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A Nested Analysis of How Corruption Affects Maternal Mortality

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Nønne Schjærff Engelbrecht was a bright, empathetic, and deeply committed person. I first met her as a student in the International Administration and Global Goveernance program at the University of Gothenburg. When she proposed writing her thesis on corruption and maternal mortality, I was not surprised; the topic reflected issues she cared deeply about. The result was an outstanding piece of work. Through quantitative analyses and fieldwork in Nepal, she showed how corruption can affect both access to and the quality of healthcare for pregnant women.

I encouraged Nønne to develop the thesis into a working paper, and she agreed. However, true to her character, she devoted much of her time and energy to advancing the rights and well-being of vulnerable populations through practical engagement. Before the paper could be completed and published, she passed away.

We publish this working paper in honor of Nønne's intellectual achievement and her commitment to improving the lives of others. We hope that her work will continue to contribute to the understanding of corruption, health, and social justice.

Marina Nistotskaya
Professor of Political Science
University of Gothenburg
June 2026

Abstract

Maternal mortality remains a major global health challenge and exhibits substantial variation across countries. While previous research has shown that quality of government influences health outcomes, the relationship between corruption and maternal mortality has received limited attention. This study examines whether and how corruption affects maternal mortality. Using a nested analysis design, the study combines a cross-national statistical analysis with a case study of Nepal. The quantitative analysis demonstrates a robust and statistically significant relationship between corruption and maternal mortality. Lower levels of corruption are associated with lower maternal mortality, even after controlling for socioeconomic development, female education, abortion laws, public health spending, and inequality. The results further suggest that the effectiveness of public health spending is conditional on the level of corruption. The Nepal case study identifies several mechanisms through which corruption affects maternal mortality. Corruption reduces the effectiveness of public health spending by diverting resources from their intended purposes, increases barriers to care, and may undermine the reliability of health data. The findings also suggest that corruption operates as a cross-cutting factor affecting all three phases of delay in the Three Delays Model. The study contributes to the literature on quality of government and health by extending the analysis of corruption to maternal mortality and by identifying mechanisms linking corruption to adverse health outcomes.

Key words: corruption, maternal mortality, quality of government, nested analysis, three delays model

Introduction

> "Women are not dying because of a disease we cannot treat. They are dying because societies have yet to make the decision that their lives are worth saving."
>
> Mahmoud Fathalla, President of the International Federation of Gynecology and Obstetrics, World congress, Copenhagen, 1997

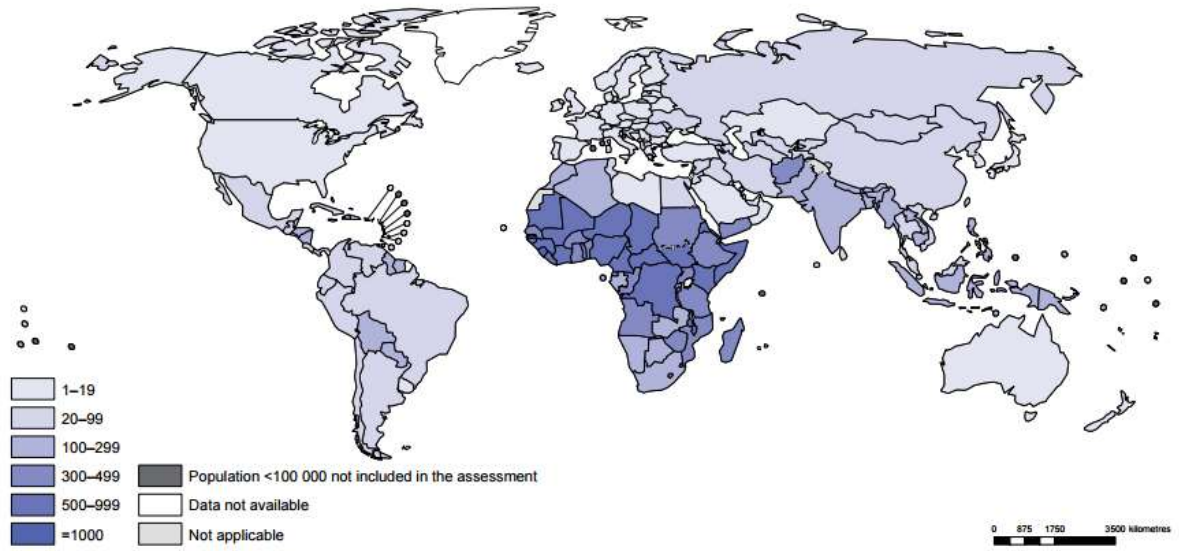
Every two minutes, a woman dies from preventable causes related to pregnancy and childbirth. This amounts to approximately 830 maternal deaths every days worldwide (WHO, 2015). Around 200 of these deaths occur among adolescent girls (RFSU, 2016), for whom complications during pregnancy and childbirth remain the leading cause of death in developing countries (WHO, 2015).

Maternal mortality accounts for about 1% of all deaths among women of reproductive age worldwide, and an estimated 99% of maternal deaths occur in low- and middle-income countries (Lindstrand, 2006: 236). This stark disparity reflects profound inequalities in access to health care and is often regarded as one of the clearest indicators of the gap between rich and poor countries in terms of health outcomes. In 2008 the maternal mortality ratio (MMR) ranged from 290 maternal death per 100,000 live births in developing countries to just 14 in high-income countries, thereby giving a 15-year old girl living in sub-Saharan Africa a 1-in-31 lifetime risk of dying of maternal causes compared to a 1-in-4300 risk for girls in a developed country (UNDP, 2011: 5).

In response to persistently high levels of maternal mortality, Millennium Development Goal (MDG) 5 called for a 75% reduction in maternal deaths between 1990 and 2015. However, this goal was far from reached: the number of maternal deaths worldwide declined by only 43% between 1990 and 2015 (WHO, 2015). Moreover, only 9 of the 95 countries with high levels of maternal mortality succeeded in achieving the goal (WHO, 2016). MDG 5 achieved the least progress relative to its target among all the Millennium Development Goals (RFSU, 2016). The aim to reduce MM is now a special priority under the newly adopted Sustainable Development Goals. Goal 3.1 is to reduce the global MMR to less than 70 deaths per 100,000 births by 2030, with no country having a MMR of more than twice the global average (WHO, 2015). The global

MMR in 2015 was 216 per 100,000 births (WHO, 2016) and the global community thus have a long way to go before reaching the goal.

Figure 1: Maternal deaths per 100, 000 live births, 2015



Source: WHO et al: 2015: 19

What is particularly alarming about the high MM is that most maternal deaths are preventable (Lindstrand, 2006: 236). What causes MM is *not* a lack of knowledge about how to handle the complications, but structural causes creating limitations in the access to care. The social determinants of health, or what can be called the barriers to care, are thereby particular important when it comes to MM.

In the "Closing the gap in a generation: health equity through action on the social determinants of health", the World Health Organization (WHO, 2008) identifies good governance as key area for improving health and health equity (WHO, 2008: 44). Their definition of good governance centres on democracy, "fair participation in policy-making", where active and informed individuals participate in health decision-making that affects them (WHO, 2008: 166). Reputable research supports this claim (Wang and Mechkova 2018).

Simultaneously research has questioned the role of democracy as a key determinant of human welfare, including public health. Focus has instead shifted to other aspects of politcs, namely the *exercise* of power. An influential the Quality of Government (QoG) framework idefines impartiality in the implementation of public authority as the ley dereminant of human welfare (Rothstein and

Teorell 2008, Nistotskaya 2020), often measured thorugh the levels of corruption (Holmberg et al 2009; Holmberg and Rothstein 2011). Where the correlation between QoG and good health has been empirically established (Gupta et a. 2001; Holmberg and Rothstein 2011; Rajkumar amd Swaroop 2008), the causal mechanisms remain poorly understood. Furthermore, the literature on institutions and health has paid limited attention to the distinctive characteristics of maternal mortality. This study therefore aims to address these gaps, by focusing on corruption as a barrier that limits access to quality maternal health services.

The paper begins with a literature review, followed by the three delay model of MM and the role of corruption and the rationalization of the nested analysis approach. Section 2 discusses the data, method and finding from a large-N analysis and Section 3 discusses the case, method and findings from the qualitative research. A short discussion and conclusion wrap up the study.

Literature Review

When trying to understand how to improve human well-being most political science research have concerned on the access to power, such as elections and party politics, while the exercise of power – or the output side of politics – has been largely overlooked (Rothstein, 2011: 5-6). The quintessential characteristics of the outside part of politics is the degree to which power is exercised impartially (Rothstein and Teorell 2008). Stemming from this line of reasoning, a growing body of literature have shown the positive effect of QoG on human well-being (Holmberg et al 2009; Holmberg and Rothstein 2011; Nistotskaya 2020). This section will give an overview of the literature regarding the QoG's effect on public health.

A rather limited but growing body of literature is investigating the relationship between QoG and different health outcomes, including child mortality and life expectancy. While few authors have questioned the existence of the link, some authors foound a strong direct relationship between QoG and health outcomes, others for an interaction effect of corruption and public health spending (PHS) while others ephasize income as an important threshold-indicator for when income or QoG matters the most. Most research is limited by mere correlation between QoG indicators and health, leaving the question of mechanisms for future research.

Unlike most authors Holmberg and Rothstein (2011) dedicate a substantial part of their article to possible causal mechanisms between institutional variables and health outcomes. They point to a

series of indirect chains between QoG and health outcomes – one of these is through economic performance.

They argue that QoG is affects economic performance, which, in turn, should translate into better living standards, such as better food and housing, access to water and sanitation, and better working conditions. However, as they – and several others (Preston 1975) – point out the relationship between wealth and health is not linear. In poorer countries there is a strong positive relation, after a certain threshold the relationship, however, flattens out, showing that life expectancy (LE) levels in richer countries are less sensitive to variations in income. Furthermore, Lazarova and Mosca (2008) find that in countries with an absolute income *lower* than 5,000 PPP international dollars per capita income matter the most for health, while governance matter the most for countries above that threshold. Using cross-sectional data for 101 countries and employing 18 health indicators (excluding MM), Klomp and de Haan (2008) reach a similar conclusion: that QoG[1] has an indirect influence on health via its positive impact on income and the quality of the health care sector. In countries with a relatively healthy population, QoG has a positive indirect effect through the quality of the health care sector, but not via income. In countries with poor health, it is the other way around. They do, however, find no evidence that QoG is directly related to health of individuals once they control for economic and demographic factors (Klomp & de Haan, 2008: 611)

Others have shown that although income and health are closely linked, the connection between periods of economic growth and periods of improvement in population health is weak (Bloom & Canning, 2007).

The proposition that wealth should lead to better health is further challenged by the fact that there is great variation in life expectancy between equally poor and equally rich countries (Evans, 2009: 110). A possible reason for this is that although rising incomes mean that the country has greater resources, these resources are not necessarily applied to health - and what further is, the resources are not necessarily equally distributed.

Emphasizing the fact that there is a strong causal link between social and economic inequality and poor population health, Holmberg & Rothstein (2011) reason that there might be another indirect causal link between QoG and health through inequality. They argue that in countries with low

[1] The QoG variable is measured thorugh legislator effectiveness, the level of perceived corruption, bureaucratic quality, law and order, and regulation and protection of property rights.

QoG, people will not entrust the government with money through tax payments, without economic resources social policies that can eradicate high level of inequality will be scare or non-existent, resulting in poor population health. Consequently, high QoG will positively affect people's willingness to pay taxes, since QoG will create more confidence that the various government agencies use the money well. Holmberg and Rothstein therefore argue that high QoG should result in higher PHS and lead to better population health (2011: 534).

Jayasuriya & Wodon (2003) share that view and argue that since most countries have no resources to expand the PHS to improve health outcomes, they should instead improve the efficiency of public spending when aiming to improve the health status of their populations. Looking at life expectancy they use two measures of QoG, quality of the bureaucracy and corruption. They find that the quality of the bureaucracy is a strong determinant of the efficiency of countries in improving health, while the impact of corruption on the other hand is not statistically significant (Jayasuriya & Wodon, 2003: 6).

The relationship between higher PHS and better health are not universally acknowledged. Wagstaff and Claeson (2004) argue that large health budgets are nessesary, but not sufficient, to reach the MDG. They further argue for targeted health interventions - even in countries with high QoG - since these suggest higher returns in reduced mortality than across-the-board increases in government spending. Strand et al (2008) argue along the same lines when they conclude that Africa may not need more money as much as they need more competent bureaucrats to improve health (Strand et al, 2008: 86). They find that QoG are the single most important political determinant of effective policy responses to AIDS across the sub-Saharan countries. Political mobilisation, the available financial resources and the scale of the epidemic are all found to be less important than QoG (Strand et al, 2008: 86). Similarly, Pritchett (1996) and Filmer & Pritchett (1999) found that the negative and ambivalent findings on public spending are due to different levels of efficiency and corruption in the administration.

Holmberg and Rothstein (2011) likewise argue for an interaction effect of PHS and QoG. Using a sample of 180 countries they analyse the effect of three different measures of QoG variables (The World Bank's rule of law indicator and government effectiveness measure, and Transparency International's Corruption Perception Index) on five different health variables (life expectancy, under five mortality rate, MM, healthy life expectancy and a subjective health measure). They found that 1) all three measures of QoG matter for population health in both rich and poor countries, 2)

it is only public spending – not private – that has a positive effect on population health and 3) increasing QoG can, to some degree, compensate for the lack of economic resources when it comes to improving population health.

Continuing this line of reasoning, Rajkumar and Swaroop (2008) examine what they call "the surprising result that public spending often does not yield the expected improvement in outcomes" (2008: 96). They draw on the work by Pritchett (1996) they look closer into the relationship between PHS, QoG, and child mortality. Employing data from 91 countries and using an interaction variable between PHS and QoG (measured through corruption and bureaucratic quality), they conclude that the differences in the efficacy of PHS can largely be explained by QoG. Their analysis shows that a one percentage point increase in the share of PHS in GDP will lower the child mortality rate by .32 % in high QoG countries and .2% in average QoG countries. At the same time, in low QoG country, an increase in PHS has no effect mortality (Rajkumar & Swaroop, 2008). In other words, increasing PHS is unlikely to lead to better outcomes if a country has incompetent or corrupt bureaucracy.

Hu and Mendoza (2013) revisit the link found by Rajkumar & Swaroop (2008). Using a dataset covering 136 countries from 1960-2005 and broad range of indicators for institutional quality, some of which are congruent with the concept of QoG.[2] Hu and Mendoza (2013) find that both PHS and institutional quality matter for the reduction of child and infant mortality. However, unlike Rajkumar and Swaroop (2008) they find no clear evidence of an interaction effect between PHS and QoG, throwing some doubt on the conclusions from Rajkumar and Swaroop's study.

Thus, despite the growing body of literature concerning QoG's affect on health outcomes, only a handful of studies consider MM as an outcome variable (Holmberg and Rothstein, 2010; Muldoon et al. 2011). Furthermore, the empirical literature does not treat MM as a gendered phenomenon. For example, both the above mentioned studies use the set of control variables for all health outcomes under consideration. However, MM is a genedered issue as the societal status of women, the cost of health services and the status of abortion laws play central roles for the MM (Thaddeus & Maine 1994), and therefore need to be carefully factored in the analysis.

[2] The International Country Risk Guide variables includes government stability and corruption, The Worldwide Governance Indicators that includes voice and accountability, political stability and absence of violence or terrorism, government effectiveness, regulatory quality, rule of law and corruption, and finally The Open Budget Index that provides measurements of public availability of budget information and other transparent and accountable budgeting practices

This omission is especially problematic because maternal mortality has consequences that extend beyond maternal health itself. Because maternal deaths occur overwhelmingly among young women, maternal mortality has a disproportionate impact on life expectancy. In addition, the death of a mother increases a child's risk of mortality by a factor of ten (UNICEF, 2008), making maternal mortality an important determinant of both population health and child survival.

Against this background, the present study investigates the relationship between quality of government and maternal mortality. More specifically, it conceptualizes quality of government as the absence of corruption and addresses two research questions: Does corruption affect maternal mortality? And if so, through what mechanisms? To answer these questions, the study combines a cross-national statistical analysis of the direct and indirect effects of corruption on maternal mortality with an in-depth qualitative case study examining how corruption influences maternal health outcomes in practice.

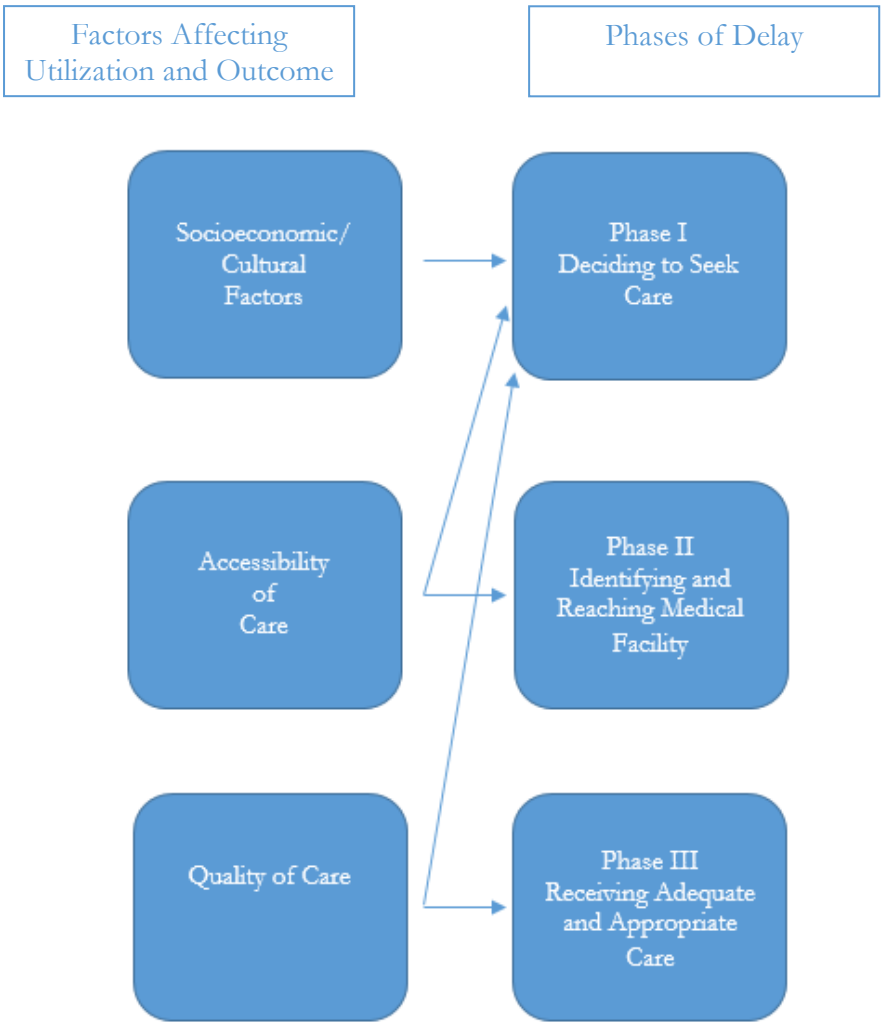
Theoretical Framework: The Three Delays Model

This section discusses distinct characteristics of MM and the Three Phases of Delays model of MM, which guides the analysis.

Thaddeus & Maine (1994) argue that MM can usually be prevented if timely and adequate treatment is provided; therefore the outcome is most adversely affected by delayed treatment. Delay can occur in three different phases: 1) in the decision to seek care; 2) in the arrival at a health facility; 3) in the provision of adequate care (Figure 2). A delay in any one of the phases can prove fatal (Thaddeus & Maine, 1994: 1092).

At each phase a woman's decision is affected by a number of factors, some of which – such as care cost, distance to a medical center and poor health literacy – act as barriers to care. In other words, barriers to care is something that makes it difficult for people to attain care. For example, a woman's access to and utilization of health care is shaped by her societal status (Thaddeus & Maine, 1994: 1098).

Figure 2: Thaddeus & Maine (1994)'s Three Delays Model



Figures A1, A2 and A3 of Appendix A depict factors affecting the individuals decisions at each of the delay phase. In the first phase, the likelihood of delay increases as a woman's social status decreases. Delays in seeking medical care frequently occur when women do not have the autonomy to make decisions about their own health. Instead, authority over healthcare decisions may reside with a spouse or senior family member, creating barriers to timely access to care (Thaddeus & Maine, 1994: 1098). Furthermore, the effect of women's social status on decisions to seek care is closely intertwined with the cost of treatment. Women's ability to access healthcare often depends not only on their position within the household but also on the financial resources required. In many contexts, healthcare expenditures for women are evaluated differently than those for men, making the consequences of low status particularly pronounced when treatment is costly (Thaddeus & Maine, 1994: 1098). There is, in other words, a reluctance

to allocate resources for women's health, and the lower the status of the women is, the greater the reluctance will be. Money in the hands of women are therefore an important factor to lower the risk for delay in phase one.

Another factor related to P1 is the socio-legal factors, where illegal abortion is a major restrain. In countries where abortion is illegal, women are deprived the right to treatment which results in delays and ultimately, in many cases, death.

Thaddeus and Maine (1994) identify corruption as one of the factors influencing decision-making in the first phase. They argue that informal payments and bribes to healthcare personnel in order to obtain medicines or treatment increase the cost of seeking care, thereby discouraging timely healthcare utilization.

The model conceptualizes phase two – identifying and reaching a medical facility – as a function of actual accessibility to healthcare services. Accessibility is determined by the geographical distribution and location of health facilities, the distance and travel time required to reach them, the availability of transportation, and the financial costs associated with obtaining care. Delays may occur when transportation is unavailable, travel is difficult or risky, or when the costs of accessing care exceed a household's expectations or ability to pay. Together, these factors shape whether women experiencing obstetric complications are able to reach appropriate medical care in a timely manner.

Receiving adequate and appropriate care (phase three) dependents on the capacity of health facilities to deliver effective treatment once a patient has arrived. This capacity is influenced by the availability of qualified personnel, sufficient medical supplies, and the organizational ability to diagnose and manage complications appropriately. Failures at this stage may arise from understaffing, inadequate training, shortages of blood, medicines, or equipment, and errors in clinical decision-making. Consequently, physical access to a healthcare facility alone is insufficient; positive maternal health outcomes ultimately depend on the facility's ability to provide timely and appropriate care.

Thaddeus and Maine's (1994) important contribution is thier emphasis that the three phases are not independent but closely interrelated (Figure 2). The authors show that previous experiences in later phases feed back into earlier stages of the care-seeking process. Perceptions of accessibility and previous experiences with the quality of care influence subsequent decisions to seek treatment. Poor-quality care can undermine trust in healthcare providers and discourage

future utilization, whereas positive experiences can strengthen confidence in the healthcare system and increase the likelihood of seeking timely care when complications arise.

Based on the discussion above, I put forward the following hypotheses:

H1: All things being equal, countries with higher levels of corruption will have higher levels of MM.

H2: The effect of public health spending (PHS) on MM will be conditioned on the levels of corruption.

Methodological Approach: Nested Analysis

This chapter introduces Nested Analysis and explains its suitability for the aims of the studyl. The specific methods employed in the quantitative and qualitative components are discussed in greater detail in the chapters devoted to the large-N analysis and the case study.

Lieberman (2005) proposes a unified mixed method approach to comparative research, which he terms Nested Analysis (NA). The concept of NA refers to the integration of different methodological approaches within a single coherent research design, where the selection and sequencing of methods are guided by the findings of preceding analyses. (Harrits, 2011: 152).

Nested Analysis combines large-N statistical analysis with in-depth examination of one or more cases drawn from the larger sample (Lieberman, 2005). By integrating cross-case comparison with within-case analysis, it enables researchers both to identify general patterns and to investigate the causal mechanisms underlying them (Harrits, 2011). The approach is particularly suited to research areas where theory remains underdeveloped, as it supports both theory generation and theory testing within a single analytical framework (Lieberman, 2005).

As Lieberman (2005: 442) notes, a strong social science study does does more than establishes a relationship between independent and dependent variables; it should also explain the mechanisms through which cause produces effect. This distinction is central to the present study. While the question of whether corruption affects maternal mortality seeks to establish a general empirical relationship, the question of how corruption affects maternal mortality focuses on identifying the causal mechanisms that link the two.

Large-N study

To evaluate H1 and H2, a cross-country OLS multivariate regression analysis, using the measure of MM from the year 2010, and the measure of corruption and all control variables from the 2006-2009 period, is conducted. All data is from The Quality of Government Data Set (version 20), except for the Abortion Law variable which is obtained from Center for Reproductive Rights (2009).

Operationalization

To capture MM the study employs the number of maternal deaths per 100,000 live births, which is a widely used measure for MM. Maternal death is the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes (WHO, 2016). The strength with this measure is that it expresses the quality of pregnancy care and delivery care and that it is not sensitive to fluctuation in fertility (Lindstrand, 2006: 237).

Measuring MM accurately is difficult in countries where comprehensive registration of deaths and of causes of death does not exists (WHO, 2016). Under such circumstances census, surveys or models are used to estimate levels of MM. Global and regional estimates of the MMR are developed every five years (WHO, 2016). The outcome variable MM is logged transformed.

The study's main independent variable – corruption – is measured using the Transparency International's Corruption Perception Index (TI 2016). The scores ranges from 0 (highly corrupt) to 10 (clean). The country scores do not usually fluctuate very much from year to year, but since the measure is built on perceptions the average of 2007-2009 is employed. In the robustness test the World Bank variable "Control of Corruption" is used instead.

The control variables are chosen to capture key dimensions of the gendered social, economic, and institutional environment in which maternal mortality occurs, reflecting the fact that maternal health outcomes are shaped not only by medical factors but also by women's position in society.

Abortion Laws: unsafe abortion remains an important contributor to maternal mortality worldwide. While abortion is a medically safe procedure when performed by trained personnel under

appropriate conditions, unsafe abortions continue to account for a substantial share of maternal deaths, particularly in low- and middle-income countries. Research shows that restrictive abortion laws are associated with higher rates of unsafe abortion and, consequently, higher levels of maternal mortality (Population Reference Bureau, 2005; Guttmacher Institute, 2012). Conversely, countries that have liberalized abortion legislation, such as Nepal and South Africa, have experienced marked reductions in abortion-related maternal deaths.

Although legal provisions do not always translate directly into access to services, the legal status of abortion remains an important determinant of the safety, affordability, and availability of abortion care. Abortion laws are therefore included as a control variable in the analysis. I expect more restrictive abortion regimes to be associated with higher levels of maternal mortality.

The data are drawn from the Center for Reproductive Rights (2009) and capture the legal status of abortion worldwide in 2007. To account for the time required for legal changes to influence access to services and health outcomes, the variable is lagged by three years. The original four-category classification is recoded into a binary measure distinguishing restrictive abortion regimes (abortion permitted only to save a woman's life or preserve her physical or mental health) from more liberal regimes (abortion permitted for socioeconomic reasons or without restriction as to reason). This distinction better captures the theoretical contrast between restrictive and permissive access to abortion services while minimizing problems associated with frequent minor legal changes across categories.

Schooling Years for Girls: the World Health Organization (2008) identifies girls' and women's education as a key determinant of health outcomes. While previous studies of quality of government and health typically control for female literacy, the duration of female education is particularly relevant for maternal mortality.

Education affects maternal health through several mechanisms. Longer schooling is associated with delayed marriage and childbearing, reducing the risks associated with adolescent pregnancy. It also increases women's economic opportunities, bargaining power, and autonomy, while improving knowledge of reproductive health and the effective use of healthcare services. These factors have consistently been linked to safer motherhood and lower maternal mortality (UNDP, 2011; World Bank, 2010). To capture these effects, I use average years of schooling among females aged 15 and above rather than female literacy. The variable serves as a proxy for women's

empowerment, economic independence, and delayed childbearing. Data are drawn from the QoG dataset.

Public Health Spending is measured as Public Health Expenditure as a percentage of GDP. This indicator captures both recurrent and capital expenditures financed through government budgets, external grants and loans, and social health insurance schemes (Teorell et al., 2013: 408). It is widely used in the literature on public spending and health outcomes (e.g., Rajkumar & Swaroop, 2008; Hu & Mendoza, 2013). In the present study, the variable is included both to estimate the direct effect of public health spending on maternal mortality and, through an interaction term, to assess whether this effect varies with levels of corruption.

Economic Development is controlled for using GDP per capita based in purchasing power parity (PPP) terms. Previous research suggests that the relationship between income and health is non-linear. The Preston Curve, for example, shows diminishing health returns to income beyond a threshold of approximately US$5,000 GDP per capita, a finding also reported by Lazeriva and Mosca (2008). To account for this non-linearity, GDP per capita is recoded into a binary variable, with countries below US$5,000 coded as 0 and countries above this threshold coded as 1.

Inequality: to control for socioeconomic inequality, I use the Gini coefficient of household disposable income. This measure captures inequality in the income actually available to households after taxes and transfers and is therefore particularly relevant for assessing disparities in living standards. An additional advantage is its relatively broad country coverage compared to alternative measures of income inequality. The Gini coefficient ranges from 0, indicating perfect equality, to 100, indicating complete inequality. The data are drawn from the QoG dataset and cover the period 2006–2009.

Results

Figure 3 depicts a bivariate relationship between corruption and MM, indicating a clealy s negative association between absence of corruption and maternal mortality. As the level of corruption decreases, maternal mortality tends to decline, although substantial cross-country variation remains.

Figure 3: Corruption and Maternal Mortality: Bivariate Correlation

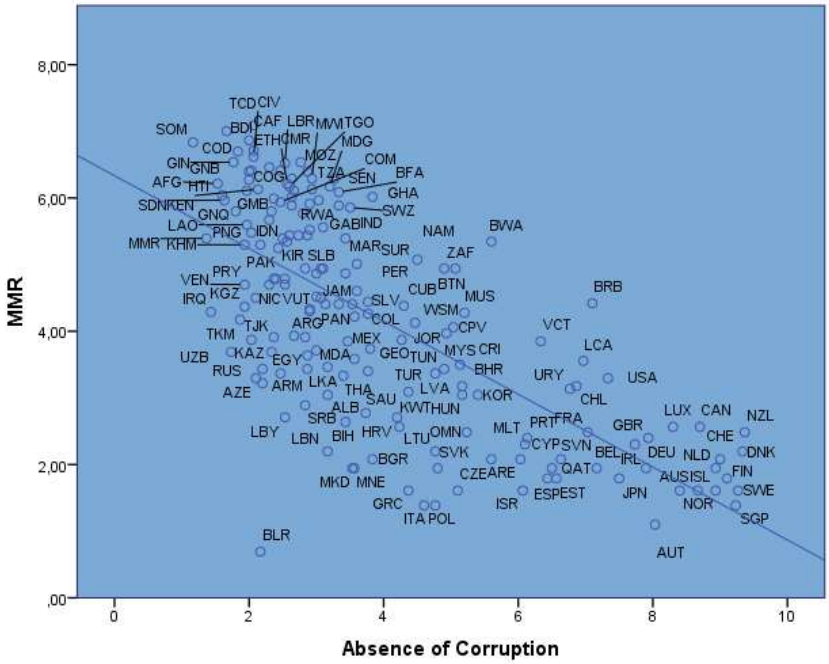


Table 1 reports the results of the regression analysis. Corruption enters statistically significant and negatively signed across all models. Although the magnitude of the effect decreases as additional controls are introduced, the relationship remains robust, suggesting that corruption exerts an independent influence on maternal health outcomes.

Several control variables also perform as expected. More liberal abortion laws, higher levels of female education, and greater economic development are consistently associated with lower maternal mortality. Among these, female education appears particularly important, substantially increasing the explanatory power of the model. In contrast, public health spending does not display a significant independent effect once other factors are taken into account, indicating that the amount of resources devoted to health may be less important than how effectively those resources are used.

Table 1: Corruption and Maternal Mortality

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Corruption	-0.545*** (0.043)	-0.429*** (0.043)	-0.284*** (0.045)	-0.301*** (0.052)	-0.207*** (0.053)	-0.186*** (0.048)	-0.391*** (0.094)
Abortion law		-1.180*** (0.187)	-0.409** (0.177)	-0.413** (0.182)	-0.513*** (0.171)	-0.693*** (0.195)	-0.620*** (0.191)
Schooling years			-0.250*** (0.033)	-0.260*** (0.034)	-0.182*** (0.036)	-0.145*** (0.040)	0.153*** (0.039)
Public health spending				0.041 (0.046)	0.021 (0.046)	0.030 (0.049)	-0.173* (0.094)
GDP pc					-0.982*** (0.212)	-0.994*** (0.226)	-0.783*** (0.233)
Inequality						0.026** (0.012)	0.034*** (0.012)
PHS × Corruption							0.037** (0.015)
Constant	6.336*** (0.194)	6.319*** (0.175)	7.252*** (0.200)	7.215*** (0.200)	6.938*** (0.199)	5.568*** (0.606)	6.162*** (0.629)
Adjusted R^2	0.484	0.578	0.720	0.722	0.764	0.846	0.856
N	170	169	135	134	131	79	79

Notes: Standard errors in parentheses. ***p<0.01 **p<0.05 *p<0.10

The interaction model provides further insight. The positive and statistically significant interaction between corruption and public health spending suggests that the effectiveness of public health expenditure depends on the quality of government. In more corrupt settings, additional health spending appears less effective in reducing maternal mortality, consistent with the argument that corruption undermines the delivery of healthcare services and diverts resources away from their intended purposes.

Appendix B and C report the results of disgnostic tests and robustness checks, respectively. Overall, the diagnostics indicate that the model is well specified and produces reliable estimates. There is no evidence of problematic multicollinearity among the explanatory variables, and although one influential outlier is identified, it does not materially affect the results. The robustness checks, in which corruption is operationalized using a World Banks's Control of Corruption measure, further strengthen confidence in the findings, as both the direct effect of

corruption and the interaction effect remain statistically significant and retain coefficients of similar magnitude to those reported in the main analysis

Two caveats should be noted when interpreting the results for public health spending. First, the measure captures public health expenditure as a percentage of GDP rather than the absolute resources available for healthcare. As a result, countries with similar spending shares may devote very different amounts of resources to health, while differences in purchasing power further complicate cross-country comparisons. The indicator is therefore best understood as a measure of the priority assigned to health rather than the actual level of healthcare resources. Second, the measure does not capture how health expenditures are allocated within the health sector. The expected relationship between public health spending and maternal mortality assumes that at least part of these resources are directed toward maternal health. However, priorities vary across countries, and maternal health may receive very different levels of attention. In the absence of comparable cross-national data on spending specifically targeted at maternal health, public health expenditure remains a useful, albeit imperfect, proxy. Consequently, the estimated effect of public health spending should be interpreted with some caution.

Overall, the findings indicate that maternal mortality is associated not only with women's education, overall level of economic development, and access to abortion, but also with the quality of government.

Case study: Translating Correlation into Causality

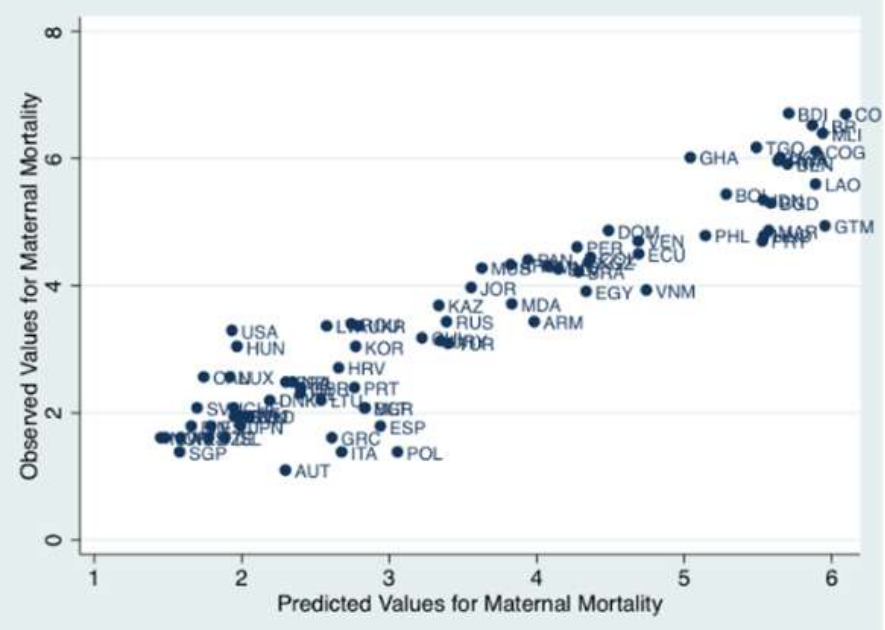
The large-N analysis not only identifies broad patterns in maternal mortality but also informs the design of the subsequent case study (Lieberman, 2005: 439). The case study seeks to uncover the causal mechanisms through which corruption affects maternal mortality, thereby assessing the plausibility of the relationships identified in the statistical analysis. By tracing these processes in context, it complements the large-N analysis and provides a deeper understanding of how corruption shapes maternal health outcomes.

Selecting the case

According to the Nested Analysis logic, the results of the large-N analysis also inform case selection. Cases located close to the fitted regression line represent typical cases, whereas observations that deviate substantially from model predictions are candidates for deviant case analysis. Given the theory-testing purpose of this study, a typical case is selected. Figure 4, which plots observed against predicted values of maternal mortality from Model 7 (Table 1), serves as the primary basis for this selection.

For theory-testing purposes, cases that conform closely to the expectations of the statistical model are preferable, as they provide the most appropriate setting for examining the causal mechanisms underlying the observed relationship. Although Nepal is not displayed in Figure 4 because of missing data on the inequality variable, it lies close to the fitted regression line in all other model specifications and can therefore be considered a typical case.

Figure 4: Observed vs Predicted Values of Maternal Mortality, Model 7 (Table 1)



Two additional considerations informed the selection of Nepal as the case study. First, because the study seeks to examine the impact of corruption on maternal mortality, it is important to select a case where corruption constitutes a meaningful constraint on healthcare delivery. Nepal exhibits relatively high – and, in recent years, increasing – levels of corruption (Transparency International,

2016). The case is therefore drawn from the subset of observations that both conform to the statistical model and display substantial levels of corruption.

Second, Nepal provides a particularly relevant policy context. Since the 1990s, the Nepalese government has made the reduction of maternal mortality a consistent policy priority and has achieved considerable progress in this area (UNDP Nepal, 2016). Examining the role of corruption in such a setting is especially informative, as it sheds light on the extent to which corruption may have constrained the effectiveness of otherwise substantial efforts to improve maternal health outcomes.

In collaboration with the United Kingdom's Department for International Development (DFID), Nepal's Ministry of Health and Population launched the Aama Programme, a nationwide initiative aimed at reducing maternal and neonatal mortality through a combination of supply-side and demand-side interventions and the provision of free maternal healthcare services (Lamichhane & Tiwari, 2012: 5). The programme is based on the premise that reducing both the financial and health risks associated with childbirth can improve maternal health outcomes while contributing to poverty reduction and greater equity in access to healthcare. To this end, it provides free institutional delivery care and cash incentives to women to offset transportation costs and other expenses associated with seeking care (Lamichhane & Tiwari, 2012: 5).

The Aama Programme makes Nepal a particularly informative case for examining the effects of corruption on maternal mortality. The combination of a sustained policy commitment to reducing maternal mortality and relatively high levels of corruption provides an opportunity to investigate how corruption may influence the implementation and effectiveness of maternal health interventions.

Methodological consideration

Informant interviews

The purpose of the case study is to investigate the mechanisms through which corruption affects maternal mortality. Given the limited availability of systematic evidence on this relationship, informant interviews were chosen as the primary method of data collection. This approach made it possible to gather detailed information from individuals with direct knowledge of maternal health services and the challenges posed by corruption.

Because corruption is a sensitive topic, all informants were guaranteed anonymity. While some agreed to have their organizational affiliation or professional role disclosed, others requested complete anonymity. A full list of informants is provided in Appendix D, and interviews are referenced accordingly throughout the chapter.

Two different approaches were used when recruiting informants. For individuals and organizations working specifically on anti-corruption issues, the purpose of the study was disclosed in full. For all other informants, a broader description was provided, emphasizing an interest in Nepal's efforts to reduce maternal mortality and the challenges and opportunities encountered in this work. This strategy was adopted to minimize the risk that respondents would frame their answers around corruption before discussing their experiences more generally.

One potential concern is that providing only a partial description of the study's purpose could raise ethical questions. However, interviews with informants outside the anti-corruption field did not include direct questions about corruption. Instead, corruption was discussed only when informants themselves raised the issue and felt comfortable addressing it—which, in practice, all of them did. This approach reduced the risk of leading respondents toward a particular explanation and ensured that corruption emerged organically from their own accounts. As a result, it strengthens confidence that references to corruption reflected the informants' genuine perceptions of the factors affecting maternal mortality.

Informant interviews differ from standardized surveys in that not all respondents need to be asked identical questions (Esaiasson et al. 2007). Different informants possess different forms of expertise, and interviews can therefore be adapted to the knowledge and experiences of each respondent. Moreover, insights gained from earlier interviews can generate new themes and questions for subsequent interviews. Given the limited knowledge about the mechanisms through which corruption affects health – and maternal mortality in particular – unstructured interviews were chosen as the primary interviewing mode in order to maximize the richness and validity of the data.

At the same time, all interviews began with a common set of open-ended questions. Respondents were first asked to describe their work and involvement with maternal health. For informants not working directly on anti-corruption issues, this was followed by questions about the factors contributing to the decline in maternal mortality in Nepal, the obstacles to further progress, and challenges encountered during policy implementation. These questions typically generated extensive discussion, and the remainder of the interview focused on probing, clarification, and follow-up questions. Interviews with anti-corruption specialists followed a similar structure but included a more direct question regarding the role of corruption in shaping maternal health outcomes in Nepal.

Informants were chosen on the basis of their involvement in health care, maternal mortality or anti-corruption and were therefore well positioned to provide relevant insights into the subject under investigation. The sample includes patients, physicians, researchers, aid workers, and representatives of non-governmental organizations.

The original research design also envisaged interviews with representatives of the government's anti-corruption agency in order to obtain a more direct understanding of how corruption is addressed institutionally and how its effects are perceived by public authorities. The absence of this perspective may be considered a limitation of the study. However, several of the interviewed informants possessed extensive knowledge of the agency's activities and, in some cases, had collaborated with it professionally, thereby partially compensating for this gap in the data.

There is little reason to question the credibility of the informants. Because most respondents were not initially informed that corruption constituted the primary focus of the study, the risk of responses being shaped by a desire to confirm the researcher's expectations was reduced. This strengthens confidence that discussions of corruption emerged from the informants' own experiences and assessments rather than from external prompting.

At the same time, it cannot be ruled out that some informants may have been personally exposed to or involved in corrupt practices. While this does not necessarily undermine the reliability of their accounts, it may have made them less willing to discuss practices in which they themselves had participated. To mitigate this risk, the sample was deliberately composed of actors occupying different positions within the maternal health system. This made it possible to triangulate information across perspectives – for example, comparing the experiences of healthcare providers

with those of patients and aid workers. Importantly, informants generally spoke openly about corruption, including corruption within their own professions and organizations, suggesting a relatively high degree of candour throughout the interviews.

In addition to informant interview, the group interview and focus group interview were conducted in collaboration with a local organization in Nepal during a monitoring visit aimed at evaluating the implementation of policies designed to reduce maternal mortality. As a result, both interviews included questions posed by representatives of the organization in addition to those relevant to the present study. However, these questions largely concerned challenges in the implementation process and were closely aligned with the themes explored in the research.

The focus group interview was conducted in Nepali and translated into English by members of the collaborating organization, as the participants did not speak English. While this introduced an additional stage of interpretation, it was necessary to facilitate communication and participation.

Cross-cultural interviews may be affected by misunderstandings arising from both language differences and culturally embedded meanings and practices (Kvale & Brinkmann, 2009). With the exception of the focus group interview, all interviews were conducted in English, which served as a second language for the informants and, in most cases, their professional working language. No significant communication difficulties were encountered during the interviews. Potential cultural barriers were addressed through extensive preparation concerning Nepalese social norms and customs, as well as through informal guidance from Nepalese contacts familiar with local practices. While it is impossible to rule out the existence of unrecognized cultural misunderstandings, considerable effort was made to minimize their likelihood and potential impact on the data collection process.

Results

Varieties of corruption

> "*Some of these things should have never happened… In other sectors the immediate effect is not seen, whereas here you can lose your life*." (Interviewee 8).

Transparency International defines corruption as "the abuse of entrusted power for private gain" (Transparency International, 2016b), and this definition is adopted throughout this section. Compared to the narrower definition of corruption as the "abuse of public office for private gain" employed in the large-N analysis, this formulation captures a broader range of actors and practices. As Savedoff and Hussmann (2006) note, private actors in the health sector are frequently entrusted with responsibilities that have important public consequences. Although such actors may not formally hold public office, they can nevertheless misuse entrusted authority and divert resources intended to improve health outcomes. A comprehensive understanding of how corruption affects health therefore requires attention to all actors exercising significant authority within the health sector, regardless of whether they operate in public or private institutions.

Without exception, the informants described a society – and a health sector in particular – in which corruption is widespread. Every type of corrupt practice discussed in this section was independently reported by at least two informants. While the purpose of the study is neither to estimate the prevalence of corruption nor to quantify specific practices, the interviews paint a remarkably consistent picture of corruption as a pervasive feature of both public administration and healthcare delivery. As one informant summarized: "*Big people, big corruption. Small people, small corruption. It's in all levels. (...) It is in everything—everything*!" (Interview 10).

Based on the interview material, several forms of corruption can be identified. One of the most prominent is *absenteeism*, which informants consistently described as a widespread problem affecting multiple levels of the health sector. Corruption related to staff transfers emerged as a particularly important driver of absenteeism among healthcare personnel.

"(...) *most of the time they are not present at the health care facilities. Even if they are present they will be present only from 11 am to 2 pm. And most of the time they don't come at all*." (Interview 5).

Recruiting and retaining healthcare personnel in Nepal's remote regions has long been a challenge. To compensate for these difficulties, staff assigned to remote areas receive higher salaries. However, public-sector wages often remain less attractive than the income that can be earned through private practice, particularly in urban areas. Unlike public facilities, where healthcare personnel receive a fixed salary, many private clinics operate on a fee-for-service basis. This creates strong incentives for healthcare workers to remain in urban centres while continuing to draw public salaries. The economic incentive is however not the only reason why doctors prefer staying in the urban areas. One informant points to the fact that doctors, due to lack of equipment and personnel, run a bigger career-risk when working in the remote areas since the risk of medical errors increases under such circumstances. Factors like family-ties and preferences for the urban life might also play a role in the considerations relating to transfers.

According to several informants, corrupt practices within the transfer system facilitate this arrangement. Healthcare personnel may pay officials to avoid assignment to remote areas or to secure transfers back to urban locations. In some cases, individuals reportedly continue to receive compensation intended for remote postings while working elsewhere. The result is the emergence of what informants referred to as "ghost doctors": physicians who are officially assigned to a facility but are rarely, if ever, present.

The consequences are significant. When doctors and other healthcare personnel are absent, access to care is reduced and services may be provided by less qualified staff or not provided at all. From a governance perspective, absenteeism illustrates how public resources can be consumed without generating the intended health benefits. Salaries continue to be paid, yet healthcare services are not delivered.

Absenteeism was not, however, limited to healthcare personnel. Informants also described absenteeism among members of the Health Facility Operation and Management Committees (HFOMCs) and within the Ministry of Health. HFOMCs are responsible for overseeing facility management, including staffing, equipment, and the availability of medicines, and are expected to meet regularly. According to several respondents, these meetings are often not held, contributing to shortages of staff, equipment, and essential medicines. In this respect, absenteeism extends beyond frontline service delivery and affects the broader administrative structures responsible for maintaining the health system.

Taken together, these findings suggest that absenteeism constitutes an important mechanism through which corruption affects maternal health. By reducing both the availability and quality of healthcare services, it increases the difficulty of obtaining timely and appropriate care, particularly for women experiencing pregnancy-related complications.

A second category of corruption identified in the interviews concerns the provision of *medical treatment* itself. Informants described a range of practices in which healthcare providers exploited their professional authority for personal or institutional gain, often at the expense of patients' health and wellbeing.

One frequently mentioned practice was overtreatment. According to several informants, unnecessary procedures are sometimes performed because they generate additional income for healthcare providers and facilities. Caesarean sections were repeatedly cited as an example. Both private clinics and public facilities receive higher payments for caesarean deliveries than for normal births, creating incentives to recommend surgical intervention even when it is not medically necessary.

"*It is easy. If the doctors say that the foetus has problems and that a caesarean is needed, they [the mothers] will obviously say yes. (...) There are some hospitals where the number of caesarean sections is double the number of normal deliveries*." (Interview 10).

Similar concerns were raised regarding the treatment of uterine prolapse. Several informants described cases in which women underwent hysterectomies despite the availability of less invasive treatment options. In some instances, these procedures were allegedly motivated by performance targets or financial incentives rather than medical necessity.

Financial gain was not the only motivation cited. Informants also reported that unnecessary procedures were sometimes used to provide training opportunities for students and inexperienced doctors. In such cases, the asymmetry of information between healthcare providers and patients becomes particularly important. Patients are rarely in a position to independently assess the necessity of a procedure and must therefore rely on the judgement of medical professionals. This creates opportunities for the misuse of entrusted authority.

At the opposite end of the spectrum, informants also described forms of undertreatment and the withholding of information. One example concerned abortion services, where some providers reportedly failed to offer adequate counselling on contraception and family planning. According

to informants, this increased the likelihood of repeat procedures and, consequently, future income for providers. More broadly, several respondents described a practice whereby doctors employed in both public and private facilities encouraged patients attending public clinics to seek treatment at their private practices instead.

"(...) *they encourage the people in the government hospital to come over to their own clinics and do not provide them with the proper treatment in the government hospital. So, you know, that is also a kind of corruption*." (Intervieew 1).

Such practices impose additional costs on patients, delay access to care, and may discourage treatment altogether for those unable to pay. In the context of maternal health, these delays can have serious consequences, particularly when complications require immediate medical attention. The findings therefore suggest that corruption affects not only the availability of healthcare services but also the nature and quality of the treatment provided once women enter the health system.

The *provision of medicines* represents another area in which corruption appears to undermine maternal healthcare. As part of its efforts to reduce maternal mortality, the Nepalese government has introduced a policy providing free medicines, including iron supplements for pregnant women. According to the informants, however, a variety of corrupt practices have emerged around the distribution of these medicines.

One commonly reported practice involves healthcare personnel charging patients for medicines that are officially provided free of charge. In other cases, medicines intended for public distribution are allegedly diverted for private gain.

"*They hide that or use that medicine for their own benefit and they provide to the user only the damaged or the expired [medicine], or only some tablets of paracetamol. That is reality.*" (Intervieew 3).

Several informants also described the systematic falsification of records relating to medicine distribution. Documentation is reportedly produced indicating that medicines have been distributed to patients, while the medicines themselves are redirected to private clinics or pharmacies where they can be sold. The close connections between public and private healthcare providers facilitate such practices, particularly when the same healthcare personnel work in both sectors.

Informants further reported cases in which patients received expired, inadequate, or less effective medicines while records indicated that the appropriate medication had been provided. This practice not only generates private profits but also reduces the likelihood that irregularities will be detected, as patients technically receive some form of treatment.

The consequences for maternal health can be severe. Women may be required to purchase medicines that should have been available free of charge, increasing the financial burden associated with seeking care. Others may receive ineffective treatment or fail to obtain the medicines they need altogether. In each case, corruption creates additional barriers to timely and appropriate care, often forcing women to seek treatment elsewhere or return for repeated consultations. As with absenteeism, public resources are consumed without generating the intended health benefits, resulting in a clear disconnect between healthcare spending and healthcare outcomes.

Corruption also affects the *procurement* and distribution of medicines, equipment, and other medical supplies. Because multiple actors are involved in the supply chain, opportunities exist at several stages for the diversion of public resources. Informants frequently described procurement fraud in which officials inflated the reported costs of goods and appropriated the difference. One example concerned medicine procurement, where invoices submitted to the Ministry of Health reportedly listed prices several times higher than the actual purchase costs.

Informants also described more sophisticated schemes involving donor-funded equipment. In some cases, health facilities allegedly received equipment free of charge from international donors and subsequently billed government agencies as if the equipment had been purchased through public funds (Interview 7). Regardless of the specific mechanism, the outcome was the same: public resources were expended without generating corresponding improvements in service delivery. Such practices reduce the resources available for maternal healthcare and weaken the effectiveness of public health spending.

The *licensing of medical colleges* emerged as another area vulnerable to corruption. According to informants, obtaining a licence often involves substantial informal payments, while documentation regarding infrastructure, staffing, and educational standards may be manipulated to meet regulatory requirements on paper.

"(...) *you falsify your standard, yet you get your licence. That is really dangerous in terms of public health!*" (Interview 1).

These practices have implications that extend beyond financial losses. When institutions lacking the required facilities, staff, or equipment are granted licences, the quality of medical education may suffer. Over time, this can affect the competence of healthcare personnel and, ultimately, the quality of care available to patients. Corruption in licensing therefore represents a long-term mechanism through which governance failures may undermine maternal health outcomes.

Nepal's maternal health strategy relies heavily on *incentive schemes* designed to encourage institutional deliveries and antenatal care attendance. Informants generally regarded these programmes as successful, but also identified several forms of corruption associated with their implementation.

One common practice involved the misappropriation of cash incentives intended for women. Because payments are distributed through healthcare facilities immediately following delivery or completion of antenatal visits, healthcare workers are often responsible for administering the funds. Informants reported cases in which records indicated that payments had been made even though the women never received the money. According to several respondents, low levels of literacy and limited awareness of entitlements made such fraud easier to conceal.

A related practice involved the creation of fictitious beneficiaries. Health facilities, healthcare workers, and Female Community Health Volunteers (FCHVs) were described as occasionally submitting claims for services allegedly provided to non-existent women in order to obtain additional payments from the government.

"*So what is happening is that by creating a false report she [the FCHV] is getting this incentive, but she is getting the amount for work she didn't do.*" (Interview 8).

As in previous examples, the result is a disconnect between public expenditure and actual service provision, reducing the effectiveness of policies designed to improve maternal health.

Informal payments to healthcare personnel constitute another important mechanism through which corruption affects access to care.

"*Because you are sick you want to get treatment fast. So sometimes people can afford to pay some 'speed-up money'.*" (Interview 1)

Informants described a system in which patients could secure faster treatment through informal payments, effectively allowing wealthier individuals to bypass waiting times. In other cases, healthcare personnel reportedly demanded payment for services that were officially provided free of charge or charged additional fees beyond those authorized by policy.

These practices undermine the objectives of Nepal's maternal health programmes, which were specifically designed to reduce financial barriers for poor and marginalized women. By increasing the cost of care, informal payments reduce access for those least able to pay and contribute to delays in obtaining treatment. In the context of maternal health, such delays may have serious consequences when complications require rapid intervention.

Finally, informants consistently highlighted weak *monitoring and accountability* as a key factor enabling corruption throughout the health sector. Various actors within the system are formally responsible for monitoring facilities, personnel, and programme implementation. According to respondents, however, monitoring activities are often infrequent or absent.

"*They are supposed to monitor if the women are getting everything, they are supposed to monitor if the health personnel are actually there working in the health facilities, giving the services. They should be going there, but they don't do that very often.*" (Interview 6).

Weak oversight allows many of the previously described practices to persist. In this sense, monitoring does not constitute a direct mechanism affecting maternal mortality but rather a facilitating condition that enables other forms of corruption to continue unchecked.

Several informants further reported that clinic owners and other influential actors sometimes bribed inspectors or used political connections to avoid scrutiny altogether. This reportedly allowed substandard or unlicensed facilities to continue operating despite serious deficiencies in infrastructure, staffing, or professional qualifications. Although the operation of illegal clinics is not in itself necessarily an act of corruption, corruption becomes relevant when public officials responsible for enforcement accept payments or favors in exchange for overlooking violations. The consequence is that women may receive care from poorly qualified providers, increasing the risks of misdiagnosis, inappropriate treatment, and adverse maternal health outcomes.

Patronage emerged as another important form of corruption described by the informants. This category encompasses nepotism, favouritism, and the allocation of public positions or contracts on the basis of personal or political connections rather than merit or competitive procedures.

Several informants pointed to problems within the Health Facility Operation and Management Committees (HFOMCs). While regular committee meetings were often described as poorly attended or not held at all, annual budget meetings reportedly attracted considerable interest. According to respondents, decision-making processes frequently lacked transparency, and contracts for equipment procurement, construction, or renovation were often awarded to relatives, friends, or political associates of committee members. Such practices increase public expenditure without necessarily improving the quality or efficiency of healthcare services.

Patronage was also reported to influence appointments throughout the health sector. Informants described a system in which family ties, political affiliations, personal influence, or informal payments could affect recruitment and promotion decisions. Appointments to positions such as district health officers, senior administrative posts, or leadership roles within medical education were cited as examples. To the extent that positions are filled on grounds other than competence, patronage risks undermining institutional performance and the quality of healthcare delivery.

Beyond questions of competence, patronage also alters patterns of accountability. As one informant explained:

"*Due to that [patronage] the person that is appointed would definitely be obliged to the political masters, right? Not obliged to the institution, but to the masters that were influential in making the appointment of the particular person in question. So that way the sense of accountability also shifts towards the political masters—not to the public.*" (Interview 1).

This observation points to a broader institutional consequence of patronage. When career advancement depends on personal relationships rather than performance, incentives are redirected away from serving the public interest and towards satisfying those who control access to positions and resources. Decisions regarding staffing, procurement, and service delivery may therefore reflect private or political considerations rather than organizational needs or patient welfare.

These findings suggest that patronage affects maternal health indirectly by weakening institutional capacity, reducing accountability, and increasing the likelihood that public resources are allocated inefficiently. In this way, it contributes to a system in which healthcare expenditures are not necessarily translated into improvements in the quality or accessibility of care.

The interview material reveals a wide range of corrupt practices operating throughout the Nepalese health sector. These practices include absenteeism among healthcare personnel and administrators, informal payments and bribes, the diversion of medicines, procurement fraud, manipulation of incentive schemes, corruption in licensing and accreditation processes, and various forms of patronage in appointments and contracting. Although the specific forms of corruption differ, they share a common characteristic in that they involve the misuse of entrusted authority or public resources for private benefit. Importantly, corruption was not described as confined to a particular level of the health system. Rather, informants identified corrupt practices among frontline healthcare workers, facility managers, government officials, oversight bodies, and private actors, suggesting that corruption permeates multiple stages of healthcare governance and service delivery.

Effects of Corruption

The interview material suggests that corruption affects maternal mortality through three broad channels. First, corruption reduces the effectiveness of public health spending by diverting resources away from their intended purposes. Second, it creates and reinforces barriers to care throughout the maternal health system. Third, it undermines the reliability of administrative data used for policy design and evaluation.

Corruption and the Effectiveness of Public Health Spending

The case study provides strong support for the argument emerging from the large-N analysis that corruption reduces the effectiveness of public health spending. The statistical analysis suggested that variations in governance quality may explain why increased health expenditure does not always translate into improved health outcomes. The interview material confirms this interpretation.

As shown in Table 2, nearly all forms of corruption identified by the informants involve a disconnect between public expenditure and actual service delivery. Salaries are paid to absent healthcare personnel, medicines are purchased but never reach patients, incentive payments are diverted, procurement costs are inflated, and monitoring activities are funded but not carried out. In each case, public resources are consumed without producing the intended outputs.

Table 2: Corrupt Practices and their Outcomes

Form of Corruption	**Description**	**Outcome**
Absenteeism	Poorly staffed clinics Health management committees that don't meet/The health ministry/Poorly equipped clinics	P1 & P3 delay Increased PHS
Transfers of doctors	Results in absenteeism/poorly staffed clinics	P1 & P3 delay Increased PHS
Over-treatment	Unnecessary operations	P1, P2 & P3 delay Increased PHS
Lack of treatment	Withholding information Sending women to private clinics instead of treating at public clinics	P1, P2 & P3 delay
Fraud with medication	Lack of drugs Expired medicines/wrong treatment Women get forced to buy drugs in (more expensive) private pharmacies/Unexpected costs	P1, P2 & P3 Increased PHS
Fraud with billing	Exaggerating costs of e.g medicine Billing donated equipment	Increased PHS
Malpractice with licenses	Compromises the quality of the education and in the end the quality of care	P1 & P3 delay Increased PHS
Fraud with incentive schemes	Incentives are not given to the mothers "List of fake mothers"	P1 & P2 delay Increased PHS Unreliable Data
Bribes to HCP	Increased cost for the patient A system based on money, not need	P1, P2 & P3 delay
Lack of monitoring	Fake clinics and doctors/poor quality The government pays for monitoring to prevent fraud. No monitoring is done.	P1 & P3 delay Increased PHS
Patronage	Lack of nessesary competence and experience	P1 & P3 delay Increased PHS

Absenteeism provides a particularly clear example. The government may pay a full-time salary while only receiving a fraction of the expected service – or, in the case of so-called ghost doctors, no service at all. Similar dynamics are evident in the diversion of medicines, fraudulent billing practices, and the manipulation of incentive schemes. Corruption therefore does not simply increase the cost of healthcare provision; it reduces the amount and quality of care generated by a given level of spending.

These findings lend support to the argument advanced by Rajkumar and Swaroop (2008) that corruption effectively "swallows" part of public spending. As a result, improvements in maternal

health become more costly to achieve and the returns to public investment are lower than expected.

Corruption as a Cross-Cutting Barrier to Care

The interview material also helps explain the direct relationship between corruption and maternal mortality identified in the statistical analysis. Viewed through the lens of the Three Delays Model, corruption appears not as a factor affecting only a single stage of the care-seeking process but as a cross-cutting phenomenon capable of influencing all three delays.

Many maternal health policies in Nepal are explicitly designed to reduce barriers to care. Free healthcare, free medicines, and financial incentives for institutional delivery seek to lower the costs associated with seeking treatment. Corruption frequently operates in the opposite direction. Informal payments, the diversion of medicines, and the misappropriation of incentives increase the financial burden placed on women and their families, thereby undermining the intended effects of these policies.

The case study further suggests that corruption affects all three phases of delay. It contributes to delays in receiving adequate care through absenteeism, shortages of medicines, weak monitoring, and deficiencies in professional competence. It contributes to delays in reaching care when women are redirected to private facilities, required to purchase medicines elsewhere, or confronted with unexpected costs. Finally, corruption may influence the decision to seek care by shaping perceptions of healthcare quality and trustworthiness. Negative experiences with poorly staffed facilities, unavailable medicines, or demands for informal payments may reduce confidence in the health system and discourage future utilization.

The findings therefore suggest that corruption should be conceptualized as a factor that cuts across all three delays rather than as a determinant of only one stage of the process. By increasing existing barriers and creating new ones, corruption raises the likelihood of delays throughout the maternal health system.

Corruption and Data Quality

A final consequence of corruption concerns the reliability of administrative data. Several informants described the creation of fictitious beneficiaries and false reporting within maternal health incentive programmes. Such practices make it difficult to accurately evaluate programme performance and assess the effectiveness of maternal health interventions.

This issue extends beyond Nepal. Reliable data are essential for identifying priorities, allocating resources, and evaluating policy outcomes. In settings where information on maternal health remains limited, inaccurate data may be as problematic as missing data, as they risk directing policymakers toward ineffective interventions or misleading conclusions. Corruption therefore not only affects service delivery directly but may also undermine the evidence base upon which future policy decisions are made.This section will discuss how corruption as a factor creating or increasing existing barriers to care, as a likely source of inefficiency of public health spending and of unreliable data.

Discussion

The case study provides strong support for the findings of the large-N analysis and offers important insights into the mechanisms through which corruption affects maternal mortality. Rather than operating through a single channel, corruption appears to permeate multiple levels of the health system and to take a variety of forms, including absenteeism, informal payments, procurement fraud, patronage, manipulation of incentive schemes, and weak oversight. Although these practices differ in their immediate manifestations, they share the common feature of diverting resources or attention away from their intended purpose.

The findings suggest that corruption affects maternal mortality both directly and indirectly. On the one hand, corruption reduces the effectiveness of public health spending by weakening the link between resources allocated and services delivered. On the other hand, it creates and reinforces barriers to care throughout the maternal health system, increasing the likelihood of delays in seeking, reaching, and receiving appropriate treatment. In addition, corruption undermines the quality of administrative data, making it more difficult to evaluate existing policies and design effective interventions.

Taken together, the evidence indicates that corruption should not be understood as a peripheral problem affecting only the margins of healthcare delivery. Rather, it constitutes a systemic challenge that influences the functioning of maternal health services at multiple points. The Nepal case therefore provides a plausible explanation for the relationship identified in the statistical analysis: countries with higher levels of corruption are likely to experience higher levels of maternal mortality because corruption simultaneously reduces the effectiveness of health investments and increases the barriers women face in obtaining timely and appropriate care.

Among potential limitations of the study is a concern that the operationalization of corruption differes across large- and small-N components. Although the quantitative and qualitative analyses rely on closely related concepts, they do not employ identical definitions. In the large-N analysis, corruption is operationalized as the abuse of public office for private gain, whereas the qualitative analysis adopts Transparency International's broader definition of corruption as the abuse of entrusted power for private gain. Consequently, the qualitative analysis may capture forms of corruption that fall outside the scope of the quantitative measure. However, given that both public and private actors exercise significant authority and control over resources within the health sector, the broader definition arguably provides a more comprehensive account of the forms of corruption relevant to maternal health. Ideally, future research would employ measures capable of capturing this broader understanding of corruption in cross-national analyses.

Another issue concerns the distinction between corruption and mismanagement. In practice, the boundary between the two may not always be clear. For example, failures to convene management committees, procure equipment, or provide adequate services could result from incompetence, weak administrative capacity, or deliberate abuse of authority. The analysis presented here relies on the accounts of informants, many of whom interpreted these practices as intentional and linked them to identifiable incentives and private benefits. Nevertheless, it cannot be ruled out that some cases described as corruption may partly reflect broader problems of governance or organizational capacity. The findings should therefore be interpreted as identifying plausible corruption-related mechanisms rather than providing definitive evidence regarding the motivations behind every observed practice.

A third consideration relates to external validity. Some of the mechanisms identified in the case study are closely connected to the design of Nepal's maternal health policies and may therefore not be directly transferable to other settings. The maternal health incentive schemes is one example. Other forms of corruption, however—including absenteeism, informal payments, procurement fraud, patronage, and irregularities in licensing and accreditation—are likely to be relevant across a much wider range of contexts. Moreover, many of these practices are not unique to maternal health but have implications for health service delivery more generally. The findings therefore suggest mechanisms that may operate beyond Nepal, although their prevalence and relative importance are likely to vary across settings.

Finally, the study does not claim to provide an exhaustive account of corruption in the health sector. The forms of corruption identified emerged from the interview material and reflect the specific institutional context under investigation. Other settings may exhibit different forms of corruption, while additional mechanisms may exist even within Nepal. The study should therefore be regarded as a first step toward understanding how corruption affects maternal mortality. Further comparative and case-based research is needed to develop a more comprehensive understanding of the relationship between corruption and maternal health outcomes.

Conclusion

This study set out to examine whether and how corruption affects maternal mortality. Combining a large-N analysis with an in-depth case study of Nepal, the findings provide evidence that corruption is an important determinant of maternal health outcomes and help illuminate the mechanisms through which this relationship operates.

The statistical analysis demonstrates a robust association between corruption and maternal mortality. This relationship remains statistically significant even after controlling for a range of socioeconomic and gender-related factors known to influence maternal health. The results further suggest that the effect of public health spending is conditional on the level of corruption. While public health expenditure is not independently associated with lower maternal mortality, its effectiveness appears to increase as corruption declines. These findings contribute to an ongoing debate within the quality-of-government literature regarding whether governance conditions the relationship between public spending and health outcomes.

The Nepal case study complements these findings by identifying several mechanisms through which corruption may affect maternal mortality. The evidence suggests that corruption reduces the effectiveness of public health spending by weakening the link between resources allocated and services delivered. Salaries are paid to absent personnel, medicines fail to reach intended beneficiaries, procurement costs are inflated, and incentive schemes are manipulated. At the same time, corruption increases barriers to care throughout the maternal health system. Rather than affecting only a single stage of the care-seeking process, corruption emerges as a cross-cutting factor capable of increasing delays in seeking, reaching, and receiving appropriate care. The case

study further suggests that corruption may undermine the reliability of administrative data, thereby complicating policy evaluation and the development of effective maternal health interventions.

Taken together, these findings contribute to the literature on quality of government and health in several ways. First, they extend existing research by demonstrating that corruption is associated with maternal mortality, a health outcome that has received relatively limited attention in the governance literature. Second, they provide evidence that the effectiveness of public health spending depends on the quality of government. Third, they move beyond establishing statistical association by identifying a range of plausible mechanisms linking corruption to maternal mortality. In doing so, the study contributes to a more nuanced understanding of how governance influences health outcomes.

The policy implications of these findings are straightforward. The results should not be interpreted as an argument against public investment in health. On the contrary, reducing maternal mortality requires substantial and sustained public spending. However, the findings indicate that increased expenditure alone is unlikely to achieve its full potential in contexts characterized by widespread corruption. Efforts to reduce maternal mortality should therefore combine investments in maternal health with measures aimed at strengthening accountability, improving oversight, and reducing opportunities for corruption. A better understanding of the mechanisms through which corruption affects maternal health may help policymakers design more effective interventions and accelerate progress towards Sustainable Development Goal 3.1.

The findings also point to several promising avenues for future research. The present study focused primarily on corruption within the health sector itself. However, corruption may affect maternal mortality through more indirect channels as well. Corruption in infrastructure sectors, for example, may influence road quality, transportation systems, and emergency referral networks, thereby increasing travel times and reducing access to healthcare facilities. Similarly, corruption in local administration or law enforcement may create additional financial and logistical barriers to care. Future research could therefore explore how corruption in sectors beyond healthcare affects the different phases of delay identified in the Three Delays Model.

A second avenue concerns the relationship between public and private healthcare provision. A striking feature of the Nepal case is that many of the identified forms of corruption occur either within the private sector or at the interface between public and private providers. Moreover, corruption appears to take different forms across the two sectors. While overtreatment and

unnecessary procedures were primarily associated with private providers, public facilities were more frequently linked to absenteeism, shortages, and the withholding of services. This raises important questions regarding the relationship between healthcare organization and corruption. Are certain forms of corruption more prevalent in one sector than the other? Do public and private providers create different incentives for corrupt behaviour? Is corruption easier to combat in one sector than the other? Addressing these questions would contribute not only to the study of corruption but also to broader debates concerning the governance of healthcare systems.

Finally, the study should be viewed as an initial step towards understanding the relationship between corruption and maternal mortality. The mechanisms identified in Nepal provide plausible explanations for the statistical relationship observed across countries, but additional comparative case studies are needed to assess their prevalence and relative importance in other settings. Further research would help refine both theories of corruption and the design of policies aimed at improving maternal health outcomes.

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Appendices

Appendix A. Theoretical Framework

Figure A1: Determinants of Delay: Phase I (Deciding to Seek Care)

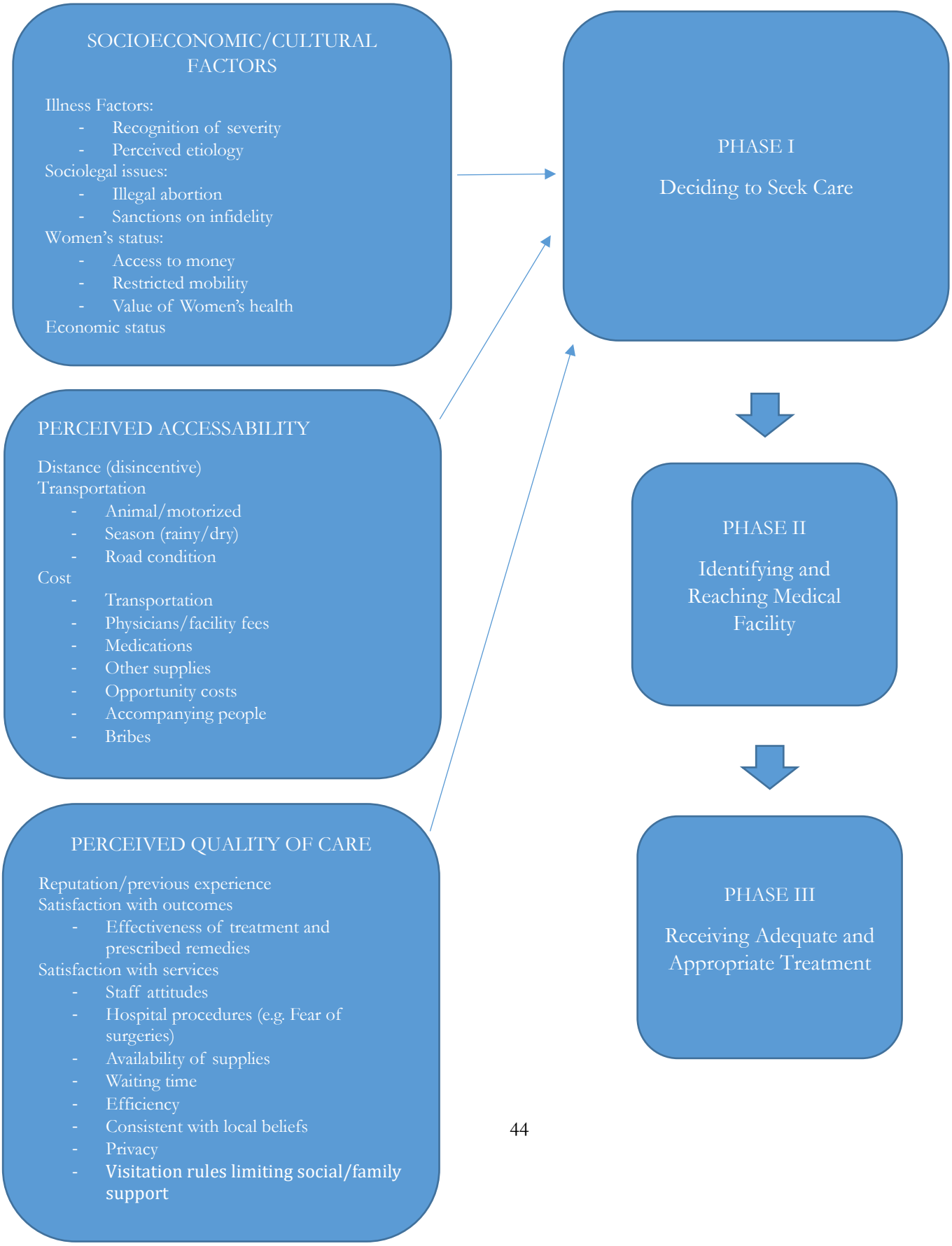


Figure A2: Determinants of Delay: Phase II (Identifying and Reaching Medical Facility)

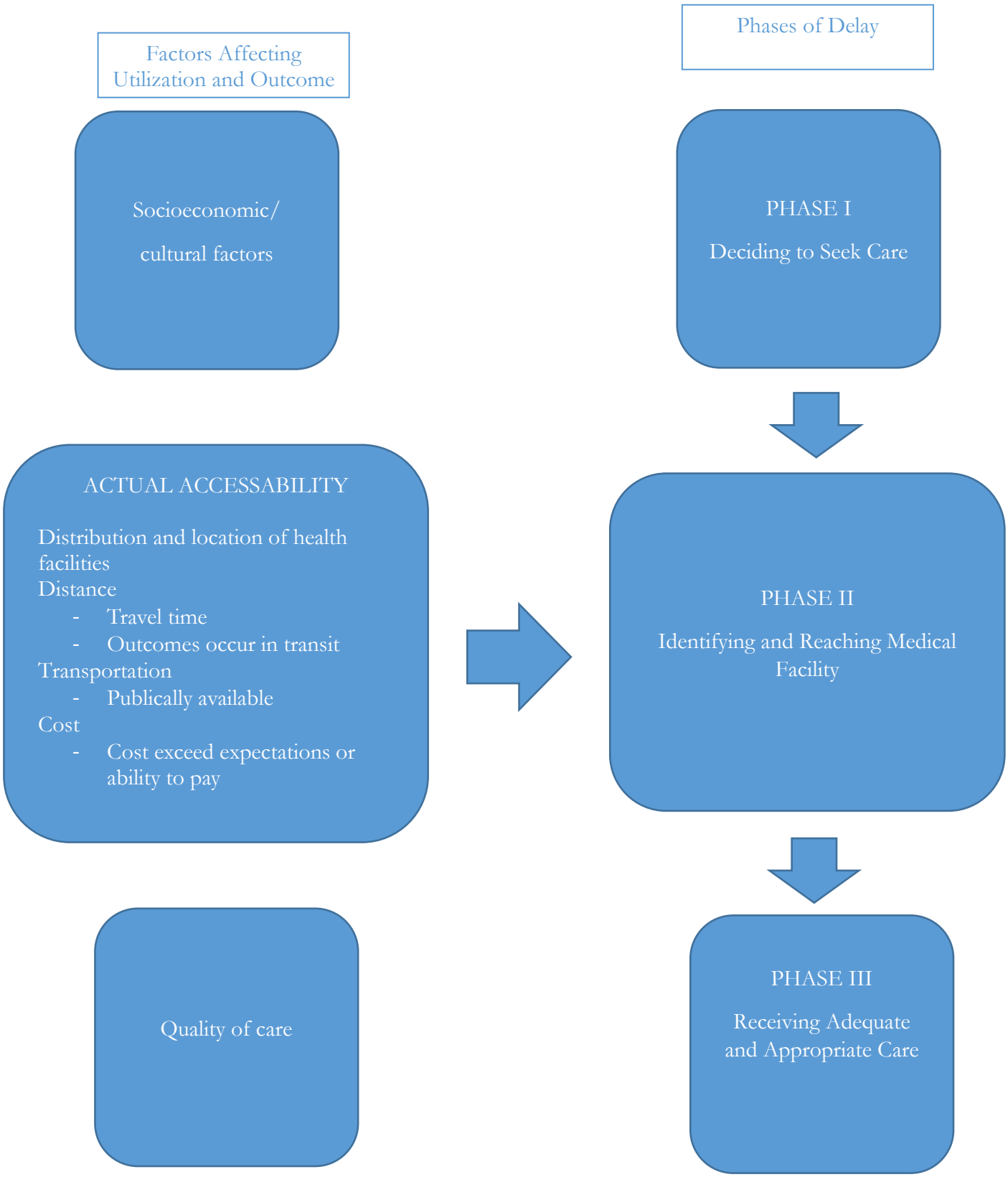
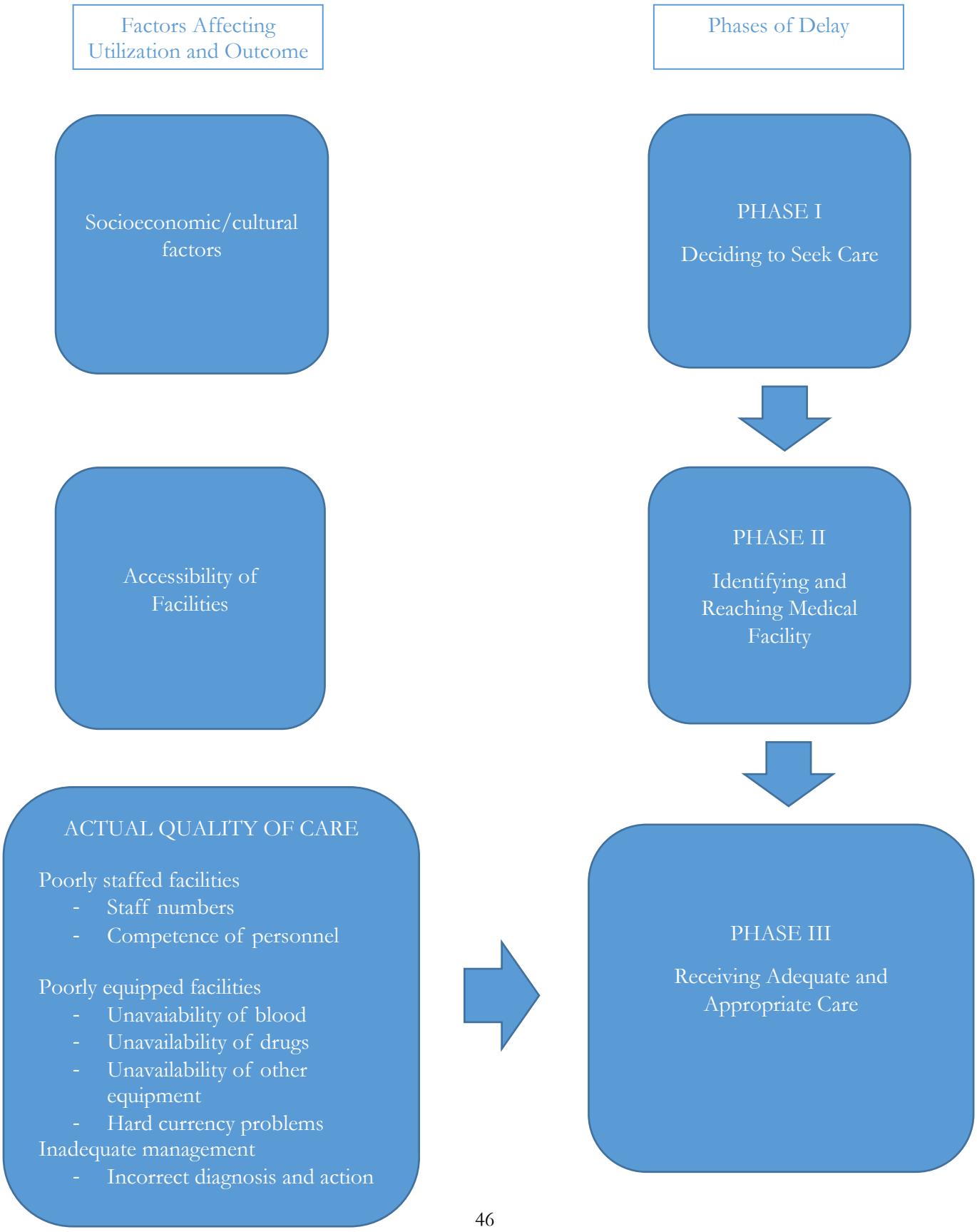


Figure A3: Determinants of Delay: Phase III (Receiving Adequate and Appropriate Care)



Appendix B: Diagnostic Tests

To assess the reliability of the regression results, a series of diagnostic tests were conducted to evaluate whether the assumptions underlying ordinary least squares (OLS) regression were violated. The interaction term between Absence of Corruption and Public Health Spending was excluded from the multicollinearity diagnostics, as interaction terms are inherently correlated with their constituent variables.

The diagnostics provide no evidence of problematic multicollinearity. Variance Inflation Factor (VIF) values range from 1.86 (Inequality) to 2.81 (Absence of Corruption), well below commonly accepted thresholds. Similarly, none of the bivariate correlations exceed 0.90, and tolerance values range from 0.36 to 0.54, further indicating that multicollinearity is not a concern (Field, 2009).

Inspection of the studentized deleted residuals identified one potential outlier, Poland, with a value of -3.39. However, the presence of an outlier does not necessarily imply that the observation exerts undue influence on the regression estimates. Examination of leverage values identified Singapore as a potentially influential case, but Cook's distance never exceeds 0.23, remaining well below the conventional threshold of 1.0 (Field, 2009). There is therefore no indication that any individual observation exerts disproportionate influence on the model.

Additional diagnostics based on DFBETAs likewise suggest that no single observation has an excessive impact on the estimated coefficients. Using the recommended threshold of $2/\sqrt{n}$, all observations fall within acceptable limits.

Finally, heteroscedasticity was assessed by plotting standardized predicted values against standardized residuals. The residuals appear randomly dispersed around zero, indicating no systematic pattern in the variance of the errors and thus no evidence of heteroscedasticity.

Taken together, the diagnostic tests suggest that the model is well specified and produces reliable estimates. There is no evidence of problematic multicollinearity, influential observations, or heteroscedasticity, and the results therefore appear robust to the standard diagnostic checks.

Appendix C: Robustness check

Table C1: Corruption and Maternal Mortality, using World Bank's Control for Corruption

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Absence of corruption	-1.091*** (0.091)	-0.873*** (0.087)	-0.566*** (0.092)	-0.603*** (0.110)	-0.421*** (0.109)	-0.398*** (0.101)	-0.777*** (0.197)
Abortion law		-1.240*** (0.179)	-0.448** (0.179)	-0.461** (0.181)	-0.535*** (0.169)	-0.724*** (0.195)	-0.664*** (0.192)
Average schooling			-0.256*** (0.033)	-0.267*** (0.034)	-0.183*** (0.036)	-0.150*** (0.040)	-0.155*** (0.039)
Public health spending				0.045 (0.047)	0.020 (0.047)	0.037 (0.049)	-0.006 (0.052)
GDP pc					-0.994*** (0.210)	-0.987*** (0.225)	-0.809*** (0.233)
Inequality						0.027** (0.012)	0.034*** (0.012)
Public health spending × corruption							0.070** (0.031)
Constant	4.059*** (0.092)	4.549*** (0.108)	6.127*** (0.242)	6.014*** (0.279)	6.106*** (0.265)	4.802*** (0.592)	4.534***
Adjusted R^2	0.449	0.566	0.712	0.713	0.758	0.847	0.855
N	175	174	137	136	133	79	79

Notes: Standard errors in parentheses. ***p<0.01 **p<0.05 *p<0.10

Appendix D: List of Informants

Transparency International Nepal	An organisation working with Good Governance and Anti-corruption in Nepal. The Nepalese branch of Transparency International.	Referred to as Interview 1
Pro-public; Forum for Protection of Public Interest	An organisation working with Good Governance and Anti-Corruption in Nepal.	Referred to as Interview 2
Samuhik Abhiyan	An organisation working with (among other things) Good Governance and Anti-Corruption in Nepal	Referred to as Interview 3
Beyond Beijing Committee	A woman's organisation working with sexual and reproductive rights. The Nepalese branch of International Planned Parenthood Federation.	Referred to as Interview 4
Women for Advocacy	An organisation working broadly with women's issues.	Referred to as Interview 5
HERD – Health Research and Development Forum.	A national NGO/research institute promoting evidence informed policies and practices for sustainable development in health, environment and social sectors. Have done extensive research on health projects relating to maternal health and helped the government evaluate some of their policies.	Referred to as Interview 6
An International Aid Agency	An international aid agency that has worked specifically with MM.	Referred to as Interview 7
A Doctor	That has been in charge of implementing the Aama program, conducted training of FCHV. Has further worked at the Integrated Rural health development training centre.	Referred to as Interview 8
A Kathmandu University Employee	Are doing research on women's health	Referred to as Interview 9
A Nurse	Has worked with different International Development agencies with their programs to lower the MMR	Referred to as Interview 10
A Organisation	An organisation working specifically with women.	Referred to as Interview 11
Group interview at a HF	5 people, a mix of doctors and nurses.	Referred to as Interview 12
Focus group interview	12 women living in remote areas. They had different educational background but were all trained to help women in their community by answering questions related to maternal health, policies on abortion etc.	Referred to as Interview 13