Etaine Lamy led the writing and associated analysis, with my input, for this post. Etaine is studying for her degree in economics at the University of Glasgow and has been on a short-term placement in my Unit arranged by the Q-Step initiative. Q-Step promotes quantitative social science education in the UK by increasing undergraduate training in quantitative methods. Rather than let Etaine’s work sit unpublished for ages (as I might take a while to do my share of work on the paper), we thought we would write a blog summary. Please bear in mind, this hasn’t been peer reviewed, and we are trying a newish method. As a result, the results should be taken as preliminary. Any suggestions for improvement welcome. The R code to replicate is here.

Background

The New Labour government (1997-2010) aimed to cut health inequalities. In 2003, they set these targets: decrease inequalities in infant mortality and life expectancy by 10% between those deprived and the rest of the country by 2010. By its scale and ambition, the English strategy remains unique in the world with more than £20bn invested.

Did the New Labour strategy manage to inverse the trend of growing health inequalities, seen in Britain but also in the rest of Europe? Research has been divided so far. Mackenbach (2011) found that overall, inequalities had stayed stable or in some cases even increased. However, a recent study by Barr and Whitehead (2017) found that the target had been reached for male life expectancy. Hu et al (2016) examined the trends in England compared to other European countries using a difference-in-difference analysis. They did not find an

effect.

The method

To add to this debate, we used a relatively new method: the Synthetic Control Method. Alberto Abadie and Javier Gardeazabal developed it in 2003 to study the economic effects of terrorism in the Basque Country. Since then, the SCM has been applied in a wide range of areas, from economics to public health. The SCM can work well for comparative case studies. Here we build a counterfactual synthetic England and Wales (using data from 1987 onwards) to compare post intervention trends (2003 onwards) in the actual and the counterfactual England and Wales.

We built the synthetic control for England and Wales from a pool of 11 countries: Australia, France, Greece, Israel, Italy, Japan, Portugal, Spain, Switzerland, New Zealand and the United States. We made this choice of countries because of data availability and because we found it

difficult to match England and Wales in terms of income inequality trends. These countries all had a Gini coefficient of 27 and over in 2003. The pool also excludes any country with a similar health inequalities strategy at the same period of time (for example, Ireland). Our set of predictors includes socio-economic variables, primarily from the World Bank database such as GDP per capita in current US$, CO_2 emissions per capita, the enrolment rate in tertiary education, and the Gini coefficient from the World Income Inequality Database. While the strategy was for England, our mortality data covers England and Wales and other indicators are for the UK as a whole.

We wrote a protocol before starting the analysis. We did change the analysis plan somewhat as the analysis revealed some unanticipated problems.

Our findings

Lifespan variation: average loss of life

Our measure of health inequality is lifespan variation (Vaupel et al, 2011). This measures the average life expectancy lost per death. Because a country’s lifespan variation is driven by premature deaths more prevalent in deprived areas an effective health inequalities strategy might have reduced the level in England and Wales compared to its synthetic. If anything we find the opposite (panels a and b, Figure 1), the decline is slower post intervention (starting in 2005) in England and Wales. SCM lacks traditional tests of statistical significance. Yet changing the intervention date (in-time), changing the intervention country (in-space) provide placebo tests.

The in-time placebo test shows that there is still a change after 2005 (panel a, Figure 4). The in-space placebo test (panel d, Figure 1), shows a greater effect for England and Wales

compared to most other countries. The result also holds when adding 8 countries with lower income inequality and when adding several other socio-economic predictors (panel c, Figure 1).

Figure 1

Life expectancy

Given that trends in inequality in life expectancy are tied to life expectancy, we might expect that a successful strategy would have resulted in a faster rise in England and Wales’ life expectancy. We find no evidence for this. The synthetic and actual curves almost mirror each other after 2003 (panel a and b, Figure 2). Our result seems robust using similar placebo tests as above (panels c and d, Figure 2 and panel b, Figure 4).

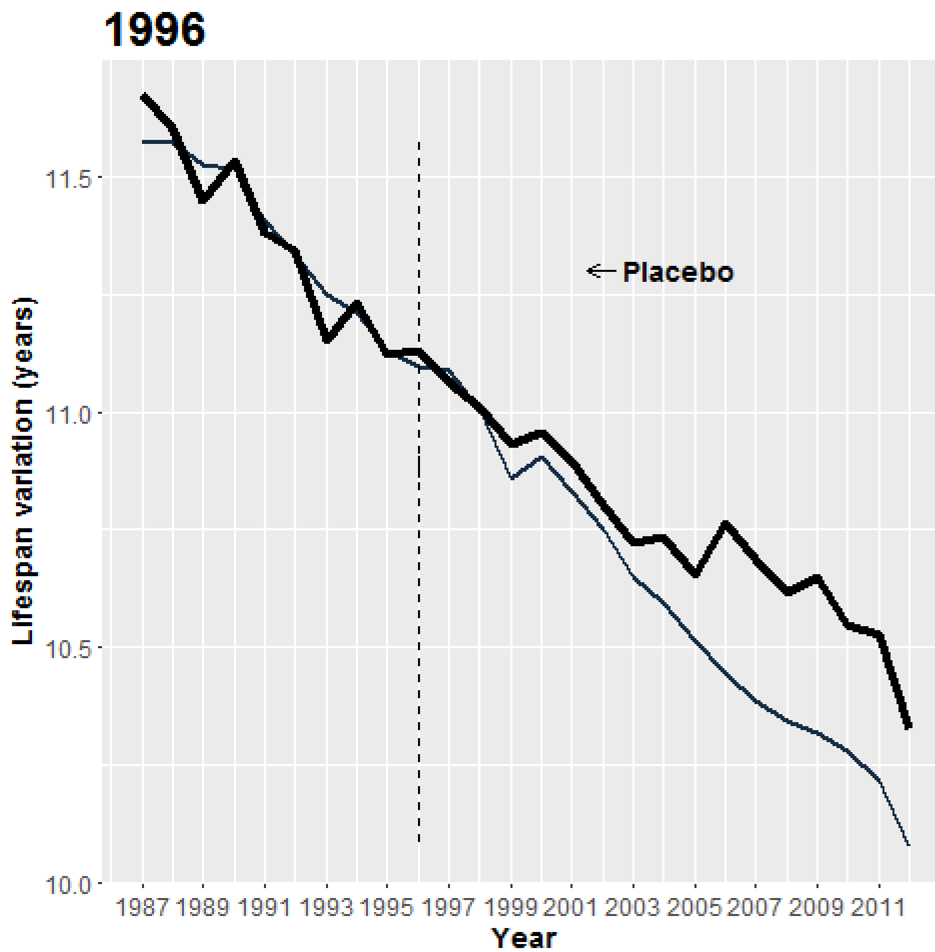
Figure 2

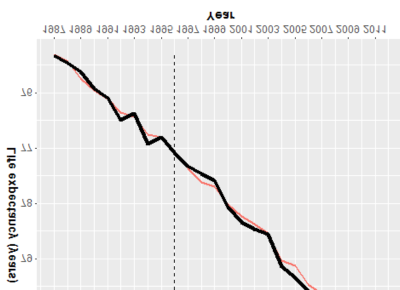
Infant Mortality Rate

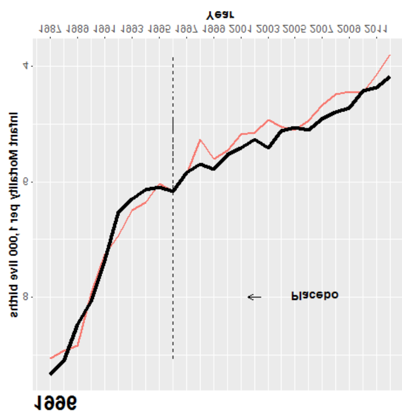
We repeated the analysis for infant mortality. England and Wales follow a very atypical trend during the pre-intervention period. All countries in the pool follow a similar, steep reduction from 1987 to the mid-1990s. However, although England and Wales starts at the median in the pool, the pace of reduction slows down from the early 1990s. For this reason, the fit of the synthetic control is not very good (Panels a and b, Figure 3); however, the results seem robust to placebo tests (panels c and d, Figure 3 and panel c, Figure 4). The strategy does not seem to have had an effect on infant mortality for the whole population either.

Figure 3

Figure 4






Year
Infant Mortality per 1,000 live births
Placebo
1996

Conclusions

While these results are preliminary and have not been peer-reviewed, they suggest that at a national level the inequalities strategy did not impact life expectancy and its variation, nor infant mortality. Of course no study should be regarded as definitive and readers are directed to other research in this area.

There are many challenges in this sort of analysis. For example, although countries in the pool did not carry out a health inequalities strategy per se during the period, their policies could still impact health inequalities. Moreover, defining a synthetic control England was not simple particularly given the rising income inequality trend in the UK which stabilised following New Labour’s election.

Tweet