

# Effect of democratic reforms on child mortality: a synthetic control analysis



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## Summary

**Background** The effects of political regimes on health are unclear because empirical evidence is neither strong nor robust. Traditional econometric tools do not allow the direction of causality to be established clearly. We used a new method to investigate whether political transition into democracy affected child mortality.

**Methods** We used a synthetic control method to assess the effects of democratisation on child mortality as a proxy of health in countries that underwent transition from autocracy to democracy that lasted for at least 10 years between 1960 and 2010. Democracy was indicated by a score greater than 0 in the Polity2 index. We constructed synthetic controls (counterfactuals) based on weighted averages for factors such as child mortality, economic development, openness to trade, conflict, rural population, and female education from a pool of countries that remained autocracies during the study period.

**Results** Of 60 countries that underwent democratic transition in the study period, 33 met our inclusion criteria. We were able to construct good counterfactuals for 24 of these. On average, democratisation reduced child mortality, and the effect increased over time. Significant reductions in child mortality were seen in nine (38%) countries, with the average reduction 10 years after democratisation being 13%. In the other 15 countries the effects were not significant. At the country level the effects were heterogeneous, but the differences did not correlate with geographic, economic, or political indicators. The effect of democratisation, however, was stronger in countries with above average child mortality before transition than in countries with below average child mortality.

**Interpretation** Our results are consistent with the interpretation that democratic reforms have the greatest effects when child mortality is a direct concern for a large part of the population. Future research could focus on identifying the precise mechanism through which the effects emerge.

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## Introduction

The effects of political regimes on health are unclear. Democracy is argued to be good for health because it gives the poor a stronger voice in political decision-making than other regimes, leading to improved public health policies, or because it stimulates economic growth and, therefore, income and health.<sup>1,2</sup> Not everybody, however, agrees that democratisation necessarily improves people's health.<sup>3</sup> The empirical evidence is neither strong nor robust<sup>4</sup> and establishing causality is difficult.<sup>5,6</sup>

Few studies have quantitatively assessed the effects of democracy on health. Besley and Kudamatsu,<sup>4</sup> and Franco and colleagues<sup>7</sup> have reported positive correlations between democracy and health indicators, such as life expectancy and mortality, with global data.<sup>2,7,8</sup> Alvarez-Dardet and Franco-Giraldo<sup>9</sup> also showed a positive relation between democracy and health in postcommunist countries, with the fall of the Berlin Wall used as a natural experiment. By contrast, Ross<sup>8</sup> found no significant effect of democracy on child mortality in a global dataset.

Causality is unclear because health and prosperity might themselves affect political systems, and both could

be affected by other factors. In one study by Kudamatsu,<sup>10</sup> who used panel data from various African countries, causality is clearer. He showed an association between democratic transition and reduced infant mortality, although the analysis was limited to a few countries from one continent and generalisation of the results should be viewed with caution.

We used a new method to assess data from multiple countries and different continents and investigate the effects of democratic reforms on health, represented by child mortality. The synthetic control method (SCM) developed by Abadie and colleagues,<sup>11,12</sup> allows identification of heterogeneity and causality in health effects related to democratisation, unlike traditional statistical methods. We used the SCM to assess the health effects of 33 democratic reforms between 1960 and 2010.

## Methods

### Synthetic control method

SCM allows estimation of the effect of an event, termed the treatment, within a country, despite the fact that the counterfactual for the treated country is not observed.

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### Research in context

#### Evidence before this study

Between September, 2011, and December, 2015, we regularly searched for published papers in Google Scholar and JSTOR, with the terms “health” and “democracy”. We found only a few studies that have empirically assessed the relations between democracy and health. The evidence on a causal effect is neither strong nor robust. One study did not find a significant correlation between democracy and child mortality, whereas three others showed positive relations between democracy and health indicators. None of these studies, however, could demonstrate causality. Another study showed a causal effect of democratisation on health by using retrospective fertility surveys for a subset of African countries.

#### Added value of this study

In this study we have used a new method, the synthetic control method, and used data from a large set of countries to assess the causal effects of democratisation on health, assigned as

child mortality. We found important heterogeneity in the effects of democratic transition between countries, with effects being significant in 40% and non-significant in the others, although none had an increase in child mortality. The difference in effects did not correlate with geographic, economic, or political indicators, but in countries with initial child mortality higher than average, the effect was greater than in countries where it was lower than average.

#### Implications of all the available evidence

A political transition into democracy reduces child mortality on average, but the results are heterogeneous across countries. This difference might explain why results have varied in previous studies. The health situation before democratisation seems to be a factor in the effects afterwards. Reforms that improve the political power of the poor might, therefore, be particularly important when health problems are severe.

In the case of this study, the treatments are democratic transitions. SCM allows comparison of child mortality in a treated country before and after political reform with the weighted average child mortality constructed from a pool of countries without political reform.<sup>12</sup> The weights are calculated such that the synthetic control resembles the characteristics of the treated country before the regime change. The SCM minimises the distance between the vector of characteristics of the treated country and that of the synthetic control before treatment.

The use of the SCM is an improvement on other parametric and semiparametric estimators for several reasons: the characteristics before treatment between the treated country and its counterfactual fit in a transparent way; its selection of potential control countries is flexible; and the method implies weaker identification assumptions than traditional estimation techniques, which also provides flexibility.<sup>13</sup> Additionally, this method allows exclusion of observations for which it is not possible to build a proper counterfactual, as the inclusion of these countries would lead to biased results.<sup>13</sup> Through combining the properties of large cross-country studies, which often lack internal validity, and case studies, the findings of which often cannot be generalised, the SCM estimator gains external and internal validity.<sup>13</sup>

A limitation of the method is that standard inference techniques are not suitable to assess the significance of the results because the number of permanent regimes in the control group is small. Abadie and colleagues, therefore, suggested the use of a placebo test<sup>12</sup> to compute p values in order to assess whether the effect of political reform on child mortality in the treated country is larger than that if the political reform is randomly assigned to a country in the control group. Furthermore, as suggested by Cavallo and colleagues,<sup>14</sup> we extended the method to

compute an average treatment effect that we used to estimate the average effect and joint significance of the treatments in different countries compared with any potential combination of placebo effects.<sup>13</sup>

#### Main indicators

We used panel data to calculate annual indicators for health and political reforms in Asian, African, and Latin American countries from 1960 to 2010. The political reform indicator is based on the Polity2 index from the Polity IV database,<sup>15</sup> and has been used in several other studies on political reforms.<sup>16–19</sup> The Polity2 index ranges from –10 to 10. A country is classified as a democracy when the Polity2 value is greater than 0, with higher values indicating an increasing degree of democracy, and otherwise is classified as an autocracy. The threshold of 0 corresponds to a broad definition of democracy, but as stressed by Persson and Tabellini,<sup>16</sup> it captures many large changes in the Polity2 index that are clustered around 0. We used two additional criteria for political reform. First, as it might take several years before political transition affects health, we only included transitions that lasted at least 10 years in the treated sample. Second, the sample of treated countries had to have at least 10 years of observations under autocracy before the democratic transition.

Child mortality was used as indicator of health, and was measured as the number of children who died before age 5 years per 1000 livebirths. This factor is a good indicator of overall health because 20% of all deaths occur before this age.<sup>20</sup> We used data from the UN Inter-agency Group for Child Mortality Estimation. To test whether the effect of democratic reforms is stronger in countries with higher child mortality, we compared countries with above average and those with below average child mortality in the year of the reform.

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