

A Comprehensive Review of Maternal Mortality Rates in the United States

and Other Developed Nations

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Abstract

Maternal mortality rates are a reflection of the overall health and quality of healthcare within a country. While the majority of developed countries have seen a decrease in maternal mortality rates over the past few decades, the United States has seen an increase in rates. This review intends to identify factors in four developed nations that contribute to their decreases in maternal mortality rates as well as factors within the United States that may contribute to a continuous rise in rates. Methods for research include searching through databases for scholarly articles, particularly those that identify variables which may influence maternal mortality rates. Several shared themes from the research on the four countries emerged that may explain their low rates. Additionally, multiple explanations of the high rates within the United States were identified. More research is necessary to determine appropriate ways the strategies successful nations have implemented could be applied to the healthcare system within the United States.

Keywords: maternal mortality rates

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The World Health Organization has identified multiple global health indicators which reflect the overall health and quality of healthcare within a country. One of these global health indicators is a country's maternal mortality rate (MMR), which is the annual number of female deaths per 100,000 live births from any cause exacerbated or caused by pregnancy ("Maternal mortality ratio (per 100 000 live births)", 2014). This ratio excludes accidental or incidental causes (e.g., if an expecting mother were to die in a car accident). These deaths can occur during pregnancy, childbirth, or "within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy," for a specified year ("Maternal mortality ratio (per 100 000 live births)", 2014). The United Nations has developed Millennium Development Goals to target issues in global healthcare, and one of these goals is to improve maternal health and reduce MMRs ("United Nations Millennium Development Goals," n.d.).

In the past few decades, while MMRs in the majority of developed nations have declined, the opposite trend is occurring within the United States. California is an exception to this trend, as this state's MMR has decreased, resulting in the lowest MMR in the United States. The goal of this study is to identify successful factors in the state with the lowest MMR and the developed countries with the lowest MMRs in order to improve outcomes within the United States and internationally.

Two of the most common causes of maternal mortality (talk about obstetric hemorrhage and preeclampsia... define).

Search Strategies

Initial search terms and keywords included “maternal mortality,” “maternal mortality rates,” “maternal mortality trends,” “maternal death,” and “causes of maternal mortality.” To specifically look within the United States, search terms including “California” and “Georgia” were added. To search among other developed nations, keywords including “Greece,” “Iceland,” “Finland,” and “Poland” were used. After gathering initial research and to further narrow the results, search terms and keywords such as “CMQCC,” “CA-PAMR,” “GAPQC,” “midwifery,” “healthcare access,” and “prenatal care” were searched. Criteria for the research included articles that were scholarly, peer reviewed, and published within the last ten years. Online databases from Point Loma Nazarene University’s Ryan Library and University of California San Diego’s Biomedical Library were used. Databases utilized include CINAHL, ProQuest, EBSCOHost, PubMed, TRIP Pro, and Web of Science. Google Scholar was also used. In addition to the databases, government websites for California, Georgia, and the United States were used for further research. Articles were selected based off of the geographical region of focus and how pertinent the information was to the research topic. In total, five articles were used for California, five articles were used for Georgia, 19 articles were used that discussed specific nations, the United States, and comparisons between the United States and the other nations.

California Findings

California is the leading the United States in the aim to reduce maternal mortality rates. Healthcare workers and government officials have come together to create organizations such as the California Maternal Quality Care Collaborative (CMQCC) and the California Pregnancy Associated Mortality Review (CA-PAMR) to change the way healthcare workers approach and

prevent maternal mortality. The following sections will discuss how California's integrative services have worked to achieve a reduced maternal mortality rate within the state.

California Maternal Quality Care Collaborative

The CMQCC was created in 2006 at the Stanford University School of Medicine in response to the increasing maternal mortality rates in the United States. CMQCC has used research, quality improvement initiatives such as their toolkits, and outreach programs throughout the entire state to reduce the MMR. Since their inception, CMQCC has seen a decrease in California's MMR by 55% between 2006-2013 (California Maternal Quality Care Collaborative, n.d.). Despite this drastic decrease in California, the MMR in the United States has continued to rise. The following section will discuss how CMQCC has worked independently as well as with other organizations to decrease the rate of maternal deaths in California.

Quality improvement toolkits. One of the primary ways that CMQCC has decreased the MMR in California is by the creation of quality improvement toolkits. They have created toolkits for the leading causes of maternal death and illness, including cardiovascular disease, early elective delivery, obstetric hemorrhage, preeclampsia, and venous thromboembolism (California Maternal Quality Care Collaborative, n.d.). Each toolkit includes articles and tools regarding best practice, guidelines for care and hospital-level implementation available in multiple formats, and a professional education powerpoint (California Maternal Quality Care Collaborative, n.d.). These toolkits are essential to lowering the MMR as they allow for standardization of handling critical obstetric events. Through these toolkits, healthcare professionals have the knowledge and direction needed to successfully respond to the leading preventable causes of maternal death. The

toolkits are widely available to healthcare professionals throughout California and can be quickly downloaded off of CMQCC's website.

A study was conducted from January 2011 to March 2016 reviewing the CMQCC's obstetric hemorrhage toolkit. Obstetric hemorrhage is recognized as one of the leading causes of preventable maternal mortality and this study was conducted to assess the effectiveness in reducing death and injury when using CMQCC's toolkit. The study was conducted in 99 California hospitals, using the before and after model to assess the efficacy of the toolkit (Main et al., 2017). Results of the study indicated that the women in hospitals who used the CMQCC hemorrhage toolkit saw a 20.8% reduction in obstetric hemorrhages, whereas women in hospitals who did not use the CMQCC hemorrhage toolkit saw a statistically insignificant 1.2% reduction in the same time period (Main et al., 2017). The study also looked at hospitals who have prior hemorrhage collaborative experience and how the CMQCC bundles affected their obstetric hemorrhage rates. Among these hospitals, reduction rates averaged 28.6% (Main et al., 2017). This study further confirms the efficacy of CMQCC's toolkits and their ability to help healthcare professionals prevent and address obstetric emergencies such as hemorrhage.

California Pregnancy Associated Mortality Review

The CA-PAMR was created in 2006 in association with CMQCC as a response to rising maternal mortality rates. The California Department of Public Health's (CDPH) Maternal, Child and Adolescent Health (MCAH) Division invested funds to create CA-PAMR as one of the various ways to investigate and improve maternal health outcomes. The CA-PAMR is composed of an interdisciplinary team including the CDPH, CMQCC, and the Public Health Institute (PHI) (California Department of Public Health, California Maternal Quality Care Collaborative, &

Public Health Institute, 2018). The main function of the CA-PAMR is to examine and investigate every maternal death that occurs in California. The committee identifies pregnancy-related maternal deaths and determines the cause of death as well as associated risk factors. The investigation considers the physical, socioeconomic, and racial background of the deceased mother to better understand contributing factors to her death. The committee also identifies factors in the healthcare facility and provider that may have contributed to the death. Such factors could include facility policies, communication within the facility, and nursing knowledge (Main, McCain, Morton, Holtby, & Lawton, 2015).

With this information, CA-PAMR then recommends opportunities for quality improvement in maternal care, with a specific focus on preventable maternal deaths. Areas for possible improvement can be a range of sectors including public health data collection, maternal healthcare provided in hospitals, reproductive health counseling, and overcoming social and economic factors (California Department of Public Health, California Maternal Quality Care Collaborative, & Public Health Institute, 2018). The creation of CMQCC's previously mentioned toolkits has been informed by CA-PAMR's findings regarding preventable maternal deaths and opportunities to decrease these preventable deaths.

Integration of Services

The CMQCC, CA-PAMR, PHI, and CDPH's MCAH have all worked collectively in an effort to reduce California's maternal mortality rate. It is the integration of doctors, nurses, public health workers, and government officials that has made these programs successful in reducing maternal death. The involvement of state agencies such as CDPH has given these programs legal authority and assured longevity - allowing CA-PAMR and CMQCC to thoroughly investigate

and intervene in preventable maternal deaths (Mitchell et al., 2014). Additionally, the link between CA-PAMR and CDPH has allowed for a more comprehensive medical record review by combining vital statistics data and hospital discharge data. California hospitals have had high participation rates, both in providing hospital data as well as implementing CMQCC's toolkits and guidelines. This participation may be attributed to the authority of the CDPH in combination with the desire for positive maternal outcomes (Mitchell et al., 2014). The creation of the CA-PAMR and CMQCC to work together allowed for a more well-rounded and efficient approach to maternal healthcare. The integration of private healthcare, public healthcare, and government services has been essential to the dramatic decrease in California's MMR.

Georgia Findings

In contrast to California's decreasing maternal mortality rates, the state of Georgia has had one of the highest rates of maternal death for several years (Georgia Perinatal Quality Collaborative, n.d.). In 2018, the Yale Global Health Justice Partnership (GHJP) released a 77 page report outlining their research findings regarding maternal mortality in Georgia and how the state has handled, or rather failed to handle, these deaths (Global Health Justice Partnership, 2018). The report highlights research regarding access and quality of maternal healthcare, access and affordability of health insurance, funding allocated for maternal healthcare, and the reliability of data analysis. The GHJP also discusses the racial disparities involved in maternal deaths and how the system in Georgia is blaming and failing its mothers (Global Health Justice Partnership, 2018). The following section will discuss how Georgia is combatting its high maternal mortality rates, as well as reasons that the maternal death rate may be so high.

Georgia's Initiatives

The Georgia Perinatal Quality Collaborative (GaPQC) was created in 2012 by a group of neonatologists, obstetricians, midwives, and public health professionals in part to respond and improve the high maternal mortality rates. The GaPQC recognized that they were among the states with the highest maternal mortality rates, and created a goal to become a safe place for women to give birth (Georgia Perinatal Quality Collaborative, n.d.). Georgia also started the Maternal Mortality Review Committee (MMRC) in 2012 to work alongside the GaPQC. The GaPQC and MMRC are a reflection of the successful initiatives started in California, the CMQCC and the CA-PAMR. Much like CMQCC's toolkits, GaPQC has created "safety bundles" for obstetric hemorrhage and severe maternal hypertension. As two leading causes of maternal death, these safety bundles instruct healthcare providers on how to recognize and manage these two obstetric emergencies (Georgia Perinatal Quality Collaborative, n.d.). Similar to the CA-PAMR, the MMRC reviews maternal deaths in Georgia and provides recommendations to patients, providers, facilities, systems of care, and communities about improvement opportunities in preventing maternal death (Georgia Department of Public Health, Maternal and Child Health, 2014). The GaPQC and MMRC have not produced the same results as California's initiatives. This could in part be because Georgia's initiatives are more recent, but could also be due to systemic problems such as racism within maternal healthcare, creating initiatives but not using them, blaming of individual mothers, and a lack of access to maternal healthcare.

Systematic Issues

Racism within maternal healthcare. In 2012, the MMR in Georgia for black women was 62.1 deaths per 100,000 live births versus 27.1 deaths per 100,000 live births for white

women (Global Health Justice Partnership, 2018). In the United States as a whole, black women are three to four times more likely to die during childbirth than white women. Georgia is the fifth poorest state in the United States, and it ranks 50th in terms of the percentage of the state population that has health insurance (Global Health Justice Partnership, 2018). Poor health outcomes are often linked to low socioeconomic status, and poverty disproportionately affects black communities. However, racial disparities between black and white maternal deaths remain the same even when factors including education level, socioeconomic status, and unemployment are accounted for (Global Health Justice Partnership, 2018). Therefore, while social factors may play a part in accounting for the large racial disparity in maternal deaths, they do not explain it.

Black patients have reported feeling undervalued, disrespected, and discriminated against in the healthcare setting (Global Health Justice Partnership, 2018). These negative experiences in healthcare could lead pregnant black women to delay seeking prenatal care due to fears over discrimination. Additionally, a “coverage gap” that disproportionately affects poor minorities was created by Georgia’s decision not to expand Medicaid (Global Health Justice Partnership, 2018). The coverage gap describes those whose incomes are too high for Medicaid, but too low to afford their own insurance. This gap has a deep effect on Georgia’s poor, black women and their ability to receive timely prenatal care and timely diagnosis of chronic conditions that can affect maternal outcomes. Institutional racism is deeply rooted in Georgia’s healthcare system and can be seen in the way that black women experience far more maternal deaths than white women (Global Health Justice Partnership, 2018).

Inefficient initiatives. As previously discussed, Georgia has started several initiatives modeled after California’s success. The GaPQC and the MMRC were created with the intention

to reduce Georgia's high maternal mortality rates. However, the Global Health Justice Partnership (2018) points out that the MMRC has only fulfilled the bare minimum requirements to be a nationally recognized organization. Georgia's MMRC meets the Centers for Disease Control and Prevention (CDC)'s minimum standards of being an organization that reviews the state's cases of maternal death and subsequently gives recommendations to healthcare providers and legislation.

Several problems have been identified with Georgia's MMRC, which puts into question the organization's ability to make meaningful change. The primary problem that will be discussed is that while the MMRC does provide recommendations, they are vague and they don't suggest any way to actually implement them. For example, in the 2014 Report, the MMRC recommendations included: "Implement hemorrhage and hypertension patient safety bundles" and "Expand Medicaid coverage to one year postpartum" (Georgia Department of Public Health, Maternal and Child Health, 2014). In the report, the recommendations are written in a bullet point list. There is no elaboration on the recommendations and no explanations or suggestions on how to implement such recommendations. Therefore, while the MMRC is meeting the minimum requirement of providing recommendations, they are meaningless without realistic ways to implement them. The 2014 Report is the only report the MMRC has published since its inception in 2012.

Blaming mothers. The Global Health Justice Partnership (2018) states when discussing maternal mortality, representatives in Georgia tend to place blame on individual mothers and their own lifestyle choices, rather than recognizing maternal death as a systematic issue. Lifestyle factors such as obesity and hypertension do influence a mother's health, but they do not

explain or justify the continuously rising maternal mortality rate. The Global Health Justice Partnership (2018) states that around the world, there is no rise in maternal mortality rates that matches or parallels the increasing rates of obesity and other risk factors; therefore the increasing maternal mortality rates are an isolated incident. Chronic medical conditions should not lead to maternal death in communities where adequate maternal healthcare is available. Many of these chronic health conditions can be linked to socioeconomic factors, such as living in poor or rural communities where healthy food is not accessible or not affordable. The rate of maternal mortality in Georgia will not change if the state places blame on individual mothers rather than solutions to flaws in their own healthcare system.

Lack of Access to Maternal Healthcare

A single factor that may make the largest difference in maternal mortality rates in Georgia is the lack of access women have to maternal healthcare services. There is a significant deficit in the availability of obstetric providers in Georgia. Rural areas in Georgia outside of the Atlanta Metropolitan Service Area (MSA) are the most affected. Georgia is divided into 82 Primary Care Service Areas (PCSA)s, many of them being rural and outside the Atlanta MSA (Zertuche & Spelke, 2014). There are no obstetric service providers in 31 of the PCSAs and 57 have no certified nurse midwives (Zertuche & Spelke, 2014). Many women are forced to drive long distances to access prenatal care. Barriers to traveling for prenatal care include not being able to afford gas, not having a car, and lack of public transportation in rural areas (Zertuche & Spelke, 2014). Without adequate prenatal care, women are more likely to have undiagnosed pregnancy conditions which can lead to a more complicated birth and potentially maternal death. Additionally, obstetric providers have low incentive to provide care in rural areas because many

women are on Medicaid, which gives the providers lower reimbursement rates (Zertuche & Spelke, 2014).

United States Findings

As of January 1, 2018, the United States had a MMR of 14 deaths per 100,000 live births per year. Newer data from 2019 revealed that this rate has increased to 19 (“Country Comparison: Maternal mortality rate,” 2019). There is no one explanation for why the United States has a rate that is so much higher than other developed nations, but a few factors stood out in the data examined to explain the disparity.

Comorbidities. The first factor identified is the high occurrence of comorbidities in the United States (Mayer, Dingwall, Simon-Thomas, Sheikhnureldin, & Lewis, 2019). A comorbidity or comorbid disease during pregnancy is a chronic, co-existing condition a woman has that is not caused by pregnancy, but could be exacerbated by it (Comorbidity, n.d.). The issue is not merely that many women have comorbid diseases, but that many Americans either lack or receive insufficient treatment for these comorbidities (Center for Disease Control and Prevention, 2019b).

Pregnant women, regardless of if they have pre-existing health conditions, are encouraged to get prenatal care. Prenatal care (also known as antenatal care) is frequent check-ups with a healthcare provider at which a woman might receive advice to promote a healthy pregnancy (e.g. which prenatal vitamins to take) and screenings for complications (e.g. tests for gestational diabetes) (“Prenatal care,” 2019). It is especially important for women with comorbidities to receive prenatal care to monitor any progression or exacerbation of their condition. Hypothetically, if a woman living with hypertension becomes pregnant and does not

receive adequate prenatal care either because of lack of education on the importance of prenatal care or lack of access, she would not have the check-ups and screenings to catch if her pregnancy exacerbated her pre-existing condition, and her hypertension could lead to preeclampsia, which is a complication of pregnancy that can have fatal consequences. Similar scenarios are happening throughout the United States where women are not getting adequate care for their comorbidities, leading to more dangerous pregnancies and deliveries.

Lack of standard approaches. The next factor contributing to the high MMR is a lack of standardized approaches throughout the United States (Center for Disease Control and Prevention, 2019b). As previously mentioned, CMQCC is taking steps in the state of California towards having clear, standardized steps to respond to various health crises that can arise. In response to questions about a previously healthy patient who passed unexpectedly from complications after delivery, maternal-fetal medicine and obstetrics and gynecology Dr. Mary D'Alton said, "Variability is the enemy of safety... when we do things in a standardized way, we have better outcomes," (Montagne, 2017, para 117). This quote emphasizes the need for universal practice standards in order to respond to changing health statuses appropriately and promptly. Consistency in practice prevents miscommunication and promotes better patient outcomes, which could reduce mortality rates.

Lack of data. The third factor is the overall lack of data for MMR in the United States. The current data the United States has is questioned for accuracy and reliability. This is largely due to inconsistent mechanisms of documenting maternal deaths in addition to underfunding for research into this data (Mayer et al., 2019). In a 2016 article from the journal of Obstetrics and Gynecology, it was said: "Accurate measurement of maternal mortality is an essential first step

in prevention efforts, as it can identify at-risk populations and measure the progress of prevention programs,” and that “this inability” to create accurate data “reflects the chronic underfunding over the past two decades of state and national vital statistics systems,” (MacDorman, Declercq, Cabral, & Morton, 2016, p. 454). This argument reveals the need for more money to be invested in further research to develop the standard approaches to target the causes of the country’s high MMR.

New method of documentation. The final factor that came up is the relatively new way of documenting maternal mortality. In the past two decades, a new checkbox was added to death certificates to make it more clear when a death of mother could be attributed to pregnancy or not (Davis, Hoyert, Goodman, Hirai, & Callaghan, 2017). This new documentation method would determine whether a death would be counted for in the MMR. Different states adopted this policy at different times (an example of inconsistency of data procurement altering data accuracy), which can give a partial explanation as to why the MMR in the United States has increased so rapidly over the past two decades. The “increase in maternal mortality,” as a result of this new method of documentation, “might be an artifact of improvements in surveillance and highlight past underestimation of deaths,” (Mayer et al., 2019, para 2). The implementation of new documentation might explain the increasing trend in rates, but it also reveals that the data is even more accurate and the United States still falls significantly behind other countries.

Developed Nations Findings

As of January 1, 2018, four countries were tied with the lowest MMR of three deaths per 100,000 live births per year. Since research was begun for this project, newer data have come out for international MMR rankings. The countries with the lowest rates for 2019 had rates as low as

two deaths per 100,000 live births per year, while the MMR for the United States had increased to 19 as previously mentioned (“Country Comparison: Maternal mortality rate,” 2019). However, the data were not yet available at the time of data collection, therefore the research gathered focuses on the four countries with the lowest ratings according to the 2018 data. These countries are Finland, Greece, Iceland, and Poland (“Country Comparison: Maternal mortality rate,” 2019). At the time of data collection, these four countries had rates that were eleven deaths lower than the rate of the United States. Similar to how there is no one factor that can be blamed for the high MMR in the United States, there is no one factor that all four countries have in common leading to lower rates. However, some trends were identified in the data examined that could offer some explanation.

Finland

Allocation of resources. Finland attributes much of their success to their country’s allocation of resources. The country had financial struggles during the 1990s, and budgetary cuts were made in certain areas of healthcare. However, Finland refused to cut funds dedicated towards maternal health, reflecting the country prioritizing the goal of reducing their MMR (Markkula-Kivisilta, 2013).

Emphasis on supporting expectant mothers. Additionally, Finland places an emphasis on the importance of supporting expectant mothers. The country’s healthcare system prioritizes providing access to care for all women. This care gives nutritional support, counselling for sexually transmitted infections, and addresses needs specific to women with disabilities and minorities (Stearmer, 2013, June 27). An example of a tangible way this support is shown is that a box full of equipment is brought to expectant mothers including items such as baby blankets

(Stearmer, 2013, June 27). Bringing this box helps connect expecting mothers with healthcare workers, and establishes a tone of support early on to promote a healthy pregnancy. By having contact between pregnant women and healthcare professionals, the hope is to be able to diagnose and treat any health conditions that could complicate or be complicated by pregnancy (Karalis, Ulander, Tapper, & Gissler, 2016).

MMR qualifications. The final reason identified for Finland's success when compared to the United States is that Finland has a different method of documenting maternal mortalities. Specifically, it was pointed out that the United States may count certain deaths that may not have counted as a maternal mortality linked death in Finland. The example was given that if a mother suffering from postpartum depression were to die by suicide, although it would count in the United States, it may not in Finland (Epatko, 2014).

Greece

Allocation of resources. When examining reasons for Greece's low MMR, the primary reason that surfaced in research was the country's allocation of resources. A considerable amount of funding has been put towards maternal health (Stearmer, 2013, July 9). Their healthcare system has created prenatal care departments that specifically emphasize providing preventative care for high risk pregnancies (Stearmer, 2013, July 9). This type of care benefits all mothers, but is especially important for mothers who live with existing comorbidities.

Iceland

Allocation of resources. When examining data for Iceland, the country's success was also largely attributed to their allocation of resources. Their funding reflects their prioritization of maternal health (Stearmer, 2014). Additionally, Iceland's healthcare system places an emphasis

on the importance of having accessibility to prenatal care for all expecting mothers in order to help mothers maintain a healthy pregnancy (Birgisdottir, Bjarnadottir, Kristjansdottir, & Geirsson 2016). While the vast majority of people in Iceland are insured, for women who are not, the government will provide coverage throughout their pregnancy and through the postpartum period (Evans, 2018).

Healthcare system practices. Another factor identified is that Iceland's healthcare system has not become too medically focused, reducing the risk of sometimes unnecessary and dangerous medical interventions during birth (Stearmer, 2014). An example of this can be seen by looking at the country's cesarean delivery (c-section) rate. An article in 2014 reported that Iceland's c-section rate was 17% (Stearmer, 2014). That same year, the c-section rate in the United States was 32.2% (Center for Disease Control and Prevention, 2019a). There are scenarios in which c-sections are necessary, but research has shown that they are overdone in the United States (National Partnership for Women & Families, 2016). There is a significantly higher occurrence of complications in c-sections than in vaginal deliveries, and also a higher occurrence of complications in elective c-sections than c-sections done after trialed vaginal delivery (Pallasmaa, Ekblad, Gissler, & Alanen, A. 2015). Another example is Iceland's utilization of midwives (Stearmer, 2014). Natural births and home births are much more common in Iceland because of midwifery, again reducing risk of potential complications from unnecessary medical interventions.

Poland

Role of midwives. Similarly to Iceland, Poland emphasizes the role of midwives in reducing MMR. In both countries, midwives work to facilitate "birth in accordance with

women's own values," (Halfdansdottir, Olafsdottir, Hildingsson, Smarason, & Sveinsdottir, 2016, p. 103). There are numerous benefits of midwifery, including reduced occurrence of labor induction and increased patient satisfaction with care, among others (Evans, 2018).

Midwives in Poland have more autonomy than midwives in the United States. However, midwives also receive more training in Poland, and there are more midwives in Poland than in the United States (Evans, 2018). At Sharp Mary Birch Hospital in San Diego, California, the largest women's health hospital west of the Mississippi, there are only three licensed midwife employed (citationS. Looney, personal communication, March 17, 2020). This is largely due to differences in culture, as not as many people in the United States know about midwifery as a career and also what midwives do. This knowledge deficit both decreases the demand for midwives in the United States and also decreases the number of people pursuing the career (Evans, 2018). Additionally, not all insurance plans in the United States pay for midwifery care, making it inaccessible to women who cannot afford it (Evans, 2018).

Additionally, midwives that work in the United States often have more restricted autonomy than in other countries. It has been suggested that physicians are often hesitant to give midwives autonomy out of self-preservation because physicians would be more likely to receive a lawsuit than midwives, and additionally because midwives here may have less training in the United States than in countries like Poland (Evans, 2018).

Accessibility of healthcare. Another explanation Poland offers for their success compared to the United States is the availability or lack thereof of healthcare in the United States. As previously mentioned, it is believed that uninsured and underinsured mothers not receiving adequate prenatal care contributes greatly to the high MMR in the United States

(Evans, 2018). Similar to the previously examined countries, Poland prioritizes access to healthcare for mothers, and this leads to less risky pregnancies and safer deliveries for babies and mothers.

Trends Associated with Decreased MMR

Trends from the four countries tied in 2018 for the lowest MMR for their success include the allocation of resources, access to care, and the role of midwives. It is important to remember that all four of these countries have different economies, governments, and healthcare systems than the United States, making it difficult to implement their strategies in the same way. Additionally, an article speaking about Iceland's MMR addressed that the country has significantly less births per year than the United States, also contributing to the difficulty in mirroring this country's practices and those of other countries (Birgisdottir, Bjarnadottir, Kristjansdottir, & Geirsson, 2016). It is also possible that these countries could have issues with accurately reporting their data for a variety of reasons, as the United States has had (Rossi & Mullin, 2012). Despite these differences, tactics could still be gleaned from these countries and applied to the United States healthcare system. An article discussing Finland's success that could tie together all four countries and stimulate change in the United States is this: "It is not always a question of resources, but how a country chooses to use them," (Markkula-Kivisilta, 2013, para 10).

Summary of the Literature

From the review of the literature, it has been observed that there are multiple strategies being taken to reduce MMR and promote maternal health within the United States and throughout other countries. California has successfully implemented strategies that have

contributed to the state's large reduction in MMR. California's interdisciplinary approach has been instrumental in their success. Georgia has created similar initiatives, but has not had the same results. Research has shown issues in Georgia including lack of maternal healthcare access, institutional racism, and a lack of acknowledgement towards systematic issues. Other countries have prioritized maternal health in various ways that have led to reduction in MMR. It is clear from examining the data from 2018 and 2019 that the issue of maternal mortality in the United States is not improving as it is in other developed nations. More research is needed to determine which strategies would be most effective in the United States and how they could be implemented into healthcare system practices.

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