

Maternal Mortality Rate: A Comparative Analysis Between Financially and Politically Disparate Countries

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In September of 2000, the United Nations Millennium Declaration committed all signees to a series of goals to be achieved by 2015. One of the Millennium Development Goals, goal number five, was to improve maternal health. This goal was to be accomplished through two major initiatives: a 75% reduction in the 1990 maternal mortality rate, and increasing universal access to reproductive health. A longer term goal, Sustainable Development Goal 3 includes the objective of reducing global MMR to less than 70/100,000 live births by 2030. Though the 75% reduction in MMR was not achieved, it is not too late to achieve SDG 3. Here, we attempt to analyze maternal death by examining the factors contributing towards it in three countries: The United States, Cuba, and Sweden. We chose these countries because of their vastly different resources, healthcare systems, and healthcare outcomes. As demonstrated here by the World Health Organization, maternal mortality rates between 1990 and 2015 of these three countries are



vastly different:

By investigating these three countries, we hope to find common threads that will allow us to more clearly identify factors that help exacerbate, or avoid, maternal death.

United States

The United States of America is a country with seemingly unlimited monetary resources.

In 2015, the Gross Domestic Product of the United States was about \$18 Trillion, more than \$6 Trillion more than the second largest economy, China (United Nations, 2016). In fact, the monetary value of the United States' economy totals more than that of the entire European Union. In terms of healthcare expenditure, the United States spends roughly 18% of its GDP annually, worth approximately \$3.2 trillion in 2015 (Galea, 2017). Average expenditure among other economically sound nations trends around 9% of their GDP, and the closest country in the world to the United States in terms of spending, by percentage, is Sweden, who spends 12% of their GDP (Galea, 2017). This only equates to roughly a third of the amount spent by the United States when converted to dollars, however.

Logically, one would expect the country that spends the most money on health care to have the best results, across the board. Interestingly, this is not the case in many areas. Using the 34 countries that are part of the Organization for Economic Cooperation and Development (OECD) as a baseline, the United States ranks 26th in life expectancy and dead last in obesity, among other metrics (OECD, 2017). Significantly, however, the United States also lags in maternal morbidity and mortality. The lifetime risk of maternal death in the US is estimated to be 1 in 3,800 (World Health Organization, 2015). This is roughly on par with countries with significantly less medical influence and international power such as Lebanon (1 in 3,700) and Thailand (1 in 3,600), though it is well behind others, such as Slovenia (1 in 7000) and Lithuania (1 in 6300).

The rates of maternal mortality in the United States are disproportionately high for a country with widespread medical care and immense financial capital. Here, we will attempt to delve into the many factors that may contribute to this disparity.

A Statistical Error?

One of the most common arguments presented by doctors and epidemiologists to explain the disparity between the United States and many of its peers is also one of the easiest to understand: the numbers are simply wrong. A potential source of error comes from improvements that the United States has made in tracking maternal mortality. Between 1993 and 2014, new ICD-10 codes regarding pregnancy complications and new questions regarding pregnancy on death certificates were both implemented in the United States. When controlling for these factors, the rise in maternal mortality over this time is nullified (Joseph et al., 2017). Importantly, the authors here do not claim that the United States is overestimating their maternal deaths, but that the measurements used by the country have gotten more accurate. This sentiment is reflected by other sources, as well. Differences in measurement methods by country can lead to significantly different rates. For example, the Center for Disease Control in the United States, when examining maternal mortality, identifies all deaths within a year of pregnancy while most other countries only report within 42 days, as is the convention by ICD 10 and WHO (Creanga et al., 2014). The much wider definition of maternal mortality, as used by the CDC, can inevitably lead to higher estimates of mortality being utilized by organizations comparing the rate of the US to other countries. Despite this, however, Creanga et al. still found a significant difference between the United States and countries in the European Union.

Capitalism and Healthcare

Capitalism is readily embraced as one of the backbones of both American culture and economy, and its effects heavily impact the landscape of healthcare in the country. Unfortunately, this frequently leads to the commodification of healthcare as a part of the medical-industrial and medical-financial complexes. As pharmaceutical and insurance

companies seek to maximize their profits, human health is often put to the side while companies attempt to maximize their profit margin. Especially significant in the case of maternal health is the medicalization of many pathologies, including birth itself. Clinical parameters are altered in order to maximize the number of people who are “sick” and to increase the number of procedures being done (Abadía-Barrero and Ardila-Sierra, 2017). A notable example of this is seen in the rate of caesarean sections performed in the US. While the average rate of c-sections among OECD countries was roughly 28 procedures/100 live births, the United States averages 32.5% (OECD, 2015). Though this difference may seem insignificant, the difference is stark when compared to another country in this analysis, Sweden, which has a c-section rate of 16.4%, roughly half that of the US (OCED, 2015). It has been found that serious complication rates are 10.4% with the procedure, and overall complication rate can be as high as 27% (Pallasmaa et al, 2010). This procedure keeps women in the hospital for an average of three days post birth versus two days for vaginal birth, and generally requires 6-8 weeks of recovery versus 2-3 weeks for natural birth (Pallasmaa et al, 2010). The extended recovery times also increase the chance for postpartum complication. Exposing patients to a larger degree of risk inevitably leads to a larger degree of poor outcomes, and the push for more procedures is largely a result of the drive for profit maximization.

Profit-based medicine also has the negative effect of pricing many people out of regular care, creating a population with health problems that are often undiagnosed or unmaintained. The steady decline of maternal mortality as a result of traditional causes such as hemorrhage or sepsis in favor of chronic factors, such as cardiovascular disease, (Creanga et al., 2014) indicates that the cause of increasing maternal mortality in the United States is likely not a decline in the country's' ability to deal with emergent complications. Instead, unaddressed, preexisting

conditions are likely to blame for the rise in deaths. For example, up to 89% of women suffering with depression also present with at least one chronic condition or risk factor (Farr et al., 2011). Despite this, only 50% of pregnant women receive treatment for their condition, likely leading to complications of pregnancy and poorer outcomes untreated individuals that statistically less common in those who are treated (Ko et al., 2012; Yonkers et al., 2009). Additionally, according to the CDC, the rates of pregnant women suffering from heart disease, high blood pressure, obesity, and diabetes is on the rise in the United States (CDC, 2016). The presence of these risk factors is positively correlated with the risk of maternal mortality, and, while there are many factors that contribute to the presence of these afflictions, the fact that black women are 3-4 times more likely to die as a result of childbirth is also indicative of significant socio-economic contribution (Creanga et al., 2014).

Political Barriers to Access

In addition to financial barriers to health, there are political discrepancies in the United States that lead to widely variable healthcare. Because of the wide variety of political beliefs in between states, the United States has differing approaches to female reproductive health. One need to look no further than Texas and California to see the effect political landscape can have on maternal health.

The state of Texas has an MMR roughly on par with Turkey or Mexico, with 35.8 deaths per 100,000 births in 2014 (Macdorman et al., 2016). This is considered by a variety of sources to be the highest in the “developed” world. This can be accounted for by a number of factors. First, the number of uninsured in Texas is incredibly high as a result of both former and current governors’ rejection of the Affordable Care Act medicaid expansion. While many states saw their uninsured numbers drop following the implementation of this expansion, Texas did not

participate. Additionally, there was almost a twofold increase in the MMR in 2011, the same year that Planned Parenthood stopped receiving public funding in the state of Texas (Macdorman et al., 2016). Since this time, 25% of family planning clinics have closed in the state and those that have stayed open are significantly scaled back, leading to an increase in unwanted pregnancies, particularly in populations that are at high risk for complication (White et al., 2015). Unfortunately, the political climate in the state tends to focus on deservingness instead of treating maternal health as a right (Willen and Cook, forthcoming), leaving women who cannot afford birth control the choices of abstinence or risk of pregnancy.

While the MMR in Texas continues to rise, California's continues to decline. In 2013, the MMR in California was 7.3 deaths/100,000 births, the lowest in the United States (State of California, 2017). There is a number of factors that has contributed to California's success, though the most important has been prioritizing women's health. A variety of measures, including hemorrhage carts and protocols for measuring blood loss, have come as a direct result of the emphasis on reducing maternal mortality. Additionally, the number of uninsured individuals in California is half that of Texas, leading to better preventative care that takes place during pregnancy, not just during birth (Kaiser Family Foundation, 2017). The political climate in California not only attempts to endorse health coverage for all, but has made a pointed effort in reducing the maternal mortality rate, leading to results that put it at the top of all American states.

Cuba

Commonly referred to as the “Cuban Jewel”, Cuba's health care system is well known for its emphasis on accessibility and implementation of health as a constitutional right. Their

model demonstrates that economic strength is not necessarily needed to enjoy quality health outcomes. Despite its limited resources, with a relatively low per capita health expenditure figure, Cuba approaches maternal health outcomes similar to those of developed nations. Within the Latin American and Caribbean countries, Cuba's maternal mortality rate of 39 deaths per 100,000 live births is an outlier among the region's overall figure of 85 (Bragg, Salke, Cotton and Jones, 2012). Their impressive outcomes are due largely in part to their systems emphasis on universality, equitable access, and governmental control.

Revolutionary Healthcare

Following the Cuban Revolution in 1959, social and political measures of reform aimed to reduce disparities in living conditions, income, education, employment, and health status. The first years of the revolution directed focus to creating accessible health care facilities and services. Mutualistas were the most commonly found health services in Cuba. These facilities were family-owned, fee-for-service schemes that only the middle class could comfortably afford. The wealthy class utilized privately owned hospitals run by independent doctors. The large remainder of the population either used other facilities that were typically overcrowded and understaffed, or went unable to access any care at all. At this point in time, citizens were beginning to envision health as a responsibility of both the state and public. In 1976, Article 50 of the Cuban Constitution stated, "Everyone has the right to health care and protection." The Article continued by outlining the states' role in fulfilling this, by "providing free medical care and hospital care by means of installations of the rural medical service network, polyclinics, hospitals, preventative and specialized treatment centers." They emphasize that in return, "all the population cooperates in these activities and plans through the social and mass organizations"

(The Constitution of the Republic of Cuba, 1976). By placing responsibility on both the state and public, Cuba accepted its role in fulfilling access to health care, while encouraging participation from citizens that would help to strengthen their model in place. The Ministry of Public Health (MINSAP) established all health facilities under control of the government, marking its transition from privatized to socialized care.

The Maternal–Child Programme (*Programa Nacional de Atencion Materno-Infantil—PAMI*), established in 1970 by a small group of doctors in MINSAP, led governmental sectors and community organizations to work together to provide a network of community-based services. According to Kath (2010), Cubans responding in an interview agreed that PAMI is given priority over all of the established health programs (p. 26). Consolidation of health care facilities under MINSAP created a comprehensive network of care that served both urban and rural populations.

A Preventative Framework

The structure of services in Cuba is optimized to deliver care through a hierarchy of services. At the core of this are consultorios, or family doctor clinics, that provide 24-hour primary care within their respective communities. These facilities have become the central approach to providing basic primary care services to residents of entire communities. The consultorio has a far more extensive role than typical clinics found in the United States, with primary care workers working routinely with patients for a multitude of health services. Health care workers are made readily available to patients, and the entire staff is often familiar with and responsible for every person of the community. Visits made during a study carried out in various cities, towns, and villages found that the typical day for a paired nurse and doctor is divided in

half. The first portion of the day consists of appointments with patients in the clinic itself, and the remainder of the day is spent on home visits within the community (Offredy, 2008). Dr. Christina Luna, the national director of ambulatory care in Cuba, gives large credit to these clinics for such impressive health outcomes. She notes, “we were conscious that prevention had to be a cornerstone of our system, and that people had to be understood in all their dimensions: biological, psychological and social, and as individuals, within families, and within their communities” (World Health Organization, 2008).

Family doctor clinics have a very well established diagnostic and referral system that puts patients in direct contact with their own respective polyclinics, or secondary care systems. The health care team at the polyclinic works with women that wish to become pregnant in order to assess risks and plan for an optimal conception. In the event of a high-risk pregnancy, community-based maternal homes are open to care for women. These homes are also open to women who live in more isolated communities. During the observations done at consultorios, a nurse explained that if it is “a pregnant woman nearing time for her delivery and she lives in the mountains, we have places where they can stay before the birth of the baby so that they can be transferred to a hospital before the birth” (Oddfrey, 2008). When referred to a maternal home, a woman can be followed through outpatient care or admitted to stay directly at the center, depending on the severity of her condition. This allows for complications to be promptly identified and treated, greatly reducing the chances of a preventable death from occurring. Treatment is provided to those who require emergency intervention in hospitals. Cuba has about 256 hospitals, serving areas regionally throughout the country. Doctors at the consultorio noted that in the event of an emergency, patients can go straight to a hospital without direct referrals from their consultorio doctor. The doctor will always contact a patient’s family doctor so that

they can both provide relevant knowledge of the patient's medical history and visit for a follow-up. Due to their exceptional coordination between facilities, Cuba boasts a rate of 99% of births taking place under the supervision of a medical practitioner (Oddfrey, 2008).

Maternity homes for women with high-risk pregnancies are designed to bridge any "health gaps" that may exist between the home and hospital settings (Bragg, Salke, Cotton, & Jones, 2012). Based on observations conducted in a maternity home located in Havana, the general risk factors meriting referral to the home include: young or advanced maternal age, poor nutritional status, under or overweight status, conditions such as hypertension and diabetes, and social conditions including poverty, homelessness, and conflict within the home. Doctors and nurses are around on clock on a daily basis, and often other supportive staff is made available, including psychologists, counselors, and other health specialists. The services are all made available are free of charge. When a woman is admitted to a maternity home based on poor living conditions, a social worker will regularly make home visits to address these issues and ensure a women can return home prepared to care for both herself and her newborn. With infant mortality rates remaining on par with those of developed nations, maternity homes are pressing to further reduce maternal mortality rates to a similar standard.

Primary Care through a Rights-Based Approach

The primary health care movement gained international recognition formally at the Alma Alta International Conference in 1978. Basilico (2013) notes that "divergent economic and political ideologies, driven by the interests of Cold War superpowers, influenced the discourse of international health" at the time. The idea of socialized medicine put the state in charge of equally distributing services, which positioned Cuba against policymakers in the United States,

who tended to promote market-based services. With the rise of neoliberalism, the Cuban primary health care movement remained untouched by policies that now are directly disadvantaging countries that privatize their services. The primary health care movement was fully embraced, leading to the realization of health as a human right even before Alma Alta declared its intentions in 1978.

Examining a rights-based approach reveals three major themes to health system reforms, defined as “the place of social determinants within a rights-based approach; equity as an explicit goal of a rights-based public health system; and how a human rights approach addresses vulnerability” (Meir, Gable, Getgen, & London, 2011). With a human rights framework informing public health policy, Cuba successfully embraces these features, making them a positive outlier among countries with similar economic status. Their maternal mortality rates continue to decrease, as they address the broader social conditions placing women at risk for largely preventable deaths arising from pregnancy and childbirth. Reforms under a state-led program implemented Cuba’s public health policy by facilitating access to care. On healthcare, Yamin notes “patients all too often see themselves as beggars and accessing services is, in turn, treated as a matter of largesse by providers (Yamin, 2016). Extensive coordination between each level of care shows strength in the circle of accountability, due to the large emphasis placed on preventative medicine and community participation. Additionally, their approach recognizes the vulnerability women face within their given social contexts. Bragg (2012) notes “positioning maternal and child health priorities to the policy foreground were a critical step in saving the lives of Cuban women and children.” The government recognizes success of the nation as being dependent upon health of this population, in order to strengthen the overall health of their

country. A rights-based approach to health in Cuba has led researchers to suggest this model for both resource rich and poor nations, alike.

Sweden

Sweden is strongly committed to women and children's health within their publicly funded and largely decentralized healthcare system. Throughout the nation's three basic principles of health care consisting of human dignity, need and solidarity, and cost-effectiveness, 12 county councils and nine regional bodies finance the health services. Sexual and reproductive health rights are a high priority in interconnecting issues within maternity and neonatal care. The nation's growing appreciation of maternal welfare gives increasing concern to providing for adequate medical attention for mothers.

Access to Health

Sweden's universal health care system allows for residents accessible and quality care. "The Swedish Health Care System" emphasizes that the nation publicly finances their health expenditures representing 11% of their GDP in 2014 alone. Their country councils and municipalities are responsible for levying their proportional income taxes, while the government redistributes their resources among their population in an equally distributed manner. The cost incurred in childbirth is not a financial burden for families in Sweden, unlike the United States. The nation exemplifies the affirmation in the "Universal Declaration of Human Rights" that states, "Motherhood and childhood are entitled to special care and assistance... enjoying the same social protection (1948). The coverage is automatic and universal according to the 1982 Health and Medical Services Act, where even asylum seeking and undocumented children can seek health care services. There is no defined benefit package by their system allowing the state

to cover public health and preventative services like primary care, inpatient and outpatient specialized care, prescription drugs, mental health and maternal care (2016).

Government Intervention Efforts

Swedish county councils run a nationwide network of prenatal and pediatric care clinics recommending preparation and guidance to new parents. According to Berachochea's "Why Do Rights Based Approaches to Health Matter, the state should have an "obligation to respect, protect, and fulfill the state from preventing other third parties from violating the right to health (2011)." For this reason, Sweden offers a free of charge service aimed to promote a mother's health as well as her children's. The clinics monitor the pregnancies to counteract any complications with the maternity and obstetric care. The council's provide asylum seekers for the parents who don't have Swedish citizenship. Parents can obtain the right to acute health and dental care, having the right to childbirth care, abortion care, contraceptive advice maternity care and more. They still receive the highest quality non-subsidized immediate care but children born to non-Swedish citizens have to assume the citizenship of their parents and have to obtain asylum to continue benefiting from the Swedish healthcare system. The state accepts responsibility for the education of doctors and midwives, establishing the right holders and the duty bearers in the case of morbidity.

Midwives

Sweden's national health approach includes offering midwives and doctors' corresponding roles and equal contribution in setting their public health system. Sweden has had a relatively low maternal mortality rate from 8 deaths per 100,000 to half in less than two decades. Aimee Lindsay emphasizes that Sweden had an expected 4 maternal deaths per 100,000

live births in 2013. Skilled attendance at birth is vital for preventing delivery complications and increasing childbirth survival. Midwives ensure the communication and coordination between pregnant women, their families and labor wards. The improvements in the nation's obstetric care have been contingent on their equal care public health system. They introduced aseptic techniques and task sharing knowledge between the doctors delivering the babies and the assisting midwives. Their concentration of preconception care, including interventions prior to pregnancy, optimize women's health has improved their pregnancy outcomes. Through the management of pre, during and post birth processes, Sweden is acknowledged as the safest state in the world to give birth (2015) and has increased satisfaction and overall quality of maternity services.

Swedish midwives and doctors are jointly working together to reduce maternal death. The nation offers an all-encompassing and well-functioning prenatal health system that benefits one of the lowest rates of maternal mortality in the world. According to the "Swedish Medical Center", the Swedish Association of Midwives promotes women's sexual and reproductive health to improve reproductive and perinatal care. The nurse-midwives are trained as registered nurses with a Master's degree in Nursing, specializing in caring for women with low-risk pregnancies. They are able to recognize complications and deliver emergency care for women, establishing a trustworthy relationship with their patients. There are on-call 24-hour rotation midwives at the hospital to attend the birth of patients, distinct from the ones that are seen for routine visits. The security and comfort that the midwives provide to the expecting mother decreases their fear and stress during pregnancy and birth, improving birth outcomes (2017). Their concentration is to provide an all-inclusive approach to fulfilling a healthy pregnancy and an adequate birth experience. Their practice an ethical and humanistic approach is patient

centered, focusing on treating women and their partners as subjects rather than objects of care. By not taking the cost of healthcare into consideration, Sweden is providing a human right's standard of living for proper and adequate health.

Conclusion

Through a human rights needs-based approach, every woman should be entitled to free and effective maternal care. Maternal mortality is contingent on whether or not nations have access and political will to deliver and monitor quality public health services. While the U.S demonstrates more of a needs based approach to healthcare, the nation prioritizes their health problems and suppresses the needs of its individuals. On the other hand, Sweden and Cuba's governments have implemented a rights-based method with evidence based and effective services on national and local levels. Sweden's effective national health strategy gives midwives and doctors corresponding roles in maternity care and equal involvement in setting up their equal access healthcare system. Despite Cuba's universal access to healthcare and implementation of services for successful infant health, they have dramatically fewer resources than the U.S, affecting their current high maternal mortality rate. The United States' high cost of pregnancy and newborn care, as well as a cutback on critical preventative contraceptive services contributes to being the only industrialized country with a rising maternal mortality ratio.

As a result of our analysis, there are several factors that seem to decrease MMR and, accordingly, improve maternal health. A combination of political policy and accessibility of resources including technology and healthcare professionals is how maternal mortality will decrease over time. Sweden has strategically applied their capital and laws to produce a dominant maternal rate. Cuba has regulated their healthcare policies, but lacks the necessary

means to improve their rate. Lastly, the United States inefficiently allocates their resources to maternal health, but has the means to lower their ratio. By emphasizing a rights based approach to health and strategically utilizing human and monetary resources, both the United States and Cuba, as well as other countries with lagging MMRs, could work towards attaining SDG 3 by 2030.

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