

Slums and Pandemics: How Did Intra-City Heterogeneity Affect the Dynamics of COVID-19?



Disease outbreaks can affect vulnerable people disproportionately, contributing to the increase in health and economic disparities.



Social distancing increased less in areas with slums than in other areas after the adoption of non-pharmaceutical interventions (NPIs) in Rio de Janeiro and São Paulo.



NPIs can have heterogenous effects across different groups (slum versus non-slum residents, for example).

CONTEXT

Disease outbreaks can affect vulnerable people disproportionately, increasing health and economic disparities. The COVID-19 pandemic affected places where most social interactions occur, as the new coronavirus spreads mainly through close contact among people. Health authorities consequently advised people to avoid crowded areas and to practice social distancing, but such measures can be challenging to put in practice in densely populated areas, such as overcrowded slums in developing countries. Residents of these neighborhoods are also poorer individuals whose incomes are likely to be more adversely affected by lockdowns. Brazil was one of the countries most affected by the COVID-19 pandemic.

PROJECT

This project is the first in the growing literature on the economics of epidemics to address the role of slums in the economic and health dynamics of pandemics. The project is divided into three parts: an empirical, a theoretical and a quantitative part. Empirically, we use daily geo-localized data from millions of mobile phones in São Paulo and Rio de Janeiro, Brazil's two largest cities. Theoretically, we build an economic model to address how the prevalence of slums contributes to the spread of infectious diseases. Quantitatively, we use this model to assess several different policy scenarios.

RESULTS

Social distancing increased significantly less in areas with slums after the adoption of non-pharmaceutical interventions (NPIs), such as the closure of schools, restaurants, and retail stores, in both cities. This effect is shown on the graph. Moreover, localities with slums are associated with more fatalities. The model reproduces our empirical finding that, after the outbreak of the pandemic, low-income slum residents engage in less social distancing relative to individuals who live in other neighborhoods. As they are poorer, slum residents work relatively more hours, even though this means spending more time in crowded areas. This leads to worse health outcomes for this group. Although slum dwellers correspond to 22% of Rio de Janeiro's population, they account for around 30% of the COVID-19 deaths in the city.

This group thus contributes more towards reaching herd immunity in society. In a counterfactual world without slums, residents in richer non-slum neighborhoods end up catching the virus more and die in higher numbers, which illustrates important distributional effects caused by the pandemic. The model additionally further simulates the pooling of all intensive care units in Rio de Janeiro into one group that is offered to anyone who needs it, regardless of insurance. This alleviates the capacity constraints and decreases the death burden of the disease among both slum and non-slum residents. The total death rate is reduced by 28% relative to an environment in which no policies are implemented.

POLICY IMPLICATIONS

The emergence of several epidemics (such as Ebola and three lethal coronaviruses) in less than 20 years highlights the importance of appropriate policy responses to disease outbreaks.

Shelter-at-home policies act to delay the dynamics of the disease. These policies can be important to buy time before vaccines or new treatments are introduced. Confinement policies that shelter only one group lead to a redistribution of deaths from the sheltered group to the other. This leads to the welfare of both groups to fall since one faces more deaths and the other a restriction on their movement.

Cash transfers are particularly important for the poorer individuals who live in slums. When we assess a policy that hands over cash to the population, slum dwellers can afford to become relatively more cautious. This decreases the number of infections among this group at the expense of increasing this statistic among those living in other neighborhoods.

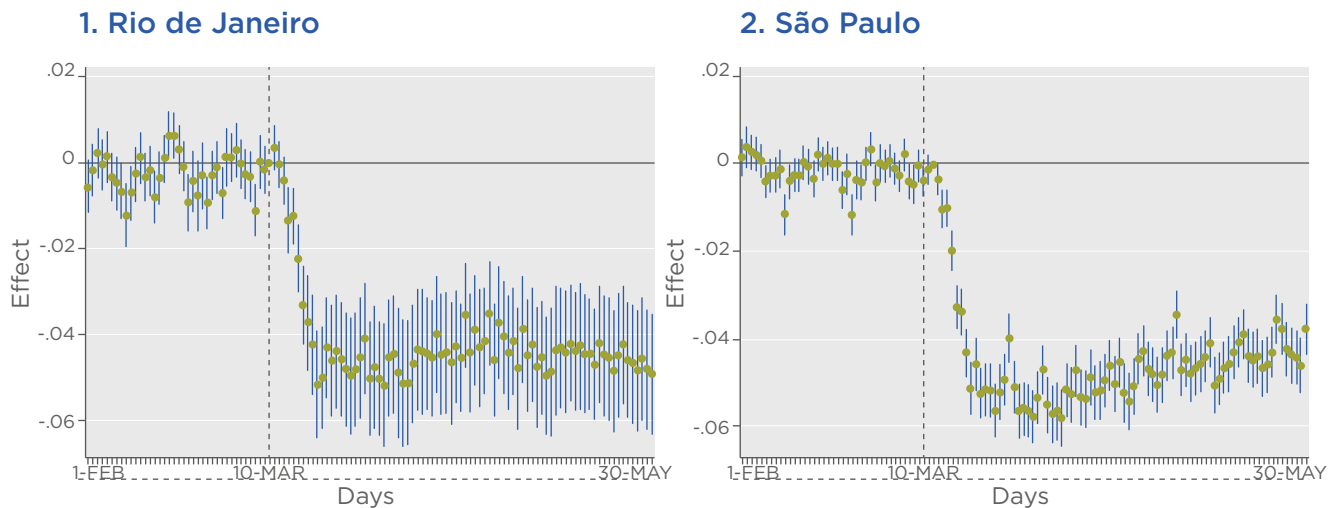
Key Concept



NON-PHARMACEUTICAL INTERVENTIONS (NPI)

Policies such as the closure of schools, restaurants, and retail stores, aimed at curbing the spread of an infectious disease.

Figure 1. Effect of Non-pharmaceutical Interventions (NPIs) on Social Distancing in Areas with Slums Relative to Those without Slums



Note: The graph shows the effect of non-pharmaceutical interventions (NPIs) on social distancing in areas with slums relative to those without slums. There was no difference prior to the introduction of NPIs (vertical line). Negative numbers after NPIs imply that areas with slums engage in less social distancing than other areas.



FULL STUDY

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