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Democracy's crisis advantage seems conditional: evidence from excess mortality across island and non-island jurisdictions for the Covid-19 pandemic

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Article

Keywords: Catastrophic Biological Risk, Covid-19, Democracy, Excess Mortality, GDP, Gini Coefficient, Inequality, Macroeconomic, Pandemic

Posted Date: March 26th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9142227/v1

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Additional Declarations: There is **NO** Competing Interest.

Abstract

Institutional advantages in crisis may be conditional on whether policies can be feasibly implemented. We test this using the Covid-19 pandemic, examining whether the associations of democracy and income inequality with outcomes vary across contexts with different implementation constraints. Using data from 193 jurisdictions, we link democracy (V-Dem Liberal Democracy Index) and income inequality (Gini coefficient) to age-standardised excess mortality (2020–2021) and GDP per-capita growth, comparing island and non-island settings. Democracy predicted lower excess mortality in island jurisdictions, but failed to do so in non-island jurisdictions, supported by a democracy–island interaction. In contrast, higher inequality predicted greater mortality and deeper economic contraction in non-islands, while democracy showed no consistent association with GDP trajectories. These findings suggest that institutional effects on crisis outcomes are context-dependent, with democracy conferring advantages when implementation constraints are lower, and inequality acting as a broader constraint on effective collective action.

Introduction

Large-scale crises test whether societies can coordinate behaviour at speed and scale, requiring institutions that can mobilise collective action across multiple levels of governance, communicate credibly, sustain compliance, and implement disruptive policies with legitimacy. Outcomes depend not only on the severity of the threat or formal preparedness, but on whether rules are perceived as legitimate, whether individuals expect others to comply, and whether states possess the administrative and fiscal capacity to implement, monitor, and enforce them effectively (Besley & Pearson, 2011; Levi, 1988; Ostrom, 1990). Yet institutional advantages are often treated as universal. For example, that “more democratic” governance should reliably yield better population health (Barnish, Tørnes, & Nelson-Horne, 2018; Bollyky et al., 2019; McCartney et al., 2019; Oyèkọ́lá, 2023). We argue instead that institutional advantages are conditional: they depend on whether there are surrounding implementation constraints. Context allows policies to be implemented, enforced, and socially sustained.

A practical way to study this conditionality is to examine contexts where feasibility differs systematically. Island jurisdictions possess distinctive implementation constraints where borders are more governable, entry can be controlled with fewer points of leakage, and early epidemic dynamics can be altered decisively through border, quarantine, and disease elimination policy (Boyd, Baker, Kvalsvig, & Wilson, 2025). In contrast, non-island jurisdictions often face continuous cross-border movement and higher implementation complexity. This difference does not guarantee success, but changes the feasibility of health and economic crisis intervention. It plausibly amplifies or attenuates the pathways through which governance quality and social legitimacy translate into crisis outcomes.

This perspective implies that regime type (more vs less democratic) matters primarily through its interaction with implementation constraints. Democracy can facilitate compliance through trust, accountability, and credible communication. On the other hand, social structure, notably income inequality, can undermine coordination by fragmenting risk exposure, limiting the ability to comply, and weakening social solidarity and economic resilience.

Rather than asking whether democracy or inequality “predict” pandemic outcomes in general, we test a more specific proposition: do these societal characteristics matter differently in contexts with different implementation constraints?

We test these ideas using a global cross-jurisdictional dataset (193 jurisdictions), linking the V-Dem Liberal Democracy Index (which is the product of both liberal and electoral components of democracy), and income inequality (Gini coefficient) to two Covid-19 pandemic-era outcomes: age-standardised cumulative excess mortality (2020–2021) and GDP per-capita growth across 2019–2020 and 2020–2021. To reduce bias from differential reporting of Covid-19 deaths, we focus on age-standardised excess mortality, a more robust outcome for cross-jurisdiction comparison expressing the difference between expected deaths based on baseline trend and those observed during the pandemic period. We pre-specify island status as a moderator of effects and estimate interaction models controlling for major structural covariates.

Our aim is not simply to re-litigate whether democracy “performed better” or whether inequality “made things worse,” but to identify a more general pattern: when do institutional features translate into effective crisis response? We test whether democracy’s association with mortality is stronger in island settings where implementation leverage is higher, and whether inequality shows a more pervasive relationship across contexts as a broad constraint on collective action capacity and economic resilience.

Existing evidence on democracy, inequality, and pandemic performance is suggestive, but not decisive about this conditionality. Studies differ sharply in outcome measurement, covariate control, and geographic scope, and often treat governance effects as homogeneous across settings. This makes it difficult to distinguish genuine institutional advantages from artefacts of reporting, timing, and context. In what follows we summarise what is known about democracy and inequality as determinants of population health and pandemic outcomes, then motivate why a feasibility contrast between island and non-island jurisdictions provides a useful test of conditional effects.

The Covid-19 pandemic presented a global health crisis causing tens of millions of deaths. Beyond formal preparedness (eg, as measured by the Global Health Security Index)(Boyd, Baker, & Wilson, 2025) and strategy choices such as border controls and exclusion/elimination strategy (Boyd, Baker, Kvalsvig, et al., 2025), outcomes also depended on broader social and institutional factors including corruption and institutional quality (Boyd, Baker, Kvalsvig, et al., 2025; Covid-19 NP Collaborators, 2022). These are factors whose effects may be contingent on implementation constraints across contexts.

Democracy associates with better health across multiple indicators including mortality, life expectancy, and infant health (Barnish et al., 2018; McCartney et al., 2019; Oyèkọ́lá, 2023). Democratisation through 1980–2016 drove 8-10% reductions in adult mortality relative to countries that remained autocratic (Bollyky et al., 2019). These relationships motivate interest in pandemic performance, but they do not imply effects will be uniform under crisis conditions.

Measuring Covid-19 outcomes presents important methodological challenges that threaten to obscure genuine performance differences. Comparison of officially reported deaths with excess mortality across democracy levels, revealed large gaps in low-democracy regimes indicating unreported deaths but small gaps in high-democracy countries (Neumayer & Plümper, 2022). Hence, studies using official Covid-19 statistics may

reflect reporting behaviour more than true mortality. Using excess mortality, which cannot be easily manipulated, democratic countries with higher government effectiveness demonstrated reduced excess mortality (Annaka, 2022).

Multiple studies using excess mortality and controlling for extensive confounders found consistent inverse associations between democracy quality and excess deaths, with effects ranging from 2.18 fewer deaths per 100,000 per democracy index point, to strong effects for political culture dimensions (Jain, Clarke, & Beaney, 2022; Kim, 2025; Martín-Martín et al., 2024). Yet most analyses implicitly assume these effects are homogeneous across contexts, leaving open whether governance advantages depend on implementability.

While autocracies imposed more stringent lockdowns, democracies achieved 13-34% higher compliance with less restrictive measures through social capital and voluntary cooperation rather than coercion (Chen, Frey, & Presidente, 2023). These pathways, including accountability, trust, and civic engagement, are likely to matter most when policy tools can be implemented credibly and enforced effectively, suggesting a natural interaction with contexts such as border governability in conjunction with rapid elimination of any outbreaks.

Limited evidence exists regarding economic outcomes. Countries with higher democratic maturity tended to suffer greater GDP per capita losses early in the pandemic, possibly reflecting more transparent reporting or proactive public health responses that temporarily constrained economic activity (Nakasaki & Nagasaki, 2024). However, more democratic states also enacted substantially larger fiscal stimulus packages (Yasar & Elgin, 2024).

In terms of income inequality, limited high-quality studies suggest it may adversely affect pandemic outcomes, although evidence remains mixed. A systematic review found only two high-quality multi-country studies (n>100) examining the Gini coefficient and mortality (Abbasi, Karimi Dehkordi, SoleimanvandiAzar, Roohravan Benis, & Nojomi, 2025), and few examine context-dependence. One study (n = 125) found a positive correlation between higher inequality and increased mortality (Davies, 2021), the other (n = 207) found higher inequality predicted lower mortality (Erdal, Uguz, & Sasmaz, 2024). However, this latter study used reported Covid-19 deaths, not excess mortality, and the former used an arbitrary metric of cumulative deaths. Other studies had methodological limitations including lack of age-standardisation (Ataguba, Birungi, Cunial, & Kavanagh, 2023; Brown, Dattilo, & Rockey, 2025).

A high-quality study of 29 European countries found the Gini coefficient was associated with increased excess mortality even when controlling for GDP, health expenditure, and vaccination rates (Pizzato, Gerli, La Vecchia, & Alicandro, 2024). Another study examining 34 countries found high inequality countries (Gini >0.35) experienced more excess deaths per million than less unequal countries (Ioannidis, Zonta, & Levitt, 2023), but it remains unclear whether geography conditions these associations. Divergent regional and global findings may reflect genuine geographic heterogeneity or important methodological variations. This leaves open whether these relationships depend on context.

Recent research indicates that islands and non-islands experienced Covid-19 impacts differently, with preparedness being more important for non-islands while border restrictions proved more important for islands (Boyd, Baker, Kvalsvig, et al., 2025; Boyd, Baker, & Wilson, 2025; Rose et al., 2021). This contrast provides a concrete test of conditional institutional effects: if democracy operates partly through legitimacy,

compliance, and the effective implementation of disruptive policies, its association with mortality should be stronger where key levers, particularly border and quarantine policy, are more governable. We therefore estimated whether democracy and inequality show systematically different relationships with pandemic related excess mortality and GDP growth in island versus non-island jurisdictions, using age-standardised cumulative excess mortality to reduce bias from differential reporting.

Results

We analysed 193 jurisdictions to examine whether associations between governance characteristics and pandemic outcomes differed by implementation context. Our primary finding is that the relationship between democracy and excess mortality varies systematically between island and non-island settings, consistent with conditional institutional effects.

Democracy x island interaction and excess mortality

Democracy's association with excess mortality differed between island and non-island jurisdictions. In fully-adjusted models, the interaction between democracy (LibDem Index) and island status was strong (β = −4.51 ± 1.72 SE, p = 0.0095), indicating that the relationship between democracy and mortality depends on geographic context (Figure 1, Figure 2). Among island jurisdictions (n = 29), higher democracy scores were associated with lower age-standardised cumulative excess mortality (β = −5.92 ± 2.20 SE, p = 0.013), whereas among non-island jurisdictions (n = 134) there was, surprisingly, no evidence of an association (β = −0.47 ± 0.65 SE, p = 0.47). For a hypothetical island with cumulative excess mortality of 100 per 100,000 population, our models predicted 33.6 (95% CI 10.1 to 52.6) fewer deaths per 100,000 for a 10-point (+0.1) higher LibDem score (Figure 1). Robustness checks (see Supplementary Material) strengthened confidence in these findings.

This interaction indicates that the effect of democracy on mortality differs significantly between island and non-island jurisdictions, consistent with the hypothesis that governance effects depend on implementation constraints. In unadjusted analyses, democracy was negatively associated with mortality across all jurisdictions, but this association was attenuated after adjustment for key structural factors and was not evident in non-islands.

The unadjusted analysis across all jurisdictions (n = 170), revealed higher LibDem Index scores were strongly associated with lower age-standardised cumulative excess mortality (β = −4.25 ± 0.54 SE, p < 0.000001), see Table 1. The fully-adjusted model (n = 163) explained a moderate proportion of variance (adjusted R^2 = 0.39) with GDP per capita a strong negative predictor of mortality (β = −0.66, p = 0.0002). Full regression results across all models and variables can be found in the Supplement, Table S2.

Table 1: Regression results and sample sizes for the excess mortality models (LibDem and Gini, separately, vs age-standardised cumulative excess mortality 2020–2021 (fully-adjusted models controlling for GDP per capita, Global Health Security (GHS) Index score, population size, and, in the Gini model, government corruption).

Jurisdictions	model	term	estimate	std error	p-value	r2	adj r2	F-stat	n
All	bivariate	LibDem	-4.247	0.544	<0.000001	0.27	0.26	60.97	170
All	adjusted	LibDem	-2.157	0.745	0.004307	0.40	0.39	26.74	163
Islands	bivariate	LibDem	-7.140	1.689	0.000227	0.39	0.37	17.88	30
Islands	adjusted	LibDem	-5.924	2.199	0.012699	0.46	0.37	5.19	29
Non-islands	bivariate	LibDem	-3.223	0.508	<0.000001	0.23	0.22	40.19	140
Non-islands	adjusted	LibDem	-0.474	0.651	0.468584	0.48	0.46	29.49	134
All	bivariate	Gini	0.143	0.025	<0.000001	0.21	0.20	33.64	132
All	adjusted	Gini	0.061	0.023	0.010604	0.46	0.44	18.90	117
Islands	bivariate	Gini	0.234	0.086	0.011774	0.25	0.21	7.49	25
Islands	adjusted	Gini	-0.055	0.189	0.776246	0.37	0.10	1.39	18
Non-islands	bivariate	Gini	0.116	0.022	0.000001	0.21	0.20	27.92	107
Non-islands	adjusted	Gini	0.052	0.019	0.009178	0.53	0.50	20.70	99

Income inequality (Gini coefficient) and excess mortality

Income inequality showed a more consistent association with adverse outcomes, particularly in non-island settings. In fully-adjusted models, higher income inequality (Gini coefficient) was associated with higher excess mortality when analysing all jurisdictions (β = 0.061 ± 0.023 SE, p = 0.011, adj. R^2 = 0.44). This relationship was not observed in islands (β = −0.055, p = 0.78), but remained significant in non-islands (β = 0.052 ± 0.019 SE, p = 0.009, adj. R^2 = 0.50), where a 5-point lower Gini coefficient (less inequality) predicts 15.8 (95% CI: 4.3 to 26.3) fewer deaths per 100,000 population for a hypothetical island jurisdiction with starting excess mortality of 100 per 100,000 population), see Figure 3.

Macroeconomic outcomes

Inequality was also associated with macroeconomic outcomes. Higher inequality (higher Gini coefficients) predicted larger GDP contractions in 2019–2020 (β = −0.225 ± 0.070 SE, p = 0.0018), particularly in non-island jurisdictions (β = −0.242 ± 0.053 SE, p = 0.000013), see Figure 4. A weaker positive association was observed for GDP growth in 2020–2021 (Figure 5), indicating a modest rebound following larger initial contractions. These results indicate inequality magnified Covid-19's macroeconomic shock in 2020, primarily in non-island jurisdictions. More unequal non-island economies showed modestly stronger rebound after deeper initial contractions.

Democracy and GDP growth

Democracy was not associated with GDP growth trajectories after accounting for structural covariates. In fully-adjusted models, LibDem Index scores were not associated with GDP per-capita growth in either 2019–2020 or 2020–2021, and this pattern was consistent across island and non-island jurisdictions.

Across models, higher GDP per capita and stronger GHS Index scores were associated with lower excess mortality, while population size and corruption showed variable associations (Supplement Table S2).

Descriptive data

Table 2 presents descriptive data across the three categories of jurisdiction.

Table 2: Descriptive data across jurisdiction categories

	All Jurisdictions		Non-Islands		Islands	
Variable	Mean (SD) [Range]	N	Mean (SD) [Range]	N	Mean (SD) [Range]	N
Age-standardised cumulative EM (2020-2021)	162.11 (154.44) [-59.63, 897.42]	193	194.33 (158.90) [-29.4, 897.42]	145	64.75 (84.79) [-59.63, 333.68]	48
GDP growth 2019-2020 (%)	+0.39% (2.6%) [-9.2%, +10.0%]	182	+0.46% (2.6%) [-9.2%, +10.0%]	137	+0.18% (2.6%) [-5.8%, +5.6%]	45
GDP growth 2020-2021 (%)	+0.81% (2.6%) [-7.5%, +13.2%]	182	+0.99% (2.6%) [-7.5%, +13.2%]	137	+0.27% (2.7%) [-5.6%, +8.9%]	45
LibDem Index	0.41 (0.26) [0.01, 0.89]	170	0.39 (0.26) [0.01, 0.89]	140	0.50 (0.24) [0.05, 0.84]	30
Gini coefficient	37.0 (7.20) [24.6, 59.1]	132	37.4 (7.55) [24.6, 59.1]	107	35.2 (5.20) [26.7, 43.8]	25
Population	40.7 million (149 million) [10,600, 1410 million]	189	48.7 million (168 million) [34,700, 1410 million]	143	15.8 million (46.7 million) [10,600, 272 million]	46
GHS Index 2019	40.5 (14.4) [16.2, 83.5]	191	42.2 (14.19) [16.2, 83.5]	144	35.25 (14.00) [17.7, 77.9]	47
Government Corruption Index	-0.027 (1.39) [-2.79, 2.36]	163	0.144 (1.35) [-2.79, 2.36]	133	-0.79 (1.33) [-2.76, 1.92]	30

Note: EM = excess mortality per 100,000 population; N = sample size; SD = standard deviation; Range = [minimum, maximum]; GDP growth: growth in five-year mean GDP per capita year on year; GHS Index: Global

Health Security Index score 2019; Government Corruption Index: perception of government corruption index as derived by the Covid-NP Collaborators (see Methods); LibDem Index: V-Dem Liberal Democracy Index.

Discussion

Our results suggest that institutional advantages in crisis are conditional rather than universal. In the Covid-19 pandemic liberal democracy was associated with lower excess mortality in island jurisdictions but not in non-islands, a difference supported by a democracy–island interaction in fully-adjusted models. These differences correspond to approximately 34 fewer deaths per 100,000 for a hypothetical Covid-19 excess mortality of 100 per 100,000 and a 10-point (+0.10 LibDem score) increase in democracy in island settings. For reference, during 2020-2021 the mean cumulative excess mortality in islands was 65 per 100,000 (Table 1). In contrast, income inequality showed a more consistent association with worse outcomes, particularly in non-island settings.

The key pattern is the conditionality of democracy's association with mortality. Interpreted through a collective-action lens, this suggests that democratic governance may confer an advantage primarily when the policy problem is highly tractable and solutions are implementable and can be enforced and sustained. This is when governments can translate legitimacy and accountability into timely, enforceable action.

A plausible explanation is variation in implementation constraints. Island settings can make measures such as border control and quarantine enforcement more tractable, reducing opportunities for reintroduction of infection and allowing early interventions to have outsized effects. Under these conditions, democratic strengths, such as credible risk communication, accountability, and voluntary compliance (in a context of perceived success likelihood), may translate more directly into population-level outcomes. In non-island contexts, where implementation is structurally harder and epidemic coupling across borders is greater (Kim, 2025), these same governance attributes may be insufficient to overcome constraints, thereby attenuating any observable association between democracy and mortality.

In contrast, inequality behaves as a broad constraint on coordination capacity. Higher Gini coefficients were associated with higher excess mortality in non-island jurisdictions and with deeper GDP contractions in the initial shock period. This pattern is consistent with inequality operating through multiple channels that do not depend on border tractability: for example, differential exposure (frontline work and crowded housing), unequal capacity to comply with distancing, and weaker social insurance and trust. In this sense, inequality may function as a risk amplifier that increases both health vulnerability and macroeconomic fragility during acute shocks, particularly in settings already facing high implementation constraints.

The absence of a robust association between democracy and GDP trajectories after accounting for structural covariates is also informative. This suggests that any democratic advantages for mortality under high-leverage conditions do not automatically translate into aggregate economic protection, but nor do they mean increased economic costs.

Democracy, islands, and pandemic mortality

Democratic islands combining political legitimacy, cohesive social structures, and enforceable borders may have translated trust and accountability into timely interventions (stringent border controls, targeted

quarantine, and clear public communication) through voluntary compliance without authoritarian coercion. This confluence of democracy and geography was most evident in the form of an explicit exclusion/elimination strategy which was associated with a negative excess mortality for the 2020-21 period in five countries, four of which were democratic islands (Boyd, Baker, Kvalsvig, et al., 2025). The crisis outcome in islands is determined not just by the ability to leverage implementation, and their level of democracy, but also this probably facilitates strategy choice.

The broader Covid-19 literature generally finds democracy protective for excess mortality when pooling across countries (Annaka, 2022; Martín-Martín et al., 2024). Our analysis partially aligns but suggests this benefit is geographically contingent, concentrated in islands when applying important adjustments of age-standardisation, appropriate variable transformations, and robust controls (ie, GDP, population size, corruption, GHS Index).

Inequality, mortality, and economic trajectories

Inequality's role was more uniform, at least in non-island settings. Higher Gini coefficients were associated with higher excess mortality globally and among non-islands, with adjusted models explaining roughly half the variance. This result extends prior regional findings to a nearly global sample using age-standardised excess mortality.

The economic results reveal a similar structure. Inequality predicted GDP decline from 2019 to 2020, yet more unequal non-island economies showed somewhat stronger rebound in 2020–21 once controls were included. This finding suggests an "overshoot" dynamic: high-inequality countries were more vulnerable to initial shocks but rebounded more strongly macroeconomically in year two, perhaps via aggressive reopening or concentrated sectoral recovery.

Importantly, this overshoot doesn't mitigate underlying macroeconomic harm. Deeper initial contraction combined with higher mortality and stronger rebound is not equivalent to a gentler, more equal trajectory. Rather, inequality appears to act as a risk amplifier, exacerbating crisis vulnerability while fostering volatile recoveries that leave structural disparities intact or worsened. This underscores that having established redistributive and social protection policies are central to pandemic resilience, not peripheral.

Democracy, economic performance, and the "lives vs livelihoods" narrative

One striking negative result is the absence of a robust relationship between democracy and macroeconomic outcomes. Once pre-pandemic GDP, population size, and health preparedness were controlled for, democracy did not predict either the 2019–20 contraction depth or 2020–21 recovery pace. Bivariate associations disappeared with structural controls, indicating confounding by wealth and baseline characteristics. This finding complicates narratives praising democracies for economic protection or authoritarian regimes for prioritising growth over health. Pre-existing economic structure, particularly baseline GDP per capita, emerges as the dominant recovery driver.

However, our results should not be over-interpreted as implying regime-type neutrality on all economic dimensions. We examine only aggregate GDP per-capita growth. Other outcomes, distributional effects, sector-specific impacts, employment, debt sustainability, or fiscal support composition, may differ systematically by

regime type, as suggested by work showing larger fiscal packages in democracies (Yasar & Elgin, 2024). Detailed cross-national analysis of these dimensions remains largely absent and represents an important research agenda.

Potential implications for democratic resilience, inequality, and global catastrophic risk

As the world moves on from the Covid-19 pandemic, but faces the ongoing threat of global catastrophic risks, these findings point to a more general principle: institutional performance in crises depends on the interaction between governance and the feasibility of implementation. Viewed alongside pre-Covid evidence that democracy generally improves population health, our findings suggest a more conditional picture under pandemic stress, with pronounced democracy benefits in island jurisdictions. This pattern suggests democracy's effectiveness as a resilience enhancer depends on complementary conditions: administrative capacity, geographic manageability, and cohesive social structures. Where these are present, as in many islands, democracy and geography can combine to produce exceptionally low pandemic-associated mortality. One important implication is that policy advice for crises should not take a one-size-fits-all approach. This point has previously been made with respect to the World Health Organization's advice on borders and trade during the Covid-19 pandemic, where island geographical advantages, and indeed administrative capabilities, may not have been recognised (Boyd & Wilson, 2021).

Inequality's consistent role as a risk multiplier has broader implications for global catastrophic biological risks. Historical work on societal collapse emphasises extractive institutions, corruption, and socio-economic stratification in undermining resilience, while recent theorising on long-term global risks highlights inequality's dangers for collective action and social stability (Kemp, 2025; Peregrine, 2021). Our results offer contemporary empirical support for these broad concerns.

Measurement timing, data quality, and methodological contributions

This study reinforces the critical importance of measurement choices in evaluating pandemic performance. Early studies using officially reported cases and deaths often showed authoritarian advantage, patterns that inverted when reliable excess mortality data became available (Neumayer & Plümper, 2022). Our use of age-standardised cumulative excess mortality for 2020–21, with signed cube-root transformation to handle skew and negative values, reduces bias and estimation instability. Log transformations of GDP and population size, plus inclusion of the GHS Index and a corruption index, approximate a plausible structural model without overfitting.

This design inevitably involves trade-offs. Each covariate reduces sample size for complete-case analysis, particularly in inequality models where corruption data are less complete, raising generalisability and potential selection bias concerns. Excess mortality dataset choice matters as different global estimates vary in coverage, age-adjustment, and uncertainty handling. Our results therefore complement, rather than replace, earlier analyses using alternative sources and time windows. Full reconciliation of why some studies find strong global democracy effects while ours finds them primarily in islands requires side-by-side dataset comparison, standardised age-adjustment, and harmonised specifications.

Methodologically, our study combines (i) global coverage, (ii) appropriately age-standardised and cumulative excess mortality, (iii) appropriate data transformations, (iv) theoretically grounded controls and a plausible

causal diagram (see Methods), (v) both democracy and inequality as predictors, and (vi) explicit island stratification. No prior work jointly satisfies all these conditions, particularly linking health and macroeconomic outcomes within a single framework. Additionally, we have reported two independent lines of evidence that the island interaction is a genuine within-data signal, rather than a product of either outliers or regional clustering.

Limitations and future directions

Several limitations should be noted. First, this observational analysis cannot rule out unmeasured confounding from historical, cultural, geographic, or institutional factors that may influence both governance characteristics and pandemic outcomes. Second, sample sizes are modest in fully-adjusted models, particularly for islands ($n \approx 18–29$), warranting cautious interpretation despite the statistically robust democracy*island interaction. Third, we focus on 2020–21, before widespread vaccination and long-term adaptation; later pandemic waves, virus variants, and vaccination campaigns may have altered these relationships. Fourth, economic outcomes are limited to aggregate GDP per-capita growth. Finally, our models explain up to 50% of variance, and spatial relations among jurisdictions are not fully captured, indicating our causal assumptions are necessarily incomplete.

Future work should incorporate spatial analyses to capture contagion dynamics and regional clustering, distinguish specific institutional features beyond broad democracy scores (electoral quality, civil liberties, centralised versus decentralised governance), extend longitudinally through later years to evaluate effects of democratic backsliding, fiscal exhaustion, and vaccination strategies, and employ a wider range of outcome measures.

Conclusion

Our study suggests democracy's pandemic-related benefits are conditional, emerging most clearly when combined with the greater opportunities for strong control policies provided by island geography, and the potential for populations to recognise these advantages, the increased likelihood of control success, and cohere in response. Surprisingly, the purported benefits of democracy in a crisis attenuated in non-island settings when controlling for other important structural covariates such as pandemic preparedness and wealth. Additionally, high inequality consistently undermines health and macroeconomic performance, especially in non-island states. For policymakers, democratic quality must be coupled with capable institutions and reduced inequality, as well as preparedness and wise strategy choice to yield maximally robust resilience. Investments in democratic governance, anti-corruption, and inequality reduction are therefore mutually reinforcing components of preparedness for future pandemics and other large-scale global shocks, not competing priorities.

Methods

Jurisdictions studied

Our dataset comprised 193 sovereign jurisdictions categorised according to island (n = 48) and non-island status (n = 145). See Supplement for definition of islands and additional methodological details.

Outcome variables

Excess mortality

Age-standardised cumulative excess mortality (2020 and 2021 combined), for all the jurisdictions was obtained from the GBD Study Demographics Collaborators (GBD 2021 Demographics Collaborators, 2024). This age-standardised excess mortality variable represents the difference between observed all-cause deaths and expected deaths (based on pre-pandemic trends) during 2020–2021.

GDP per capita growth

We used growth in gross domestic product (GDP) (adjusted for purchasing power parity [PPP]) per capita to represent macroeconomic outcomes. GDP PPP per capita data for all jurisdictions was sourced from the World Bank's World Development Indicators. Growth was measured as annual percentage change in five-year geometric mean of GDP PPP per capita.

Independent variables

Democracy level

Following Kim (Kim, 2025), we used the V-Dem Liberal Democracy Index (LibDem Index). This dataset is collated and published by V-Dem and we used the pre-Covid-19 2019 iteration of data.

Income inequality

We used the Gini coefficient which is a measure of income inequality on a scale from 0 to 100, with higher values indicating higher inequality. Data for 2015–2019 were obtained from the World Bank, and the five-year mean used in analysis.

Control variables

Covariates included in our models were: mean GDP per capita (as above) calculated for the five-year period ending in 2019; jurisdiction population size for 2019 obtained from the World Bank; GHS Index scores for 2019 (Cameron, Nuzzo, & Bell, 2019) representing pandemic preparedness and previously correlated with pandemic outcomes (Boyd, Baker, & Wilson, 2025); government corruption scores from the Covid-19 NP Collaborators, previously demonstrated to predict outcomes (Covid-19 NP Collaborators, 2022). Figure 6 illustrates our *a priori* causal assumptions.

Analyses

Correlations among variables:

Multicollinearity was assessed using variance inflation factors (VIFs) and Pearson correlation analysis (n = 116 countries, listwise deletion) to guide control variable selection. Control variables with absolute correlations exceeding 0.8 with other variables were excluded from final models, omitting the corruption index from LibDem models only.

Regression analysis:
Ordinary least squares regression examined associations between LibDem (political) and Gini (economic) predictors and outcomes of excess mortality (signed cube-root transformed: sign·|value|^1/3 due to existence of negative values) and GDP growth, with GDP per capita and population entered as natural logarithms. Six analysis families (inequality and mortality across islands, non-islands, all jurisdictions) were fitted first as unadjusted models (main predictor only), then as adjusted models adding log GDP per capita, log population, GHS index, and corruption index where applicable.

Interaction analysis:
Interaction analyses tested whether associations between democracy (LibDem) or inequality (Gini 2015-2019) and outcomes (pandemic-related excess mortality, GDP growth 2019-20 and 2020-21) differed between island and non-island states by adding a binary island indicator and interaction term to fully-adjusted models. Models used heteroskedasticity-robust (HC3) standard errors to test whether slopes differed by island status conditional on controls.

Robustness checks:

We conducted robustness checks including influence diagnostics, region fixed effects, and feasibility-gradient sensitivity analyses (see Supplementary Material).

Declarations

Ethics statement

Our analysis employed only publicly available jurisdiction-level data, and as such was exempt from institutional ethical review.

Acknowledgments

We thank Prof Austin Schumacher from the GBD Collaboration for data sharing.

Author contributions

MB and NW conceived the study. MB, NW, and MGB contributed to the study design. MB collated data and performed the analysis, MB, NW, MGB contributed to drafting the manuscript, with each contributing important intellectual content.

Conflict of interest

None declared

Funding

This study received no specific funding.

Data availability

Data and code used in this study are available at: https://adaptresearchwriting.com/wp-content/uploads/2026/03/260305-data-code_covid-democracy.zip

Use of Artificial Intelligence (AI) tools

AI was used to help iterate and improve R code for the analysis and to assist in reducing word count from an initial overlength paper. All AI outputs were closely scrutinised and revised by the authors before use in this study.

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Figures

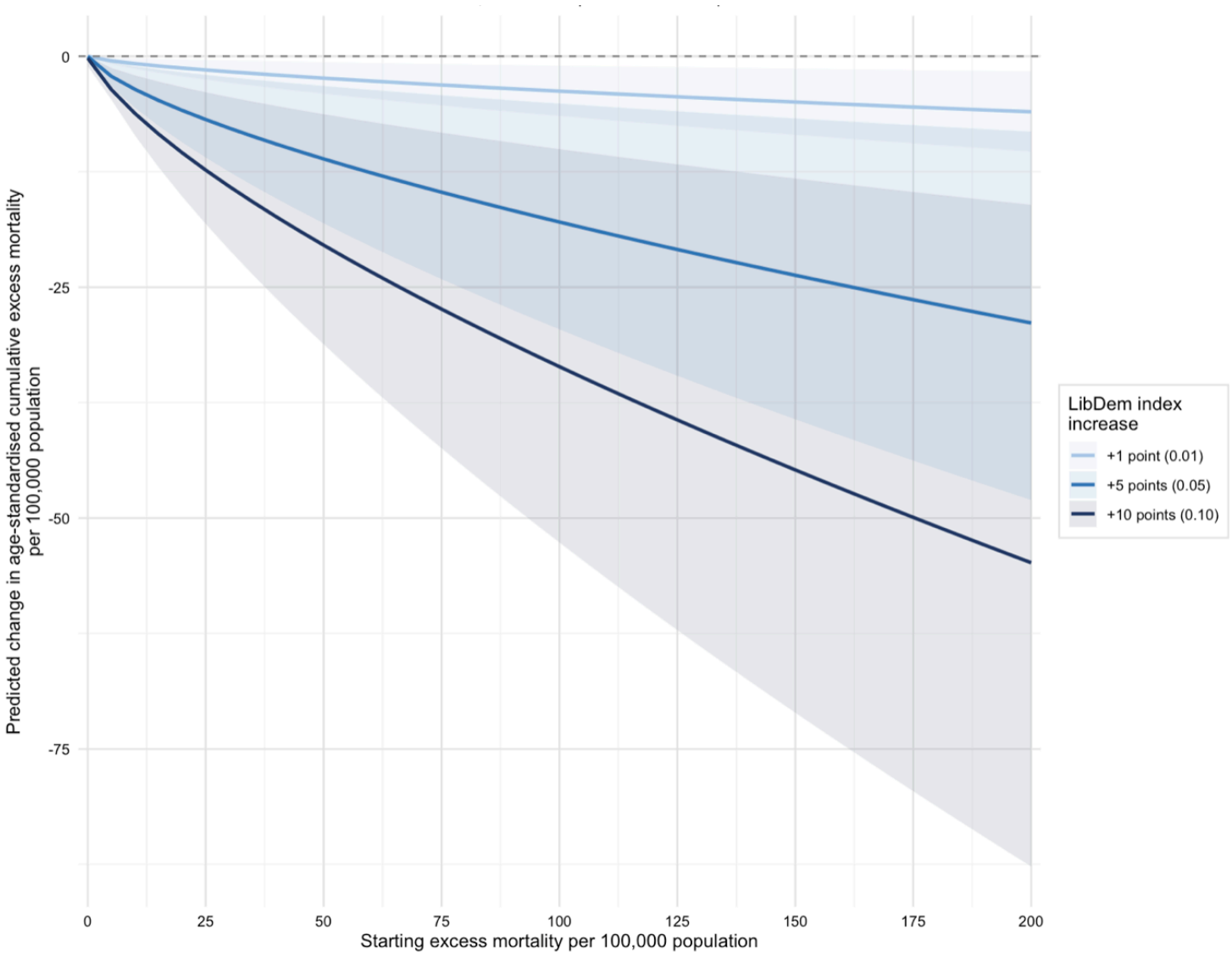


Figure 1

Democracy and excess mortality in island jurisdictions: Predicted age-standardised cumulative excess mortality (2020–2021) by democracy level for island jurisdictions, showing a negative association with higher democracy level (eg, a 10-point higher LibDem index predicts 33.6 fewer deaths per 100,000 population for a hypothetical island jurisdiction with starting excess mortality of 100 per 100,000 population). Fully adjusted model, controlling for GDP per capita, Global Health Security (GHS) Index score, and population size; n = 29.

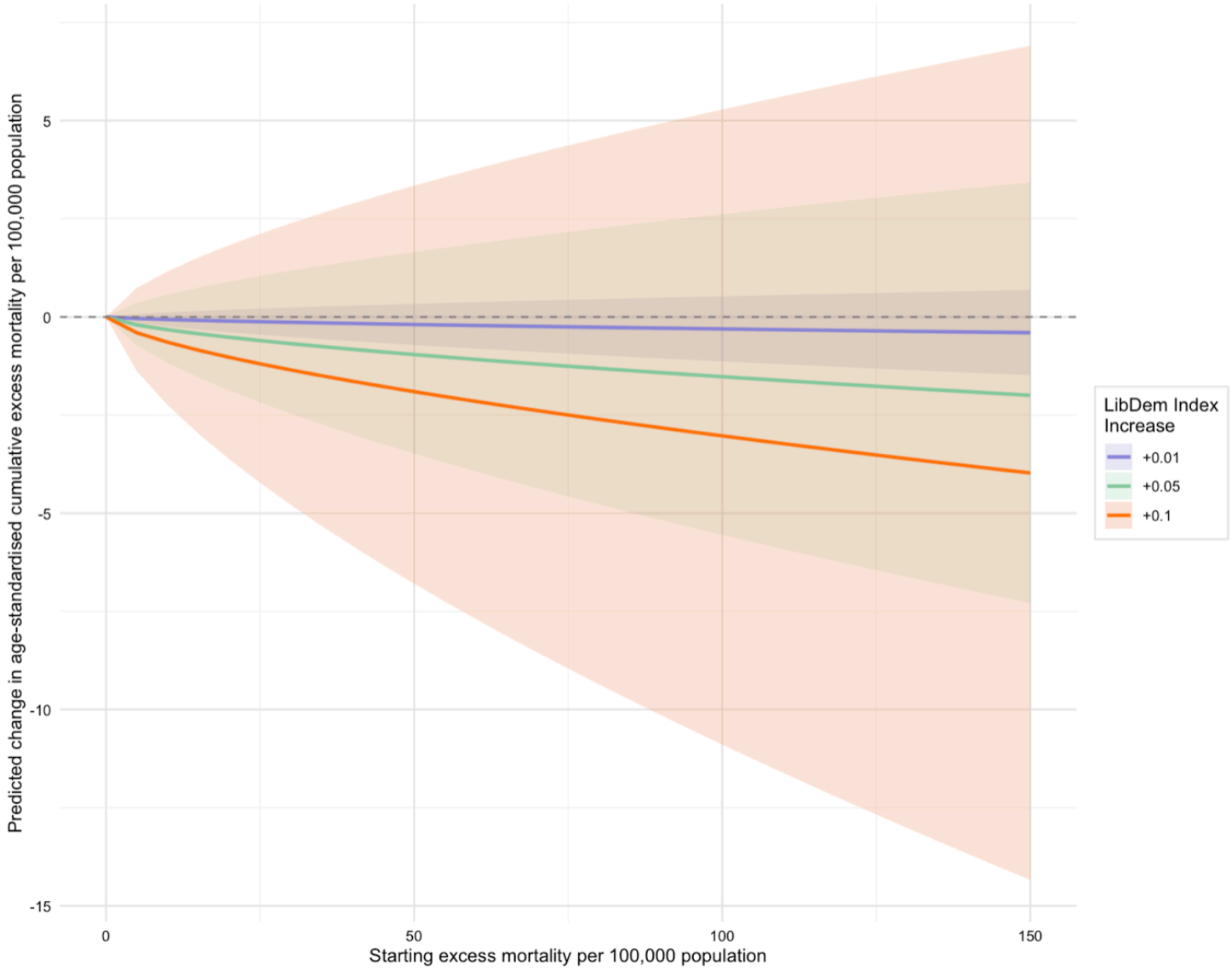


Figure 2

Democracy and excess mortality in non-island jurisdictions: Predicted age-standardised cumulative excess mortality (2020–2021) by change in democracy level for non-island jurisdictions, showing no association with higher democracy level (95% confidence intervals include '0'). Fully adjusted model, controlling for GDP per capita, Global Health Security (GHS) Index score, and population size; n = 134.

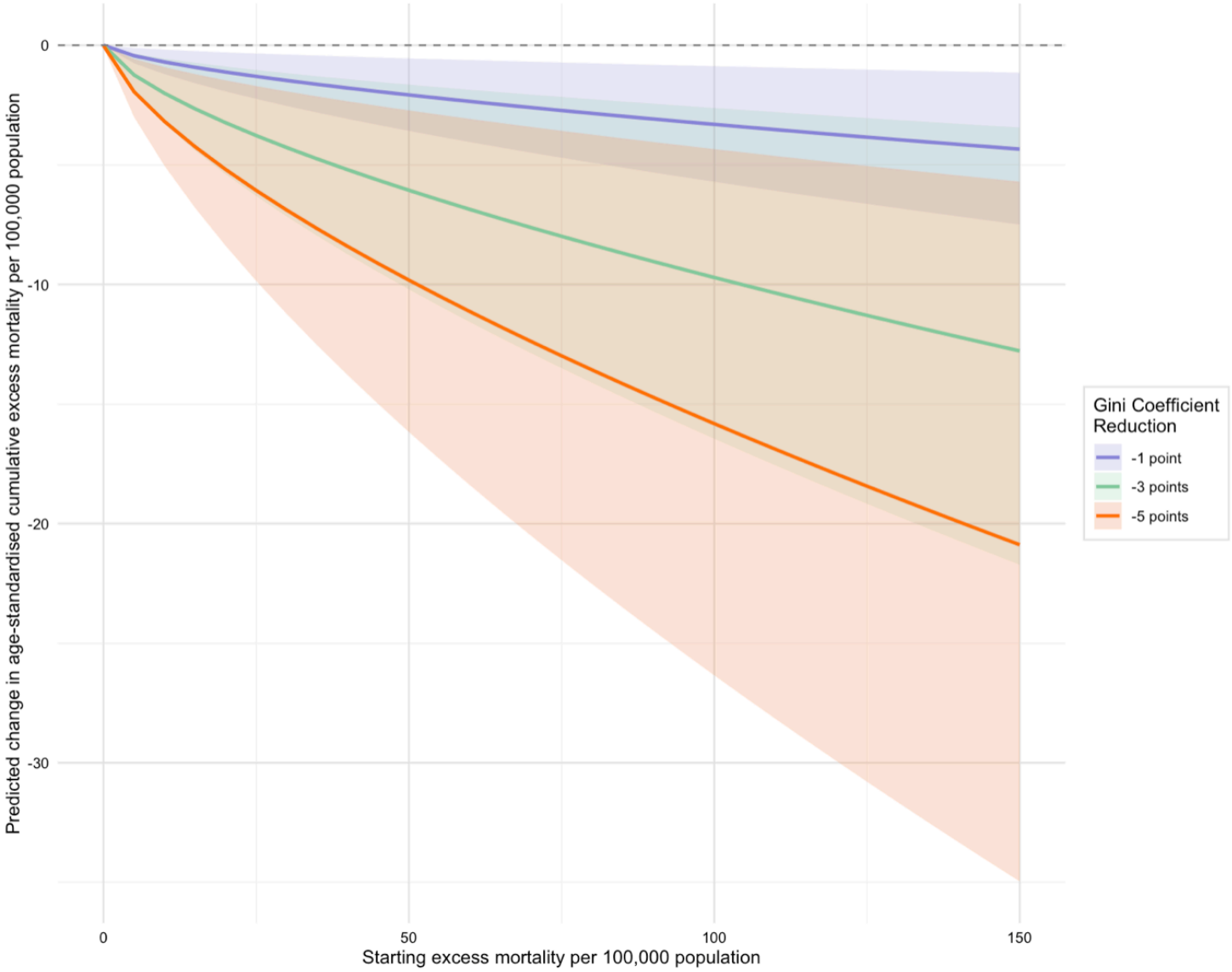


Figure 3

Inequality (Gini coefficient) and excess mortality in non-island jurisdictions: Predicted age-standardised cumulative excess mortality 2020–2021 by change in level of income inequality for non-island jurisdictions only, showing a lower Gini coefficient predicts a lower excess mortality (fully adjusted model, controlling for GDP per capita, Global Health Security (GHS) Index score, population size, and government corruption; n = 99).

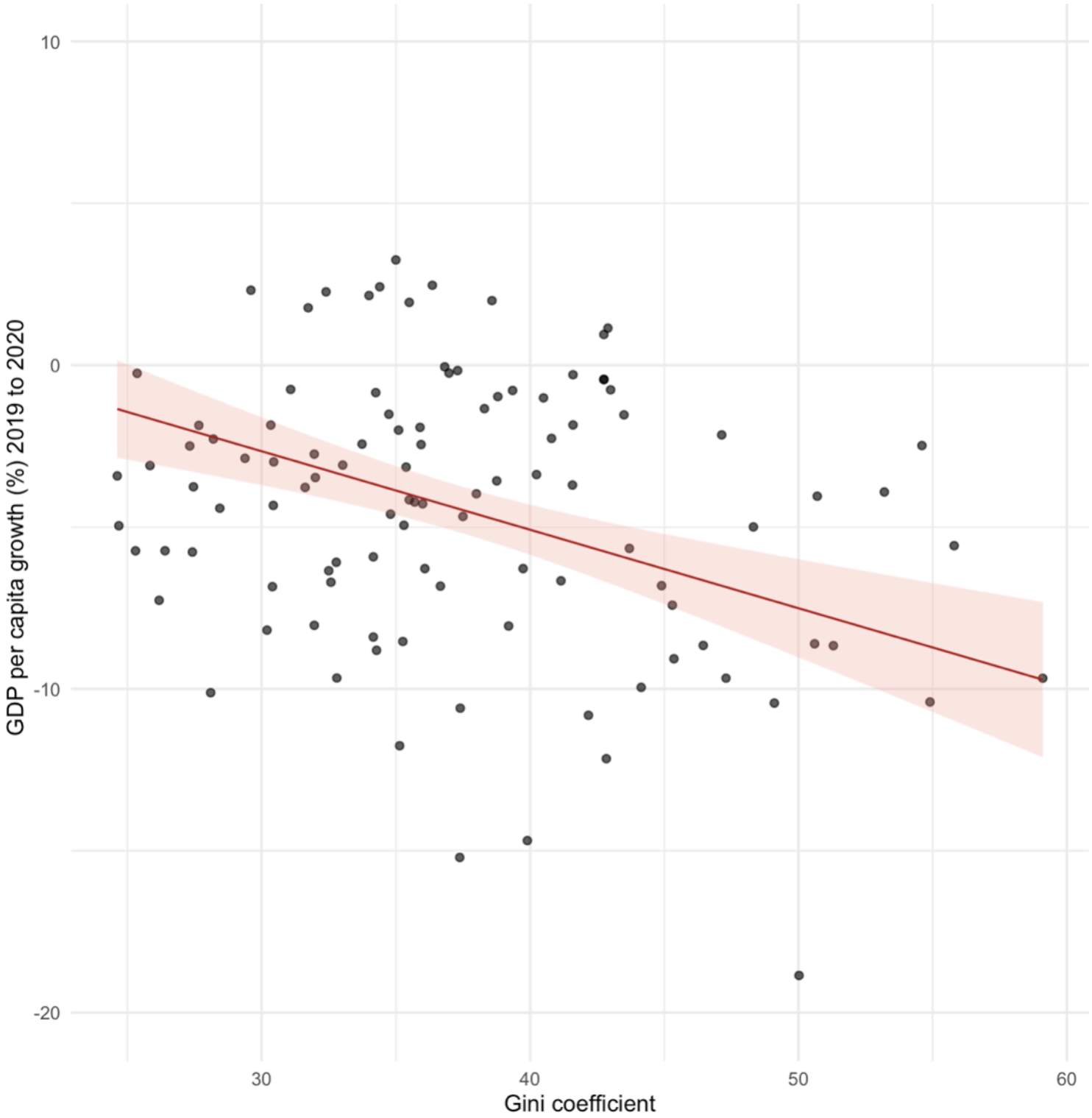


Figure 4

Gini coefficient and GDP per capita growth 2019 to 2020 for non-island jurisdictions (fully-adjusted model controlling for GDP per capita, GHS Index score, population size, and government corruption; n= 99 jurisdictions).

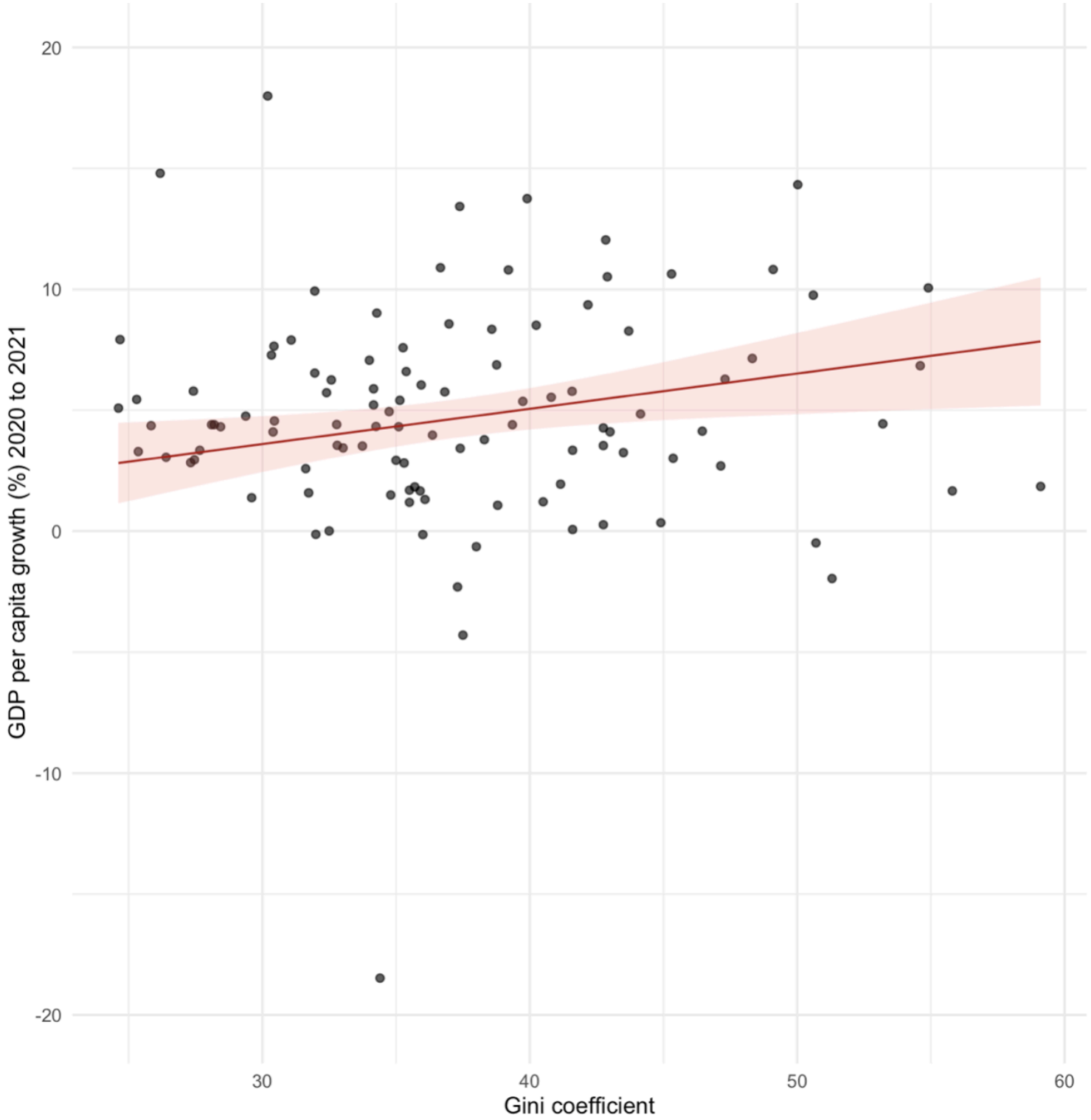


Figure 5

Gini coefficient and GDP per capita growth 2020 to 2021 for non-island jurisdictions (fully-adjusted model controlling for GDP, GHS Index, population size, and government corruption; n= 99 jurisdictions)

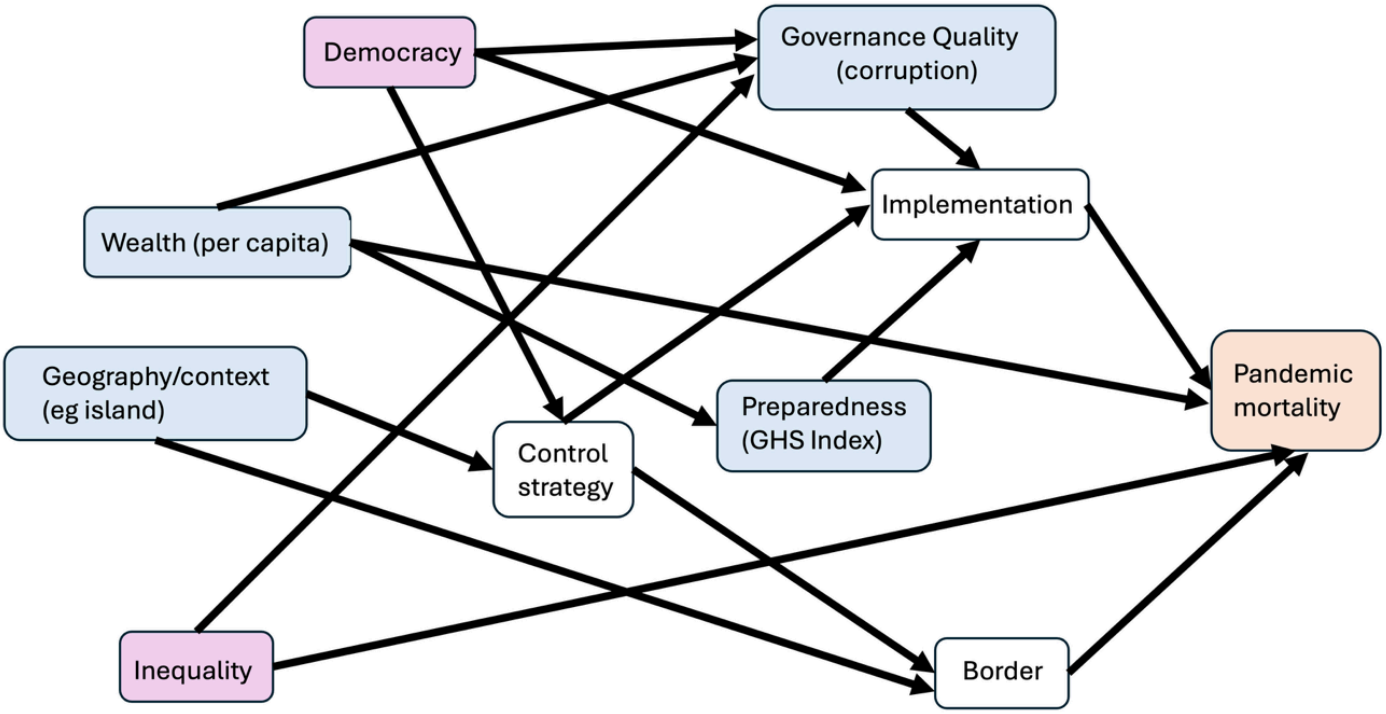


Figure 6

Causal assumptions used in designing the analysis (for outcome of pandemic-related excess mortality, shaded orange). Showing independent variables (red), covariates (blue), and mediating pathways (unshaded).

Supplementary Files

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