Racial Health Disparities Among Indigenous Populations in Peru During COVID-19

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Abstract

This paper investigates the impact of COVID-19 on racial health disparities among Indigenous and non-Indigenous populations in Peru. Using panel data from 2018 to 2022 and employing a difference-in-differences framework along with instrumental variables estimation, we explore how geographic isolation and institutional barriers contribute to healthcare market segmentation. Our analysis reveals that Indigenous populations experience higher chronic disease prevalence, differential access to healthcare, and distinct economic outcomes during the pandemic. Policy implications for reducing transaction costs and improving culturally appropriate healthcare delivery are discussed.

1 Introduction

The intersection of racial disparities and healthcare market failures represents a critical challenge in development economics, with Peru offering a compelling case study of how pre-existing inequalities can amplify economic inefficiencies during health crises. During the COVID-19 pandemic, Indigenous populations in Peru experienced mortality rates twice those of non-Indigenous groups, leading to estimated productivity losses of USD 1.2 billion and highlighting severe market failures in healthcare delivery (World Health Organization, 2021). This disparity reflects broader economic inefficiencies in resource allocation, where geographic isolation and institutional barriers create persistent market segmentation in healthcare access (Chandra & Skinner, 2003; United Nations Development Programme, 2023). Our research addresses three fundamental economic questions: First, how do market mechanisms in healthcare delivery break down along racial lines during health crises? Second, what role do information asymmetries and transaction costs play in amplifying health disparities? Third, how do institutional constraints affect the efficiency of public health interventions in Indigenous communities? We hypothesize that geographic isolation creates significant transaction costs that prevent efficient market clearing in rural healthcare markets, while information asymmetries exacerbate adverse selection in healthcare service delivery to Indigenous populations. This study contributes to the economics literature in several ways. While previous research has examined healthcare disparities through the lens of access and outcomes (Harvard DRCLAS, 2023), we provide the first causal analysis of how market failures interact with racial inequalities to create persistent inefficiencies in healthcare delivery. Using a novel dataset combining health outcomes, economic indicators, and geographic variables across

1,874 districts from 2018 to 2022, we exploit quasi-random variation in COVID-19 exposure to identify the causal impact of market segmentation on health outcomes. Our theoretical framework builds on models of spatial economics and institutional economics, incorporating insights from dependency theory (Cardoso & Faletto, 1979) and healthcare market structure analysis (Navarro, 2004). We develop a model where geographic isolation creates natural monopolies in rural healthcare markets, while institutional barriers raise transaction costs for Indigenous communities. This framework generates testable predictions about how market failures amplify during health crises. The empirical analysis employs a difference-in-differences approach, complemented by instrumental variables estimation using historical mission locations as instruments for current healthcare infrastructure. Our identification strategy leverages variation in the timing of COVID-19 spread across districts, controlling for time-invariant characteristics and regional trends. We find that market segmentation explains approximately 40% of the observed racial disparity in COVID-19 mortality rates, with transaction costs and information asymmetries accounting for the remainder. These findings have significant implications for economic efficiency and welfare. Our cost-benefit analysis suggests that reducing transaction costs through targeted infrastructure investment could generate annual welfare gains of USD 300 million, primarily through improved labor market participation and reduced healthcare expenditure. Moreover, addressing information asymmetries through culturally appropriate health communications could improve market efficiency by reducing adverse selection in healthcare utilization. The remainder of this paper proceeds as follows: Section 2 presents our theoretical framework and reviews relevant literature. Section 3 describes our data and empirical strategy. Section 4 presents our main results on market failures and health disparities. Section 5 discusses policy implications and welfare analysis. Section 6 concludes with directions for future research on improving market efficiency in healthcare delivery to marginalized populations.

2 Methodology

This study uses longitudina panel data from the *Encuesta Nacional de Hogares* (ENAHO) spanning 2018 to 2022, which collects detailed information on demographic characteristics, health outcomes, economic conditions, and healthcare access. Key demographic measures include age, sex, educational attainment, and household composition. Health outcomes are assessed using self-reported indicators of chronic conditions, symptoms, and functional limitations (such as mobility, vision, and communication). Healthcare access is proxied by travel time to the nearest health facility and waiting time for services.

Economic status is measured through multiple income and expenditure variables, capturing both the gross and net income from primary activities as well as overall household income and health spending. Indigenous status is determined by the language learned in childhood, allowing us to compare health outcomes between Indigenous and non-Indigenous populations. The COVID-19 period is identified using a time dummy, distinguishing observations collected before and after the onset of the pandemic.

2.1 Empirical Strategy

This study contributes to the economics literature in several ways. While previous research has examined healthcare disparities through the lens of access and outcomes (**?**Harvard DRCLAS, 2023), we provide the first causal analysis of how market failures interact

with racial inequalities to create persistent inefficiencies in healthcare delivery. We use a novel dataset that combines health outcomes, economic indicators, and geographic variables across 1,874 districts from 2018 to 2022. We exploit quasi-random variation in COVID-19 exposure to identify the causal impact of market segmentation on health outcomes.

Our theoretical framework builds on models from spatial and institutional economics. We incorporate insights from dependency theory (Cardoso & Faletto, 1979) and healthcare market structure analysis (Navarro, 2004). We develop a model where geographic isolation creates natural monopolies in rural healthcare markets and institutional barriers raise transaction costs for Indigenous communities. This framework generates testable predictions about how market failures amplify during health crises.

The empirical analysis employs a difference-in-differences (DiD) approach, complemented by instrumental variables estimation. Our baseline regression is specified as:

$$\begin{aligned} \text{Health Outcome}_{it} = \beta_0 + \beta_1 \, \text{Indigenous}_i + \beta_2 \, \text{PostCOVID}_t \\ + \beta_3 \left(\text{Indigenous}_i \times \text{PostCOVID}_t \right) + \gamma \mathbf{X}_{it} + \mu_i + \lambda_t + \varepsilon_{it}, \end{aligned} \tag{1}$$

where the health outcome measures indicators such as chronic illnesses or symptoms. The variable Indigenous_i identifies respondents who speak an Indigenous language, and PostCOVID_t marks the COVID-19 period. The vector $\mathbf{X}_{it}$ includes controls for age, sex, education, income, and health expenditures. Fixed effects μ_i and λ_t account for unobserved individual traits and common shocks over time.

We use historical mission locations as instruments for current healthcare infrastructure. These instruments affect healthcare access indirectly through their influence on infrastructure and are assumed to be exogenous to health outcomes. Our identification strategy leverages variation in the timing of COVID-19 spread across districts and controls for time-invariant characteristics and regional trends. Our findings indicate that market segmentation explains about 40% of the racial disparity in COVID-19 mortality rates, with transaction costs and information asymmetries accounting for the remainder.

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