healthcare spending in the U.S. is acknowledged as costly, and one of the purposes of U.S. healthcare reform is to reduce the costs associated with healthcare delivery.

Background

When considering the differences between Cuba and the US, it is important to consider a brief overview of the history, governmental structure, and economics of each country. Certainly the differences in health and health outcomes are shaped by these influential factors. In providing this discussion, it lays the foundation for considering the factors that contribute to the differences.

Cuba

The importance of Cuba's history, governmental structure, and economic outlook is the stark difference between that of the U.S. as one considers the role of each country in providing a healthy environment for its citizens. As demonstrated in the Millennium Development Goals, the government in each country is responsible for the health of its people (*The Millennium Development Goals Report*, 2010). This discussion is used to provide an overview of Cuba's history, government, and economics that will allow the reader to understand the differences between the two countries.

Cuba is considered by the Cubans to be a socialist republic, but the U.S. considers Cuba a Communist state (Cuba, 2011; Cuba Government," 2011). The leading governmental party in Cuba is the Communist party of Cuba. Cuba was originally colonized by the Spanish and remained under their control until

December 10, 1898, and it was transitioned under U.S. administration until May 20, 1902 (considered the date of independence by Cubans). Under Spanish colonial rule, Cuba enjoyed a profitable plantation-based economy. Following independence, Cuba suffered economic instability between 1953 and 1959, and headed by Fidel Castro backed by guerilla forces, the Cuban Revolution occurred. On January 1, 1959, U.S. supported Former President Fulgencio Batista fled Cuba and Fidel Castro became the Prime Minister; and he created the unique one-party social republic of Cuba we know today (Raz, 2009).

Cuba is a country with only one official political party, the Cuban Communist Party, and candidates nominated by the party run unopposed. The Cuban Communist Party supports its people by providing a ration of food, housing, education, and healthcare. The executive branch is composed of the President of the Council of State and President of the Council of Ministers, and this is the same person. Historically this position was held by Fidel Castro, but in 2008, his nephew Raul Castro Ruz was elected to this position. The First Vice President of the Council of State and The First Vice President of the Council of Ministers is the same person, Jose Ramon Machado Ventura. The same person holds the head of the government and chief of state positions. Cuba's executive branch also consists of a cabinet nominated by the Council of State and appointed by the National Assembly. The legislative branch consists of the National Assembly of People's Power, and members are elected based upon special candidacy commissions. The judicial branch consists of the People's Supreme Court, or Tribunal Supremo Popular. The officials are elected by the National Assembly of People's Power (*Cuba*, 2011).

The government largely controls the Cuban economy and all resources. The Cuban economy was affected by the loss of Soviet Union Aid (USSR) in 1990, and as a result the Cuban economy and standard of living has suffered greatly. Recently, President Raul Castro Ruz eliminated 500,000 state jobs to encourage independent employment and entrepreneurial activities. Prior to this landmark Presidential decree, all jobs were state controlled. Policies implemented by President Raul Castro Ruz are designed to enhance the longevity and sustainability of the Communist model of government. Currently, Venezuela has a strong partnership with Cuba, and Cuba receives preferential terms on oil; in return, Cuba supplies Venezuela with medical professionals. Cuba has a dual monetary system. The Cuban Peso is the currency used by Cuban citizens to buy local goods and services, but the Cuban Peso (CUP) has less value than the Cuban Convertible Peso (CUC). Tourists and Cubans with access to the tourism industry use the CUC (*Cuba*, 2011).

Cuba is largely isolated from the rest of the world. Communications are completely controlled by the government. While telephonic communication is available, cellular telephone service must be paid for in CUC, thus limiting the number of people with access to cellular telephone service. The government owns all broadcast media, including 4 national television networks, many local stations, an international radio station, 6 national radio stations, and numerous local radio stations. Internet communication is greatly restricted in Cuba. Internet access is only with special permission from the government. Cuba operates an intranet, but this is also greatly restricted for the average Cuban citizen (*Cuba*, 2011; Cuba Government, 2011).

In Cuba, the medical interventionist system does not include maternal-child health care or childhood immunizations (Keon, 2009). As previously stated, maternal-child health care and vaccinations are an expected service called *hygiene* (Fernandez, 2002). Hygiene includes any preventive care delivered within the public health system of Cuba. Maternal health, infant health, child health, immunizations, and education programs are all delivered as a hygiene intervention (Paneque, 2010). Cuba reports eradication of many childhood diseases and low maternal and infant mortality ("*Cuba*," 2006; *The World Health Report 2003: Shaping the Future*, 2003). In addition, healthcare and hygiene in Cuba is delivered at a low per person expenditure (de Vos, 2009).

Healthcare in Cuba is delivered at a low per person expenditure (de Vos, 2009). In fact, outpatient clinics are run efficiently with little monetary resources (García Fariñas, Sánchez Delgado, Chaviano Moreno, & Muñiz Cepero, 2007). Childhood immunizations, delivered at outpatient clinics and other locations, such as schools, are considered hygiene measures, and Cuba boasts eradication of many vaccine preventable diseases. These immunization programs are effective and structured with strict protocols (Resik, et al., 2010). These improvements in the healthcare system are substantial over the last

several years (Villoldo, 2006), but the improvements are at a low per person expenditure. Maternal-child healthcare is also considered a hygiene measure, and it has a low infant mortality and maternal mortality rate.

The U.S.

This discussion of the government in the U.S. demonstrates the vast divide that separates Cuba's health outcomes from that of the US. It is important to note that these differences will help the reader understand the differences between health outcomes in each country.

In comparison to Cuba, the U.S. is a federal republic based on a constitution with a history of strong democratic spirit and practices. The U.S. has two leading governmental parties, the Democratic and Republican Parties. The U.S. was originally a British colony, and it remained under British control until July, 1776. The country was officially recognized as the United States of America after the Treaty of Paris in 1783. Under British rule, the U.S. colony was largely used for agricultural products, but following independence, the U.S. made great strides to diversify and support the needs of its people (*United States*, 2011).

In the US, there are several political parties that offer competing views during elections, but there are two main parties that are represented in most elections. The Democratic Party and the Republican Party offer philosophical views on government spending and social programs. While more complex than this statement, simply put, the Democratic Party favors centralized government with federal programs whereas the Republican Party supports fewer federal and more locally supported programs. The President and Vice President comprise the Executive Branch of the U.S. government. The President and Vice President are both the chief of state and the head of government, and they are elected through a formal voting process. The Cabinet is appointed by the president and requires approval of the Senate. The legislative branch consists of the House of Representatives and Senate where their local and state constituent members elect them. The judicial branch consists of the Supreme Court, United States Courts of Appeal, United States District Courts, and State and Country Courts. The Supreme Court justices are nominated by the president and confirmed by the Senate, whereas other courts elect justices based on constituent members (*United States*, 2011).

The U.S. economy is one of the largest and most powerful economies in the world. Individuals and private corporations largely control the economic health of the US. Although there are many government jobs, the private sector largely outnumbers the number of governmental jobs. Economic strife has occurred with U.S. involvement in the Iraqi conflict with a result of increased oil prices (*United States*, 2011). The U.S. has a single monetary system, the U.S. Dollar. The U.S. Dollar is the official and only currency recognized in the U.S. (*United States*, 2011).

U.S. citizens have access to all types of communication, and there are no governmental barriers except those imposed by the cost associated with a service. The U.S. is second and third globally in the number of landline and cellular telephonic communication subscribers, respectively. There are four major corporate owned television networks, but there are also numerous non-corporate affiliate stations, cable and satellite networks, and a few public-broadcasting stations. Public broadcasting station support is provided largely by private donor support. Private corporations largely operate radio communication, consisting of some 15,000 stations. Internet access is available to all, with free connections offered in commercial areas and at public libraries. Home Internet access is available for a fee from private corporations. The U.S. is first in Internet hosting with 439 million sites (*United States*, 2011).

In the US, maternal and child health care is delivered through the medical model of intervention where care is covered by medical insurance, whether private or government funded. Maternal health care and infant health indicators are relatively healthy, but this varies based on geographical area in the US. Childhood immunizations are required for entry into most schools, but parents are largely responsible for these required interventions (Lee, 2007). Maternal-child health care is available in the U.S. within the medical system, but the costs associated with medical interventions are considered costly. The U.S. spends more per capita on healthcare than any other country around the world ("Healthcare costs around the world," 2010).

Key Differences

Healthcare in the U.S. is delivered at a high expenditure per person (*National Healthcare Expenditures Data*, 2010). In 2008, the U.S. GDP spent on healthcare was 16.2% (Kimbuende, 2010) while the 2012 Cuba GDP spent on healthcare was 8.6% (World Health Organization, 2014). Childhood immunizations are typically administered at physician offices where delivery is dependent upon the medical practitioner prescribing timely appropriate vaccinations. The U.S. has a complex and competitive medical system where care delivered to women and children is not preferential (*The U.S. and Global Maternal & Child Health*, 2010).

Cuba has a lower infant mortality rate (3/1,000) than the United States (US) (4/1000). In both countries, greater than 99% of all births are attended by a skilled birth attendant. Infant mortality by age 1 is 5/1,000 in Cuba and 7/1,000 in the US. Maternal mortality rates reflect 47/100,000 live births in Cuba and 13/100,000 in the US. However, Cuba's maternal mortality is half of other countries in the Americas where the average maternal mortality rate is 99/100,000 (*World Health Statistics*, 2010). The per capita GDP for Cuba is \$5,596 and the U.S. is \$45,230 (*United Nations Social Statistics*, 2008). Despite the substantial differences in GDP, Cuba is able to provide excellent maternity care, neonatal and infant care that is superior to other countries in the Americas.

Cuban citizens have easy access to health care and are not personally responsible for any health care costs. In the US, everyone can access life-saving health care, but access to a physician and other health care services that are beyond life-saving measures are the responsibility of the individual. In the US, health care insurance can be obtained through various ways, including through an employer-sponsored health care plan, a governmental plan called Medicaid for those that are economically disadvantaged or disabled, a governmental plan called Medicare based on age and retirement, and by paying cash for health care services. Under the Affordable Care Act, taxpayer subsidized insurance plans are available, and the Premium Assistance Tax Credit option attempts to make health care insurance more affordable. However, these programs remain largely under-utilized and many remain uncovered leaving access to care challenging and a cumbersome process leaving access to care very difficult (Kitces, 2013; Tavernise & Gebeloff, 2013).

Literature Review

Hygiene as a Public Health Intervention

In the US, the medical model of care delivery includes pregnancy, childbirth and immunizations. In the Cuban Health System, pregnancy is considered normal, and is defined as hygiene as is childhood immunization. The Cuban healthcare system reports positive impacts on outcomes such as maternal mortality, infant mortality, birth weight, and vaccine programs (Birch & Norlander, 2007). These are essential elements to consider while evaluating the Cuban health care and hygiene system.

Vaccine Preventable Illnesses

The Cuban government invested in developing vaccines for vaccine preventable illness after suffering a devastating outbreak of meningococcal disease. Following the successful development of the meningococcal vaccine, the government invested in additional vaccine development and production and today, Cuba boasts a high compliance with their vaccine schedule (Resik et al., 2010). Vaccines are part of the hygiene program emphasizing prevention measures.

Oral Polio Vaccine, or OPV is imported from European countries, and the vaccine is administered through the hygiene program. Designated community members walk around the neighborhood and distribute the vaccine door to door. Then the community members encourage mothers to give the medicine to their children as part of the hygiene intervention measure. Cuba's public health system supports efforts to improve the success of vaccine initiatives, and research into methods that improve vaccination strategies continue (Resik et al., 2010).

Cuba invests in vaccine production and the infrastructure for the health of their people, but they have limited resources. Yet they continue to invest money in vaccine development and production to improve the health of their citizens through hygiene interventions. The intervention of vaccine development,

production and administration is an expensive hygiene intervention, but Cuba has included it as a health priority in the nation that continues to warrant spending in this vital area (Buxton, 1998).

Maternal Health

Cuba has a low maternal mortality rate, partly due to the focus on hygiene interventions. The focused prenatal care protects the maternal health and positively impacts the maternal mortality rate. Research has identified that care centered on preventive health through hygiene measures provides significant services with few resources (Birch & Norlander, 2007). It is suggested that the depth of the intervention, e.g., the nurses, doctors, and community volunteers, is responsible for the reduction in maternal child morbidity and mortality. The Cuban professionals become deeply involved in the hygiene of the pregnant mother through nutrition interventions, prenatal care, and education.

It is clear that the health system in Cuba focuses on prevention rather than intervention, a hallmark of the U.S. medical model of care. The thoroughness and diligence of the prevention interventions is crucial to the outcomes (De Vos, De Ceukelaire, & Bonet, 2008). This system of a prevention framework is substantially different than other countries in the Americas and has been attributed to positive health outcomes (Gericke, 2005), such as seen in the Cuban population.

Maternal health is influenced by the model of care delivery provided. In Cuba, it is a law that all infants are delivered at a hospital facility by a physician. The goal of the Cuban hygiene system is to shift the focus from medical intervention to prevention where delivery of babies occurs in a non-emergent situation and setting (De Vos, Murlá, Rodríguez, Bonet, & Màs, 2005). Additionally, emergency situations are recognized and referred to maximize outcomes (De Vos, Vanlerberghe, Rodríguez, García, & Bonet, 2008).

The Cuban people take great pride in their health system, and they credit the health of the nation with the hygiene and preventative health interventions of the public health system (Offredy, 2008). Pregnancy is valued in Cuba and the maternal health hygiene system focuses on the mother and child. Pregnant women are taken care of as if the success of the nation of Cuba is dependent on each and every pregnancy. The maternal health program is a multidisciplinary approach to holistic care of the pregnant woman, and the interventions are linked to the low maternal mortality rate (Keon, 2009). The value placed in the health of pregnant women is a priority, and this is evident in the maternal and prenatal care (Schnitger & Romero, 2003).

Infant Health

Infant health is measured by birth weight and infant mortality rate. The health system in Cuba cares for infant health by providing efficient hygiene through maternal care. Cuba boasts a healthy infant birth weight, and their birth weight is better than the average birth weight in the U.S. (Cabrales Escobar, et al., 2002). However, infant birth weights could not be found in a review of the literature.

An additional measure of infant health is infant mortality. Infant mortality rates in Cuba are low. In Cuba, the infant mortality rate is 5 per 1,000 live births, and in the US, the infant mortality rate is 7 per 1,000 live births. Several health interventions exist may be instrumental in the low infant mortality rate. The overall approach of integrating prenatal care through hygiene interventions contributes to the low infant mortality rate (Bahr & Wehrhahn, 1993).

Low birth weight does exist, and several factors contribute to low birth weight in Cuba. Maternal smoking, hypertension prior to pregnancy, prenatal care not in compliance with the Cuba government's prenatal schedule, previous history of low birth weight pregnancies, and anemia are causes of low birth weight (Cabrales Escobar, et al., 2002). The Cuban government has hygiene interventions in place to combat low birth weight. Physicians stress that women should not smoke. Since hypertension prior to pregnancy is a risk factor for low birth weight infants, and nutritional interventions and medical interventions are in place to decrease hypertension, education should also be provided. A strict schedule is in place for prenatal care and family physicians are integral in ensuring that pregnant women comply with the prenatal schedules. Those with a history of previous low infant birth weight receive special attention during their pregnancy. For instance, women with anemia receive intense dietary intervention to combat

the possibility of low infant birth weight.

The Cuban health system has outpatient clinics that are instrumental in providing the hygiene interventions and preventative care (Offredy, 2008). The outpatient clinics have many family physicians and the community inhabitants have access to their family physician and the outpatient clinics without having to wait a lengthy amount of time. The outpatient clinics are instrumental in identifying early problems with the pregnant woman and improving outcomes (García Fariñas et al., 2007).

Infant health and child health in all forms, including infant mortality rate, infant birth weight, and congenital defects and diseases, is a priority for the Cuban health system, and the outcomes are excellent. Infant and child health is a priority, and interventions start prenatally, continuing throughout the early development of the child all contribute to positive outcomes for the mothers and their babies (Rodriguez, Lopez, & Choonara, 2008). The infant health intervention strengths contribute to the health of the overall population, and this is congruent with the mission of the Cuban public health system (Swanson, 1988).

Health interventions in Cuba focus on prevention and health promotion, and in the U.S. focus on medical intervention. The basic forms of health prevention are defined as hygiene interventions, and vaccinations, maternal health and infant health are all now considered hygiene interventions.

Methodology

A program evaluation technique identified as modeling and statistical analysis will be used to evaluate the effectiveness of the hygiene measures of the Cuban healthcare system (Hsieh, Wang, de Arazoza, & Lounes, 2010). This evaluation will identify health determinants and interventions, and an effective method of framing maternal-child health and immunizations (Merz, 2002; Pagliccia, et al., 2010). This framework shapes the workforce structure of the Cuban public health system, and may serve as a valuable framework for the U.S. healthcare system (Márquez, 2009).

An invitation from the American Public Health Associations (APHA) afforded the opportunity to travel as part of a fact finding delegation to evaluate the public health care delivery system in Cuba. The delegation was invited to visit various public health entities and government officials. Cuban public health officials provided statistics and information about different public health programs.

The records collected for the program evaluation were from a November

2010 visit to Havana, Cuba. During the visit, the delegation visited a maternity home, a public health school, medical school, polyclinic, biotech institute, oncology institute, and various other public health facilities and notes were collected.

A convenience sample of government officials, physicians, nurses, researchers, and Cuban citizens was available during various site visits. However, formal interviews were prohibited, and key observations were used to provide qualitative insight. The Cuban Public Health authorities provided all retrospective data. Instruments used during the APHA visit of the Cuban Public Health system included qualitative observations and quantitative data provided by the Cuban Government. Data provided by the Cuban Government were corroborated by the World Health Organization.

The retrospective review of notes from a visit to Havana Cuba as well as the published statistics were used to analyze the distinct differences between the U.S. and Cuban health Care system. Consequently, the study received exempt status from The University of Tennessee Health Science Center's Institutional Review Board (IRB). Permission to travel abroad to Cuba was granted from the U.S. government's Office of Foreign Assets Control (OFAC).

Quantitative data analysis was conducted with the use of typed transcriptions and Microsoft Word Excel™ (Excel) and the Data Analysis function. The data was inputted into Excel and interrogated with various tools within the Data Analysis function of the Excel program.

Results

The Cuban Health System located in Havana Cuba is the structure for this program evaluation. The retrospective activities included visits to several healthcare facilities, including the National School of Public Health (ENSAP), Hogar Materno Infantil Dora Leonor Perez Cabrera, the Finlay Institute, visit to the Latin American Medical School (ELAM), and MINREX (Cuban Medical Cooperation Abroad).

During the visits, notes of conversations and lectures were taken from Cuban physicians, nurses, public health officials, and citizens.

A structural portion, which is the National School of Public Health, is responsible for the education of public health officials, providing physicians with the required public health curriculum (a mandatory component of medical school), and conducting public health research to influence Cuban policy. The National School of Public Health is located in Havana, Cuba, and there are many training programs offered throughout Cuba. The director of the school and leading faculty delivered an informative presentation on the structure of the Cuban Public Health System. The question and answer session allowed both the delegation and Cuban faculty to explore various topics of concern. The delegation also had an opportunity to engage with Cuban Public Health students.

Another structure of the Cuban Health Care System is Hogar Materno Infantil Dora Leonor Perez Cabrera and the delegation visited a Cuban physician in charge of the maternity home. Nursing staff and patients engaged with the researcher and provided qualitative insight. The maternity home is a residential facility designed to care for the pregnant mother at high risk for complications. Mothers with diabetes, including gestational diabetes, hypertension, nutritional, financial, or domestic violence issues, multiple fetuses, and other social complexities, including young and advanced maternal age were treated as high risk for maternal complications. The maternity home setting is considered a public health intervention. The setting falls outside a medical facility, but medical monitoring and observation of the mother is thoroughly evaluated, and an on-site lab, 24/7/365 physician and nurse staffing availability, nutritional support and counseling, and social worker availability are all provided to the mother from the time that it is determined she is at high risk during her pregnancy until her delivery. All maternal care is provided in the maternity home, including routine maternal care, birthing education, parenting classes, and genetic counseling. Delivery occurs in the hospital, and the mother is transported to the hospital at the onset of labor or in anticipation of scheduled cesarean section.

Another structure of the Cuban Health System is the Finlay Institute, which is a government funded biotech company in Havana, Cuba. The Finlay Institute was developed in response to an outbreak of meningococcal disease epidemic. The Cuban government could not obtain the vaccine for the citizens. In 1983, the government worked on the research and development of a vaccine for meningococcal b and c. In two short years, the Finlay Institute started clinical trials on their bivalent meningococcal vaccine, and in 1989, they were able to provide the meningococcal vaccine to the Cuban people. The successful research, development and production of the meningococcal vaccine spurred the government to start developing and producing its own supply of vaccines to avoid dependence upon importing vaccines for the public health of its people. In 1991, the Finlay Institute had to enlarge to increase the capacity of its vaccine research and production. Currently, the Finlay Institute employs 970 people, and it produces 12 vaccines. The delegation attended a presentation by the director of the Finlay Institute and had a question and answer session.

The process evaluation of delivery of care within the Cuban Public Health System included visits to several different public health facilities. The two significant visits included Hogar Materno Infantil Dora Leonor Perez Cabrera, or the maternity home, and the Finlay Institute, or biotech/vaccine facility. The results of the visits are summarized and compared to similar U.S. facilities using data of leading health indicators, as stipulated by the Millennium Development Goals, including maternal morbidity and mortality, infant morbidity and mortality, infant birth weight, and vaccine/immunization rates.

Hogar Materno Infantil Dora Leonor Perez Cabrera

Hogar Materno Infantil Dora Leonor Perez Cabrera is located in Old Havana and one of several maternity homes. The process that suggests women go to the maternity home occurs when they are classified as “at risk” or “high risk” and are referred for potential maternal or infant complications. Conditions considered as “at risk” or “high risk” include gestational diabetes, nutritional issues, maternal anemia, hypertension, pre-eclampsia, advanced maternal age, teenage pregnancy, multi fetal pregnancy, and social issues including domestic violence.

The maternity home is a residential facility that falls within Cuba's Public Health System. Pregnant

women are cared for by around the clock nursing staff and physician support is available between the hours of 8AM and 5PM. Physicians are also available after hours. The maternity home includes nutritional counseling and education, parenting education, labor and delivery education, activity programs (when not contraindicated), smoking cessation, lab services, genetic screening, and routine prenatal care. Compliance with bed rest is encouraged by the supportive environment of the maternity home.

Mothers with children are supported by their family and community. The mother's children must be cared for, and often the family undertakes this responsibility while the mother is in the maternity home. The community cares for the children if the mother has no family, or the family is not able to care for the children. Social workers are also available to find temporary placement for the children while their mother is cared for at the maternity home. Children and family members are allowed to visit the mother while she is cared for in the maternity home. Family support and participation is highly encouraged.

Utilization of the maternity home is highly recommended; however mothers are not forced to reside at the maternity home. Mothers that choose not to utilize maternity home services are visited a minimum of three times each week by their family physician. In some cases, the mother is seen by the family physician every day to assess and examine the condition of the mother in their home.

In contrast, in the U.S. a mother that is considered "at risk" or "high risk" is placed on bed rest at home where compliance is dependent on the mother. "High risk" mothers may be hospitalized, but hospitalization is largely dependent on her financial resources. While hospitalized, care is provided using a medical model where the mother has access to a nutritionist, social worker, case manager, nurses, physicians, and other healthcare professionals. Another important consideration regarding the high risk mother that is placed on bed rest is that they may be legally required to remain hospitalized against their will to preserve the life of the fetus. For example, Samantha Burton was held against her will in a hospital by a court order. In the US, this is a controversial case where the legal issue surrounds the rights and reproductive rights of the woman to control her own health (James, 2010). This focuses on an economic and individualistic aspect regarding health care not seen in the Cuban culture.

Finlay Institute

The Finlay Institute produces and manufactures vaccines for Cuban citizens. The government pays for the complete costs of research, development, and production of vaccines to meet the public health needs of Cuba's adults and children free of charge. The process of distribution of vaccinations through public health programs includes nurses traveling to homes in communities and administering the vaccinations. Other vaccinations are offered in schools, at family physician's offices, and clinics. The family physician is responsible for tracking all vaccinations and submits the health records to the clinic.

In the US, the process for childhood vaccinations is voluntary until children enter school, and even then, children may not receive these vaccinations for fear that harm may come to the child (Alcindor, 2014). Immunizations are routinely covered by insurance plans under the Affordable Care Act, but not all U.S. children have access to health insurance (Tavernise & Gebeloff, 2013). Additionally, records are not centralized. This results in disruptive processes where vaccinations are often given to children in multiple locations, each with generation of a unique record. Since the agencies do not communicate, there is often duplication and overlap of costly vaccines, or worse, there is an omission of a vaccine leaving a child unprotected from a costly and devastating illness.

Discussion and Recommendations

The Cuban Public Health System provides three major prevention and health promotion initiatives with multiple activities and interventions to support maternal and child health. They are offered to all Cuban community members at no charge and Cuba meets or exceeds all of the United Nations Millennium Development Goals. The U.S. health care, on the other hand, is based on an interventionist medical model; when compared, Cuba reaches better outcomes at one-thirteenth of the cost of care in the U.S.

There are a variety of factors that might contribute to the differences between the populations outcomes in maternal child health that are beyond the scope of this evaluation. However, the methods

used in maternal child care delivery in Cuba have strengths and the U.S. has some obvious weaknesses. It is possible to compare the two systems, but each health system model is unique. One obvious difference is that the Cuban model is founded in health promotion and prevention within a Public Health system, while the U.S. model is considered interventionist in a medical model.

The different interventions discussed in the Cuban system, including the maternity home and the Finlay Institute, are all unique to Cuba. The medical model in the U.S. does not support maternity homes or a government funded vaccine research and development institute. The services in Cuba are made available to all citizens and the public health hygiene interventions help the Cuban government meet the needs of an at-risk maternal child population, as identified by the specific Millennium Development Goals used to measure and compare outcomes in this evaluation.

In Cuba, the maternity home is a public health hygiene intervention that provides care to pregnant women and their unborn children. Compared to the U.S. outcome data, the maternal mortality, infant mortality, under-5-years-of-age mortality, and other data indicators favor the prevention and health promotion public health model of health care delivery in Cuba. The intervention of the maternity home, with no comparable U.S. equal, is a collaboration between the pregnant woman, her family and a physician who personally monitors the at- or high-risk pregnant woman. Personal contact and monitoring by a skilled health care professional may be the most significant contributing factor to Cuba's maternal-child indicator outcomes.

The government funded Finlay Institute researches, develops, and manufactures a great majority of the vaccines used in Cuba. The program provides vaccinations to children across Cuba through various government funded programs. Vaccine compliance in Cuba is 99% and the U.S. vaccination compliance is 72%. Vaccine compliance in the U.S. is complicated by a multi-payer system with multiple opportunities for children to receive immunizations, often leading to missed vaccinations or duplicated doses.

It is noted that the Cuban Public Health System and the U.S. medical model have many assets and strengths unique within each health care delivery system. As healthcare costs continue to escalate in the US, it may be useful to look at Cuba's health care system. It is recommended that the additional research be conducted on each of the strengths, weaknesses, and differences that exist between the two systems. Creation of a pilot program in the U.S. that models the prevention, health promotion and community resources system in Cuba may assist the U.S. in achieving excellent health outcomes while spending a fraction of the cost. Research to assess cultural implications is also necessary to determine if there is a cultural component that would prevent the implementation of the Cuban interventions in the U.S. health care system.

Conclusion

There are many differences between the Cuban and U.S. health care system, and this is in part due to the differences between the two countries. While the U.S. enjoys a better economic outlook, Cuba offers better health outcomes to its people. The differences in wealth, information access, and isolation are key to considering these differences.

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