

# **Which Aspects of Democracy Matters for Infant Mortality?**

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## **Abstract**

Currently, the literature provides several empirical findings on democracy and infant mortality but research on this subject is inconclusive. The existing literature is unable to explain with empirical evidence which aspects of the broad concept of democracy drives reductions in infant mortality rates though it finds democratic governance is good against infant mortality. This paper investigates which aspects of democracy drive the inverse relationship democracy has with infant mortality. Using panel data covering 182 countries from 1960 to 2019, I find 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. However, other electoral and liberal components of democracy support this effect. The results also suggest that the effects of democracy on infant mortality are stronger in democratic regimes than in autocracies.

## **Keywords**

Democracy, Infant Mortality, Electoral Democracy, Liberal Components, Regimes.

Why, in the realm of global health outcomes, does the impact of democracy on infant mortality sometimes present such an enigmatic puzzle? Why is it that in some democratic nations, democratization coincides with a marked reduction in infant mortality rates, while in others, this correlation appears elusive? What intricate interplay of the various aspects of democracy distinguishes democracies where improvements in infant mortality are observed from those where such progress remains stagnant? How does the quality of democracy itself—whether robust or faltering—contribute to the varied health outcomes witnessed in nations professing democratic governance? Is it the mechanism of strong political accountability inherent in liberal democracies, the disparities in healthcare investments and health professionals, or the implementation of health-related strategies that account for this variation? How does one

explain high levels of quality health outcomes in some authoritarian and hybrid regimes that do not exist in some democracies? In unraveling this complex scenario, one is compelled to question which aspects of democracy translate into improved health outcomes or whether the effect of democracy on health is a game of chance. In response to the ongoing debate, of what is democracy good for (Harding, 2020; Ross, 2006), research on the dividends of democracy has increased over the years, to support democracy's goodwill against a fast-growing wave of autocratization.

One key area that has received attention is infant mortality. Though several indicators exist to measure the state of healthcare when conducting country-level analysis, infant mortality has recently been featured in research to access quality healthcare in the general population (Annaka & Higashijima, 2021; Besley & Kudamatsu, 2006; Gerring et al., 2012; Klomp & de Haan, 2009). Infant mortality stands out as a critical indicator for assessing the impact of democracy on health outcomes due to its sensitivity to the overall well-being of a society. The significance of infant mortality lies not only in its direct reflection of the health of newborns but also in its capacity to capture broader socio-economic and healthcare disparities. Infants, being particularly vulnerable to socio-economic factors, serve as a sensitive barometer for the effectiveness of health systems and societal structures. High infant mortality rates often correlate with inadequate access to healthcare, suboptimal living conditions, and socio-economic inequalities—all of which are intricately linked to the quality of governance. Because infant mortality captures both the immediate health outcomes of the youngest members of society, it provides a lens through which one can evaluate the broader societal health landscape influenced by democratic governance. Detailing the effect that specific aspects of democracy have on infant mortality contributes to understanding the dividends of democracy and the mechanism it employs to improve human and social development.

Currently, the literature provides several empirical findings on democracy and infant mortality. An increasing body of research suggests an inverse and robust relationship between democracy and infant mortality. Gerring et al. (2012); Kudamatsu (2012); Safaei (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).

Regardless of the extensive literature on democracy and infant mortality, the literature does not help us to fully understand this relationship. 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. There is no comparative analysis to ascertain the driving cause of the relationship one observes between democracy and infant mortality. There is a lack of empirical findings on the specific aspects of this "big bundled" concept of democracy that matters most in reducing infant mortality rates. Using panel data from the V-Dem Institute, World Bank, and GapMinder covering 182 countries from 1960 to 2019, the study conducts a comparative regression analysis of eight aspects of democracy: five aspects of the electoral democracy index and three aspects of the liberal components index against infant mortality to reveal the driving aspects of democracy which induces reductions in infant mortality rates. I analyze the effects of each aspect of democracy against infant mortality across regimes using Lührmann et al.'s (2018) *Regimes of the World Typology* to offer a deeper understanding of the variation of the nature of the democracy – infant mortality relationship across regimes.

The study presents a couple of findings. First, I find that suffrage, the clean elections, freedom of expression and alternative sources of information, and the legislative constraints on the executive drive the inverse relationship between democracy and infant mortality. Also, the results reveal a supportive role played by the other electoral and liberal components of democracy. Second, I find that the positive impact of democracy on infant mortality is more potent in liberal democracies than it is in electoral democracies as well as closed and electoral autocracies. Democracy induces a reduction in infant mortality rates more when countries move from good to a more decent democracy.

## 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 its citizens.

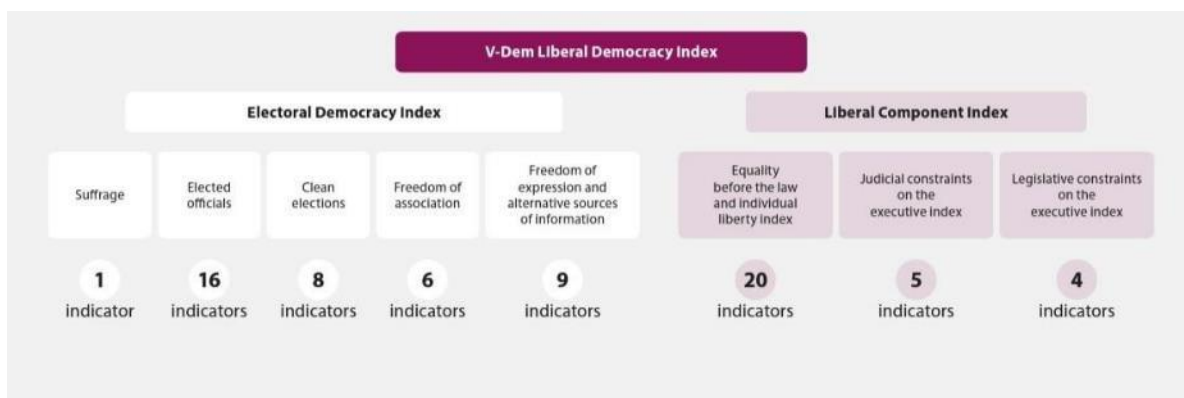
The research on the dividends of democracy is broad. According to Deacon (2009), democracies

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 (2019) argues that higher levels of representation, political participation, and electoral competition incentivize political representatives to enhance the general welfare of the masses. Also, democracy has been found to have a positive effect on health (Gerring et al., 2012; Templin et al., 2021; Y. 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)

### *Conceptualizing Democracy*

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) *Regimes of the World Typology*. For 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'—achieve a sufficient level of institutional guarantees of democracy such as freedom of association, suffrage, clean elections, an elected executive, and freedom of expression (Coppedge et al., 2016; Dahl, 1971, 1998). For liberal democracy, Lührmann et al. (2018) posit that such regimes have effective legislative and judicial oversight over the executive, protection of individual liberties, and the rule of law. 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 characterize democracies, lower levels of these democratic aspects could also be found in autocratic regimes. This phenomenon can create a misconception whereby autocracies democratizing at minimal levels falsely claim to be democratic. 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). 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.'

Should the dividends of democracy vary across closed autocracies, electoral autocracies, electoral democracies, and liberal democracies? In explaining what closed autocracies are, 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 freedom of expression and alternative sources of information differentiates electoral autocracies from democracies. Whereas both electoral and liberal democracies provide satisfactory levels of the electoral aspects of democracy, the liberal components of a democracy are not satisfactory in electoral democracies. Liberal democracies provide satisfactory levels of the liberal components of democracy (Coppedge et al., 2016). Since regime classifications are based on democratic principles, one can expect that the dividend of democracy reflects in the lives of inhabitants of

a democratic regime. A democratic regime ought to have the positive outcomes associated with what democracy has been found to offer those who practice it. For instance, if democracy shows to influence infant mortality positively, such effects should be reflected in regimes that are electoral and liberal democracies such that fewer babies ought to die.

### *Democracy's Effect on 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). According to the World Health Organization (WHO, n.d.), infant mortality is the probability of a child born in a specific year or period dying before reaching 1 year old 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). Though Wullert & Williamson (2016, p. 1067) do not find a significant linear relationship between democracy and infant mortality, the literature supporting democracy and infant mortality is much larger.

In Sub-Saharan Africa, Kudamatsu (2012, p. 1316) finds a reduction in infant mortality rates after recurring patterns of competitive multiparty elections that provide avenues for regime change. 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 directly and positively influences 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 healthcare delivery infrastructure.' Also, Klomp & de Haan (2009) find that 'democracy rather than regime instability has a positive relationship on healthcare. 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). It, therefore, seems that the political accountability mechanisms inherent in democracy explain the overall inverse effect that democracy has on infant mortality.

## Political Accountability

The literature on democracy and infant mortality, such as Gerring et al. (2021), Bollyky et al. (2019), and Annaka & Higashijima (2021) suggests that political accountability mechanisms inherent in democracies account for the positive influence that democracy has over health outcomes when measured by infant mortality. These studies also link the aspects of electoral and liberal democracies, as conceptualized by Coppedge et al. (2016), to the types of political accountability. Following Lindberg et al. (2017), I define political accountability as 'the constraints on government's use of political power through requirements for justification of its actions and potential sanctions.' Though the executive, legislature, and judiciary are all arms of government, the above conceptualization is restricted to government as the executive branch, the chief executive, cabinet, ministries, and the ranking members of the civil service (Mechkova et al., 2019). Previous literature discusses three types of political accountability: vertical, horizontal, and diagonal accountability.

For vertical accountability, citizens use electoral and non-electoral channels to exert control over politicians (Fox, 2015; Mechkova et al., 2019; Relly, 2012). While much emphasis has been on electoral channels such as multiparty elections regarding vertical accountability, Relly (2012) posits that citizenry groups' actions that expose illegality within government agencies and trigger the actions of oversight agencies also constitute vertical accountability. However, vertical accountability is predominantly exercised through aspects of electoral democracy such as suffrage, clean elections, and elected officials (Annaka & Higashijima, 2021; Bollyky et al., 2019; Coppedge et al., 2016; Gerring et al., 2021; Lührmann et al., 2020; Mechkova et al., 2019).

For diagonal accountability, civil society, pressure groups, and the media constraint government action or induce its effectiveness by directly mobilizing public support against government actions or inactions or via uncensored information provision (Lührmann et al., 2020; Mechkova et al., 2019; Scholte, 2004). Freedom of association, freedom of expression, and alternative sources of information index are electoral aspects of democracy within which diagonal

accountability is exercised (Coppedge et al., 2016; Lührmann et al., 2020; Mechkova et al., 2019).

Horizontal accountability occurs when the arms of governments and state institutions, such as the legislature, judiciary, public accounts committees, and ombudsmen, exercise oversight over the executive (Mechkova et al., 2019; O'Donnell, 1998). These state institutions exercise their constitutionally mandated power to curtail the executive from acting arbitrarily and, in some instances, demand responses for what the executive has done or failed to do. In liberal democratic regimes, horizontal accountability is exercised through the liberal components of democracy. Thus, the legislative constraints on the executive, judicial constraints on the executive, and equality before the law (Coppedge et al., 2016; Lührmann et al., 2020).

The literature on democracy and health outcomes measured by infant mortality has fully or partially attributed either type of political accountability as driving or supporting an inverse relationship between democracy and infant mortality. For the analysis, I define and differentiate between 'drive' and 'support' regarding the intensity of the relationship I seek to observe between the various aspects of democracy and infant mortality. From the Oxford dictionary, this paper defines 'drive' to mean 'forcing something to go in a particular direction' whereas 'support' means 'to help or encourage something you agree with.' By these definitions, I expect a driving relationship between an independent and dependent variable would have a greater statistically significant effect than a supportive relationship, which may not necessarily demonstrate statistical significance.

### *The Mechanisms of Political Accountability*

Recent studies by Annaka & Higashijima (2021), Edgell et al. (2018), Gerring et al. (2021), and Y. Wang et al. (2019) underscore the significance of electoral democracy components in shaping health outcomes. Competitive multiparty elections, a cornerstone of electoral democracy, emerge as a potent mechanism for exercising vertical accountability. The prevalence of vertical accountability through elections implies that high levels of suffrage and clean elections may directly compel the government to deliver quality public goods, including improved healthcare. In nations where opposition participation is unrestricted, and elections are fiercely contested, incumbents are incentivized to fear potential re-election challenges, prompting adequate investments in the health sector.

The anticipation of electoral repercussions encourages incumbents to prioritize public health,



with the risk of being voted out if their performance is unsatisfactory. As a result, democracies with clean elections and suffrage spend a significant percentage of its Gross Domestic Product on healthcare as compared to non-democracies (Bollyky et al., 2019). This cumulative focus on healthcare by incumbents to stay in power is expected to yield positive outcomes in key health indicators, such as infant mortality. In Sweden, Finland and Norway which are some of the countries with the lowest rate of infant mortality, one observes that health care is central to state politics. The centrality of public health in the political discourse and electoral campaigns of advanced democracies further exemplifies the enduring impact of suffrage and clean elections (Chernichovsky, 1998). In the United Kingdom for instance, increased funding for the National Health Service emerged as a pivotal campaign message for the coalition supporting Brexit and it is most often than not central to political campaigns prior to elections.

It is worth noting that the efficacy of suffrage and clean elections in influencing incumbent decisions is contingent, in part, on some aspects of diagonal accountability. Mechkova et al. (2019) identify diagonal accountability as a crucial factor, wherein media freedoms and a robust civil society influence the provision of public goods. The institutions underpinning diagonal accountability are marked by freedom of association, freedom of expression, and alternative sources of information. Freedom of association empowers citizens to form or join groups independently of the government, fostering criticism and exposure of governmental actions. Through freedom of expression and access to alternative sources of information, citizens can express grievances without fear and access uncensored information from diverse outlets. I do not expect the ‘elected officials’ indicator to drive the relationship between democracy and infant mortality. Though elected officials are a necessary aspect of democratization without which elections cannot take place, the mere fact that leaders are elected does not imply a democracy nor can enforce political accountability. Competitive authoritarian regimes that sprang after the cold war introduced minimal forms of democracy such as ‘elected officials’ to merely express a democratic rhetoric rather than actually democratizing (Levitsky & Way, 2012). Building on these insights, this study posits the following hypothesis:

**Hypothesis 1:** Suffrage, clean elections, freedom of association, freedom of expression, and alternative sources of information drive the inverse effect democracy has on infant mortality.

I also anticipate that in countries where legislative constraint on the executive is high, there would be quality health outcomes. Such expectation is particularly pronounced in parliamentary

regimes, where the legislature holds a miniature version of the public's voting power wielded over the executive in presidential democracies. Parliamentary legislatures have easier mechanisms to issue votes of no confidence or form substantial opposition coalitions, that can compel resignations and dismissals of prime ministers in the event of deteriorating health conditions and low-quality public goods. These mechanisms serve as powerful checks on incumbents, fostering accountability in public goods provision. Similarly, presidential systems with strong legislatures have historically demonstrated the capacity to invoke similar powers, leading to the removal of incumbents. The enforcement of legislative oversight, exemplified by the impeachment of South Korean President Park Geun-hye in 2016, showcases the potential for accountability measures to address lapses in healthcare delivery. In advanced democracies, where legislatures are not mere rubberstamps of the executive, healthcare is likely to receive adequate budgetary allocations. This is driven by legislators' accountability to their constituents, prompting a prioritization of critical issues such as healthcare to secure re-election. Similar to the mechanisms of vertical accountability, legislative constraints on the executive may contribute to the reason why democracies spend more on healthcare on average than autocracies (Bollyky et al., 2019).

I do not expect equality before the law and the judicial constraints on the executive to support as many reductions in infant mortality rates as compared to the legislative constraints on the executive even though it is expected that during democratization, these indicators would increase alongside other electoral and liberal components of democracy. Though Equality before the law can ensure that corrupt politicians or leaders who engage in illegality are punished (Lührmann et al., 2020), it does not possess inherently strong mechanisms to redirect government attention to healthcare. Also, Judicial constraints on the executive which ensures that politicians do not usurp powers or act unconstitutional has less mechanism to pressure the incumbent to deliver on public goods (Coppedge et al., 2016; Lührmann et al., 2020). History tells us that politicians are more fearful of losing political power than standing trial for corruption-related offences or other forms of illegalities. If electoral mechanisms and legislative mechanisms are weak, authoritarian leaders can entrench themselves in power and use legal means to weaken judicial systems in their favor. So far as authoritarian rulers hold on to power, they are certain of unequal application of the law in their favour. Owing from this reasoning, I expect that:

**Hypothesis 2:** The legislative constraints on the executive support the inverse effect democracy has on infant mortality.

Depending on whether the electoral aspects of democracy, as well as the liberal components, show a significant negative effect on infant mortality rates, one may also observe a variation of the democracy and infant mortality relationship across the various regimes. Since one cannot classify Russia, Nigeria, Venezuela, Sweden, and Norway equally democratic (Diamond, 2002), I do not expect that the effects of democracy within these countries will be alike. For electoral democracies, low levels of legislative constraints on the executive, may prevent countries under these regimes from benefiting from the dividends that these aspects of democracy provide to liberal democracies. (McMann et al., 2020).

More interestingly, I do not expect a 'zero' effect of democracy on infant mortality rates in electoral autocracies. Aside from closed autocracies that do not hold elections (Lührmann et al., 2018), multiparty elections for executive and legislative office holders in electoral autocracies can lead to some levels of political accountability even if such elections are rigged or manipulated (Lührmann et al., 2020). Lower levels of accountability would, therefore, create low dividends for democracy, and higher levels of accountability result in much more substantial dividends for democracy. Advanced democracies have shown many dividends of democracy compared to new democracies and hybrid regimes (Diamond, 2002; Keefer, 2007). I also expect that contrary to my central hypothesis, closed autocracies for which a substantial number of them are oil - rich nations such as Saudia Arabia and the United Arab Emirates will experience low levels of infant mortality regardless of practicing authoritarianism. A realistic explanation is that, oil-rich dictatorship such as Russia, Saudia Arabia, Qatar and the United Arab Emirates have enormous wealth from oil to invest in development (Boix & Stokes, 2003) regardless of regime type. Even if leaders of rich dictatorships were simultaneously corrupt or unaccountable to voters, there is enough state resource to still create good health outcomes. Nonetheless, these cases are a handful and do not contradict the earlier hypothesis. A greater number of the world's regimes are those which state resources are scarce and emanate from taxation and commerce hence will require democratic institutions to effectively operate. In addition to the previous hypotheses, I also expect that:

**Hypothesis 3:** The democracy on infant mortality is stronger in liberal democracies than in electoral democracies and autocratic regimes.

## Methodology

### *Sample selection*

To analyze which aspects of democracy drive reductions in infant mortality rates, I use data on 182 countries, both democratic and autocratic regimes, from 1960 to 2019 to investigate which aspects of democracy drive down reduction in infant mortality rates. The scope of the data is 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.’

### *Data Sources*

This paper uses unbalanced panel data from the V-Dem Institute, the World Governance Indicators from the World Bank, and GapMinder from 1960 to 2019.

The paper uses the V-Dem Dataset Version 12 for the V-Dem data, covering 202 countries from 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 world countries. V-Dem uses innovative methods for aggregating expert judgments to produce valid and reliable estimates of difficult-to-observe concepts (Coppedge et al., 2021). We also employ Fariss et al.'s (2022) Latent Estimates of Historical Data on Gross Domestic Product from the V-Dem dataset.

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

GapMinder identifies systematic misconceptions about critical global trends and proportions and uses reliable data to develop easy-to-understand teaching materials to rid people of their misconceptions (Y. Wang et al., 2019; GapMinder, 2022).

### ***Dependent Variable***

In testing the above hypotheses, the dependent variable in this analysis is ‘Infant Mortality’ measured by ‘Infant Mortality Rate.’ According to the V-Dem dataset v12, the infant mortality rate is the number of infants dying before one year of age per 1,000 live births each year. Following 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***

For independent variables, the V-Dem dataset v12 measures 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, measuring the aspects of electoral and liberal democracy as conceptualized by Coppedge et al. (2016) is an accurate measure of democracy in this study. Our interest in regime disparities warrants that I measure variables that reflect regime characteristics.

For the electoral democracy index, I include the following variables in the analysis.

1. Suffrage: Measured by the share of the population with suffrage. V-Dem describes it as the share of adults with 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, can form and participate in elections and how 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. V-Dem describes the variable as the extent to which the 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 include in the analysis:

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 to which citizens can enjoy access to justice, secure property rights, freedom from forced labor, 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).

### ***Control Variables***

In the analysis, I control for six variables that other studies have found to impact the independent and dependent variables. Firstly, I control for Gross Domestic Product per capita (GDP) with V-Dem data from Fariss et al. (2022). Baird et al. (2011) find a negative relationship between GDP per capita and infant mortality. We 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. Secondly, the urbanization rate is controlled with data from V-Dem as well. V-Dem data describes the urbanization rate as the ratio of the urban population to the total population. O'Donoghue (1991) finds a negative association between urbanization and infant mortality. Also, the female literacy rate in each country is controlled using the World Bank's World Development Indicators. 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. 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.

Furthermore, with data from GapMinder, I control Foreign Aid. GapMinder describes foreign aid as assistance from other countries to improve economic development and welfare. Mishra & Newhouse (2009) suggest that aid offered to countries to boost health care positively impacts infant mortality rates. In addition, domestic and international armed conflict is also controlled using V-Dem data. V-Dem codes domestic conflict as a dummy variable whereby a country has either experienced armed conflict within the state or not.' V-Dem data also codes it as a dummy variable for international conflict to represent armed conflict outside the state. Wang et al. (2019) suggest that armed conflicts, whether domestic or international, has a negative impact on infant mortality rates.

### *Variable Manipulations*

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

The data on female literacy rates exists mainly from 1985 till 2020. For some countries, the variable miss data for shorter periods 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, the empirical strategy is to interpolate the data for missing years of female education based on the available years (Gerring et al., 2012).

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

Though Houweling et al. (2005) and Arthur & Oaikhenan (2017) suggest that domestic government health expenditure affects infant mortality, I exclude it as a control variable in the analysis. We exclude domestic health expenditure due to detecting multicollinearity with the

'gross domestic product (GDP) per capita' variable. This exclusion is because domestic health expenditure's effect on infant mortality seems to depend on the size of a country's GDP per capita (Baird et al., 2011). The higher a country's GDP per capita, the more 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, due to the non – spontaneous nature of the effects of democracy on health (Gerring et al., 2021; Wang et al., 2017), I lag all the democracy-independent variables by one year. Gerring et al. (2012) posited that democracy should be given sufficient time to yield meaningful, tangible benefits to society since democratic institutions require time to enact and implement policies geared towards quality public goods provision. As robustness checks, I re-run the analysis with 5-year lagged independent variables. In reality, the timeframe (one year or five years) required by a new democratic government to kick off an agenda to save babies depends on whether the government is a re-elected government or an entirely new regime. One-year lagged democracy variables, therefore, assume a scenario where a government is re-elected while testing the 'new regime' scenario in robustness checks.

## Results and Discussion

To test hypotheses 1 and 2, Table 1 below shows the results of 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 primary 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 democratic mechanisms to create substantial effects on infant mortality. All the panel data regression models are controlled with fixed effects. The final model 9 shows an  $R^2$  of 0.746, meaning the model of interest explains 74.6 % of the variation in infant mortality.



Table 1: Regression Table for Democracy and Infant Mortality (t-1).

Regression Estimates of the Effect Aspects of Electoral Democracy and the Liberal Components Have on Infant Mortality Rates, 1960-2019.									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Infant Mortality Rates logged.								
Suffrage t-1	-0.140*** (0.0205)								-0.118*** (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)			(0.0523)
Judicial Constrains t- 1							-0.136***		0.0157
							(0.0239)		(0.0437)
Legislature Constraints t-1								-0.179***	-0.0978**
							(0.0196)		(0.0360)
<hr/>									
_cons	4.935***	4.828***	4.846***	4.857***	4.856***	4.857***	4.875***	4.924***	4.998***
	(0.0285)	(0.0231)	(0.0228)	(0.0231)	(0.0232)	(0.0242)	(0.0248)	(0.0241)	(0.0319)
Country FE	√	√	√	√	√	√	√	√	√
N	5640	5640	5640	5640	5640	5640	5583	5247	5236
R <sup>2</sup>	0.738	0.736	0.738	0.738	0.738	0.737	0.734	0.745	0.746
adj. R <sup>2</sup>	0.730	0.728	0.730	0.730	0.730	0.729	0.725	0.736	0.738

All democracy-independent variables are lagged by 1 – year. Standard errors in parentheses. IP = interpolated; FE = Fixed Effects; √ = included. \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

### *Regression Estimates.*

In Table 1, for the electoral aspects of democracy (EAD), 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 the coefficient reduces from -0.140 in Model 1 to -0.118 in Model 9. Model 9 seems to suggest an 11.8 percent 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 negative coefficient of -0.119 and -0.110 in Model 3 and Model 9, respectively. Model 9 suggests an 11 percent 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 negative coefficient of -0.114 and -0.112 in Model 5 and Model 9, respectively. Model 9 suggests that a 1 unit increase in freedom of expression and alternative sources of information leads to infant mortality rates reducing by 11.2 percent.

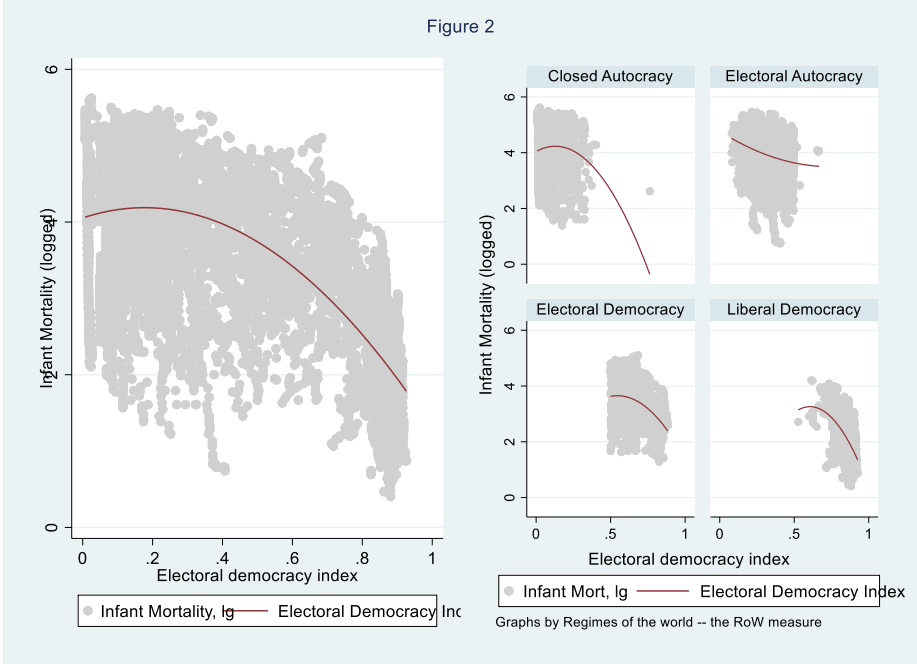
For the liberal components, equality before the law index displays a significant and negative relationship in Model 6, but in Model 9, it displays a significant and positive result contrary to expectations from the literature (Gerring et al., 2012). The judicial constraint on the executive index shows 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 percent decrease in infant mortality rates with a one-unit increase in the legislative constraints on the executive.

### *Which Aspects of Democracy Drives Reductions in Infant Mortality Rate?*

By comparing the estimates and significance levels of the aspects of democracy from Model 1 and Model 9 in Table 1, the results show 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, seems to drive the relationship that democracy has with infant mortality. Table 2 above partly corroborates hypothesis 1 and fully supports hypothesis 2. While Hypothesis 1 expected suffrage, clean elections, freedom of association, as well as freedom of

expression, and alternative sources of information to drive the inverse effect democracy has on infant mortality, the results suggest that freedom of association is not a driving factor of the democracy – infant mortality relationship. Also, the results seem to corroborate the supportive role that the legislative constraints on the executive as a liberal component of democracy have on infant mortality rates. Surprisingly, the results do not show an inverse relationship between equality before the law index and infant mortality. Though the study does not expect equality before the law to drive or substantial support reductions in infant mortality, the positive coefficient in Model 9 deserves explanation. The positive coefficient of equality before the law in Model 9, contrary to Model 6, could be because of the reduction in the N size in Model 9.

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



*Figure 2: The electoral aspects of democracy (Electoral Democracy Index) and infant mortality across regimes of the world.*

In Figure 4, I test Hypothesis 3 using a scatterplot to depict the effects of the EAD which seem to drive the democracy and infant mortality relationship across regimes in the regression analysis. The scatterplot above not only shows a curvilinear relationship between the EAD and infant mortality, but it also displays the variation of the democracy–infant mortality effect across closed autocracies, electoral autocracies, electoral democracies, and liberal democracies. Increases in the EAD do not lead to a decrease in infant mortality rates initially but unless some

threshold of democratization is reached does one observe a continuous reduction in infant mortality rates. The curvilinear relationship is explained by the unspontaneous effects of democracy on health outcomes as discussed in the literature (Gerring et al., 2012).

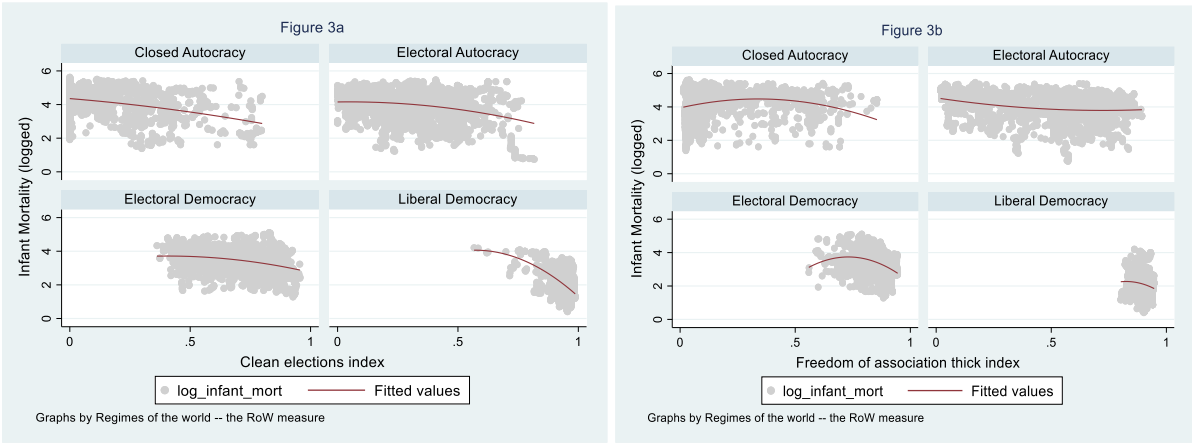
The results get most interesting with the four graphs on the right of figure 2 which zoom in further to show the relationship between the EAD and infant mortality rates across each regime. Closed autocracies have the lowest levels of EDI and most of such regimes seem to show increases in infant mortality 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 is 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 in electoral democracies where EDI levels are higher than they are 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 theories of vertical and diagonal accountability (Mechkova et al., 2019; Annaka & Higashijima, 2021). Consider the aspects of electoral democracy that the results support as driving down infant mortality rates in democracies: suffrage, clean elections, and freedom of expression. High level of suffrage guarantees voters in opposition strongholds and floating voters’ participation in elections. In competitive elections, the government requires more than its traditional voters to win power – it will need to convince opposition or floating voters as well. A viable reelection strategy will be to enhance public goods provision including quality healthcare across voter segments. In Ghana, before either the New Patriotic Party (NPP) or the National Democratic Congress (NDC) will win any election, it ought to impress voters in regions beyond its traditional support base namely the Ashanti and Volta regions respectively. The mechanisms employed by clean elections to reduce infant mortality rates are like suffrage. One can expect decreases in infant mortality rates when chief executives are credibly elected as compared to when they assume

office through rigged elections (Annaka & Higashijima, 2021). When elections are rigged, incumbents evade accountability and are not punished by voters for poor performance on health care. Several rounds of rigged elections imply that politicians ought not to invest in health care to win political power. The reverse is true if elections are clean. Recurring rounds of clean elections ensure constant accountability on the executive and the cumulative effect over several years is a robust or improved health care system. Freedom of expression and alternative sources of information also contributes to the drive through ensuring that public opinion is unhindered or uncensored. In good democracies, civil society organizations such as Save the Children, International Federation of Red Cross, and Red Crescent Societies (IFRC) and Doctors Without Borders are powerful tools for highlighting lapses in a country’s health system. Other domestic civil society groups such as the Right2Know Campaign and Anti-Corruption Action Center (ANTAC) in South Africa and Ukraine respectively have in recent years contributed significantly to holding government accountable. Such accountability mechanisms put pressure on governments to deliver effectively and supply the needed public goods to improve public welfare.

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 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.

*The Complementary Nature of the Electoral Aspects and Liberal Components of Democracy.*



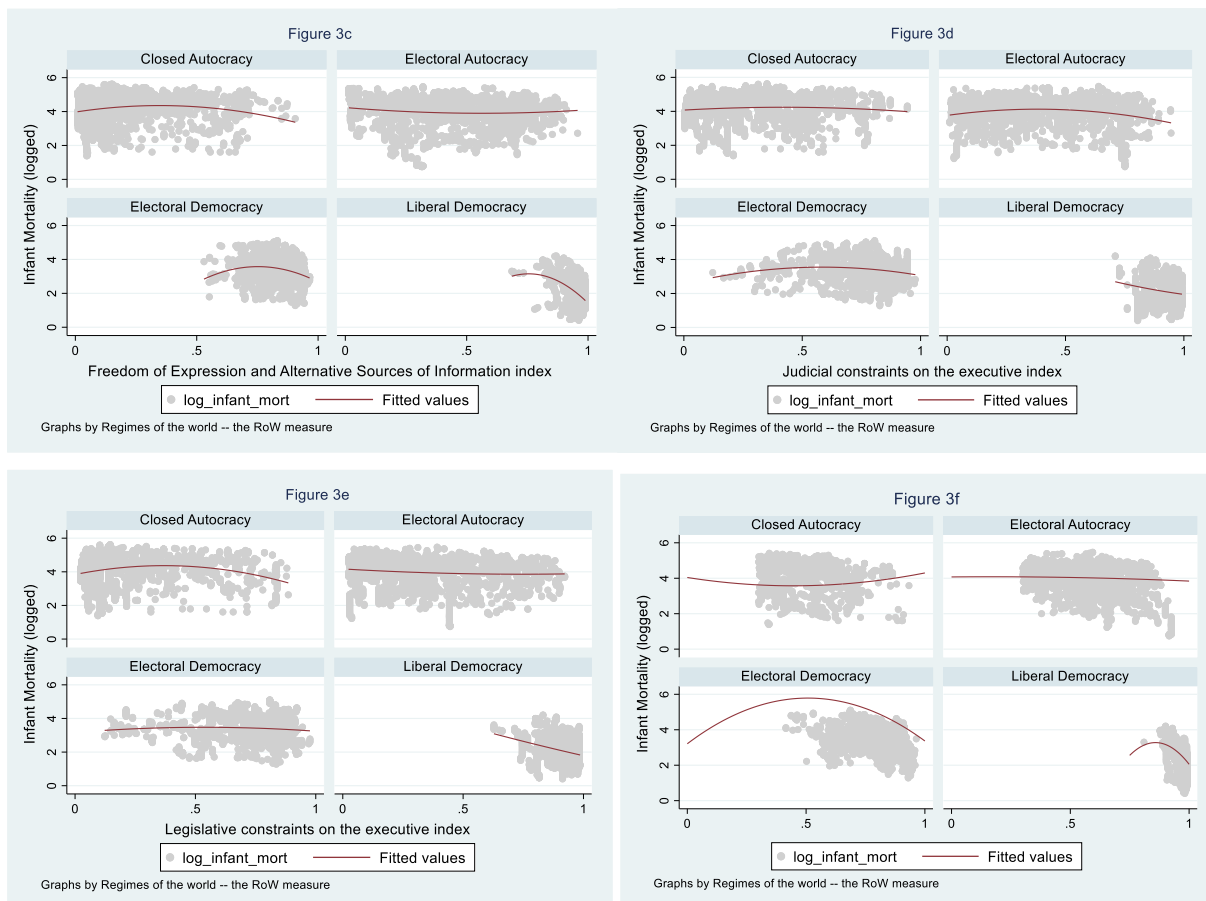


Figure 3a – 3f above provides additional evidence regarding how both the electoral aspects and liberal components of democracy contribute to reductions in infant mortality rates. Though the final regression model shows the aspects of democracy driving the democracy-infant mortality relationship, Figures 3b, 3d, and 3f above suggest that freedom of association, equality before the law, and the judicial constraint on the executive contribute to the overall democracy – infant mortality relationship. 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. More importantly, the graphs above provide evidence supporting a strong inverse effect on infant mortality rates if countries move from decent levels of democracy to perfect liberal democracies. These results imply that liberal democracies stand a greater chance of fighting infant mortality rates than autocracies and even electoral democracies.

### Robustness Checks.

We re-run the regression for aspects of democracy considering 5-year lagged independent variables to assess infant mortality explained by an increase in democracy five years prior. Only the final model ( Model 9 ), the model of interest, is presented.

Table 2: Regression Table for Democracy and Infant Mortality (t-1).

Robustness Checks, EDI, LCI and Infant Mortality (1960 – 2019)	
(1)	
Infant Mortality Rates, logged	
Suffrage $t-5$	-0.0101 (0.0225)
Elected Officials $t-5$	0.0272 (0.0125)
Clean Elections $t-5$	-0.0770** (0.0277)
Freedom of Association $t-5$	0.0242 (0.0414)
Freedom of Expression $t-5$	-0.00152 (0.0504)
Equality before the Law $t-5$	0.0259 (0.0430)
Judicial Constraints $t-5$	-0.0330 (0.0347)
Legislative Constraints $t-5$	-0.0564 (0.0328)
GDP per capita, logged	-0.693*** (0.0113)
Female Literacy, IP	-0.00349*** (0.0000557)
Urbanization	0.999*** (0.0530)
Foreign Aid	-0.000481*** (0.0000909)
Domestic Conflict	-0.0321* (0.0129)
International Conflict	0.0579** (0.0186)
_cons	4.872*** (0.0301)
Country FE	✓
$N$	5240
$R^2$	0.744
adj. $R^2$	0.736

EDI and LCI lagged by 5 – years. Standard errors in parentheses. IP = interpolated; FE = Fixed Effects; ✓ = included.  
\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$



In Table 2 above, 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 compared to the other aspects of democracy but display a decrease in co-efficient. The results 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 organized five years 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 after that ensure the implementation of these policies to support child delivery and maternity support programs to save babies.

## Conclusion

These results enhance understanding of the impact that democracy has on infant mortality by providing insights into the aspects of democracy driving the inverse relationship. Using panel data covering 182 countries from 1960 to 2019, I find that suffrage, clean elections, freedom of expression and alternative sources of information, drive the inverse relationship between democracy and infant mortality with support from the legislative constraints on the executive. Freedom of association, equality before the law, and the judicial constraints on the executive were also found to influence the overall democracy–infant mortality relationship. Another important finding is that liberal democracies followed by electoral democracies perform better than authoritarian regimes concerning reductions in infant mortality rates.

The study poses some policy implications that can contribute to attaining the United Nations Sustainable Development Goal 3 on Good Health and Well-being as well as ongoing efforts to enhance democracy and fight global authoritarianism. 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 can yield good public health outcomes, save babies, and secure the next generation.

## Policy Implications

These findings hold significant implications for the fields of global health and political science. Recognizing how democratic governance directly impacts public health opens avenues for interdisciplinary collaboration within the global health community, political science scholars and policymakers. These findings equip policymakers with a better understanding of which aspects of democracy play a pivotal role in improving health outcomes. It underscores the importance of strategic resource allocation, emphasizing the need to prioritize efforts in the areas where democratic governance has the most substantial impact on healthcare. Countries, seeking to improve health outcomes can enhance suffrage, clean elections, freedom of expression, and alternative sources of information, as well as the legislative constraints on the executive to strengthen political accountability mechanisms that make governments more attentive to public goods provision. Furthermore, democracy aid to new democracies and developing countries can prioritize improvements and safeguards in state institutions such as the electoral commissions, legislature, media, civil society, and human rights commissions, working in the frontlines of democratization. This study can strengthen the ongoing efforts of democracy – related organizations such as the International Institute for Democracy and Electoral Assistance and the V-Dem Institute aiding nations to safeguard democracy and resist authoritarianism.

## References

- 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>
- Bellinger, N. M. (2019). Why democracy matters: Democratic attributes and human well-being. *Journal of International Relations and Development*, 22(2), 413–440. <http://dx.doi.org.ezproxy.ub.gu.se/10.1057/s41268-017-0105-1>
- Besley, T., & Kudamatsu, M. (2006). Health and Democracy. *American Economic Review*, 96(2), 313–318. <https://doi.org/10.1257/000282806777212053>
- Boix, C., & Stokes, S. C. (2003). Endogenous Democratization. *World Politics*, 55(4), 517–549. <https://doi.org/10.1353/wp.2003.0019>
- 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](https://doi.org/10.1016/S0140-6736(19)30235-1)
- 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>
- Dahl, R. A. (1971). *Polyarchy: Participation and Opposition*. New Haven and London.
- Deacon, R. T. (2009). Public Good Provision under Dictatorship and Democracy. *Public Choice*, 139(1/2), 241–262.
- Diamond, L. (2002). Elections Without Democracy: Thinking About Hybrid Regimes. *Journal of Democracy*, 13(2), 21–35. <https://doi.org/10.1353/jod.2002.0025>
- 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 [dataset]. Harvard Dataverse. <https://doi.org/10.7910/DVN/FALCGS>
- Fox, J. A. (2015). Social Accountability: What Does the Evidence Really Say? *World Development*, 72, 346–361. <https://doi.org/10.1016/j.worlddev.2015.03.011>
- 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>
- 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>
- 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>
- 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.

Levitsky, S. R., & Way, L. A. (2012). Beyond Patronage: Violent Struggle, Ruling Party Cohesion, and Authoritarian Durability. *Perspectives on Politics*, 10(4), 869–889. <https://doi.org/10.1017/S1537592712002861>

Lindberg, S. I., Lührmann, A., & Mechkova, V. (2017). From de-jure to de-facto: Mapping Dimensions and Sequences of Accountability [Working Paper]. World Bank. <https://doi.org/10.1596/26212>

Lührmann, A., Marquardt, K. L., & Mechkova, V. (2020). Constraining Governments: New Indices of Vertical, Horizontal, and Diagonal Accountability. *American Political Science Review*, 114(3), 811–820. <https://doi.org/10.1017/S0003055420000222>

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), Article 1. <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>

McMann, K. M., Seim, B., Teorell, J., & Lindberg, S. (2020). Why Low Levels of Democracy Promote Corruption and High Levels Diminish It. *Political Research Quarterly*, 73(4), 893–907. <https://doi.org/10.1177/1065912919862054>

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'Donnell, G. A. (1998). Horizontal Accountability in New Democracies. *Journal of Democracy*, 9(3), 112–126. <https://doi.org/10.1353/jod.1998.0051>

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>

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](https://doi.org/10.1016/S2214-109X(16)30104-8)

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>

Relly, J. E. (2012). Examining a model of vertical accountability: A cross-national study of the influence of information access on the control of corruption. *Government Information Quarterly*, 29(3), 335–345. <https://doi.org/10.1016/j.giq.2012.02.011>

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

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

Scholte, J. A. (2004). Civil Society and Democratically Accountable Global Governance. *Government and Opposition*, 39(2), 211–233.

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>

Wang, Y.-T., Lindenfors, P., Sundström, A., Jansson, F., Paxton, P., & Lindberg, S. I. (2017). Women's rights in democratic transitions: A global sequence analysis, 1900–2012. *European Journal of Political Research*, 56(4), 735–756. <https://doi.org/10.1111/1475-6765.12201>

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 [Computer software]. 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>

Zakir, M., & Wunnava, P. V. (1999). Factors affecting infant mortality rates: Evidence from cross-sectional data. *Applied Economics Letters*, 6(5), 271–273. <https://doi.org/10.1080/135048599353203>