Democratic reform and health: interpreting causal estimates

In *The Lancet Global Health*, Hannah Pieters and colleagues (September, 2016)[1] analyse the effect of democratic reforms on child mortality across the world. We wish to highlight, however, that even with sophisticated causal inference techniques, such results cannot necessarily be interpreted as causal effects.

First, the results are compatible with a number of different theories including that democratic reforms have no effect on health *ceteris paribus* (ie, holding everything else fixed). Consider the cases of South Africa, Zambia, Mozambique, and Zimbabwe, all notably missing from the analyses but experiencing substantial democratic changes, analysed here using a similar synthetic control analysis (figure).[1,2] No change is observed in South Africa after the end of apartheid in 1994. In Zambia, after reform in 1991, a reduction is observed but not until the price of copper tripled and GDP per capita doubled. In Mozambique, the large fall is likely attributable to the cessation of the civil war in 1993. And in Zimbabwe, democratic restrictions in 1987 did not precipitate an increase in child mortality.

Second, political regime does very little to explain differences between countries. Rwanda, Congo (Brazzaville), and Tanzania have very similar child mortality rates (between 40 and 60 deaths per 1000 livebirths in 2014)[4] to South Africa, Botswana, and Namibia despite the former countries being considered autocratic and the latter democratic.

It is difficult to articulate a theory of political economy within the confines of the word limits of a journal. However, in none of the above cases, is democratic reform either a necessary or sufficient condition for
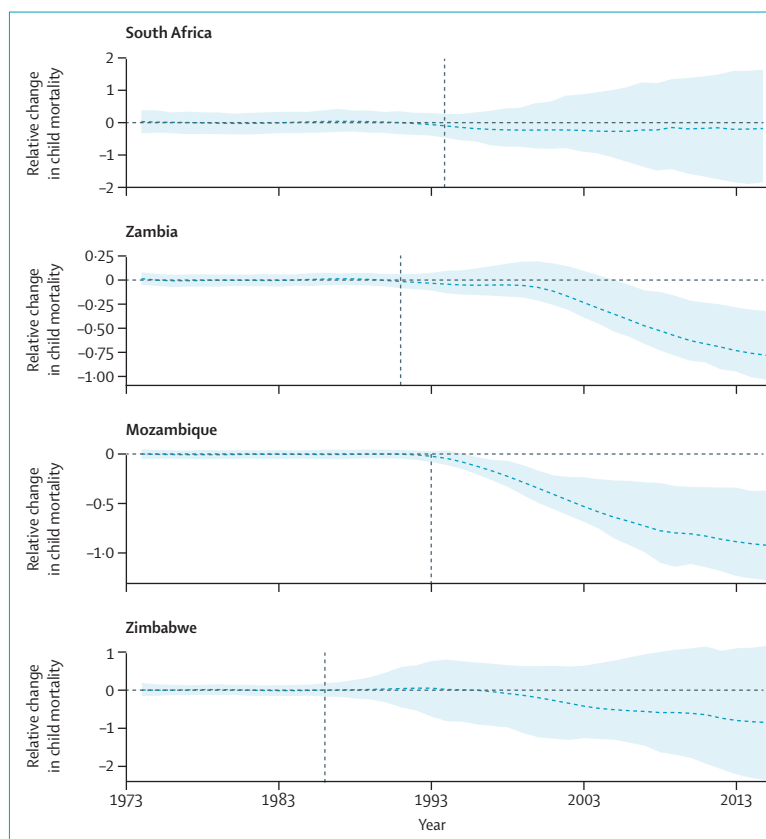

Figure: **Estimated effect of democratic reform on child mortality in four countries**
We used a synthetic control method with child mortality equal to one in the reform year. The shaded regions represent 95% credible intervals. Sources: World Bank[3] and UN IGME.[4]

improvements in child mortality. A theory first, rather than data first, approach to political economic analysis is needed.

Samuel I Watson
s.watson.1@warwick.ac.uk

Warwick Medical School, University of Warwick, Coventry CV47AL, UK

1   Pieters H, Curzi D, Olper A, Swinnen J. Effect of democratic reforms on child mortality: a synthetic control analysis. *Lancet Glob Health* 2016; **4:** e627–32.

2   Brodersen KH, Gallusser F, Koehler J, Remy N, Scott SL. Inferring causal impact using bayesian structural time-series models. *Ann Appl Stat* 2015; **9:** 247–74.

3   World Bank. GNI, Atlas method (current US$). World Bank Open Data. 2016. http://data.worldbank.org/indicator/NY.GNP.ATLS.CD (accessed Aug 11, 2016).

4   United Nations Inter-agency Group for Child Mortality Estimation. Child Mortality Estimates. C. Info. 2016. http://www.childmortality.org/ (accessed Aug 11, 2016).