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Introduction

Covid-19 has generated more than 1 million deaths worldwide. While there is an important and fast-growing literature about the consequences of the pandemic, the literature addressing the determinants of Covid-19 mortality is surprisingly small. In this study, we aim to contribute to this literature by investigating whether early-life, in particular prenatal, circumstances play a role in Covid-19 mortality and other long-term outcomes. We exploit the Cholera Epidemic afflicting Peru in the early 1990s as a quasi-natural experiment for variation in such circumstances.

From Prenatal Exposure to a Cholera Epidemic to Adult Covid-19 Mortality. Potential Mechanisms

Prenatal exposure to a Cholera Epidemic can have long-term effects, for several reasons. First, Cholera resembles acute starvation in effects, such as decreased dietary intake and intestinal absorption of nutrients (Brown, 2003). Intrauterine starvation can lead to long-term obesity and cardiovascular diseases (Barker, 1990). In turn, obesity and cardiovascular diseases are risk factors for Covid-19. Second, there is evidence that prenatal and early-life nutrition also have long-term detrimental effects on education and labor market outcomes (Almond and Currie, 2011). In turn, less educated individuals and the self-employed are less likely to comply with lockdowns and social distance measures, making them more vulnerable to Covid-19 (Bell, 2020; Wiemers et al., 2020). Finally, as with most epidemics, the Cholera Epidemic in Peru represented an income and stress shock for many families (Curtu, 2017), and there is also evidence of the detrimental long-term effects of those type of shocks (Almond and Currie, 2011). Moreover, an epidemic can overwhelm the healthcare system, reducing its ability to attend to patients, including pregnant women (Ritter and Sanchez, 2020).

Data and Empirical Strategy

Sources of data used in this paper are: Cholera cases from the Report General Directorate of Epidemiology 2011 of the Ministry of Health of Peru. Covid data from the Sistema Informático de Defunciones, and the Peruvian Demographic and Family Health Survey from 2009 to 2018.

We apply a difference-in-difference approach exploiting the variation in Cholera incidence across cohorts (month-year) and regions before and during the first year of the epidemic (1991). The spread of the disease throughout different regions of the country over time, in particular in the first year of the epidemic, was largely determined by their geographic proximity to the first cases. The locations of the first cases were close to random: they appeared in a couple of coastal cities, apparently because the bacteria originated from the Pacific Ocean.

As potential channels, we find that a 1 standard deviation increase in the incidence of Cholera during the first trimester in-utero increases the likelihood of working-age women to die of Covid-19 by 21 percent. As potential mediators we find a significant effect on BMI, obesity rates and high blood pressure, as well as on self-employment. In-utero infection with Cholera can result in nutritional deprivation, moreover, the epidemic represented an income and stress shock for many mothers, hence some, or a combination of, these factors could have prompted the results.

Conclusions

With this study we aim to contribute in several ways. First, we aim to contribute to the understanding of the determinants of Covid-19 mortality. This study provides evidence that early-life circumstances can have a powerful impact on Covid-19 mortality. Covid-19, and similar epidemics, will be most likely part of the future (World Bank, 2017), and we still know very little about their main determinants. In this study, we cannot identify the exact mechanism(s). Future studies should provide evidence about the effect of early life shocks on Covid-19 mortality and about the potential role of prenatal nutrition, parental investments and other behaviors as potential mediators.

References


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