

Assessing Mandatory Stay-at-Home and Business Closure Effects on the Spread of COVID-19

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Background and Aims

The most restrictive non-pharmaceutical interventions (NPIs) for controlling the spread of COVID-19 are mandatory stay-at-home and business closures. Given the consequences of these policies, it is important to assess their effects. We evaluate the effects on epidemic case growth of more restrictive NPIs (mrNPIs), above and beyond those of less restrictive NPIs (lrNPIs).

Methods

We first estimate COVID-19 case growth in relation to any NPI implementation in subnational regions of 10 countries: England, France, Germany, Iran, Italy, Netherlands, Spain, South Korea, Sweden, and the US. Using first-difference models with fixed effects, we isolate the effects of mrNPIs by subtracting the combined effects of lrNPIs and epidemic

dynamics from all NPIs. We use case growth in Sweden and South Korea, two countries that did not implement mandatory stay-at-home and business closures, as comparison countries for the other 8 countries (16 total comparisons).

Results

Implementing any NPIs was associated with significant reductions in case growth in 9 out of 10 study countries, including South Korea and Sweden that implemented only lrNPIs (Spain had a non-significant effect). After subtracting the epidemic and lrNPI effects, we find no clear, significant beneficial effect of mrNPIs on case growth in any country. In France, e.g., the effect of mrNPIs was +7% (95CI -5%-19%) when compared with Sweden, and +13% (-12%-38%) when compared with South Korea (positive means pro-contagion). The 95% confidence intervals excluded 30% declines in all 16 comparisons and 15% declines in 11/16 comparisons.

Conclusions

While small benefits cannot be excluded, we do not find significant benefits on case growth of more restrictive NPIs. Similar reductions in case growth may be achievable with less restrictive interventions.