Title: The spread of COVID-19 and the BCG vaccine: A natural experiment in reunified Germany

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Abstract: As COVID-19 has spread across the globe, several observers noticed that countries still administering an old vaccine against tuberculosis – the BCG vaccine – have had fewer COVID-19 cases and deaths per capita in the early stages of the outbreak. This paper uses a geographic regression discontinuity analysis to study whether and how COVID-19 prevalence changes discontinuously at the old border between West Germany and East Germany. The border used to separate two countries with very different vaccination policies during the Cold War era. We provide formal evidence that there is indeed a sizable discontinuity in COVID-19 cases at the border. However, we also find that the difference in novel coronavirus prevalence is uniform across age groups and show that this discontinuity disappears when commuter flows and demographics are accounted for. These findings are not in line with the BCG hypothesis. We then offer an alternative explanation for the East-West divide. We simulate a canonical SIR model of the epidemic in each German county, allowing infections to spread along commuting patterns. We find that in the simulated data, the number of cases also discontinuously declines as one crosses from west to east over the former border.

Data description: We use counts of cumulative cases of and deaths from COVID-19 by German county (Kreis) and by age group for every date since February 29 2020 from the Robert Koch Institute's Coronavirus Dashboard. To this we add four groups of county-level characteristics: income and demographics, historical mortality, and commuting flows.

JEL Codes: I18, J60, C21

Keywords: COVID-19, BCG vaccine, SIR model with commuting flows

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