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No Child or Mother Left Behind; Implications for the US from Cuba's Maternity Homes

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ABSTRACT

Background: Cuba, a "resource-poor" country, provides high-quality, free maternal care despite relatively low per capita health expenditures in comparison to similar expenditures in "resource rich" nations such as Canada and the US. This paper assesses maternal and child healthcare in Cuba, details the system of community-based regional maternity homes, and outlines specific recommendations for the US.
Methods: Based on observations during a visit to Cuba, and supplemental research on international health expenditures and health indicators such as infant and maternal mortality, this paper details maternal and child health in Cuba.
Results: Cuba utilizes community-based regional maternity homes to provide comprehensive care for women with high-risk pregnancies. This effective strategy of investing in maternal health by safeguarding pregnancies has lowered infant and maternal mortality rates significantly. Cuba has achieved neonatal, infant and under-five mortality rates that are better than or on par with resource rich nations such as the US. Additionally, within the Latin American and Caribbean region, Cuba has a low rate of maternal mortality.
Conclusion: Positioning maternal and child health priorities to the policy foreground were a critical step in saving the lives of Cuban women and children. The US may benefit from Cuba's example with respect to maternal and child health. Cuba's model provides important health, rights and policy lessons for all nations —be they resource rich or poor.
Keywords: Maternal and child health, Community health, Public health, Cuba

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Introduction

In November 2010, the authors travelled to Havana, Cuba as part of the American Public Health Association (APHA) delegation comprised of public health practitioners and academicians interested in learning more about the Cuban health system. The authors engaged in observations and research focused on maternal and child health. Delegates visited a maternity home (MH) in Old Havana. This article outlines

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Cuban practices, approaches, outcomes related to maternal, and child health and delineates potentially important implications for the United States (US).

According to the US State Department, the population in Cuba was about 11.2 million in 2010 [1]. Recent World Factbook estimates rank Cuba sixty-fifth globally with respect to gross domestic product (GDP) at purchasing power parity (PPP) [2]. This measure "…is the sum value of all goods and services produced in the country valued at prices prevailing in the United States" [2]. Yet, despite more limited resources, Cuba has many health outcomes that rival those of "resource rich" nations.

Infant and Maternal Health Indicators

A recent report by the Urban Institute synthesized a series of national and international indicators used to assess societies. The report outlines fourteen broad categories—including health—of "national well-being" indicators [3]. The core indicators under the health umbrella include:

- Life expectancy at birth mortality (for example, infant mortality rate, under-five mortality rate)
- Survival rate
- Children's health (for example, percentage of low birth weight babies, rate of children with very good or excellent health, rate of binge alcohol drinking, teen birth rate)
- Death rate (for example, child and teen deaths)
- Morbidity
- Nutrition and percentage of daily caloric requirements consumed
- Access to health care (for example, rate of children with health insurance)
- Access to contraception and abortion
- Access to clean water
- Obesity; and
- Mental health.

With respect to child and maternal health, often-cited indicators include life expectancy at birth, infant mortality, and maternal mortality.

United Nations (UN) data suggests that life expectancy at birth—the number of years a newborn infant could expect to live if prevailing patterns of age-specific mortality rates at the time of birth were to stay the same throughout the infant's life—is quite high in Cuba. In 2010, Cuban life expectancy at birth was 79 years [4]. Developed countries such as Japan and Switzerland had the highest life expectancies (83.2 and 82.5 years respectively) [4]. The majority of countries with life expectancies at 79 years or higher were Western nations—including the Canada and the United States (life expectancies of 81 and 79.6 years respectively) [4]. In the Caribbean and Latin America, the only countries with life expectancies similar to Cuba are Costa Rica (79.1 years) and Chile (78.8 years) [4].

Infant mortality, according to a report by MacDorman and Mathews, is "…associated with a variety of factors such as maternal health, quality and access to medical care, socioeconomic conditions, and public health practices" [5]. Infant mortality rates reflect the chances (per 1,000 live births) that an infant will die. Other rates such as the neonatal mortality rate (deaths per 1,000 live births within the first four weeks of life) and the under-five mortality rate (probability of dying before five years of age per 1,000 newborns) reflect the often-tenuous nature of health in infancy and early childhood. A recent report by UNICEF estimates that approximately 7.6 million infants and children died before age five across the globe in 2010 [6].

The health gradient suggests that there is an association between health and income. Persons with higher incomes generally have better health outcomes and persons with less income worse health outcomes. When examining gross domestic product (GDP)—a measure of national income—across nations, there is also generally a relationship

between higher national incomes and health outcomes, but paradoxes exist. The per capita GDP for Cuba, Canada, and the US are $5,704, $46,361 and $46,546 respectively [7].

Quite significantly, and despite being an economically poor nation, Cuba has managed to achieve relatively low infant mortality rates. The MacDorman and Mathews report also estimates that the 2010 neonatal mortality rate in Cuba was three, while rates in both Canada and the US stood at four [5]. The report also estimated the neonatal mortality rate to be 11 in the Latin American and Caribbean region. Thus, Cuba is on par with neonatal mortality rate estimates for "more developed" nations.

Infant mortality estimates for 2010 suggest that rates in both Cuba and Canada were five while the US stood at seven [6]. Of these three countries, infant mortality in Cuba has declined dramatically over the past two decades—down from 11 in 1990. In addition, with respect to under-five mortality rates, Cuba has a rate of seven, which is down from 16 in 1990-1995 timeframe [8]. Similar rates in Canada were six (down from seven) and eight (down from 11) in the US. The infant mortality rate in the US is generally higher than rates in other developed countries (i.e. in Western Europe).

Concomitantly, in the recent WHO report entitled, *Trends in Maternal Mortality: 1990 to 2008*, the maternal mortality ratio (MMR) is outlined as the "number of maternal deaths during a given time period per 100,000 live births during the same time-period." [9] This report estimates that countries in Latin America and the Caribbean had a MMR of 85 in 2008, while the MMR in developed nations was estimated to be 14. Both sets of rates show MMR improvement in comparison to 1990 estimates for each region. With respect to specific rates by country, the estimated 2008 MMR for Cuba, Canada and the United States were 53, 12 and 24 respectively [9].

What makes Cuba such a "positive" outlier with respect to the aforementioned health outcomes? How is it that despite a relatively low per capita GDP, Cuba is able to generate infant and maternal outcomes on par with—or better than—similar outcomes in developed countries such as Canada and the United States? One contributing factor rests with the fact that Cuba allocates a greater percentage of GDP to public health. For example, in 2007, Cuba spent nearly 10% of GDP on public health expenditures while Canada and the US each spent about seven percent [10]. Another significant factor is the priority the Cuban nation gives to infant and maternal health.

Materials & Methods

The present work is qualitative in nature and based on observations in Havana, Cuba in 2010.

International maternal, child health indicators, and economic expenditures on public health support this work as does information about the Cuban health system. Additionally, this work examines the US public health initiative, *Healthy People 2020*.

Maternal Care as a Public Health Intervention

The public health system of Cuba is based on the concept of socialized medicine and the right of all individuals to free access to health care. After the revolution of 1959, Che Guevara, a physician and a revolutionary, made a speech outlining Cuba's health system on August 19, 1960. In his speech "On Revolutionary Medicine," he stated: "The work that today is entrusted to the Ministry of Health and similar organizations is to provide public health services for the greatest possible number of persons, institute a program of preventive medicine, and orient the public to the performance of hygienic practices". [11] Once the health care structure changed from a privatized to a socialized health system [12], it became the state's responsibility to provide health care to its citizens in a vertical system.

In 1967, access to health care was recognized as a human right. Article 50 of the Cuban Constitution outlined the right of its citizens to health care stating, "Everyone has

the right to health protection and care. The state guarantees this right;

> • by providing free medical and hospital care by means of the installations of the rural medical service network, polyclinics, hospitals, preventative and specialized treatment centers;
>
> • by providing free dental care; and
>
> • by promoting the health publicity campaigns, health education, regular medical examinations, general vaccinations and other measures to prevent the outbreak of disease. All the population cooperates in these activities and plans through the social and mass organizations." [13]

In his vision of the new public health system, the Ministry of Public Health's mission and responsibility is to provide health care services to all its citizens by primarily providing preventive medicine. He states: "Some day, therefore, medicine will have to convert itself into a science that serves to prevent disease and orients the public toward carrying out its medical duties. Medicine should only intervene in cases of extreme urgency, to perform surgery or something else which lies outside the skills of the people of the new society we are creating." [11]

Hence, the Cuban health system is undergirded by core beliefs: health is a national priority as well as responsibility of the state, and health has both biological and social dimensions [14]. The health system in Cuba focuses on a preventative framework rather than a medical model. This preventative framework is substantially different from other countries and positive health outcomes have been attributed to it [15]. The Cuban people take great pride in their health system, and they credit the health of the nation with the hygienic as well as preventative health interventions of the public health system [16]. This system accomplishes a tremendous amount with few resources [17].

Results

Observations and Notes

Within the Cuban health system, the health of pregnant women is a priority—as if the success of the nation is dependent on each pregnancy. This priority is reflected in maternal and prenatal practices as well as outcomes [18]. For example, in Cuba, pregnancy is considered a public health issue—in stark contrast to the US where pregnancy is considered a medical condition requiring medical care. This important distinction is a positive, prevention-related factor that influences critical health outcomes for mother and children. In addition, by law all infants are to be delivered in a hospital facility by a medical doctor. Hence, the goal of the health system is to shift the focus from emergency-based medical care and delivery to a preventive model of care and delivery in non-emergent settings [19]. The diligence of these interventions is crucial to the outcomes of the health system [20].

The maternal health program consists of multidisciplinary approaches to the holistic care of pregnant women, and interventions are linked to the low maternal mortality rate [21]. Pregnant women receive care centered on public health knowledge and the depth of interventions is strength of the Cuban health system. On the main, nurses, doctors, community volunteers and the like become deeply involved in the hygiene of the pregnant mother through nutrition interventions, prenatal care, and education.

Keon notes that in Cuba medical personnel are generally readily available with one physician for every 159 individuals as well as one nurse for nearly every 80 individuals [21]. These impressive ratios, combined with family doctors embedded within communities and local polyclinics staffed with specialists [22] function to provide highly accessible as well as regular care for mothers and children. Moreover, women's health is a priority both before and after any

pregnancy as efforts are taken to identify women with risk factors or conditions that can complicate or jeopardize pregnancies [23]. Once a woman with risk factors becomes pregnant, the partogram program works to outline a systematic plan for care over the course of pregnancy as well as delivery considerations [23].

Plans may involve in-patient and/or outpatient care at one of Cuba's MHs. Fifteen MHs were established in 1962 [24]. Now, there are well over 300 MHs in the nation. MHs emphasize disease prevention, health promotion, and optimization. In a more global context, "maternity waiting homes" (similar to MHs in Cuba) support the health of (late term) pregnant women with identified risk factors [25]. Essentially, the homes provide stable environments that bridge any "health gaps" existing between women's respective homes and hospitals.

The MH (Hogar Materno Infantil-Dora Leonor Pérez Cabrera) in Old Havana was inaugurated in 1997. The MH has a capacity of 50 inpatient beds and 60 outpatient beds. The general service catchment area is primarily Old Havana, but is open to women from other areas. The primary medical personnel include no midwives, but rather doctors and nurses who are on call around the clock on a daily basis. Other support personnel include a social worker and on-call specialists (for example, dentists, psychologists). Based on the delegation's observations and discussions with the medical staff, overall risk factors associated with care at such homes include:

- Conditions such as hypertension, diabetes, pre-eclampsia and anemia
- Young or advanced maternal age (for example, under age 17, over age 35)
- Poor nutritional status
- Under/overweight women
- Previous history preterm labor/Poor obstetrical history
- Women with previous multiple births
- Other risk factors (for example, infectious diseases, drug use); and
- "Social conditions" (for example, discord with spouse/partner/parents, homelessness, and poverty).

Generally, "risk" is broadly defined in Cuba and according to Gorry; the definition has fluidity and continues to expand [26]. MHs were initially designed to address geographic disparities believed to contribute to poor perinatal outcomes. Today, risk includes the factors listed above. In essence, over the past 50 years, and based on the needs of the community, MHs have evolved. With infant mortality rates currently meeting Millennium Development Goals (MDGs), MHs can target efforts to reduce further maternal mortality outcomes—which have lagged behind infant mortality gains.

Descriptions of other maternal homes in rural areas suggest much more basic facilities than the MH visited in Havana [27]. However, the following observations are important in understanding the range of potential services available to pregnant women as well as for healthy pregnancies:

Pregnant women at Maternity Homes

- Approximately 96% of women entering facility are at risk for low weight births.
- Women receiving in-patient care at MHs must entrust the care of their other children to relatives or a social worker if no relatives are available.
- The MH is a non-smoking facility and women are encouraged not to smoke, however, 40 to 50% smoke for some period during pregnancy.
- Roughly, 80% of women will breastfeed (Target: 100%).

Care/services available

- Daily visits with the doctor

- Meals prepared by nutritionist
- Mental health services (for example, psychological counseling, stress management)
- Pre-natal education (for example, breastfeeding)
- Genetic testing for abnormalities
- Ultrasound services and fetal surveillance (for example, tests for folic acid and vitamin deficiencies)
- Lab services
- Dental services
- Nutritional counseling
- Contraception (family planning) services
- Other health education (for example, HIV/AIDS); and
- Indoor and outdoor activities (for example, light physical exercise/other recreation).

Additional observations

- Care at MHs is free and includes all health care, meals, accommodations, and other/related services.
- Family visitation is permitted for women admitted on in-patient basis.
- Regional and local MHs feed into obstetrical hospitals.
- At the appropriate/necessary time, women are referred to hospitals for delivery.
- Summary health/status reports for each hospital referral accompany women and hospital doctors then assume care for the women from MH doctors.
- Pregnant women can leave the MH at any time. If a woman returns home before delivery, she is seen on a regular basis by a community doctor. She is encouraged to return to the MH, but she is only admitted to the MH with her permission.
- Woman can also access the MH services on an outpatient basis. In this case, women may take their meals at the MH, attend parenting or educational classes, and exercise during the day and return home at night [26].
- After birth, the aim is for women to return to homes well prepared for them to care for themselves and their newborns.
- If a woman is admitted to an MH due to social concerns such as lack of family support, a social worker makes home visits to address these family issues. Social workers may educate the family about the needs of a newborn or provide therapy sessions to address family dysfunction; and
- Once women return home, there are follow-up visits with a community doctor and babies receive the recommended immunizations.

The use of MHs in the Cuban health care system continues to evolve. Cost-cutting measures have forced the closure of some MHs, which puts added pressure on local doctors to monitor at-risk pregnancies in areas without these facilities. In addition, evaluation of the MH program is on going. Health care workers and home residents all participate in regular evaluation meetings to improve services and meet client needs.

MHs represent a solid commitment to both women's health and "healthy beginnings" for children. The prevention-focused, public health intervention for pregnant women with a broad range of risk factors helps Cuba achieve a relatively low MMR (as compared to the regional estimate) as well as neonatal, infant and under-five mortality rates on par with (or better than) similar rates in developed nations.

Discussion

Cuban MHs and Implications for the US

One spillover effect of the Cuban belief that health is a right for which the government is accountable is the priority afforded maternal and child health. This belief, in addition to functioning as an "equity enhancer" with respect to health care access and health outcomes, promotes a broad definition of risk with respect to pregnant mothers in particular [28]. Cuban investment in maternal and child health is not only an investment in current population health, but it is also "*sembrando el futuro*"—sowing seeds for the future [29]. Essentially, in Cuba, emphasis is placed on optimizing both individual and population health over the long haul.

If, the US is serious about positively influencing future health trajectories generally, the need exists to re-evaluate current health spending patterns. According to one estimate by Issacs, for example, the US spends more per capita on the health of the elderly (about $12,170 in 2004) than it does on children's health (about $950 in 2004) [30]. Unfortunately, this "back-end" spending pattern is not new. Moreover, it continues despite powerful indicators that suggest "front-end," prevention-focused health expenditures, as demonstrated by Cuba's impressive maternal and child health outcomes, can successfully promote health over the life course.

The pace of US efforts to improve pregnancy outcomes has not kept pace with other prevention initiatives. This is due "in part to inconsistent delivery and implementation of interventions before pregnancy to detect, treat, and help women modify behaviors, health conditions, and risk factors that contribute to adverse maternal and infant outcomes." [31] According to information from the National Preconception Health and Health Care Initiative, existing care in the US is: "discontinuous and episodic;" lacks a focus on reproductive risks; and due to the fact that important pregnancy risk screenings are often not completed by primary care doctors , prevention information does not reach the intended audience—reproductive age women [32]. Additionally, in recent years, women of childbearing age accounted for more than one-quarter of all uninsured Americans [33]. Uninsured women have greater difficulty in obtaining needed care than women with insurance. The uninsured are less likely to have a usual source of medical care and more likely to delay or forgo needed health care services.

Addressing health disparities is one of the four main goals of Healthy People 2020. Maternal and child health disparities across racial/ethnic and income groups in the US is well documented. Examining the impact of more expansive (or comprehensive) definitions of "risk" and the concomitant impact on maternal, infant, and child health (MICH) objectives might yield data that informs future public health initiatives or outreach.

Broadly, the Healthy People initiative represents a "…systematic approach to health improvement, encompasses the mutually reinforcing tasks of setting goals, identifying baseline data and ten-year targets, monitoring outcomes, and evaluating the collective effects of health-improvement activities nationwide [34]. Maternal and child health is a core area of focus as well-being in this sector "… determines the health of the next generation and can help predict future public health challenges for families, communities, and the health care system." [35] Examples of Healthy People 2020 objectives and targets MICH include:

- MICH 1: Reduce the rate of fetal and infant deaths
  - Target: 5.6 fetal deaths per 1,000 live births and fetal deaths
  - Target: 6.0 infant (within 1 year) deaths per 1,000 live births

- MICH 3: Reduce the rate of child deaths.

- Target: 25.7 (children aged 1 to 4 years) deaths per 100,000 population

- MICH 5 Reduce the rate of maternal mortality
  - Target: 11.4 maternal deaths per 100,000 live births; and

- MICH 10: Increase proportion of pregnant women receiving early/and adequate prenatal care
  - Target: 77.9% of women receive prenatal care beginning in first trimester
  - Target: 77.6% of women receive early and adequate prenatal care.

For each of the objectives above, the targets represent a 10% improvement over the baseline figures. Given the trend of spiraling health costs, investigating ways to better integrate as well as coordinate care in order to generate cost efficiencies—and perhaps savings—is necessary. How can Cuba and its MH program inform US public health efforts centered on maternal and child health?

First, the evolution and implementation of MHs reflect a commitment to health that is not contingent upon cash. Cuba is a "resource poor" nation, but values highly the "priceless" nature of a well-integrated public health system. The level of coordination and integration between the different structures supporting pregnant women (for example, family doctors, polyclinics, hospitals, social services etc) are core strengths of the Cuban system. In the context of a developed country like the US, having pregnant women move out of their homes into separate facilities for a significant period may appear excessive. However, locating pregnant women with identified risk factors in a central location streamlines costs and yields other efficiencies. Expensive technologies can be made available to large numbers of patients, while food supplies can be delivered to groups based on need. Specialized services such as ophthalmology or alternative treatments can be provided to multiple patients, and pharmacies and dispensaries can be accessed by all [36].

Second, defining "risk" broadly with respect to pregnancies expands the pool of women of childbearing age eligible to receive preventative education and health outreach. Women are admitted for care in MHs based solely on risk factors—irrespective of employment status, income, or level of education. Also, inclusion of factors associated with "social problems" helps focus on social and other determinants of health that are known to pose health threats to pregnant women and/or developing fetuses. Both practices are strategically sound public health approaches and are equitable.

Finally, once the definition of risk is determined, there is a systematic process of identification and monitoring of women with the outlined risk factors. Given the integration of the Cuban public health system, family doctors, specialists, and social workers, among others, all become involved in determining the best course of action for nearly every pregnant woman with the outlined risk factors. Often, MH care is identified as the best course of action—be it on an in-patient or outpatient basis. However, women can and often do refuse MH admission. In such instances, these women will receive daily, in-home visits from their respective (neighborhood-based) family practitioners.

Certainly, identifying and tracking every "at risk" pregnancy in country with a sizeable population and land mass as the US presents logistical challenges. However, developing some systematic process of identification may be one-step toward maximizing health returns on the nation's high level of health expenditures.

In the US, the recently passed Affordable Care Act contains increased prevention efforts, including prenatal care for mothers (for example, screenings, smoking cessation, breast-feeding education), pregnancy assistance funds for teens as well as funding for

states to assess status and need related to maternal, infant, and early childhood home visiting programs. On the main, however, the US health system does not keep a "watchful eye" on women over the course of pregnancy. Moreover, very few programs or services are compulsory for non-institutionalized pregnant women. As a result, opportunities are missed to safeguard more optimally women's health and fetal well-being. These forgone opportunities have the potential to translate into poor health outcomes and increased expenditures on the sick. Expanding the definition of "risk" (or "at-risk") with respect to prenatal care, as well as adjusting policy priorities to provide the concomitant funding, would at least afford more pregnant women the chance to seek a broader array of services in support of their health.

Recommendations and Conclusion

The Cuban model demonstrates that access to health care is an essential tool needed to promote good health and a public health system focused on prevention is effective in generating sound health outcomes. The recently enacted Affordable Care Act increases health care coverage for more Americans and outlines some provisions for preventive care. The legislation is an important effort, but does not go far enough. Policy makers need to continue to explore mechanisms and public health programs that increase health care access and prevention-based services.

The US must utilize health care expenditures/investments more effectively. While the US currently spends more than any other developed nation on health, perhaps adjusting per capita expenditures on specific priority areas (like maternal and child health) and periods of the lifespan (such as prenatal and early childhood) will have a positive influence on future health trajectories.

Expanding the definition of "risk" with respect to pregnant women and pregnancies expands the pool of women of childbearing age eligible to receive preventative services and health education. In addition, a more expansive definition of "risk" and the concomitant impact on MICH objectives might yield data that will inform efforts to reduce racial/ethnic as well as socioeconomic disparities in maternal and child health.

The following recommendations reflect considerations for the US based on lessons learned from the Cuban model regarding maternal and child health:

- Reevaluate health-spending patterns (for example, per capita expenditures on children's health vs. per capita expenditures on persons age 65 and over) and identify opportunities to make smart, prevention-focused investments in maternal and child health. Validating maternal and child health as a national priority (while providing the necessary resources and funding) may help the US "sow seeds" for good health across the lifespan as well as for future national health.
- Consider funding pilot programs that incorporate broader definitions of "risk" for pregnant women as well as provide a broad array of services/education/outreach. Monitor the health outcomes of participating mothers and infants in such a program to inform future efforts to improve health. Pilot programs may also examine various means of coordinating and integrating care in order to keep pregnant women healthy. In-residence and centrally located services are examples of this approach; and
- Identify additional incentives for women of childbearing age with known risk factors associated with pregnancy complications, to seek preventive care for themselves--both before becoming pregnant as well as during pregnancy. After birth, successful programs such as the Nurse Home Visiting Program, conceptualized by David Olds in 1977, may be expanded to a broader range of

women meeting the "risk" standard in order to provide routine "health check-ups" on them and their children.

In a nation with over 300 million persons, undoubtedly numerous health priorities exist. Yet, prioritizing maternal and child health as well as safeguarding pregnancies represent an investment in a form of "wealth" potentially available to all—good health! Moreover, refining investments in maternal and child health is a proactive strategy with the potential to benefit the nation exponentially--for years to come. Championing maternal, child health, and allotting sufficient funding for initiatives related to the lessons above can sow seeds of long-term health child-by-child; woman by woman; family by family; and community by community. Ultimately, such efforts can positively influence health outcomes for "resource rich" and "resource poor" nations alike.

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