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Correlates of Maternal Mortality: A Cross-National Examination

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Correlates of Maternal Mortality: A Cross-National Examination

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"Correlates of Maternal Mortality: A Cross-National Examination"

Abstract

Maternal mortality is an important issue that has persisted around the world; specifically in developing countries. According to the World Health Organization (2012), about 800 women die from pregnancy or childbirth related complications around the world every day with 99 percent of maternal deaths occurring in developing countries. Previous research has linked a number of other social factors to increased rates of maternal mortality including education, socioeconomic status, access to health care, autonomy, and cultural beliefs. This secondary qualitative research study looks further into rates of maternal mortality in a selection of thirty different countries and what other factors may be related to current maternal mortality rates. Data for this research was taken from the World Bank. Maternal mortality was measured as the dependent variable while indicators for education, socioeconomic status, and health care use and access were the independent variables. Results show that indicators of health, especially fertility rates, are associated with rates of maternal mortality. Educations as well as urban and rural populations were also found to be associated with rates of maternal mortality. While rates of maternal mortality have decreased in some countries over the past ten years, rates in many countries still remain high and unchanged. Maternal mortality needs to be looked at as a global problem rather than the problem of individual countries in order to effectively lower the levels.

Introduction

Maternal mortality is an important and persistent issue worldwide. While advances in modern medicine exist, a woman still dies from complications in childbirth every minute – about 529,000 each year (UNICEF). Maternal mortality is more than just an issue of health and access to health care. There are a number of other factors that contribute to the high maternal mortality rates that exist in many countries: the status of women has led to a lack of their ability to make their own decisions about their health care, including during pregnancy; poverty, especially in developing countries, has also put women at a disadvantage and at a higher risk of pregnancy related death because of their socioeconomic status; lack of access to education has also become an important contributing factor to current maternal mortality rates limiting the knowledge that women have about their own health; and cultural beliefs surrounding gender norms, religion, and pregnancy have also influenced women's use of maternal health care services, putting them at a higher risk of pregnancy related death. In this study, I sought to further the research in these connections between maternal mortality and social factors such as health, education, and socioeconomic status.

Review of Literature

Maternal Mortality as a Global Social Problem

The United Nations has identified improving maternal health as one if its eight millennium development goals (millennium development goal five), targeted at reducing the maternal mortality rate and creating universal access to reproductive health (United Nations, 2013). The United Nation's goal is to have reduced maternal mortality by three quarters between 1990 and 2015 (United Nations, 2013). While maternal mortality has dropped by 50 percent

between 1990 and 2010, it is still a significant problem facing a number of developing countries (World Health Organization, 2012). As the deadline for the millennium goal approaches, maternal mortality rates are still significantly high in a number of areas and the goal has not been met.

It is important to note that the high levels of maternal mortality are unnecessary and have become a problem specific to developing countries. According to the World Health Organization (WHO), about 800 women die from pregnancy or childbirth related complications around the world every day with 99 percent of maternal deaths occurring in developing countries (World Health Organization, 2012). The ability of developed countries to keep their levels of maternal mortality relatively low is important to note because it shows that it is possible to lower maternal mortality rates. In developing countries maternal mortality ratios remain at an average of 240 per 100,000 births compared to 16 per 100,000 births in developed countries (World Health Organization, 2012). The lower maternal mortality rate of developed countries is an example of the specific problems facing women in developed countries that lead to higher levels of maternal mortality; a majority of which may have been preventable had the women been living in developed countries.

The United Nations (2013) reports that most maternal deaths in developing countries are preventable through adequate nutrition and proper health care, including access to family planning, the presence of a skilled birth attendant during delivery, and emergency obstetric care. Currently only half of pregnant women living in developing regions receive the recommended minimum of four antenatal care visits during pregnancy (United Nations, 2013). Antenatal care is important in decreasing a woman's chance of having maternal health problems. In this study I will look at whether that lack of access to care is affecting rates of maternal mortality. One of the

leading causes of death for adolescent girls is complications during pregnancy or childbirth (United Nations, 2013; World Health Organization, 2012). Having children at a young age puts an adolescent girl at an increased risk for health problems and pregnancy related complications. In developing countries, the age of a woman at the birth of her first child is often lower than in developed countries. Maternal mortality is not a problem that stands alone for developing countries but can also be linked to other health issues. While the majority of maternal deaths are caused by things such as severe bleeding, infections, high blood pressure during pregnancy, and unsafe abortion, the remainder have been associated with diseases such as malaria and AIDS (World Health Organization, 2012; UNICEF, 2014). Maternal health is also closely linked to newborn health. Poor maternal health can lead to higher rates of infant mortality as babies who's mothers die during child birth have a much greater chance of dying in their first year than those whose mothers remain alive (World Health Organization, 2012; UNICEF, 2012).

Social Status of Women

In many places, especially developing countries, women have yet to gain equality with men. This has led to a lack of autonomy and ability to make important decisions for themselves as well as in the families. A number of studies have shown that women's autonomy and empowerment has a significant effect on their use of maternal health services (Tawiah, 2011; Mahapatro, 2012; Pandey, 2012). Tawiah (2011) found in a study of five sub-Saharan African countries, that less than half of the women had the final say in their own health care. This puts women at a significant risk during pregnancy because they are less likely to receive the necessary antenatal care that they need. In the case of Nigeria, three out of four women's husbands or partners have the final say in the woman's health care (Tawiah, 2011). This is an example of the limited decision making power that is given to women when it comes to their

own health. In Pakistan, pregnant women do not have any say regarding their own health care; their mother in law has the say in pregnancy and health care decisions (Mumtaz & Salway, 2007). When it comes to any decision making, it is expected of a Pakistani woman to refrain from even voicing her opinion at all when it comes to her own health care (Mumtaz & Salway, 2007).

A study by Mahapatro (2012) of the use of maternal health care services in India found that women's autonomy played an important role in their use of these services. The study looked at the maternal health care program that was put in place in India in order to reduce their rising maternal mortality rate. Mahapatro (2012) found that women who had the sole decision making power within their household were more likely to seek health care services and antenatal care. However, the study also noted that it was a combination of a number of factors such as accessibility, availability and quality along with the woman's decision making power that determined their use of health care services (Mahapatro, 2012). Mahapatro (2012) also found that women who had greater autonomy were more likely to have an institutional birth than those who did not have any say in financial spending. While a number of studies found links to maternal health care use and women's autonomy and decision making power, few focused specifically on a woman's status in terms of their employment and the amount of money they contribute to the household. Acharya et al. (2010) however, found that women who were in paid employment were more likely to have a say in final decisions within the household than women who were not involved in paid employment. Women's involvement in the paid workforce increases their decision making power. While women's decision making power may increase, men in Nepal, where the study was conducted, often have full control of the money making it difficult to pay for their individual health care needs (Acharaya et al., 2010). As a part of this

study I will look at women's involvement in the paid workforce as it may be an important factor in determining a woman's use of maternal health care services because it gives them more say in the family's financial spending.

Education

The United Nations (2013) has identified education as one of the key factors in reducing maternal mortality with the risk of maternal death being 2.7 times higher among women with no education. Girls in poor and developing countries are often kept out of school to perform other tasks within the household such as fetching water and doing domestic chores, leaving them uneducated and reinforcing gender inequalities (Pandey et al., 2012). Education is an important contributing factor to maternal mortality because educated women are more likely to be aware of the risks and complications that may occur during pregnancy, be aware of the resources that are available to them, and gain access to those resources (Tawiah, 2011; Mumtaz & Salway, 2007; Pandey et al., 2012). Education also becomes important in increasing the status and decision making power of women. Women with a higher level of education are more likely to have a final say when it comes to their own health care (Tawiah, 2011; Acharya et al., 2010). Higher levels of education can also be important in terms of a woman's decision making power in deciding between home and institutional birth which can be important in limiting serious health and birth complications. Tawiah (2011) found that the probability of institutional delivery was increased with increasing maternal education. Education also has an effect on women's use of contraception which is important in reducing excessive pregnancies which put women at a higher risk for pregnancy related complications that result in maternal death (Tawiah, 2011). Tawiah (2011) found that women in Nigeria and Kenya with higher education were nine times more likely to use contraceptives than women who were uneducated. In a study by Mumtaz and

Salway (2007) of women in a village of Pakistan, people were uneducated about potential risks for pregnancy. As a result, there is a lesser importance placed on antenatal and maternal health care, putting the women at a greater risk of death. Mumtaz and Salway (2007) found that there was no recognition of serious pregnancy related disorders among people in the village, with only educated villagers having some faith in the need for antenatal health care. Pakistani women who were educated had better reproductive health knowledge and were therefore more likely to use antenatal health care services (Mumtaz and Salway, 2007). The use of antenatal care and maternal health services can be important in preventing maternal deaths but if women are not educated on the importance of these services and how to gain access to them, they are less likely to use them and are at a much higher risk for pregnancy related complications.

Poverty and Socioeconomic Status

A number of studies and organizations have identified socioeconomic status as a predictor of women's access to maternal health care services. Socioeconomic status is also an important factor in women's use of services for the prevention of pregnancy related complications. Poor women are least likely to receive (or use) adequate maternal health care services than are women who are better off economically (Mahapatro, 2012; World Health Organization, 2012; Kumar Rai et al., 2013). The World Health Organization identifies poor women as the least likely to receive adequate care with only 46 percent of women from low income countries benefiting from skilled care during childbirth (World Health Organization, 2012). A number of factors are specific to women living in poor areas lead to their decreased use of maternal health services including a lack of knowledge about health, resources and knowledge to access the necessary services.

In areas where extreme poverty exists, maternal health care is typically not of the highest priority when making financial spending decisions. Many poor households hold a lower priority to health services when it comes to their financial spending when compared to other basic resources and needs (Kumar Rai et al., 2013, Mumtaz & Salway, 2007). For those living in poverty, spending money on health care may take away from the money they have for food, keeping them from using necessary health care services. Mumtaz & Salway (2007) found that among poor families living in Pakistan, an antenatal visit could cost up to 20 percent of the family's income leaving them to deem it unnecessary to spend such amounts on preventative medicine. Poor young women are also often more isolated than women who are of a higher economic status. This leaves poor women detached from social networks such as programs that use mass media to inform women about existing health services and programs (Kumar Rai et al., 2013). Mahapatro (2012) suggests that women of a lower socio-economic status may be less likely to use health services because they are less exposed to the world, are more traditional about their health condition, and have a lack of knowledge about illnesses. While some developing countries have used public campaigns to help address maternal mortality as an issue, poor women can be at a disadvantage because they are not exposed to the mediums in which those campaigns are communicated. This study will look at the incomes of countries related to rates of maternal mortality to consider the relationship between economic status and rates of maternal mortality.

Differences exist in maternal mortality and use of antenatal services between urban and rural women as well. Women living in urban areas are more likely to make use of antenatal and maternal health services than are rural women (Tawiah, 2011; Mahapatro, 2012). A study of women in Ghana found that rural women were 7.7 times less likely to make antenatal care visits

than were urban women (Tawiah, 2011). This is likely due to low income countries having maternal health care services being concentrated in urban areas in that are difficult for rural women to gain access to. Due to distance and lack of access to resources, poor as well as rural women are more likely to have home births rather than institutional births (Tawiah, 2011; Mahapatro, 2012). Tawiah (2011), in a study of five sub-Saharan African countries found that rural births were more than twice as likely to be delivered at home than were urban births. This puts rural women at a higher risk of complications during pregnancy and unable to reach health services soon enough if complications do occur. In this study I will look at the differences in rates of maternal mortality in rural and urban areas.

Cultural Beliefs

Cultural perceptions and beliefs related to gender norms, especially those involving pregnancy, can have an effect on a woman's utilization of maternal health services that could reduce her chances of pregnancy related death (Tawiah, 2011; Kumar Rai et al., 2013; Buor and Bream, 2004). In a study of women in Malawi it was found that ethnic groups had a significant impact on a woman's use of postnatal care related to their beliefs on childbirth (Kumar Rai et al., 2013). Tawiah (2011) also found that cultural beliefs surrounding religion may have an impact on women's ability to make decisions about their health care, finding that a larger proportion of Muslim women had their husband or partner making their health care decisions. Perceptions of health care also affect a woman's use of maternal health care services (Tawiah, 2011). In some areas such as Pakistan, cultural beliefs have a significant impact on views surrounding gender, pregnancy, and maternal health (Mumtaz & Salway, 2007). Women in Pakistan hold a cultural belief that excessive movements such as traveling may lead to an abortion and therefore often do not seek any antenatal care or other maternal health services (Mumtaz & Salway, 2007).

Pakistani culture also keeps a number of women from seeking antenatal care. Mumtaz & Salway (2007) found that villagers viewed antenatal care as an interference with a natural process. Cultural beliefs are important to consider in discussing maternal mortality because many cultures and religions often view health care negatively or with distrust and it keeps women from deciding themselves or being allowed by their partner or husband to make use of the services. While some research on culture and maternal mortality exists, the extent of its impact may be more difficult to show in research because it requires a more qualitative approach.

Health Care and Maternal Mortality

The health of people in a nation and the quality of the health care system can have an effect on maternal mortality rates; especially when combined when previously mentioned limiting factors. The age of a woman is one factor that has been found to be related to use of maternal health care services. In one study of women in Malawi and their utilization of health care services, it was found that women in their middle childbearing ages were more likely to use maternal health care services compared to women in their early or late childbearing years (Kumar Rai et al., 2013). The amount of children a woman has given birth to also affects her risk of maternal death. Excessive child bearing can put women at a higher risk for maternal death (Taiwah, 2011; World Health Organization, 2012). In this study I will compare rates of maternal mortality rates with fertility rates in countries to see if increased child birth results in higher rates of maternal mortality. A lack of trained birth attendants and health care professionals has also had an effect on maternal mortality rates. While traditional birth attendants exist, they often do not receive the adequate training that they need to provide the necessary services for women who choose not to have an institutional birth (Buor & Bream, 2004). In many developing countries, there is a need for more trained health workers, especially those trained in obstetrics and

gynecology to properly handle women's health and pregnancy (Buor & Bream, 2004; Anderson et al., 2014). One approach that has been suggested is to have country university level approaches that train health professionals within the country and encourage them to remain working in the country once they are certified. A study of university training for gynecology and obstetrics showed that the possibility to provide and increase access to obstetric care with a 98 percent retention rate of specialists trained within the country (Anderson et al., 2014). Increasing the amount of trained health workers can improve the disparities between the ability to access services for people living in different parts of a country. The increased training and retention of health care workers within a country can increase women's access to health services especially for those living in rural areas because the health care system then has the capacity to reach those more remote areas (Anderson et al., 2014). While my study cannot look specifically at how trained the birth attendants at present at a birth are, rates of maternal mortality will be analyzed along with numbers of births that are attended by what the World Bank defines as a skilled health professional.

Methodology

Research Design

This is a quantitative study examining maternal mortality rates in relation to a number of other social factors. The study is a secondary analysis using data from the World Bank online data bank. I chose to use data from the World Bank because it is a well funded data collection program and has data for all countries across many years and for many different variables that can be used for this study. Maternal mortality is the dependent variable and is measured against indicators of health, education, and socioeconomic status as the independent variables. For this study I chose to look at data from the years 2005 and 2010. While many of the independent

variables had data for all years, I chose to use only these two years because maternal mortality

data was available only in five year intervals. I also chose to use different years in order to

establish a more comprehensive trend and to also analyze trends in maternal mortality over time.

For the purpose of the scale of this study I selected thirty countries for my analysis: Afghanistan,

Brazil, Cambodia, Canada, Chad, China, Central African Republic, Dominican Republic,

Ethiopia, Ghana, Guatemala, Haiti, India, Iraq, Jamaica, Kenya, Libya, Malawi, Mexico, Nepal,

Nigeria, Pakistan, Philippines, Russian Federation, Somalia, Sudan, Sweden, Thailand, United

States, and Venezuela. Each country was chosen with the goal of having first, second, and third

world countries as well as countries from different parts of the world included in the range of

data. One limitation to using this data was that there was a lack of data available for all countries

for some of the independent variables. To create the data set for this study I downloaded the data

from the World Bank into an excel file then transferred the data into an SPSS data file. I then ran

bivariate correlations as well as a multiple regression to analyze the data using SPSS statistics

software (version 19).

Variables

The dependent variable from the data set used for analysis is for the maternal mortality

ratio estimate in each specific country. Maternal mortality ratios for each country were measured

as the maternal deaths per 100,000 live births (modeled estimate).

I used the following independent variables for analysis: health, education, and

socioeconomic status. Health care was measured as an independent variable using the data for

births attended by skilled health staff (% of total), contraceptive prevalence (% of women ages

15-49), and fertility rates (total births per woman). Education is also measured as an independent

variable using data for the primary completion rate of females (as % of relevant age group) and enrollment in primary, secondary, and tertiary education (% gross). Socioeconomic status is another independent variable measured by the percentage of females involved in wage and salaried work, contributing female workers (% of females employed), and the female employment to population ratio for ages 15 and over (modeled ILO estimate).The percent of the total population that lives in rural as well as the percent that lives in urban areas was also measured as an independent variable. GDP (constant 2005 US$) was also used to measure socioeconomic status.

Significance of Study

This study will help add to the research and literature on maternal mortality as an important global issue. Research in the past has been limited to certain areas and continents but this research will look at first, second, and third world countries and their rates of maternal mortality. This research will also show that social factors that are related to rates of maternal mortality are true across all areas of the world and are not specific to one sub-region or continent. While the United Nations has made maternal mortality a priority, they are not on track in reaching their goal. It is necessary for more international attention on this issue beyond the work of the United Nations. Increased research into high rates of maternal mortality could bring more attention to the issue; especially in defining it as a problem faced by developing countries that needs to be addressed.

Findings and Discussion

The goal of Millennium Development Goal Five is to lower rates of maternal mortality by three fourths from 1990 to 2015 (United Nations, 2013). Table 1.1 shows that while the

average rate of maternal mortality has decreased, those with the highest rates of maternal

mortality have been unchanged. From 2000 to 2005 the average decreased by 1.17 percent and

from 2005 to 2010 by rates decreased by only 1.18. With rates decreasing this slowly, and not at

all in many countries, it is unlikely the United Nations goal will be reached. Table 1.2 shows the

disparities between rates in developed and developing countries and the inability for some

developing countries to decrease their rates of maternal mortality. Somalia is one example of a

developing country whose rates have remained at 1000 deaths per 100,000 births; a rate that has

remained the same, and one of the highest, from 2000 to 2010. Nigeria's rates have declined but

still remain at 630 deaths per 100,000 births. Developed countries such as Canada, Sweden, and

the United States have had the ability to keep their levels of maternal mortality much lower than

developing countries. Sweden's current maternal mortality rate is only 4 deaths per 100,000

births. This is supported by research by the United Nations (2013) that has found that 99 percent

of maternal deaths occur in developing countries. These numbers are important to note because

as United Nations (2013) research has also found most maternal deaths in developing countries

are preventable through adequate nutrition and proper health care services.

Table 1.1 Maternal Mortality over time

Year	Minimum	Maximum	Mean
2000	5.00	1100.00	389.73
2005	4.00	1100.00	333.93
2010	4.00	1100.00	283.80

Table 1.2 Developing vs. Developed Countries

	Maternal Mortality Rate 2000	Maternal Mortality Rate 2005	Maternal Mortality Rate 2010
Sweden	5	4	4
Canada	7	11	12
United States	14	18	21
Pakistan	380	310	260
Nigeria	970	820	630
Somalia	1000	1000	1000

A number of factors have a strong association with rates of maternal mortality. Bivariate correlations were run with rates of maternal mortality rates from 2010 and health indicators from 2005 to measure the effect of the health indicators on rates of maternal mortality (Table 2.1). Fertility rates had a strong positive association (p=.841) in relation to maternal mortality in this sample with increasing rates of maternal mortality resulting from higher rates of fertility. This is finding follows previous research that has found that an increased number of births puts a woman at a higher risk for pregnancy related complications and death (Tawiah, 2011; World Health Organization, 2012). Prenatal care, contraceptive prevalence, and births attended by a skilled health professional all had a strong negative association in terms of rates of maternal mortality. This follows previous research that the presence of skilled birth attendants and appropriate prenatal care can lead to decreased levels of maternal mortality (Buor & Bream, 2004; Tawiah, 2011; Anderson et al., 2014; World Health Organization, 2012). One limitation to results and such high associations for health indicators may be due to the lack of available data for all countries for each indicator. This lack of data may have affected and skewed the findings.

Bivariate correlations were also run for an association between maternal mortality rates

for 2010 and education indicators from 2005 (Table 2.2). Enrollment in primary, secondary and

tertiary school for females as well as persistence to the last grade of primary school all had a

strong negative association with rates of maternal mortality. Enrollment in secondary school for

females had the strongest association (p = -.795) but, persistence to the last grade of primary

school also had a strong association (p= -.744). These findings support previous research that

females increased education reduces the chances of maternal death and, in turn, overall rates of

maternal mortality. This is likely because as previous research has found, educated women are

more likely to be aware of the risks and complications that may occur during pregnancy, and be

aware of the resources that are available to them, decreasing their chances and instances of

maternal death (Tawiah, 2011; Mumtaz & Salway, 2007; Pandey et al., 2012).

Bivariate correlations were also run for maternal mortality rates from 2010 and

socioeconomic indicators from 2005 (Table 2.3). Strong associations were not found with all

indicators as expected based on previous research. Results did however, show a strong

association between rural (p= .549) and urban populations (p= -.549) and rates of maternal

mortality. It is important to note that the direction of the association for rural populations is

negative and positive for urban populations. These results suggest that rates of maternal mortality

are increased in rural populations as previous research has suggested. Increased rates of maternal

mortality in rural populations have been suggested to be the result of a lack of access to

resources and the distance women must travel in order to receive maternal care and have an

institutional birth (Tawiah, 2011; Mahapatro, 2012). The bivariate correlation however, showed

almost no association between rates of maternal mortality and the employment to population

ratio of females (p= .006). This goes against previous research which suggests women's

autonomy and contribution to the household increases their chances of decision making for spending and can increase their health (Acharaya et al., 2014). These results however, may also be due to this study being limited to the selection of thirty countries as well as a lack of available data for some countries.

Table 2.1 Bivariate correlation showing the relationship between rates of maternal mortality (2010) and health indicators (2005)

Fertility rate, total (births per woman)	.841
Pregnant women receiving prenatal care	-.926
Contraceptive prevalence (% of women age 15-49)	-.955
Births attended by a skilled health professional	-.979

Table 2.2 Bivariate correlation showing the relationship between rates of maternal mortality (2010) and education indicators (2005)

School enrollment, primary, female (% of gross)	-.589
School enrollment, secondary, female (% of gross)	-.795
School enrollment, tertiary, female (% of gross)	-.539
Persistence to last grade of primary female (% of cohort)	-.744

Table 2.3 Bivariate correlation showing the relationship between maternal mortality rates

(2010) and socioeconomic indicators

Urban population (% of population)	-.549
Rural population (% of population)	.549
GDP (constant 2005 US$)	-.242
Employment to population ratio, female15+ (% of population)	-.006
Contributing family workers, female (% of females employed)	.872

A multiple regression was run for maternal mortality rates of 2010 as the dependent

variable with fertility rate, female persistence to last grade of primary school, rural population,

and female employment to population ratio as the independent variables. Fertility rate was the

only independent variable found to be statistically significant (p= .044) when analyzed along

with maternal mortality. The other three dependent variables were not found to be statistically

significant. This is likely due to the fact that a sample of only thirty countries was used in this

study and results may be different if all countries were being analyzed. Of the variables that were

not found to be statistically significant, both the independent variables for rural population and

persistence to the last grade of primary school were found to have an association with maternal

mortality when bivariate correlations were run. While they cannot be generalized to the whole

population outside of this sample of countries, it is not to say that they do not have any impact on

rates of maternal mortality, at least for the countries in this sample. As previously mentioned, results may have also been limited because of a lack of available data for a number of the countries used in this sample. Fertility rate was one of the variables that did have available data for all countries and may be why it was found to be statistically significant while others were not.

Table 3.1 Multiple regression for maternal mortality rates (2010) as the dependent variable

	B coefficient	Standardized coefficient
Fertility rate, total (births per woman)	180.371	.963*
Persistence to last grade of primary, female (% of cohort)	-5.484	-.398
Rural population (% of total population)	-.7002	-.601
Employment to population ratio, female 15+	4.390	.175

(p< .05 *)

Conclusion

The results of this study show that as previous research has suggested, social factors such as health, education, and socioeconomic status have an impact on rates of maternal mortality. The use of prenatal care, skilled birth attendants, and contraceptives are all associated with lower rates of maternal mortality while higher fertility rates are associated with higher rates of maternal mortality. This suggests a need for increased health services in areas where rates of maternal mortality are high. Not only should resources be provided but information should be provided as well and be accessible to all people. Education was also found to have an association with rates of maternal mortality and should be a main focus in efforts to reduce maternal mortality rates in developing countries. An association was also found between rural and urban population and

rates of maternal mortality. The negative association for urban populations and positive associations for rural populations in terms of maternal mortality rates suggests that women living in rural areas may be at a disadvantage when it comes to accessing maternal health resources. While the results of this study were not able to make many generalizations to a greater population other than the countries selected, the associations between health, education, and socioeconomic status are important to consider and help to add to the research on maternal mortality as a global issue.

Further research into maternal mortality is necessary in order to address this worldwide problem. The high rates of maternal mortality that continue to persist in developing countries are unacceptable as well as unnecessary and more research could bring more attention to the issue. Further research then should focus on what developing countries have done that help to keep their maternal mortality rates low so policies and programs may be put into effect to help lower the rates of developing countries. More quantitative research is also needed in the future to examine the possibility of underlying cultural beliefs and practices in rural areas and developing countries that may contribute to increased levels of maternal mortality. While the United Nations had made improving maternal health and decreasing the number of maternal deaths, the issue still requires more national attention and increased publications of research on this issue may help to reach that goal.

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