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See Online for webappendix

David Stuckler and colleagues[1] claim that mass privatisation of enterprises was "a crucial determinant of differences in adult mortality trends in post-communist countries". We attempted to replicate their results and found that the relationship is not robust. Here we summarise our findings, which are expanded in a webappendix. Because Stuckler and colleagues do not find a positive correlation between privatisation and mortality in central and eastern Europe, but only in the former Soviet Union, we focus on the latter set of countries.

In our replication we carried out three simple checks. First, by examining the data used by Stuckler and colleagues, we found inconsistencies between the published description of their dummy variable measuring "implementation of mass privatisation"—one of two privatisation measures used in the paper—and the coding of this variable. We therefore created a new variable coded precisely as described in the article ("a jump from 1 to 3 on the EBRD large-scale privatisation index"), and we re-estimated Stuckler and colleagues' model using this corrected measure.

	Mass privatisation	Average EBRD privatisation	Recoded mass privatisation
Stuckler and colleagues' specification	0·158 (p=0·000)	0·099 (p=0·000)	0·069 (p=0·086)
1-year lags	0·108 (p=0·010)	0·064 (p=0·006)	0·015 (p=0·690)
2-year lags	0·063 (p=0·085)	0·014 (p=0·583)	–0·015 (p=0·722)
Country-specific trends	0·093 (p=0·016)	0·069 (p=0·027)	0·050 (p=0·298)
1-year lags & country-specific trends	0·034 (p=0·408)	0·036 (p=0·234)	–0·014 (p=0·794)
2-year lags & country-specific trends	–0·042 (p=0·212)	–0·047 (p=0·091)	–0·113 (p=0·048)

Each cell of the table reports the estimated effect of privatisation on the log working-age male mortality rate from a separate regression. Privatisation is measured in three alternative ways: first column, as a dummy variable for mass privatisation coded by Stuckler and colleagues; second column, as the average of the European Bank for Reconstruction and Development (EBRD) indices for large-scale and small-scale privatisation; and third column, as a dummy variable for mass privatisation recoded precisely following the description in Stuckler and colleagues. With the exception of the privatisation measure in the third column, data are identical to those in Stuckler and colleagues. Specifications are identical but for the specific changes noted in the table. In parentheses, p values calculated from heteroskedasticity-robust standard errors.

Table: **Cross-country mortality regressions on Stuckler and colleagues' sample of countries in the former Soviet Union**

Second, because an instantaneous effect of privatisation on mortality is implausible, we re-estimated the model assuming short lags (1 or 2 years) between policy changes and mortality. Third, we controlled for differences across countries in long-term mortality trends, a common statistical method (indeed, one used by Stuckler and colleagues in other work[2]).

The results, shown in the table, demonstrate that any one of these changes substantially weakens the positive correlation between privatisation and mortality reported by Stuckler and colleagues, and a combination of any two changes eliminates it entirely. Indeed, the estimated effect of privatisation on mortality is negative when assuming 2-year lags and controlling for trends. Although the correct functional form is unknown, one could as easily conclude that privatisation lowered as raised mortality in the former Soviet Union.

It bears emphasis that our attempt to replicate Stuckler and colleagues' analysis uses the same data and general methods as in the original article. An important assumption of Stuckler and colleagues is that country-level data are appropriate for studying the relationship between mortality and privatisation, but it is difficult to control for confounding factors with aggregate data. In addition, therefore, we analysed data on Russian regions, but again the results do not support the hypothesis that privatisation raised mortality.

Our replication also follows Stuckler and colleagues' focus on estimating correlations, mostly ignoring the question of causality. However, we do reanalyse the single potential channel of causation for which Stuckler and colleagues provide evidence, which is that privatisation led to increased mortality by raising unemployment. Counter to Stuckler and colleagues' claim that "rapid privatisation of thousands of inefficient firms from the Soviet era would have cut many jobs", but consistent with many micro-level studies of post-communist employment,[3] the results do not support the view that privatisation raised unemployment in postcommunist countries.

Stuckler and colleagues' conclusions were accepted as facts by the world press, but closer scrutiny shows that the data do not support their assertion that privatisation was a "crucial determinant" of mortality in postcommunist countries. The correlations reported in the original article are simply not robust.

We declare that we have no conflicts of interest.

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1 Stuckler D, King L, McKee M. Mass privatisation and the post-communist mortality crisis: a cross-national analysis. *Lancet* 2009; **373:** 399–407.
2 Stuckler D, Basu S, Suhrcke M, et al. The public health effect of economic crises and alternative policy responses in Europe: an empirical analysis. *Lancet* 2009; **374:** 315–23.
3 Earle JS. Mass privatisation and mortality. *Lancet* 2009; **373:** 1247.

Authors' reply

We have watched with interest the increasing sophistication of attempts to discredit our paper, many at fora where we were not present, so we are grateful that we can finally respond. These criticisms have included misrepresentation of basic mortality data and a series of letters from leading advocates of privatisation that was, in turn, gratuitously offensive, epidemiologically uninformed, and factually wrong.

Unfortunately, these two letters continue on this path, with manipulation of data in ways that can be interpreted as owing more to the pursuit of preconceived beliefs than to a search for scientific truth. As Christopher Gerry and colleagues note in their webappendix, "Our goal here is not to establish per se what does cause mortality. Rather, we are concerned to demonstrate that there is no evidence in the data used by Stuckler et al that mass privatisation resulted in increased