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Key Aspects of Democracy and Quality of Government Against Infant Mortality.

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Abstract

This thesis investigates which aspects of democracy and quality of government (QoG) drive the inverse relationship democracy and the quality of government has with infant mortality. Though studies exist on democracy as well as QoG and infant mortality, the literature does not provide findings on the aspects of these broad concepts of democracy and QoG driving the democracy – QoG and infant mortality relationship. Using panel data covering 182 countries from 1960 to 2019, I conduct a comparative analysis with several model specifications to investigate the aspects of democracy and QoG driving this relationship. The analysis shows that clean elections, freedom of expression and alternative sources of information, suffrage and the legislative constraints on the executive drive the inverse relationship between democracy and infant mortality, but this effect is supported by other electoral and liberal components while, for QoG, impartiality seems to drive the inverse relationship QoG has with infant mortality with support from bureaucratic quality. The results also suggest that the effects of both democracy and QoG on infant mortality are stronger in democratic regimes than in autocracies.

Keywords: Democracy, Quality of Government, Infant Mortality, Electoral Democracy, Liberal Components, Impartiality, Corruption and Bureaucratic Quality.

Table of Contents

1.	Introduction
2.	Democracy, Quality of Government, and Infant Mortality
2.1	The Dividends of Democracy
2.2	Democracy in Brief
2.3	Democracy and Infant Mortality6
2.4	Quality of Government in Brief
2.5	Quality of Government and Infant Mortality8
2.6	Why Democracy and QoG?9
3.	Research Questions and Hypotheses
3.1	Research Questions
3.2	Hypotheses
4	Methodology
4.1	Sample selection
4.2	Data Sources
4.3	Variable Manipulations
4.4	Modelling Strategy
5	Results and Discussion
5.1	Aspects of Democracy that Drives Down Reduction in Infant Mortality Rates
5.2	The Effect of the Electoral Aspects of Democracy on Infant Mortality Across Regimes . 28
5.3	The Complementary Nature of the Electoral Aspects and Liberal Components
5.4	Aspects of Quality of Government that Drives Down Reduction in Infant Mortality Rates. 31
5.5	The Effect of Impartiality on Infant Mortality Across Regimes
5.6	The Nature of Bureaucratic Quality and Infant Mortality Across Regimes
5.7	Robustness Checks
5.8	Limitations and Delimitations
6	Conclusion
6.1	Conclusion
6.2	Policy Implications
7	References
8	Appendix

List of Figures and Tables

Figure 1: Aspects of electoral and liberal components of democracy	4
Figure 2: Aspects of Quality of Government.	8
Figure 3: A pictorial view of the variables	20
Figure 4: The electoral aspects of democracy (Electoral Democracy Index) and infant mortality acros	SS
regimes of the world	28
Figure 5 $(a - f)$: The relationship between three aspects of electoral democracy as well as the liberal	
components against infant mortality across regimes	31
Figure 6: The relationship between impartiality and infant mortality across regimes	34
Figure 7: The effect of bureaucratic quality on infant mortality across regimes	36

Table 1: Descriptive Statistics	20
Table 2: Regression Table for Democracy and Infant Mortality	25
Table 3: Regression Table for QoG and Infant Mortality.	32

1. Introduction

In recent decades, a key question in the democracy debate has been 'what is democracy good for?' (Ross, 2006; Harding, 2020). Democracy scholars such as Wang et al. (2019), Gerring et al. (2012), and Bollyky et al. (2019) have conducted empirical research in key areas of human and social development that reveals the benefits of democracy. One of these key areas that have received attention is 'infant mortality.' Democracy and infant mortality have also featured as a key topic in V- Dem Institute's Case for Democracy¹ (V-Dem Institute, 2021).

The literature provides several empirical findings. An increasing body of research suggests an inverse and strong relationship between democracy and infant mortality. Gerring et al. (2012); Kudamatsu (2012); Safae (2006); Pieters et al. (2016); Besley & Kudamatsu (2006); Klomp & de Haan (2009) and Annaka & Higashijima (2021) provide substantial evidence that democracy has a direct and inverse effect on measures of population health and human development including infant mortality. Other scholars find that the impact of democracy on infant mortality rates is consistent over time (Wang et al., 2019) and that democracy provides a greater incentive and capability than autocracy to reduce child mortality amongst the poor (Wigley & Akkoyunlu-Wigley, 2017).

The quality of government has also been found to influence human and social development according to political science scholars such as Holmberg & Rothstein (2011). The suggestion that democracy alone does not lead to better health outcomes unless coupled with QoG is not novel. Scholars such as Bauhr & Grimes (2021) do not dispute the benefits of democracy but find that the effects of democracy are dependent on QoG. This paper blends the study of democracy with the study of the quality of government (QoG).

Regarding QoG and infant mortality, Gupta & Abed (2002) and Lewis (2006) finds a negative relationship between quality governance and health outcomes. Holmberg & Rothstein (2011); Rosenberg (2018); Lin et al. (2014) and Pelizzo & Stapenhurst (2013) also provide evidence that levels of QoG have a strong effect on general health outcomes such as life expectancy and mortality rates.

Regardless of the extensive literature on democracy as well as on QoG and infant mortality, there are aspects of this relationship the literature does not address. There is a lack of empirical

¹ More information on V-Dem Institute's Case for Democracy Conference on https://www.v-dem.net/casefordemocracy.html

findings on which specific aspects of these "big bundled" concepts of democracy and QoG matter most in reducing infant mortality rates. This paper aims to address these research gaps by researching the key aspects of democracy and QoG that drive the reduction in infant mortality rates.

Aims and Main Results

This thesis investigates which aspects of democracy and QoG drive the democracy – QoG and infant mortality relationship.

Worth noting is that this paper does not seek to conduct a comparative study between democracy and QoG or seek to find out if democracy performs better or worse than QoG regarding the reduction in infant mortality rates. The thesis focuses on a comparative analysis of democracy and QoG separately about their effects on infant mortality while acknowledging their interrelatedness and compatibility in creating desired health outcomes.

Using panel data covering 182 countries from 1960 to 2019, I find that the clean elections index, freedom of expression and alternative sources of information, suffrage and the legislative constraints on the executive drive the inverse relationship between democracy and infant mortality, but the inverse effect is supported by other electoral and liberal components whereas, for QoG, impartiality seems to drive the inverse relationship QoG has with infant mortality with support from bureaucratic quality. The results also suggest that the effects of both democracy and QoG on infant mortality are stronger in democratic regimes than it is in autocracies.

These findings are important to political science for two reasons.

First, the thesis enables us to better understand the mechanisms that influence the relationship between democracy as well as QoG and infant mortality and therefore enhance the case for democracy and QoG in achieving health outcomes. The V-Dem Institute and Quality of Government Institute have recently published policy briefs on the dividends of democracy and QoG to assist governments, inter-governmental agencies, and civil society in their work towards reaching the United Nations Sustainable Development Goals (SDGs). This paper supports this cause by revealing which aspects of democracy and QoG are worth prioritizing toward reaching SDG 3 - Good Health and Well-being in all parts of the world.

Second, this thesis provides a concrete guideline for especially new democracies that seek to reduce infant mortality rates and improve general health outcomes through democracy and by

increasing their quality of government. For advanced democracies, answers to these research questions serve as an evaluative tool for government and stakeholders to access how key aspects of democracy and QoG mattered thus far in their fight against infant mortality. With a more detailed knowledge of the specific aspects of democracy and QoG that lead to a reduction in infant mortality rates, governments can better exploit democracy and quality of governance in improving health outcomes and tackling infant mortality.

Outline of the study

For the preceding chapters, I begin by reviewing the literature as well as defining the concepts used in this study in chapter 2. Chapter 3 highlights the research question and hypothesis for the study. Chapter 4 discusses the methods employed in the research. Chapter 5 presents the results and discussion while in Chapter 6, I conclude and provide some policy implications worth considering.

2. Democracy, Quality of Government, and Infant Mortality.

2.1 The Dividends of Democracy

What are the dividends of democracy? Scholars such as Harding (2020) seek to answer this question which has been at the heart of democracy promotion. Yet Ross (2006) finds little evidence that the rise of democracy improves the lives of the poor. In defining what democracy is, Coppedge et al. (2019) posit that there is no other consensus beyond 'rule by the people.' A government by the people should therefore be able to create outcomes that improve the lives of the people it governs.

The research on the dividends of democracy is broad. According to Deacon (2009, p. 260), 'democracies tend to deliver as much as 100% for environmental protection, more than 100% for roads, and about 25-50% for safe water, sanitation, and education than dictatorships.' On the mechanisms that lead to these regime disparities, Bellinger (2018, p. 4) argues that higher levels of representation, political participation, and electoral competition provide incentives for political representatives to enhance the general welfare of the masses. One area in which democracy has been found to have a positive effect is health (Templin et al., 2021; Gerring et al., 2012; Wang et al., 2019). Scholars find that democracies are better at ensuring good health outcomes even in an economic recession (Templin et al., 2021), a country's historical experience with democracy has a strong and robust influence on human development (Gerring et al., 2012), and the impact of democracy on health outcomes measured by infant mortality persist over time (Wang et al., 2019).

2.2 Democracy in Brief

Democracy according to Coppedge et al. (2011) can be understood as 'rule by the people.' Although there are other types of democracies based on their distinct characteristics such as deliberative democracy (Gutmann & Thompson, 2009), egalitarian democracy (Sigman & Lindberg, 2019), participatory democracy (Barber, 2014), two others; electoral democracy and liberal democracy stands out and forms part of Lührmann et al. (2018, p. 61) *Regimes of the World Typology*. According to Lührmann et al. (2018, p. 61), a country is an electoral democracy when it does not only hold de-facto free and fair multiparty elections, but also—based on Robert Dahl's famous articulation of 'Polyarchy' (Coppedge et al., 2016; Dahl, 1971, 1998) —achieve a sufficient level of institutional guarantees of democracy such as freedom of association, suffrage, clean elections, an elected executive, and freedom of expression. For liberal democracy, Lührmann et al. (2018) posit that such regimes have an effective legislative and judicial oversight over the executive as well as protection of individual liberties and the existence of rule of law. According to Coppedge et al. (2016), such characteristics are the liberal components of democracy.

Figure 1 below shows the two main types of democracy according to Coppedge et al. (2016) and the aspects of democracy that are categorized under each type.



Figure 1: Aspects of electoral and liberal components of democracy.

Based on (Coppedge et al., 2016). (Source: V- Dem Institute, Democracy Report 2021).

Though the aspects of the electoral democracy index and the liberal components index ²characterize democracies, lower levels of these democratic aspects could be found in autocratic regimes as well. This phenomenon creates a misconception whereby autocracies, based on the aspects of democracy they practice at minimal levels, claim to be democratic rather than 'democratizing.'

Democracy and democratization are related but different concepts. Maerz et al. (2020, p. 910) define democratization as any substantial and significant improvement on the liberal democracy index (electoral democracy index and the liberal components index) either in autocracies (liberalization) or democracies (democratic deepening). Therefore, when autocracies undergo democratization, it can correspond to improvements in the aspects of democracy that exist within such autocratic regimes. The levels at which countries democratize are the basis of Lührmann et al. (2018) regime classification of the world into 'closed autocracy', 'electoral autocracy', 'electoral democracy' and 'liberal democracy.'

For closed autocracies, Lührmann et al. (2018) claim there exist no multiparty elections for the chief executive and legislature whereas, in electoral autocracies, there exist de-jure multiparty elections for the chief executive and legislature. Though electoral autocracies hold multiparty elections, the absence of clean elections, freedom of association as well as the freedom of expression and alternative sources of information differentiates electoral autocracies from democracies. Both electoral and liberal democracies provide satisfactory levels of the electoral aspects of democracy. The disparity between electoral and liberal democracies is that the liberal components of a democracy are not satisfactory in electoral democracies whereas liberal democracies provide satisfactory levels of the elect al., 2016).

Since regime classifications are based on democratic principles, one can expect that the dividends of democracy, in general, take a similar form as the dividends for a person living in a democratic regime. A regime becomes democratic when it satisfies the institutional guarantees for democracy (Lührmann et al., 2018) and so, a democratic regime ought to have the positive outcomes associated with what democracy has been found to offer those who

² An index can be understood as a highly aggregated, composite measure of the variables whereas an indicator is a more specific disaggregated element of the variables (Coppedge et al., 2011).

practise it. For example, if democracy shows to influence infant mortality positively, such effects should reflect in regimes that are electoral and liberal democracies such that, fewer babies ought to die.

2.3 Democracy and Infant Mortality

Regarding human development, one key area that political scientists have shown interest in is the relationship between democracy and infant mortality (Wang et al., 2019; Gerring et al., 2012; Kudamatsu, 2012; Pieters et al., 2016). Infant mortality, according to the World Health Organisation (WHO, n.d.) is the probability of a child born in a specific year or period dying before reaching the age of one (1), if subject to age-specific mortality rates of that period. The research on democracy and infant mortality is quite broad. According to the literature, full-fledged democracies have (on average) 94% lower infant mortality than closed dictatorships (Wang et al., 2019). Although Wullert & Williamson (2016, p. 1067) does not find a significant linear relationship between democracy and infant mortality, the literature in support of democracy and infant mortality is much larger.

In Sub-Saharan Africa, Kudamatsu (2012, p. 1316) finds a reduction in infant mortality rates after the introduction of multiparty elections led to change in the chief executive rather than dictators consolidating themselves through fraudulent elections. In a recent study by Harding (2020, p. 253) children born in democracies are less likely to die before their first birthdays than those born in non-democracies. In a cross-national study conducted by Safaei (2006) and Besley & Kudamatsu (2006), these scholars show substantial evidence that democracy has a direct and positive influence on measures of population health or human development. A study of the relationship between democracy and infant mortality in post-communist states such as Ukraine and Armenia reveals that after democratic consolidation, infant mortality rates reduced significantly (Nazarov & Obydenkova, 2021).

Additional time-series and panel data studies exist. In a panel data study of infant mortality rates from 1800 to 2015 from 172 countries, Annaka & Higashijima (2021, p. 9) find that 'democratic reforms enable increases in the accountability of politicians to voters and a strong incentive to adopt more generous social policies.' Similarly, Bollyky et al. (2019, p. 1316) posit that 'when reinforced by free and fair elections, democracies are more likely than autocracies to lead to health gains for causes of mortality that require health-care delivery infrastructure', and 'democracy has a positive relationship with health, while regime instability has a negative

impact onacies health', says Klomp & de Haan (2009). Pieters et al. (2016) add that, on average, the transition to democracy reduces child mortality. Other studies reach similar conclusions on democracy's effect on infant mortality (Wigley & Akkoyunlu-Wigley, 2017; Wigley et al., 2020; Gerring et al., 2012).

The literature provides a wealth of evidence about the nature of the relationship between democracy and infant mortality, yet, Wigley et al. (2020); Pushkar (2012); Gerring et al. (2012); Pushkar (2012) and Annaka & Higashijima (2021) does not provide detailed information on the aspects of the broad spectrum of democracy that drives this relationship. Similarly, Bollyky et al. (2019) and Kudamatsu (2012) posits that 'election free and fair' and 'multi-party election' is likely the causal mechanism for democracy's effect on infant mortality but do not test these aspects of democracy against other aspects such as 'media freedoms' which Wigley & Akkoyunlu-Wigley (2017) contrarily find as the most-prevailing causal factor regarding the reduction of infant mortality rates. Though Wang et al. (2019) and Gerring et al. (2012) find that the effects of electoral democracy persist over time, there are several aspects of this broad type of democracy and regime type that their research does not investigate in a comparative analysis to ascertain the driving cause of the relationship one observes between democracy and infant mortality.

While the discussion of democracy and infant mortality continues, another concept, quality of government (QoG) has caught the attention of political science scholars. A large literature has found that QoG also results in a decrease in infant mortality rates.

2.4 Quality of Government in Brief

According to Rothstein & Teorell (2008), Quality of Government is defined as governance based on impartiality. Impartiality can be understood as such: when implementing laws and policies, government officials shall not take into consideration anything about the citizen/case that is not beforehand stipulated in the policy or the law (Rothstein & Teorell, 2008; Strömberg 2000). Though QoG is conceptualized by Rothstein & Teorell (2008) based on the principle of impartiality, the literature discusses other aspects of QoG such as corruption distinctively from impartiality (Holmberg & Rothstein, 2011). Corruption is defined by *Transparency International* as the abuse of entrusted power for private gain. Though corruption is an antithesis to QoG, the latter encompasses more than merely the absence of corruption (Rothstein

& Teorell, 2008, p. 169). Another key aspect of QoG is the bureaucratic quality (Charron & Lapuente, 2010). Andersen & Krishnarajan (2019, p. 717) posits that bureaucratic quality is the extent to which civil servants are competent, efficient, autonomous, and secure prudent policies, disciplined, swift, and impartial implementation. Figure 2 below shows the three aspects of QoG under discussion.

Figure 2: Aspects of Quality of Government.



Based on Rothstein & Teorell (2008); Holmberg & Rothstein (2011) and Charron & Lapuente (2010).

These aspects of QoG have been found by scholars to enhance several aspects of human development. Specifically, the literature provides support for an independent effect of QoG on reductions in infant mortality rates.

2.5 Quality of Government and Infant Mortality.

Considering QoG and health in general, Holmberg & Rothstein (2011, p. 529) find that 'QoG is positively associated with higher levels of life expectancy, lower levels of mortality rates for children and mothers and higher levels of subjective health feelings'. Holmberg & Rothstein (2011) explains that low levels of QoG (measured by corruption) affect health outcomes negatively because corruption channels funds from public health spending for private gain. In Turkey, a country that is constantly ranked as one of the most corrupt countries in the Organisation for Economic Cooperation and Development (OECD), infant mortality rates are significantly higher than their less corrupt counterparts such as Sweden and Norway (Dincer & Teoman, 2019, p.332). Studies such as Gupta & Abed (2002) and Lewis (2006) have also linked quality governance to better health outcomes. Empirical evidence supports the claim that

countries with high-quality governments tend to spend more on public health than countries that have low-quality governments (Ibukun, 2021).

Zooming in on infant mortality, Rosenberg (2018, p. 483) argues that 'net of democratic influence, good governance exerts an independent inverse effect on infant mortality rates.' Preventing infant mortality requires that there exist quality health care service, trained personnel, and merit-based appointments as opposed to corrupt appointments to health positions (Rosenberg, 2018). Pelizzo & Stapenhurst (2013) and Rajkumar & Swaroop (2008) also find that less corrupt countries have lower rates of infant mortality and that when the quality of the bureaucracy rises, public spending on health becomes more effective in lowering child mortality. Furthermore, in a study of governance and child mortality in 149 countries between 1996 and 2010, governance indicators have been found to have an inverse relationship with the under – 5 mortality rate (Lin et al., 2014).

The empirical findings in the literature suggest an independent effect of QoG on infant mortality but do not discuss other relevant details missing in the study of this relationship. Concerning QoG and infant mortality, research by Holmberg & Rothstein (2011) that posits that corruption as a measure of QoG affects infant mortality negatively is more theoretical than empirical. In other words, corruption was not tested empirically against infant mortality nor comparatively with other QoG measures to ascertain which aspects matter most for the relationship under study. Similarly, Lin et al. (2014) only factors an aggregate measure of QoG and not the specific aspects of QoG in the regression analysis with infant mortality. Though Pelizzo & Stapenhurst (2013) and Rajkumar & Swaroop (2008) find that QoG measured as the bureaucratic quality has an inverse relationship with infant mortality, the analysis excludes the other measures of QoG and the extent to which they matter for the observed relationship.

The literature on democracy and QoG at best provides theoretical suggestions or empirical tests of some but not all key aspects of democracy and QoG that are expected to matter for a reduction in infant mortality rates. A comparative study of the key aspects of democracy and QoG aimed at revealing the driving causal mechanism regarding infant mortality is missing.

2.6 Why Democracy and QoG?

The literature suggests that both democracy and QoG in a country have an independent significant effect on human well-being (Gerring et al., 2012; Holmberg & Rothstein, 2011).

Rothstein & Teorell (2008) posits that, while democratic practices such as free and fair elections, freedom of expression, and others feed into the input mechanisms of a state, the quality of government which encompasses the absence of corruption and discrimination on the output side equally matter in the exercise of public authority. Therefore, one can imply from the literature that democracy and QoG are critical for development because while democracy enables an effective and proper decision-making mechanism, QoG ensures that these decisions are implemented fairly and effectively. Based on the literature, it seems reasonable that in a democracy, introducing the quality of government enhances the effect that democracy has on health.

Worth noting is the fact that scholars do not equate democracy with good governance or always assign a direct relationship between them (Rosenberg, 2018); (Rothstein, 2011). Rothstein (2011, p. 6) claims that 'democracy, which concerns access to government power, cannot be a sufficient criterion of quality of government.' According to Rothstein & Teorell (2008, p. 178-179), the definition of democracy as a majoritarian rule does not suffice in QoG because a rule by majority decision does not necessarily guarantee impartiality in governance nor does the democratic access to political power have a straightforward relationship with the impartiality in the exercise of political power. Assuming therefore that democracy also implies QoG would lead to a conceptualization and measurement error. Democracy and QoG are therefore distinct concepts but interrelated.

During democratization, lower levels of QoG hinder the positive effects of democracy. Bauhr & Grimes (2021, p. 21) suggests that 'newly democratized countries exhibit, on average, higher levels of corruption than either more established democracies or even than some autocracies.' This does not necessarily imply that autocratic governments are more effective than governments in new democracies, but the quality of government is just as important as democracy is. Charron & Lapuente (2010) and Keefer (2007) find that QoG is highest in very democratic states but low in states that are partially democratized.

Understanding the distinction between democracy and QoG begins an inquiry into researching both concepts simultaneously regarding their effect on health outcomes. Though aspects of democracy like the rule of law imply impartiality, QoG is not only the impartiality of governmental institutions but also the quality of the bureaucracy that implements policies (Rothstein & Teorell, 2008; Charron & Lapuente, 2010). Since new democracies do not always

have a higher QoG (Keefer, 2007, p. 804), it is beneficial that in such a study, both democracy and QoG are analysed distinctly regarding their relationship with infant mortality.

3. Research Questions and Hypotheses.

3.1 Research Questions

The extensive literature that provides evidence supporting the relationship between democracy and infant mortality, as well as QoG and infant mortality lacks empirical findings on which specific aspects of these "big bundled" concepts of democracy and QoG matter most for the reduction of infant mortality rates. Such a comparative study that zooms into the key aspects of democracy and QoG can provide us with some answers on which aspects of democracy and QoG drive the democracy – QoG and infant mortality relationship.

Following the discussion of the literature, this thesis seeks to answer two research questions;

- 1. What specific aspects of democracy drive the inverse relationship with infant mortality?
- 2. What specific aspects of QoG drive the inverse relationship with infant mortality?

3.2 Hypotheses

According to Gerring et al. (2021), components of electoral democracy seem robust in influencing health outcomes. Amongst the five aspects of electoral democracy discussed previously, the literature (Annaka & Higashijima, 2021; Mechkova et al., 2019) provides support for clean elections, freedom of association and freedom of expression and alternative sources of information as having strong accountability mechanisms capable of influencing regimes to create quality public health goods.

Clean elections lead to increases in vertical accountability where voters can influence politicians to adopt more generous social policy programs (Annaka & Higashijima, 2021). Also, Mechkova et al. (2019) find that diagonal accountability exercised through media freedoms and the existence of a robust civil society influences the provision of public goods in a state. The

institutions that guarantee diagonal accountability exist under freedom of association as well as the freedom of expression and alternative sources of information. Though suffrage and elected officials are both fundamental to a working democracy, it seems that they create fertile grounds for accountability mechanisms to exist rather than create accountability. For example, there cannot be clean elections when there is no suffrage or if politicians are not elected to public office. Nonetheless, 'suffrage' and 'elected officials' in a regime where elections are rigged cannot exert pressure on politicians or threaten retribution if governing regimes fail. This explains the reason why even though, there exists suffrage and elected officials in electoral autocracies like Russia and Belarus, politicians are not accountable to their citizens.

For the liberal components of democracy, legislative constraints on the executive create horizontal accountability mechanisms (Mechkova et al., 2019) that could also influence public goods provision positively. So, before the legislature approves the budget of the executive, it can demand that the executive spends more on health care. The legislature also has the power to summon health officials to demand accountability for an appalling health care system. Equality before the law, another liberal component, can restrain politicians from corrupt activities that impact negatively on the health sector. If the principle of equality before the law is strong, politicians become aware that regardless of political or social status, they would be fined or imprisoned for abusing public office for private gain. Though the judicial constraint on the executive as a liberal component also exerts horizontal accountability, its accountability mechanisms are not necessarily tied to public goods provision. Judicial constraints on the executive are mostly to ensure that politicians do not usurp powers or act unconstitutional rather than causing them to deliver on some type of public goods.

Comparing the nature of vertical, diagonal, and horizontal accountability mechanisms, it seems that clean elections, freedom of association as well as freedom of expression and alternative sources of information drive a reduction in infant mortality rates than the legislative constraint on the executive and equality before the law. Though the latter can lead to the legislature demanding that the executive allocates more of its budgetary allocation to health care thereby leading to better health outcomes, it seems incomparable to the rewards and punishment that citizens give to politicians through vertical and diagonal accountability if they fail to deliver quality health care amongst others. The definition of democracy itself implies that power is vested in the bosom of the people. Though the legislature is composed of the people's own elected representatives, the direct participation of citizens to express satisfaction or displeasure about governance through elections, public opinions, public demonstrations, and civil society

movements could be a much more powerful tool to result in reductions in infant mortality rates than the liberal components. Based on this theoretical reasoning, I hypothesize that;

Hypothesis 1A: Clean elections, freedom of association as well as freedom of expression and alternative sources of information drive the inverse effect democracy has on infant mortality.

Hypothesis 1B: The legislative constraints on the executive and equality before the law supports the inverse effect democracy has on infant mortality.

Regarding QoG, Gupta & Abed (2002) finds that corruption when measured as a QoG indicator has higher consequences on infant mortality. This is probably because, corruption redirects funds for public goods for private gains and reduces incentives for health workers to deliver quality service (Lewis, 2006). According to Transparency International's *Corruption Perception Index 2020* report, 'countries with higher levels of corruption, regardless of economic development, tend to spend less on health'. It seems therefore that corruption stalls the progress and positive impact that could be made in health care by the other aspects of QoG, thus impartiality and bureaucratic quality.

Taking bureaucratic quality for instance, even though Pelizzo & Stapenhurst (2013) finds an inverse relationship with infant mortality, it seems that the mechanisms of corruption against infant mortality work against bureaucratic quality as well. For example, regardless of the existence of quality healthcare professionals, if there is corruption in the top hierarchy such as in the executive branch of government or the ministry of health, healthcare professionals would lack the needed resources to save babies.

For impartiality, though it ensures that the law is applied to each client equally without consideration (Rothstein & Teorell, 2008), the actions of public officials especially in the health sector are not always stipulated by law. There can exist engagements in the public sector (healthcare delivery inclusive) which is not stipulated by law and hence bureaucrats set precedence by defining how the law should be applied. Though such precedence can be applied based on the rule of law, the makeup of such laws can disfavour marginalised or poor people in society. A typical scenario would be a public hospital which due to inadequate government funds, makes a new policy to charge patients before health delivery including pregnant women in labour. Though such a policy can be applied impartially, it may lead to an increase in infant mortality rates amongst poor families who cannot pay the required fee to deliver their babies.

Comparing these aspects of QoG, it seems that the mechanisms in favour of corruption and thereafter bureaucratic quality is stronger in influencing the reduction in infant mortality rates than impartiality. Based on the above reasoning, I hypothesise that;

Hypothesis 2A: The corruption aspect of QoG drives the inverse effect QoG has on infant mortality.

Hypothesis 2B: Bureaucratic quality supports the inverse effect QoG has on infant mortality.

I test the above hypotheses by conducting a panel fixed-effects analysis of two independent variables; democracy and QoG, the dependent variable; infant mortality, and six (6) other control variables in democracies from 1960 to 2019. The study aims to test the specific driving indicators of democracy and QoG that influence reductions in infant mortality rates in both democracies and autocracies.

Regarding the hypotheses tests, I expect that the effects of democracy, as well as QoG in reducing infant mortality, would be stronger in democratic regimes than it is in autocratic regimes. As discussed in the literature (Annaka & Higashijima, 2021; Bollyky et al., 2019), the type of regime experienced in a country has a significant effect on infant mortality rates. This, according to Gerring et al. (2012), is due to the political accountability component inherent in democracies but missing in autocratic regimes. In an electoral democracy, for instance, electorates are more likely to reward politicians who supply public goods and punish those who do not through elections. Electoral democracies also provide diagonal accountability where government action is checked and constrained by the media and civil society (Mechkova et al., 2019). In liberal democracies, one can expect horizontal accountability mechanisms such as legislative and judicial constraints on the executive to prevent executives from usurping powers (Lührmann et al., 2018). Such political accountability mechanisms are absent in closed autocracies and abysmal in electoral autocracies and hence may affect their provision of public health goods. Based on this reasoning, one can therefore expect that democracies perform better than autocracies on reduction in infant mortality rates.

I also expect that the effects of democracy and QoG across regimes show a curvilinear relationship with infant mortality where increases in aspects of democracy and QoG initially do not decrease infant mortality rates followed by a continuous downward spiral after sufficient

levels of democratic experience. For democracy, Gerring et al. (2012) explain that it is because the effects of democracy on health outcomes are not spontaneous and hence some amount of time (probably years) is required for mechanisms that democracy puts in place to materialise. Based on the mechanisms employed by aspects of QoG in influencing health outcomes as posited by the literature (Rothstein & Teorell, 2008); (Holmberg & Rothstein, 2011); (Charron & Lapuente, 2010), I expect that the relationship between the aspects of QoG and infant mortality would likewise adopt a curvilinear relationship where increases in the levels of QoG initially does not lead to a reduction in infant mortality rates and thereafter followed by a continuous decreasing rate.

4 Methodology

4.1 Sample selection

To analyse which aspects of democracy and QoG drive reductions in infant mortality rates, I use data on 182 countries, both democratic and autocratic regimes from 1960 to 2019 for the comparative analysis. I choose to conduct this study from 1960 to 2019 to capture the period before the third wave of democratization which experienced an unprecedented number of countries transitioning to a democracy because of the dividends that democracy provides. As Crawford & Abdulai (2011, p. 353) posits, 'the rate of democratization, especially during the third wave, was influenced by instrumental expectations that democracy would be the means to developmental outcomes such as faster economic growth, poverty reduction, social welfare and a more equitable distribution of income.' Also, there is no data before 1960 for some variables included in this analysis hence the reason to limit the study from 1960 to 2019.

4.2 Data Sources

This paper uses an unbalanced panel data from the V-Dem Institute, the World Governance Indicators from the World Bank and GapMinder from 1960 to 2019. The analysis factors two broad independent variables; democracy and quality of government (QoG), the dependent variable, infant mortality and six control variables; gross domestic product per capita (GDP), urbanisation, female education, foreign aid, domestic armed conflict, and international armed conflict.

For the V-Dem data, I use the V-Dem Dataset Version 12 covering 202 countries from the year 1789 to 2021 (Coppedge et al., 2021). V-Dem is a project that adopts a comprehensive approach to studying democracy and translates its findings into a broad dataset of about 450+ indicators annually from 1789 to the present for all countries of the world. V-Dem uses innovative methods for aggregating expert judgments in a way that produces valid and reliable estimates of difficult-to-observe concepts (Coppedge et al., 2021). From the V-Dem dataset, I shall also use as employed by the V-Dem Institute, Fariss et al. (2022) *Latent Estimates of Historical Data on Gross Domestic Product³*.

The World Bank collects data on development indicators, compiled from officially recognized international sources. It presents the most current and accurate global development data available and includes national, regional and global estimates (World Bank, 2022).

GapMinder identifies systematic misconceptions about important global trends and proportions and uses reliable data to develop easy to understand teaching materials to rid people of their misconceptions (GapMinder 2022).

Dependent Variable

In testing the above hypotheses, the dependent variable in this analysis is 'Infant Mortality' and it is measured by 'Infant Mortality Rate'. According to the V-Dem dataset v12, the infant mortality rate is described as the number of infants dying before reaching one year of age per 1,000 live births each year. In this paper, just as Wang et al. (2019), I take the natural log of infant mortality to account for and correct the skewness of the 'infant mortality rate' variable (Coppedge et al., 2021).

Independent Variables

The V-Dem dataset v12 is used to measure as independent variables, eight (8) aspects of democracy; five (5) aspects of the electoral democracy index and three (3) aspects of the liberal component index according to Coppedge et al. (2016). Though there are other aspects of the 'big bundled' concept of democracy one could measure, I justify that measuring the aspects of electoral and liberal democracy as conceptualised by Coppedge et al. (2016) is an accurate

³ Fariss et al. (2022) data on Gross Domestic Product that the V-Dem uses expands data coverage and uses multiple indicators to provide a principled framework to estimate uncertainty for all country-year variables.

measure of democracy in this study since this study sheds light on regime disparities and hence one ought to measure variables that reflect democratic regime characteristics.

Under the electoral democracy index, I analyze the following aspects:

- Suffrage: Measured by the share of the population with suffrage. V-Dem describes it as the share of adults that has the legal right to vote in elections (Coppedge et al., 2021, p. 47).
- 2. Elected officials: Measured by the elected official's index. V-Dem posits that it describes the extent to which the chief executive and legislature are appointed through popular elections (Coppedge et al., 2021, p. 48).
- 3. Clean elections: Measured by the clean elections index. According to V-Dem, it is the extent to which elections are free and fair (Coppedge et al., 2021, p. 48).
- 4. Freedom of association: Measured by the freedom of association thick index. V-Dem describes this as the extent to which parties, including opposition parties, are allowed to form and participate in elections and the extent civil society organizations can form and operate freely (Coppedge et al., 2021, p. 47).
- 5. Freedom of expression and alternative sources of information: Measured by freedom of expression and alternative sources of information index. The variable is described by V-Dem as the extent to which government respects press and media freedom, the freedom of ordinary people to discuss political matters at home and in the public sphere, as well as the freedom of academic and cultural expression (Coppedge et al., 2021, p. 46).

Under the liberal component index, I analyse the following aspects:

- 6. Equality before the law and individual liberty: It is measured by the equality before the law and individual liberty index. V- Dem describes it as the extent to which laws are transparent and rigorously enforced, the impartiality of public administration, and the extent citizens can enjoy access to justice, secure property rights, freedom from forced labour, freedom of movement, physical integrity rights, and freedom of religion (Coppedge et al., 2021, p. 49).
- 7. Judicial constraints on the executive: Measured with the judicial constraints on the executive index. V-Dem describes it as the extent to which the executive respects the constitution and complies with court rulings and the extent to which the judiciary can act independently (Coppedge et al., 2021, p. 50).

8. Legislative constraints on the executive: Measured by the legislative constraints on the executive index and described as the extent to which the legislature and government agencies e.g., comptroller general, general prosecutor, or ombudsman are capable of questioning, investigating, and exercising oversight over the executive (Coppedge et al., 2021, p.50).

The V-Dem dataset v12 is also used to measure as independent variables, three aspects of QoG thus; impartiality, corruption, and bureaucratic quality. Based on Rothstein & Teorell (2008), Holmberg & Rothstein (2011), and Charron & Lapuente (2010), I justify that these concepts embody what the quality of government is, and hence an accurate measure of QoG for this study.

- Impartiality: Impartiality is measured using V-Dem's rule of law index. According to V-Dem, it is the extent to which laws are transparently, independently, predictably, impartially, and equally enforced, and to what extent do the actions of government officials comply with the law (Coppedge et al., 2021, p. 299).
- 2. Corruption: Corruption is measured with the V-Dem public sector corruption variable. It measures the extent to which public sector employees grant favours in exchange for bribes, kickbacks, or other material inducements, and how often they steal, embezzle, or misappropriate public funds or other state resources. V-Dem data codes low values of the 'public sector corruption' variable to imply lower levels of corruption and vice versa (Coppedge et al., 2021, p. 297)
- 3. Bureaucratic Quality: Measured by the Worldwide Governance Indicators (World Bank) as 'government effectiveness' and adopted into the V-Dem dataset. The World Bank describes it as the quality of public service provision, bureaucracy, the competence of civil servants, the independence of the civil service from political pressures, and the credibility of the government's commitment to policies (World Bank, 2022).

Control Variables

In this research, six (6) control variables for which other studies have found to impact the dependent variable, infant mortality is included in the analysis to control for confounders that

affect both independent and dependent variables⁴. I discuss these variables briefly and provide scholarly justification why it is necessary for inclusion in my analysis.

- Gross Domestic Product per capita (GDP): I control for GDP per capita with V-Dem Data acquired from Fariss et al. (2022). The variable is described as a country's gross domestic product divided by the total population. Baird et al. (2011) find that a negative relationship exists between GDP per capita and infant mortality. I follow Wang et al. (2019) and take the natural log of GDP per capita for this analysis to account for and correct the skewness in the variable.
- Urbanization Rate: I use V-Dem data to control for the urbanisation rate of each country. V-Dem data describes the urbanisation rate as the ratio of the urban population to the total population. O'Donoghue (1991) finds a negative association between urbanization and infant mortality.
- 3. Female Literacy: Female literacy rate measured by the World Bank's World Development Indicators is controlled for. The World Bank describes the female literacy rate as the percentage of females aged 15 years and above who can read and write including numeracy in everyday life. Research by Zakir & Wunnava (1999) and Houweling et al. (2005) posits that female literacy rates in a country significantly affect infant mortality rates. Higher levels of female literacy rates lead to lower levels of infant mortality.
- 4. Foreign Aid: Foreign aid is controlled by using data from GapMinder. GapMinder describes it as development assistance offered to other countries to improve economic development and welfare. Mishra & Newhouse (2009) suggests that aid offered to countries to boost health care has a positive impact on infant mortality rates.
- 5. Armed Conflict, International: The paper controls for international armed conflict using V-Dem data. V-Dem codes it as a dummy variable for 'if a country within the chosen timeframe experienced an armed conflict outside the state'. Wang et al. (2019) suggest an armed conflict in a country can cause infant mortality rates to increase.

⁴ The study is not able to control for QoG in the democracy analysis as well as control for democracy in the QoG analysis due to a limited sample for bureaucratic quality, an aspect of QoG.

6. Armed Conflict, Domestic: Domestic armed conflict is also controlled for with V-Dem data. V- Dem codes it as a dummy variable for 'if a country is engaged in an armed conflict within its borders. As mentioned earlier, Wang et al. (2019) suggest armed conflicts cause an increase in infant mortality rates.

Figure 3: A pictorial view of the variables.



Figure 3 above depicts the relationship between the independent variables, dependent variables, and control variables.

Table 1 below provides descriptive statistics of the dependent, independent, and control variables.

Table 1: Descriptive Statistics

Variables	Source	Obs	Mean	Std. Dev.	Min	Max
Dependent Variable						
Infant Mortality, logged	V-Dem	8755	3.587	1.098	0.405	5.624
Independent Variables						
Suffrage	V-Dem	10013	.924	.247	0	1
Elected Officials	V-Dem	10011	.721	.432	0	1
Clean Elections	V-Dem	10013	.428	.348	0	.987
Freedom of Association	V-Dem	10013	.514	.341	.014	.948
Freedom of Expression	V-Dem	10013	.532	.336	.009	.989
Equality before the law	V-Dem	10013	.581	.304	0	.993

Judicial Constraints	V-Dem	9932	.534	.31	.004	.992
Legislative Constraints	V-Dem	9522	.5	.322	.023	.989
Impartiality	V-Dem	9997	.518	.307	.004	.999
Corruption	V-Dem	9972	.461	.38	0	1
Bureaucratic Quality	WGI	3665	084	1.007	-2.475	2.437
Control Variables						
GDP per capita, logged	Fariss et al.	9785	1.754	1.154	-1.252	5.054
Female literacy, Interpolated.	World Bank	6095	123.851	12.561	104.66	160.992
Urbanization	V-Dem	5935	.335	.223	.044	2.43
Foreign Aid	GapMinder	10013	18.251	63.509	0	3760
Domestic Conflict	V-Dem	6341	.136	.343	0	1
International Conflict	V-Dem	6341	.056	.23	0	1

4.3 Variable Manipulations

To account for and correct the skewness in gross domestic product per capita (GDP) and infant mortality, I follow Wang et al. (2019) to log transform gross domestic product per capita and infant mortality into new logged variables.

The data on female literacy rates exists mostly from 1985 till 2020. For some countries, the variable misses data for shorter periods in-between the time series at the initial stages (for example, data exists for female literacy in Ghana during 1985 and 1988 but not in 1986 and 1987). Instead of treating them as missing values which leads to a loss of several observations for other important variables, I employ Gerring et al.'s (2012) empirical strategy to interpolate the data for missing years of female education based on the available years.

Foreign aid which implies development assistance from external sources for the economic and welfare needs of countries is controlled for. The data excludes most developed countries such as Sweden and Norway since it has never received any development assistance within the chosen timeframe. I, therefore, follow Wang et al. (2019) to recode the variable by inserting such missing countries and thereafter code them as '0' to reflect the exact case in reality (not received development assistance).

Though Houweling et al. (2005) and Arthur & Oaikhenan (2017) suggests that domestic government health expenditure affects infant mortality, I adapt Wang et al. (2019) approach of not including it as a control variable in my analysis. I exclude domestic health expenditure due to the detection of multicollinearity with the 'gross domestic product (GDP) per capita' variable. This is because the effect that domestic health expenditure has on infant mortality is

dependent on the size of a country's GDP per capita (Baird et al. 2011). The higher a country's GDP per capita, the higher the amount it is likely to spend on health care. Also, the World Bank's measure of a country's domestic health expenditure is calculated as a percentage of GDP and controlling for GDP per capita in my analysis equally accounts for a country's capacity to commit financially to health care.

Furthermore, I follow Wang et al. (2019) to lag the democracy and QoG variables by one year. The justification for this as posited by Gerring et al. (2012) is that democracy ought to be given sufficient time to yield important, tangible benefits to society and allow democratic institutions the time necessary to realize these persistent but distal benefits. I do the same for QoG since QoG employs similar mechanisms as democracy in supplying quality public goods.

4.4 Modelling Strategy.

I conduct a panel fixed effects analysis to test the above hypotheses. Panel data analysis provides an accurate inference of model parameters which leads to efficient estimates, and it can capture more than cross-sectional or time-series data, the complexities related to the phenomena under study (Hsiao, 2007). The regression models account for the country-fixed effects to control for within-country time-invariant variables that may affect the expected results. The panel fixed effect regression models assume the following statistical equations:

Democracy Regression Models

$$Y = \alpha Dem_m + \beta Z_n \tag{1}$$

Where Y is infant mortality, the outcome variable; the eight (m = 1...,8) democracy independent variables are captured in Dem_m and Z_n captures the six control variables used in the model. α is the co-efficient of the independent variables whereas β is the co-efficient of the control variables. Equation (1) is expanded as follows:

$$\log Y = \alpha_{0} + \alpha_{1}S + \alpha_{2}E + \alpha_{3}N + \alpha_{4}C + \alpha_{5}A + \alpha_{6}L + \alpha_{7}J + \alpha_{8}P + \log\beta_{1}G + \beta_{2}U + \beta_{3}F + \beta_{4}O + \beta_{5}M + \beta_{6}D$$
(2)

In equation (2), the log of infant mortality (Y) and GDP per capita (G) is introduced. Equation (2) is then transformed into the baseline panel fixed effect model that will be estimated. The transformation into a panel fixed effect model is because the panel data contains observations

on different entities, in this case, countries (i), over time (t)⁵. In the analysis, I lag each democracy variable by one year because the literature suggests that the effects of democracy on infant mortality are not spontaneous. Therefore, an episode of democratic regime observed by the independent variable one year ago influences the current year's infant mortality rates. The transformation (3a) factors the empirical strategy of running a separate regression for only one of the democracy independent variables (IV) at a time, along with the dependent variables (DV) and the control variables (CV), and thereafter run a regression that combines all the democracy IVs, the DV, and CVs (3b). The transformed equation is as follows:

$$logY = \alpha_0 + \alpha_m Dem_{mit-1} + log\beta_1 G_{it} + \beta_2 U_{it} + \beta_3 F_{it} + \beta_4 O_{it} + \beta_5 M_{it} + \beta_6 D_{it} + \eta_i + \mu_t + \varepsilon_{it}$$
(3a)

 $logY = \alpha_0 + \alpha_1 S_{it-1} + \alpha_2 E_{it-1} + \alpha_3 N_{it-1} + \alpha_4 C_{it-1} + \alpha_5 A_{it-1} + \alpha_6 L_{it-1} + \alpha_7 J_{it-1} + \alpha_8 P_{it-1} + log\beta_1 G_{it} + \beta_2 U_{it} + \beta_3 F_{it} + \beta_4 O_{it} + \beta_5 M_{it} + \beta_6 D_{it} + \eta_i + \mu_t + \varepsilon_{it}$ (3b)

Where η_i is the country-specific time-invariant variable, μ_t is the time-varying effect common to all countries such as technological advancement and ε_{it} is an error term which accounts for the other variables that are not observed but might explain the dependent variable, infant mortality.

Since infant mortality and GDP per capita are logged, the coefficient β_1 is interpreted as a percentage change in GDP per capita leading to a β_1 % change in infant mortality, respectively. All other coefficients are interpreted as a unit change in the independent variable leading to a α_m % change in infant mortality.

QoG Regression Models

$$Y = \gamma Q o G_m + \delta X_n \tag{4}$$

Same explanation as equation (1). Note that m = 1,2 and 3.

$$logY = \gamma_0 + \gamma_1 I + \gamma_2 R + \gamma_3 B + log\delta_1 G + \delta_2 U + \delta_3 F + \delta_4 O + \delta_5 M + \delta_6 D$$
(5)

Same explanation for (2)

The transformation:

⁵ Panel data contains both cross-sectional and time-series data. Countries (i) and time (t) in the models imply that the variable is measured across countries used in the panel data from 1960 to 2019.

$$\begin{split} \log Y &= \gamma_{0} + \gamma Q o G_{mit-1} + \log \delta_{1} G_{it} + \delta_{2} U_{it} + \delta_{3} F_{it} + \delta_{4} O_{it} + \delta_{5} M_{it} + \delta_{6} D_{it} + \eta_{i} + \\ \mu_{t} + \varepsilon_{it} & (6a) \\ Y &= \gamma_{0} + \gamma_{1} I_{it-1} + \gamma_{2} R_{it-1} + \gamma_{3} B_{it-1} + \log \delta_{1} G_{it} + \delta_{2} U_{it} + \delta_{3} F_{it} + \delta_{4} O_{it} + \delta_{5} M_{it} + \\ \delta_{6} D_{it} \quad \eta_{i} + \mu_{t} + \varepsilon_{it} & (6b) \end{split}$$

Same explanation for (3a) and (3b)

I employ two analyses for this study to test hypotheses 1 and 2 separately.

Analysis 1 contains nine (9) models that test each of the eight independent variables (IV) for democracy separately with the dependent variable (DV) infant mortality, alongside the six (6) control variables (CV), and thereafter test all eight democracy IVs with the DV and CVs.

Analysis 2 contains four (4) models that test each of the three IVs for QoG separately with the DV, infant mortality along with the six (6) CVs and thereafter tests all QoG IVs, DV, and CVs.

The analysis aims to reveal which of the key aspects of democracy and QoG respectively has a higher estimate as well as shows statistical significance regarding the relationship democracy as well as QoG has with infant mortality.

5 Results and Discussion

5.1 Aspects of Democracy that Drives Down Reduction in Infant Mortality Rates.

Testing hypotheses 1A and 1B, Table 2 below shows the results of all nine (9) models with different model specifications. Model 1 - 8 estimates the effect of each aspect of electoral democracy and the liberal components separately with infant mortality and the control variables whereas Model 9, which is the main model of interest shows a comparison between the estimated effect of all the aspects of democracy on infant mortality along with the control variables. Each aspect of democracy is lagged by 1 year to allow for the effects of democracy to materialize. The final model shows an R² of 0. 746 meaning 74.6 % of the variation in infant mortality is explained by the final model of interest. I present the estimates provided by the regression models and thereafter discuss the results.

Table 2:	Regression	Table	for Demo	cracy and	d Infant	Mortality.
	1.00.000000		10. 20.00	0.000,00000		1.10.1000000000000000000000000000000000

	(1)	(2)	(3)	(4)	(5) Infont Mortality Pa	(6)	(7)	(8)	(9)
Suffrage t-1	-0.140***				Infant Wortanty Ka	ites, logged.			-0.118***
	(0.0205)								(0.0250)
GDP per capita, logged	-0.687*** (0.0106)	-0.687*** (0.0107)	-0.683 ^{***} (0.0107)	-0.689*** (0.0106)	-0.689*** (0.0106)	-0.686*** (0.0107)	-0.681*** (0.0108)	-0.710*** (0.0111)	-0.704*** (0.0113)
Female Literacy, IP	-0.00343*** (0.0000521)	-0.00348 ^{***} (0.0000520)	-0.00342*** (0.0000523)	-0.00337*** (0.0000540)	-0.00337*** (0.0000544)	-0.00342*** (0.0000535)	-0.00345*** (0.0000525)	-0.00328*** (0.0000554)	-0.00322*** (0.0000573)
Urbanization	1.026 ^{***} (0.0511)	1.017 ^{***} (0.0513)	1.031*** (0.0511)	1.040 ^{***} (0.0511)	1.044 ^{***} (0.0513)	1.032*** (0.0513)	1.004 ^{***} (0.0520)	1.009 ^{***} (0.0521)	1.008 ^{***} (0.0522)
Foreign Aid	-0.000178 ^{***} (0.0000448)	-0.000184 ^{***} (0.0000450)	-0.000189*** (0.0000448)	-0.000169*** (0.0000448)	-0.000168*** (0.0000449)	-0.000180 ^{***} (0.0000449)	-0.000170 ^{***} (0.0000450)	-0.000573*** (0.0000955)	-0.000567*** (0.0000962)
Domestic Conflict	-0.00878 (0.0122)	-0.00992 (0.0122)	-0.0158 (0.0122)	-0.0122 (0.0122)	-0.0129 (0.0122)	-0.0169 (0.0123)	-0.0125 (0.0122)	-0.0245 (0.0127)	-0.0203 (0.0130)
International Conflict	0.0469 ^{**} (0.0177)	0.0587 ^{***} (0.0176)	0.0519 ^{**} (0.0176)	0.0498 ^{**} (0.0176)	0.0484 ^{**} (0.0177)	0.0503 ^{**} (0.0177)	0.0451 [*] (0.0179)	0.0546^{**} (0.0181)	0.0422 [*] (0.0182)
Elected Officials t-1		-0.0246* (0.00990)							0.0133 (0.0128)
Clean Elections t-1			-0.119*** (0.0176)						-0.110 ^{***} (0.0300)
Freedom of Association t-1				-0.121*** (0.0163)					-0.0221 (0.0434)
Freedom of Expression t-1					-0.114 ^{***} (0.0171)				-0.112 [*] (0.0555)
						-0.0997***			0.146**

Equality before the Law t-1						(0.0212)				
						-0.136*** (0.0239)		0.0157 (0.0437)		
							-0.179 ^{***} (0.0196)	-0.0978** (0.0360)		
4.935 ^{***} (0.0285)	4.828 ^{***} (0.0231)	4.846 ^{***} (0.0228)	4.857 ^{***} (0.0231)	4.856 ^{***} (0.0232)	4.857 ^{***} (0.0242)	4.875 ^{***} (0.0248)	4.924 ^{***} (0.0241)	4.998 ^{***} (0.0319)		
v	Ŷ	v /	V /	Ŷ	Ŷ	Ŷ	Ŷ	v		
5640	5640	5640	5640	5640	5640	5583	5247	5236		
0.738	0.736	0.738	0.738	0.738	0.737	0.734	0.745	0.746		
							o - o c			
	4.935*** (0.0285) V 5640 0.738	$\begin{array}{cccc} 4.935^{***} & 4.828^{***} \\ (0.0285) & (0.0231) \\ \hline V & V \\ 5640 & 5640 \\ 0.738 & 0.736 \end{array}$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	(0.0212) $(4.935^{***} 4.828^{***} 4.846^{***} 4.857^{***} 4.856^{***} 4.857^{***}$ $(0.0285) (0.0231) (0.0228) (0.0231) (0.0232) (0.0242)$ $V V V V V V V$ $(0.0285) 5640 56$	(0.0212) $\begin{array}{cccccccccccccccccccccccccccccccccccc$	$(0.0212) \\ \begin{array}{ccccccccccccccccccccccccccccccccccc$		

(0.	0523)
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In Table 2, for the electoral aspects, models 1 and 9 show suffrage with a negative and highly significant relationship with infant mortality when regressed with or without the other aspects of democracy though there is a reduction in the coefficient from -0.140 in Model 1 to -0.118 in Model 9. Model 9 seems to suggest an 11.8 per cent decrease in infant mortality rates with a 1 unit increase in the share of the adult population that can legally vote in elections. The elected officials index shows a significant and negative effect in Model 2 but in Model 9, the result is not significant. The clean elections index displays a significant and negative coefficient of - 0.119 and -0.110 in Model 3 and Model 9 respectively. Model 9 suggests an 11 per cent decrease in infant mortality rates as free and fair elections increase by 1 unit. The freedom of association index has a significant and negative relationship with infant mortality in Model 4 but not in Model 9 as other aspects of democracy are included in the regression model. The freedom of expression and alternative sources of information index has a significant and negative sources of information index has a significant and negative sources of information index has a significant and negative sources of information index has a significant and negative sources of information index has a significant and negative sources of information index has a significant and negative sources of information index has a significant and negative sources of information index has a significant and negative sources of information index has a significant and negative sources of information index has a significant and negative coefficient of -0.114 and -0.112 in Model 5 and Model 9 respectively. Model 9 seems to suggest that a 1 unit increase in freedom of expression and alternative sources of information leads to infant mortality rates reducing by 11.2 per cent.

For the liberal components, equality before the law index displays a significant and negative relationship in Model 6 but in Model 9, it displays a significant and positive result contrary to expectations from the literature (Gerring et al., 2012). The judicial constraint on the executive index shows a significant and negative effect on infant mortality in Model 7 but not in Model 9. Models 8 and 9 display a significant and negative relationship between the legislative constraints on the executive index and infant mortality. The results suggest an approximately 9.8 per cent decrease in infant mortality rates with a one-unit increase in the legislative constraints on the executive.

By comparing the estimates and significance levels of the aspects of democracy from Model 1 and Model 9 in Table 2, one observes that suffrage, the clean elections index, freedom of expression and alternative source of information index as well as the legislative constraints on the executive index seem to drive the relationship that democracy has with infant mortality. Table 2 above partly corroborates hypothesis 1A and hypothesis 1B. Hypothesis 1A stated that 'clean elections, freedom of association as well as freedom of expression and alternative sources of information drive the inverse effect democracy has on infant mortality' while hypothesis 1B read that 'the legislative constraints on the executive and equality before the law supports the inverse effect democracy has with infant mortality'.

5.2 The Effect of the Electoral Aspects of Democracy on Infant Mortality Across Regimes



Figure 4: The electoral aspects of democracy (Electoral Democracy Index) and infant mortality across regimes of the world.

In Figure 4, the graph on the left-side displays a scatterplot showing a curvilinear relationship between electoral democracy (electoral democracy index) and infant mortality. Increases in the electoral democracy index (EDI) do not lead to a decrease in infant mortality rates initially but thereafter followed by continuous reductions. The curvilinear relationship is because the effects of electoral democracy on health outcomes as discussed in the literature are not spontaneous (Gerring et al., 2012). So, democracy is not able to influence reductions in infant mortality rates at the initial stages of its introduction unless some threshold in terms of democratization overtime is reached.

The figure on the right zooms in further to show the relationship between the electoral aspects of democracy and infant mortality rates across each regime. Closed autocracies have the lowest levels of EDI and most of such regimes seem to show increases in infant mortality rates and some decreases with a shift to electoral autocracies. Also, there seem to be countries that regardless of autocracy, have lower levels of infant mortality rates. In liberal and electoral democracies where EDI levels are higher respectively, the line depicting reduction in infant mortality rates are steeper than they are in autocracies.

In Figure 4, as countries move from a closed and electoral autocracy to electoral and liberal democracy, the red line depicts a steeper downward slope implying sharp decreases in infant mortality rates. The graph seems to suggest that infant mortality rates are lowest in liberal democracies and then electoral democracies where EDI levels are high than it is in closed and electoral autocracies. Also, the downward slope of the EDI is stronger against infant mortality rates in liberal democracies than in all other regimes including electoral democracies. Figure 4 seems to imply that countries ought to move from being decent democracies to 'really good' democracies to achieve the maximum effects that the electoral aspects of democracy have on infant mortality.

The regression results and the graph displayed above resonate well with existing literature (Gerring et al., 2012; Wang et al., 2019) as well as the theory of vertical and diagonal accountability (Mechkova et al., 2019; Annaka & Higashijima, 2021).

Considering the aspects of electoral democracy that the results support as driving down infant mortality rates in democracies, clean elections, for instance, provide an opportunity for the chief executive to be credibly elected and accountable to the electorate throughout their tenure of office. Annaka & Higashijima (2021) suggests more decreases in infant mortality rates when chief executives are credibly elected as compared to when they assume office through rigged elections. Also, freedom of expression and alternative sources of information as another driving aspect ensures public opinion, guarantees media freedoms, and allows for academic and cultural expressions to thrive. These diagonal accountability mechanisms according to Mechkova et al. (2019) puts pressure on governments to deliver effectively and supply the needed public goods to improve the general welfare of citizens. Higher levels of suffrage mean that social minorities and opposition groups are less likely not to be excluded from the voters' registers and would be given the chance to vote in elections to reward and punish underperforming state officials.

The lower levels of such aspects of democracy in autocracies seem to explain the disparities between the observed relationship in autocratic and democratic regimes. Lower levels of suffrage, clean elections, and freedom of expression in autocracies among the other aspects imply lower levels of vertical and diagonal accountability needed to make autocratic regimes supply public health goods at sufficient levels to fight against infant mortality.

5.3 The Complementary Nature of the Electoral Aspects and Liberal Components

Figure 5a - 5f below enlightens one's understanding of the nature of the relationship that clean elections, freedom of association, freedom of expression and alternative sources of information, equality before the law, the legislative constraint on the executive and the judicial constraint on the executive has on infant mortality rates. It also broadens our understanding of the complementary nature of the electoral aspects and liberal components in influencing health outcomes.

In the regression analysis, suffrage, clean elections, freedom of expression and alternative sources of information as well as the legislative constraints on the executive showed to drive the relationship between democracy and infant mortality nonetheless, Figures 5b, 5d and 5f below seem to suggest that freedom of association, equality before the law and the judicial constraint on the executive components also support the reduction in infant mortality rates, especially in democratic regimes. Furthermore, in all six aspects displayed in Figure 5 below, in liberal democracies where the liberal components are highest, there seems to be a much stronger reduction in infant mortality rates than in electoral democracies which do not have satisfactory levels of these liberal components. These findings shed light on the relevance of both the electoral and liberal components regarding reductions in infant mortality rates. Also, the graphs in Figure 5 provide further evidence in support of a strong inverse effect on infant mortality rates if countries move from decent levels of democracy to extremely good liberal democracies. These results seem to imply that liberal democracies stand a greater chance of fighting infant mortality rates than autocracies and even electoral democracies.





Figure 5 (a - f): The relationship between three aspects of electoral democracy as well as the liberal components against infant mortality across regimes.

Figures 5g and 5h for suffrage and elected officials (in Appendix) do not display much variation across regimes. The reason could be that these variables in principle do not vary widely across time series. Most countries will peg universal adult suffrage at a constant age over decades without change and for elected officials, due to entrenched provisions in constitutions on which public offices are voted for, the number of elected officials in a particular country may not vary over several years.

5.4 Aspects of Quality of Government that Drives Down Reduction in Infant Mortality Rates.

Testing hypotheses 2A and 2B, Table 3 below shows the results of all four (4) models with different model specifications. Model 1 - 3 estimates the effects of each aspect of QoG separately with infant mortality and the control variables whereas model 4, which is the main model of interest shows a comparison between the estimated effect of all aspects of QoG on infant mortality along with the control variables. The aspects of QoG are lagged by one year to

allow time for improvements in QoG to have an adequate effect on infant mortality rates. The final model 4 shows an R^2 of 0.865 meaning 86.5 % of the variation in infant mortality is explained by the model of interest. Upon including the bureaucratic quality variable, in models 3 and 4, the total number of observations reduces from 5622 to 1121. This is because of no data available for bureaucratic quality before 1996 as well as some missing observations within the available time series.

Table 3: Regression Estimates of the Effects that Aspects of Quality of Government Have on											
Infant Mortality, 1960 – 2019.											
	(1)	(2)	(3)	(4)							
	Infant Mo	ortality, logged.		*							
Impartiality t- 1	0.0161			-0.153							
	(0.0258)			(0.0645)							
GDP per capita, logged	-0.689***	-0.693***	-0.520***	-0.509***							
F,88	(0.0107)	(0.0107)	(0.0221)	(0.0224)							
	0.000	0.0004<***	0.00<0.0	0.00<00***							
Female Literacy, IP	-0.00350	-0.00346	-0.00602	-0.00608							
	(0.0000514)	(0.0000520)	(0.000154)	(0.000155)							
Urbanization	1.019^{***}	1.032***	0.782***	0.808^{***}							
	(0.0513)	(0.0513)	(0.0737)	(0.0741)							
Foreign Aid	-0.000182^{***}	-0.000178***	-0.0000302	-0.0000270							
	(0.0000450)	(0.0000449)	(0.0000435)	(0.0000435)							
Domestic Conflict	-0.00981	-0.00721	0.000745	-0.00109							
	(0.0123)	(0.0122)	(0.0225)	(0.0225)							
	0.0.0.7***	0.0505**	0.0410	0.0271							
International Conflict	0.0607	0.0537	0.0410	0.03/1							
	(0.0177)	(0.0179)	(0.0351)	(0.0361)							
Corruption t- 1		-0.0855***		-0.0265							
		(0.0177)		(0.0464)							
				(,							
Bureaucratic Quality t- 1			-0.0214*	-0.0118							
			(0.00876)	(0.00948)							
				· · · · ·							
_cons	4.807^{***}	4.848^{***}	4.869^{***}	4.941^{***}							
	(0.0255)	(0.0236)	(0.0364)	(0.0632)							
Country FE	V	٧	٧	٧							
N	5640	5622	1126	1121							
R^2	0.736	0.737	0.864	0.865							
adj. R^2	0.727	0.729	0.843	0.844							

Table 3: Regression Table for QoG and Infant Mortality.

Standard errors in parentheses. IP = interpolated; FE = Fixed Effects; \forall = included. * p < 0.05, ** p < 0.01, *** p < 0.001

Regarding Table 3, the co-efficient for impartiality is not significant in Model 1 but has a significant and negative coefficient of -0.153 in Model 4 with infant mortality. Regarding Model 4, a 1 unit increase in the rule of law leads to a 15.3 per cent decrease in infant mortality rates. In Model 2, corruption displays a significant and negative coefficient of -0.0855 contrary to expectations from the literature (Holmberg & Rothstein, 2011; Gupta & Abed, 2002). In Model 4, the result of corruption is not significant. In Model 3, bureaucratic quality displays a significant and negative coefficient of -0.0214 which implies a 2.1 per cent decrease in infant mortality rates with a 1 unit increase in the quality of bureaucracy nonetheless, in Model 4, the result for bureaucratic quality is not significant when other aspects of QoG are included in the model. Due to insufficient data, especially for the bureaucratic quality variable, the N-size reduces across the four models from 5640, 5622, 1126 and 1121 respectively.

By comparing the estimates and significance levels of the aspects of QoG in Model 1 to Model 4, one sees that impartiality seems to drive the relationship that QoG has with infant mortality based on Model 4. The result for impartiality is significant in Model 4 as compared to the other aspects of QoG. Bureaucratic quality seems to have a significant negative relationship with infant mortality in Model 1 nonetheless, in the final model of interest, the result seems to show support for impartiality driving the effects that QoG has on infant mortality. Though Holmberg & Rothstein (2011) suggests that corruption has a positive relationship with infant mortality where increases in levels of corruption lead to increases in infant mortality rates, I do not find support for such claims. The results in Table 3 do not seem to corroborate hypothesis 2A that 'the corruption aspect of QoG drives the effect that QoG has on infant mortality. Hypothesis 2B stating that 'bureaucratic quality supports the inverse effect QoG has on infant mortality' is partly supported by the results in Table 3.

5.5 The Effect of Impartiality on Infant Mortality Across Regimes.



Figure 6: The relationship between impartiality and infant mortality across regimes.

In Figure 6, the graph on the left-hand side shows the curvilinear relationship that impartiality has with infant mortality rates. One observes at the initial stages, some increase in infant mortality rates regardless of increases in the levels of rule of law. As the rule of law continues to increase, the relationship adapts to a downward trend where there is a corresponding decrease in infant mortality rates. To understand the curvilinear relationship, one can imply from Gerring et al. (2012) how governance indicators (like democracy) do not produce a spontaneous effect on health outcomes.

The right-hand side of the graph zooms in further to display the relationship between impartiality and infant mortality across regimes of the world. The graph shows that closed and electoral autocracies could also have higher levels of impartiality, in other words, QoG. Nonetheless, when impartiality is considered, liberal democracies perform better regarding reduction in infant mortality rates than autocracies. Also, there seem to be similarities between the nature of the observed relationship in electoral autocracies and electoral democracies which resonates with Keefer's (2007) claim that some autocracies have higher levels of QoG than new democracies. Regarding how impartiality scores in the various regimes affect infant mortality, one sees that in liberal democracies, impartiality has a much stronger effect on infant mortality

rates than in other regimes. Figure 6 provides evidence that the more quality a liberal democracy becomes, the greater the chance for impartiality or QoG to reduce infant mortality rates.

The findings thus far regarding impartiality as the driving aspect of the QoG and infant mortality relationship are consistent with existing literature on the quality of government as conceptualized by Rothstein & Teorell (2008). According to Rothstein & Teorell (2008), QoG in itself can be precisely defined as a set of impartial government institutions that function and exercises power based on the rule of law. Therefore, by enhancing impartiality, thus the rule of law in governmental institutions, one can create an effective health system that caters for the health care needs of citizens alike as prescribed by law. For instance, with a low level of impartiality in health care systems, health professionals would certainly allocate incubators meant to save the lives of premature babies as well as other resources for maternal delivery to the rich at the expense of the poor to get tips that poor folks certainly cannot afford.

Impartiality in principle does not rule out the potency of bureaucratic quality or corruption in affecting infant mortality but addresses them simultaneously in its exercise of the rule of law. An impartial justice system that punishes corrupt public officials can deter corruption in healthcare delivery and prevent the misallocation of public health funds for private gain. Regarding how impartiality complements bureaucratic quality in maternal and child care, Holmberg & Rothstein (2011) posits that 'impartiality ensures meritocratic recruitments to the civil service leading to public sector efficiency and effectiveness in delivering and saving babies.'

Impartiality as the driving factor regarding QoG and infant mortality also resonates with the theory of vertical (Gerring et al., 2012) and diagonal accountability (Mechkova et al., 2019) discussed previously. Regarding vertical accountability, in democracies, politicians are accountable for their actions in government and are most likely to be punished in elections for overseeing a government characterised by nepotism, clientelism, political favouritism and discrimination. For diagonal accountability, a robust civil society in recent years has achieved some gains in improving the rule of law by campaigning fiercely against discrimination, nepotism, and political favouritism.

5.6 The Nature of Bureaucratic Quality and Infant Mortality Across Regimes.

The results show in Model 3 of Table 3, a negative and significant relationship between bureaucratic quality and infant mortality rates hence I graph in figure 7 the relationship between

bureaucratic quality and infant mortality rates across regimes to analyze the role bureaucratic quality plays in reducing infant mortality.



Figure 7: The effect of bureaucratic quality on infant mortality across regimes.

Figures 7 above show that the relationship that bureaucratic quality has with infant mortality in closed autocracies, electoral autocracies and electoral democracies exhibits a negative linear relationship where increasing levels of bureaucratic quality leads to lower infant mortality rates across all regimes. In liberal democracies, the relationship seems to be curvilinear such that there are lower levels of infant mortality with higher levels of bureaucratic quality until later stages when infant mortality increases slightly regardless of higher levels of bureaucratic quality. This seems to corroborate the initial theoretical reasoning in this paper that other factors can lead to increasing levels of infant mortality regardless of higher levels of bureaucratic quality. Bureaucratic quality seems to provide support for the inverse effect QoG has on infant mortality.

5.7 Robustness Checks.

I conduct two forms of robustness checks.

Firstly, I re-run the regression for aspects of democracy in democratic regimes where I consider 5-year lagged independent variables to assess if the current rates of infant mortality can be explained by an increase in democracy five years before the current year's infant mortality rates.

The justification for this as explained by Gerring et al. (2012) is that democracy could yield sufficient results if given enough time to materialise.

Secondly, I re-run the final models of the democracy and QoG regression only but here, I include as a control, the regional average of infant mortality. The regional average of the dependent variable controls for distinct regional characteristics, such as disease epidemics or the introduction of medical treatments specific to region and time that may affect infant mortality rates (Wang et al., 2019). The regional average of infant mortality is not included in the main analysis because region-specific diseases that lead to high levels of infant mortality are not common across a large time series.

Concerning Table 4 in the Appendix, in Model 9 when all aspects of democracy are regressed against each other five years prior, clean elections continue to show a negative significant effect on infant mortality as compared to the other aspects of democracy but display a decrease in coefficient. The results seem to show that when the levels of democracy attained five years prior are considered, clean elections drive the negative effect observed between democracy and infant mortality. The significant result regarding the effects that free and fair elections organised five-year ago have on current levels of infant mortality provides insight into the long-term nature of the democracy and infant mortality relationship. After clean elections, it could take between one year to five years (depending on whether there was a total regime change or re-election) for a government that is public goods–oriented to establish its governing apparatus, formulate policies, conduct legislative debates, approve policies, and thereafter ensure the implementation of these policies to support child delivery and maternity support programs to save babies.

In Table 5 (in Appendix), I re-run the final regression of the aspects of democracy against infant mortality and control for the regional average of the control variable. The results show that clean elections continue to show a significant negative effect on infant mortality rates even when the regional average of infant mortality is controlled for.

In Table 6 (in Appendix), I re-run the final QoG analysis with all aspects of QoG and the regional average of the DV. When the regional average of the DV is included in the regression, the results for impartiality do not show to be significant.

5.8 Limitations and Delimitations

This study ought to consider the limitations that might affect the generalisability and internal validity of these results. I discuss the limitations and supply recommendations on how future

research could overcome such challenges as well as ideas to improve on the findings obtained in this research.

Sample Size: The research intended to employ a panel data regression analysis covering time - series from 1960 to 2019 nonetheless the unavailability of data on previous years for some variables used for the analysis inhibits our ability to draw concrete conclusions based on the above findings. Possibly, the availability of time-series data for all variables covering 1960 – 2019 can affect the estimates and significance levels of the relationship under study. For example, the data on bureaucratic quality, a key aspect of QoG measured with the 'government effectiveness' variable of the World Governance Indicators only covers 1996 onwards. This led to a smaller N-size especially for the QoG analysis as compared to the democracy analysis.

Methodological Constraints: Based on insufficient data for the bureaucratic quality aspect of QoG, this study refrained from controlling for QoG in the democracy analysis as well as controlling for democracy in the QoG analysis even though the literature posits an independent effect between democracy as well as QoG on infant mortality (Wang et al., 2019); (Rosenberg, 2018). This was to prevent the loss of several observations from the analysis, especially for the democracy regression which has sufficient data for its main independent variables. It is possible that applying such controls can affect the findings obtained in this study.

Regarding these limitations and delimitations because of data constraints, future research can consider using more than one variable or indicator that measures several aspects of the 'variable in question' with data available for the choice of years and aggregate such variables or indicators into a single index that measures what it ought to measure for the missing variable. Now, existing datasets do not provide us with that alternative for use.

Aside from these limitations, there are other avenues for future research to improve upon the findings in this study. Researchers that look to explore this relationship can go further to investigate which specific indicators of the key aspects of democracy and QoG is driving the effect that these key aspects of democracy and QoG have on infant mortality. Future research can also conduct an analysis that explains if there exists regional and time variations in the relationship under study, thus, does the effect of democracy as well as QoG on infant mortality differ across time and space and the mechanisms involved in such differentiation.

6 Conclusion

6.1 Conclusion

This thesis enhances our understanding of what we know about the relationship between democracy as well as QoG and infant mortality. Specifically, the thesis provides insights on the key aspects of the 'big bundled' concept of democracy and quality of government driving the negative relationship that democracy and QoG have with infant mortality.

Using a panel data covering 182 countries from 1960 to 2019, I find that regarding democracy and infant mortality, clean elections, freedom of expression and alternative sources of information, suffrage and the legislative constraints on the executive drive the inverse relationship between democracy and infant mortality whereas for QoG and infant mortality, impartiality seems to drive the inverse relationship between QoG and infant mortality when compared with other QoG aspects. Higher levels of these key aspects of democracy and QoG leads to significant decreases in infant mortality rates. Freedom of association, equality before the law and the judicial constraints on the executive were also found to support the democracy – infant mortality relationship. The study also finds that democratic regimes perform better than autocratic regimes concerning reductions in infant mortality rates. This, according to the literature (Gerring et al., 2012; Mechkova et al., 2019) is due to the political accountability mechanisms inherent in democratic regimes but not in autocracies.

As discussed previously, this study poses limitations that may affect the internal validity and generalisability of these results and hence readers ought to apply these research findings with caution. Nonetheless, the study has policy implications that contribute to the attainment of the United Nations Sustainable Development Goal 3 on Good Health and Well-being and ongoing efforts to enhance democracy and the quality of government globally. Though recent increases in public health spending have been credited to health and education to decrease infant mortality rates (Rajkumar & Swaroop, 2008), putting efforts to enhance these key aspects of democracy and QoG can yield good public health outcomes, save babies and secure the next generation.

6.2 Policy Implications

The results about the aspects of democracy and QoG which drive the reduction in infant mortality rates provide us with some policy implications worth considering.

In reaching the Sustainable Development Goal 3, thus Good Health and Wellbeing, these findings can support current efforts by governments to boost quality health care in their respective countries by maximizing the dividends of democracy and QoG. The results reveal the key aspects of democracy and QoG that reduces infant mortality rates as well as the mechanisms they employ to achieve these desired outcomes. Based on these findings, countries especially new democracies or developing countries can enhance levels of clean elections, freedom of expression and alternative sources of information, legislative constraints on the executive, impartiality, and suffrage and strengthen its corresponding mechanisms of political accountability and equitable health care to reduce infant mortality rates. Since, we find democracies to perform better than autocracies in the fight against infant mortality in support of existing literature by Bollyky et al. (2019), Gerring et al. (2012), Wang et al. (2019) and Annaka & Higashijima (2021), autocratic regimes can consider a pathway to democratization as a means to achieve better health outcomes including reductions in infant mortality rates. Also, state institutions that safeguard and work to enhance these aspects of democracy and QoG such as electoral commissions, the legislature, the media, civil society, and human rights commissions ought to be well funded and supervised in other to enhance these aspects of democracy and QoG and the contributions they make in saving the lives of babies.

Furthermore, democracy aid to new democracies or developing countries can prioritize improvements in clean elections as well as freedom of expression and alternative sources of information since they enforce higher levels of the political accountability needed to induce politicians in creating effective public goods. More investments can be put in this area to support ongoing efforts by organisations such as the International Institute for Democracy and Electoral Assistance (International IDEA) and the Electoral Knowledge Framework in their work towards making politicians more accountable through democratic free and fair elections.

7 References

Andersen, D. D. E., & Krishnarajan, S. (2019). Economic Crisis, Bureaucratic Quality and Democratic Breakdown. *Government and Opposition*, *54*(4), 715–744. https://doi.org/10.1017/gov.2017.37

Annaka, S., & Higashijima, M. (2021). Political liberalization and human development: Dynamic effects of political regime change on infant mortality across three centuries (1800-2015). *World Development*, *147*, 105614. https://doi.org/10.1016/j.worlddev.2021.105614

Arthur, E., & Oaikhenan, H. E. (2017). The Effects of Health Expenditure on Health Outcomes in Sub-Saharan Africa (SSA). *African Development Review*, *29*(3), 524–536. https://doi.org/10.1111/1467-8268.12287

Baird, S., Friedman, J., & Schady, N. (2011). AGGREGATE INCOME SHOCKS AND INFANT MORTALITY IN THE DEVELOPING WORLD. *The Review of Economics and Statistics*, *93*(3), 847–856.

Barber, B. R. (2014). Participatory Democracy. In *The Encyclopedia of Political Thought* (pp. 2650–2654). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781118474396.wbept0752

Bauhr, M., & Grimes, M. (2021, July 20). *Democracy and the Quality of Government*. The Oxford Handbook of the Quality of Government. https://doi.org/10.1093/oxfordhb/9780198858218.013.10

Bellinger, N. M. (2018). Democracy and infant mortality within India: From whether to why. *European Political Science Review*, *10*(1), 3–28. https://doi.org/10.1017/S1755773916000138

Besley, T., & Kudamatsu, M. (2006). Health and Democracy. *American Economic Review*, *96*(2), 313–318. https://doi.org/10.1257/000282806777212053

Bollyky, T. J., Templin, T., Cohen, M., Schoder, D., Dieleman, J. L., & Wigley, S. (2019). The relationships between democratic experience, adult health, and cause-specific mortality in 170 countries between 1980 and 2016: An observational analysis. *The Lancet*, *393*(10181), 1628–1640. https://doi.org/10.1016/S0140-6736(19)30235-1

Charron, N., & Lapuente, V. (2010). Does democracy produce quality of government? *European Journal of Political Research*, *49*(4), 443–470. https://doi.org/10.1111/j.1475-6765.2009.01906.x

Coppedge, M., Gerring, J., Altman, D., Bernhard, M., Fish, S., Hicken, A., Kroenig, M., Lindberg, S. I., McMann, K., Paxton, P., Semetko, H. A., Skaaning, S.-E., Staton, J., & Teorell, J. (2011). Conceptualizing and Measuring Democracy: A New Approach. *Perspectives on Politics*, *9*(2), 247–267. https://doi.org/10.1017/S1537592711000880

Coppedge, M., Gerring, J., Knutsen, C. H., Krusell, J., Medzihorsky, J., Pernes, J., Skaaning, S.-E., Stepanova, N., Teorell, J., Tzelgov, E., Wilson, S. L., & Lindberg, S. I. (2019). The Methodology of "Varieties of Democracy" (V-Dem)1. *Bulletin of Sociological Methodology/Bulletin de Méthodologie Sociologique*, *143*(1), 107–133. https://doi.org/10.1177/0759106319854989

Coppedge, M., John Gerring, Carl Henrik Knutsen, Staffan I. Lindberg, Jan Teorell, David Altman, Michael Bernhard, Agnes Cornell, M. Steven Fish, Lisa Gastaldi, Haakon Gjerløw, Adam Glynn, Allen Hicken, Anna Lührmann, Seraphine F. Maerz, Kyle L. Marquardt, Kelly McMann, Valeriya Mechkova, Pamela Paxton, ... Daniel Ziblatt. (2021). *"V-Dem Codebook v12"*. Varieties of Democracy (V-Dem) Project. Coppedge, M., Lindberg, S., Skaaning, S.-E., & Teorell, J. (2016). Measuring high level democratic principles using the V-Dem data. *International Political Science Review / Revue Internationale de Science Politique*, *37*(5), 580–593.

Crawford, G., & Abdulai, A.-G. (2011). *Democratization, Poverty and Inequality*. Routledge Handbooks Online. https://doi.org/10.4324/9780203148433.ch23

Deacon, R. T. (2009). Public Good Provision under Dictatorship and Democracy. *Public Choice*, *139*(1/2), 241–262.

Dincer, O., & Teoman, O. (2019). Does corruption kill? Evidence from half a century infant mortality data. *Social Science & Medicine*, *232*, 332–339. https://doi.org/10.1016/j.socscimed.2019.05.017

Fariss, C., Anders, T., Markowitz, J., & Barnum, M. (2022). *Latent Estimates of Historic Gross Domestic Product, GDP per capita, Surplus Domestic Product, and Population Data Version 1* [Data set]. Harvard Dataverse. https://doi.org/10.7910/DVN/FALCGS

Gerring, J., Knutsen, C. H., Maguire, M., Skaaning, S.-E., Teorell, J., & Coppedge, M. (2021). Democracy and human development: Issues of conceptualization and measurement. *Democratization*, *28*(2), 308–332. https://doi.org/10.1080/13510347.2020.1818721

Gerring, J., Thacker, S. C., & Alfaro, R. (2012). Democracy and Human Development. *The Journal of Politics*, 74(1), 1–17. https://doi.org/10.1017/S0022381611001113

Gupta, S., & Abed, G. T. (2002). *Governance, Corruption, and Economic Performance:* International Monetary Fund. https://doi.org/10.5089/9781589061163.071

Gutmann, A., & Thompson, D. F. (2009). Why Deliberative Democracy? In *Why Deliberative Democracy*? Princeton University Press. https://doi.org/10.1515/9781400826339

Harding, R. (2020). Who is democracy good for? Elections, rural bias, and health and education outcomes in sub-saharan africa. *Journal of Politics*, *82*(1), 241–254. Scopus. https://doi.org/10.1086/705745

Holmberg, S., & Rothstein, B. (2011). Dying of corruption. *Health Economics, Policy and Law, 6*(4), 529–547. https://doi.org/10.1017/S174413311000023X

Houweling, T. A., Kunst, A. E., Looman, C. W., & Mackenbach, J. P. (2005). Determinants of under-5 mortality among the poor and the rich: A cross-national analysis of 43 developing countries. *International Journal of Epidemiology*, *34*(6), 1257–1265. https://doi.org/10.1093/ije/dyi190

Hsiao, C. (2007). Panel data analysis—Advantages and challenges. *TEST*, *16*(1), 1–22. https://doi.org/10.1007/s11749-007-0046-x

Ibukun, C. O. (2021). The role of governance in the health expenditure–health outcomes nexus: Insights from West Africa. *International Journal of Social Economics*, *48*(4), 557–570. https://doi.org/10.1108/IJSE-06-2020-0404

Keefer, P. (2007). Clientelism, Credibility, and the Policy Choices of Young Democracies. *American Journal of Political Science*, *51*(4), 804–821.

Klomp, J., & de Haan, J. (2009). Is the political system really related to health? *Social Science & Medicine*, *69*(1), 36–46. https://doi.org/10.1016/j.socscimed.2009.03.033

Kudamatsu, M. (2012). HAS DEMOCRATIZATION REDUCED INFANT MORTALITY IN SUB-SAHARAN AFRICA? EVIDENCE FROM MICRO DATA. *Journal of the European Economic Association*, *10*(6), 1294–1317.

Lewis, M. (2006). Governance and Corruption in Public Health Care Systems. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.984046

Lin, R.-T., Chien, L.-C., Chen, Y.-M., & Chan, C.-C. (2014). Governance matters: An ecological association between governance and child mortality. *International Health*, *6*(3), 249–257. https://doi.org/10.1093/inthealth/ihu018

Lührmann, A., Tannenberg, M., & Lindberg, S. I. (2018). Regimes of the World (RoW): Opening New Avenues for the Comparative Study of Political Regimes. *Politics and Governance*, *6*(1), 60–77. https://doi.org/10.17645/pag.v6i1.1214

Maerz, S. F., Lührmann, A., Hellmeier, S., Grahn, S., & Lindberg, S. I. (2020). State of the world 2019: Autocratization surges – resistance grows. *Democratization*, *27*(6), 909–927. https://doi.org/10.1080/13510347.2020.1758670

Mechkova, V., Lührmann, A., & Lindberg, S. I. (2019). The Accountability Sequence: From De-Jure to De-Facto Constraints on Governments. *Studies in Comparative International Development*, *54*(1), 40–70. https://doi.org/10.1007/s12116-018-9262-5

Mishra, P., & Newhouse, D. (2009). Does health aid matter? *Journal of Health Economics*, 28(4), 855–872. https://doi.org/10.1016/j.jhealeco.2009.05.004

Nazarov, Z., & Obydenkova, A. (2021). Public Health, Democracy, and Transition: Global Evidence and Post-Communism. *Social Indicators Research*. Scopus. https://doi.org/10.1007/s11205-021-02770-z

O'Donoghue, T. F. (1991). *Urbanization and infant mortality: An ecological analysis* [Ph.D., The Ohio State University]. http://www.proquest.com/docview/303944386/abstract/2BD431BFF47D46E4PQ/1

Pelizzo, R., & Stapenhurst, F. (2013). The Dividends of Good Governance. *Poverty & Public Policy*, *5*(4), 370–384. https://doi.org/10.1002/pop4.49

Pieters, H., Curzi, D., Olper, A., & Swinnen, J. (2016). Effect of democratic reforms on child mortality: A synthetic control analysis. *The Lancet Global Health*, *4*(9), e627–e632. https://doi.org/10.1016/S2214-109X(16)30104-8

Pushkar. (2012). Democracy and Infant Mortality in India's 'Mini-democracies': A Preliminary Theoretical Inquiry and Analysis*. *Journal of South Asian Development*, 7(2), 109–137. https://doi.org/10.1177/0973174112466360

Rajkumar, A. S., & Swaroop, V. (2008). Public spending and outcomes: Does governance matter? *Journal of Development Economics*, *86*(1), 96–111. https://doi.org/10.1016/j.jdeveco.2007.08.003

Rosenberg, D. Y. (2018). Political Economy of Infant Mortality Rate: Role of Democracy Versus Good Governance. *International Journal of Health Services*, *48*(3), 435–460. https://doi.org/10.1177/0020731418774226

Ross, M. (2006). Is Democracy Good for the Poor? *American Journal of Political Science*, *50*(4), 860–874.

Rothstein, B. (2011). *The Quality of Government: Corruption, Social Trust, and Inequality in International Perspective*. University of Chicago Press. http://ebookcentral.proquest.com/lib/gu/detail.action?docID=719232

Rothstein, B., & Teorell, J. (2008). What Is Quality of Government? A Theory of Impartial Government Institutions. *Governance*, *21*(2), 165–190. https://doi.org/10.1111/j.1468-0491.2008.00391.x

Safaei, J. (2006). IS DEMOCRACY GOOD FOR HEALTH? *International Journal of Health Services*, *36*(4), 767–786.

Sigman, R., & Lindberg, S. I. (2019). Democracy for All: Conceptualizing and Measuring Egalitarian Democracy. *Political Science Research and Methods*, 7(3), 595–612. https://doi.org/10.1017/psrm.2018.6

Templin, T., Dieleman, J. L., Wigley, S., Mumford, J. E., Miller-Petrie, M., Kiernan, S., & Bollyky, T. J. (2021). Democracies Linked To Greater Universal Health Coverage Compared With Autocracies, Even In An Economic Recession. *Health Affairs*, *40*(8), 1234–1242. https://doi.org/10.1377/hlthaff.2021.00229

V-Dem Institute. (2021). The Case For Democracy. https://www.v-dem.net/pb.html

Wang, Y., Mechkova, V., & Andersson, F. (2019). Does Democracy Enhance Health? New Empirical Evidence 1900–2012. *Political Research Quarterly*, *72*(3), 554–569. https://doi.org/10.1177/1065912918798506

Wigley, S., & Akkoyunlu-Wigley, A. (2017). The impact of democracy and media freedom on under-5 mortality, 1961–2011. *Social Science & Medicine*, *190*, 237–246. https://doi.org/10.1016/j.socscimed.2017.08.023

Wigley, S., Dieleman, J. L., Templin, T., Mumford, J. E., & Bollyky, T. J. (2020). Autocratisation and universal health coverage: Synthetic control study. *BMJ*, *371*, m4040. https://doi.org/10.1136/bmj.m4040

World Bank. (2022). World Development Indicators Dataset. World Bank.

Wullert, K. E., & Williamson, J. B. (2016). Democracy, Hybrid Regimes, and Infant Mortality: A Cross-National Analysis of Sub-Saharan African Nations^{*}. *Social Science Quarterly (Wiley-Blackwell)*, *97*(5), 1058–1069. https://doi.org/10.1111/ssqu.12240

8 Appendix





Table 4:	Regression Estimates – Aspects of Electoral Democracy and the Liberal Components, 1960 – 2019. (5- year lagged)								
	(1)	(2)	(3)	(4)	(5) Infant Mortality, I	(6) logged.	(7)	(8)	(9)
Suffrage t-5	-0.0348 (0.0187)								-0.00955 (0.0225)
GDP per capita, logged	-0.690*** (0.0107)	-0.688 ^{***} (0.0107)	-0.689 ^{***} (0.0107)	-0.690 ^{***} (0.0107)	-0.690*** (0.0107)	-0.689 ^{***} (0.0107)	-0.682 ^{***} (0.0108)	-0.701 ^{***} (0.0111)	-0.693*** (0.0113)
Female Literacy, IP	-0.00348*** (0.0000525)	-0.00351*** (0.0000515)	-0.00349 ^{***} (0.0000514)	-0.00349*** (0.0000517)	-0.00349*** (0.0000518)	-0.00349 ^{***} (0.0000517)	-0.00349*** (0.0000517)	-0.00348 ^{***} (0.0000545)	-0.00350*** (0.0000556)
Urbanization	1.029*** (0.0516)	1.017 ^{***} (0.0513)	1.024 ^{***} (0.0514)	1.025 ^{***} (0.0514)	1.026 ^{***} (0.0515)	1.023*** (0.0514)	1.001*** (0.0522)	1.015 ^{***} (0.0521)	0.996 ^{***} (0.0530)
Foreign Aid	-0.000182 ^{***} (0.0000450)	-0.000178*** (0.0000450)	-0.000184 ^{***} (0.0000450)	-0.000184*** (0.0000450)	-0.000183 ^{***} (0.0000450)	-0.000185*** (0.0000450)	-0.000179*** (0.0000451)	-0.000489*** (0.0000907)	-0.000481 ^{***} (0.0000909)
Domestic Conflict	-0.0102 (0.0122)	-0.0116 (0.0122)	-0.0119 (0.0122)	-0.0109 (0.0122)	-0.0108 (0.0122)	-0.0118 (0.0123)	-0.0119 (0.0123)	-0.0264* (0.0128)	-0.0306* (0.0129)
International Conflict	0.0579 ^{**} (0.0177)	0.0614 ^{***} (0.0177)	0.0586 ^{***} (0.0177)	0.0585 ^{***} (0.0177)	0.0584 ^{***} (0.0177)	0.0581 ^{**} (0.0177)	0.0507 ^{**} (0.0179)	0.0565 ^{**} (0.0186)	0.0579 ^{**} (0.0186)
Elected Officials t-5		0.0195* (0.00923)							0.0280 [*] (0.0125)
Clean Elections t-5			-0.0317* (0.0148)						-0.0809** (0.0277)
Freedom of Association t-5				-0.0234 (0.0143)					0.0211 (0.0414)
Freedom of Expression t-5					-0.0230 (0.0148)				0.00166 (0.0504)
Equality before the law $_{t-5}$						-0.0296 (0.0177)			0.0253 (0.0430)
Judicial Constraints t-5							-0.0641*** (0.0192)		-0.0326 (0.0347)
Legislative Constraints t-5								-0.0750*** (0.0167)	-0.0543 (0.0328)
_cons	4.844 ^{***} (0.0279)	4.801 ^{***} (0.0232)	4.825 ^{***} (0.0231)	4.824 ^{***} (0.0234)	4.824 ^{***} (0.0235)	4.829*** (0.0243)	4.843 ^{***} (0.0241)	4.871 ^{***} (0.0243)	4.872 ^{***} (0.0301)
Country FE N	v 5636	v 5636	v 5636	v 5636	v 5636 46	v 5636	v 5582	v 5252	v 5245

R^2	0.735	0.735	0.735	0.735	0.735	0.735	0.732
adj. <i>R</i> ²	0.727	0.727	0.727	0.727	0.727	0.727	0.724
Standard among in nonanthag	a. ID _ internalated, FI	- Eined Effecter	V _ included *	m < 0.05 ** $m < 0.01$	*** m < 0.001		

Standard errors in parentheses. IP = interpolated; FE = Fixed Effects; \forall = included. * p < 0.05, ** p < 0.01, *** p < 0.001

0.746	0.745
0.738	0.736

Democracy Against Infant	Mortality, 1960 – 2019	9.		
Suffraça	<u>ninant Mortanty, logge</u>			
Sulfrage t-1	(0.0315)			
	(0.0155)			
	0.00070			
Elected Officials t-1	-0.00978			
	(0.00787)			
	0.0007**			
Clean Elections t-1	-0.0607			
	(0.0185)			
Freedom of Association t-1	0.00582			
	(0.0267)			
Freedom of Expression t-1	-0.0162			
	(0.0342)			
Equality before the law t-1	0.0125			
	(0.0322)			
Judicial Constraints t-1	-0.107***			
	(0.0269)			
Legislative Constraints t-1	0.00235			
-	(0.0222)			
GDP per capita, logged	-0.269***			
	(0.00843)			
	()			
Female literacy. IP	-0.000415***			
	(0.0000468)			
	(0.0000100)			
Urbanization	0 340***			
Croumzation	(0.0330)			
	(0.0550)			
Foreign Aid	-0.000250***			
Toreign Ald	(0.000250)			
	(0.0000333)			
Domostic Conflict	0.00302			
Domestic Connict	-0.00392			
	(0.00799)			
International Conflict	0.00221			
International Commet	0.00331			
	(0.0112)			
Decisional Assess	0.015***			
Regional Average of DV	0.0000			
	(0.00896)			
	1 100***			
_cons	1.108			

Table 5: Robustness Checks with Regional Average of DV, Regression Estimates, Aspects of Democracy Against Infant Mortality, 1960 – 2019.

	(0.0470)		
Country FE	٧		
N	5236		
R^2	0.904		
adj. <i>R</i> ²	0.901		
Standard errors in parentheses. IP = interpolated; $FE = Fixed Effects; \forall = included.$			

* p < 0.05, ** p < 0.01, *** p < 0.001

Table 6: Robustness Checks with Regional Average of DV, Regression Estimates, Aspects ofQoG Against Infant Mortality, 1960 -2019.

	(1)	
	Infant Mortality, logged	
Impartiality	-0.0661	
	(0.0538)	
Corruption	0.0107	
L	(0.0357)	
Bureaucratic Quality	-0.00246	
	(0.00693)	
	× ,	
GDP per capita, logged	-0.453***	
r	(0.0272)	
	()	
Female Literacy, IP	-0.00153***	
, , , , , , , , , , , , , , , , , , ,	(0.000272)	
Urbanization	0.157	
	(0.181)	
	(0.101)	
Foreign Aid	-0.0000269	
8	(0.000861)	
	(0.0000001)	
Domestic Conflict	0.0285	
	(0.0193)	
	(
International Conflict	0.000549	
	(0.0270)	
	(0.02.07)	
Regional Average of DV	0.603***	
6	(0.0332)	
	(
cons	2.290^{***}	
—	(0.168)	
Country FE	V	
N	829	
R^2	0.941	

adj. R^2 0.930Standard errors in parentheses. IP = interpolated; FE = Fixed Effects; \forall = included.* p < 0.05, ** p < 0.01, *** p < 0.001