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Abstract

Building on existing evidence of **association between income inequality and population health**, the study aims to examine the role of **income inequality** as a possible driver of health inequities during the pandemic and to identify the possible pathways that link income inequality with **COVID-related mortality** across nations.

Results from multivariate regressions show **positive and statistically significant associations** between the **country Gini index** and log transformed **excess deaths** across various model specifications. Results are robust to adjustment for the set of potential confounders including demographic, regional, economic, government and health controls.

Introduction

The impact of income inequality on population health has been explored by a well-developed theoretical and empirical scholarship (Wilkinson 1996, 2000; Subramanian and Kawachi, 2004; Ram 2006; Babones 2008; Curran and Mahutga, 2018).

Emerging studies suggest that existing health disparities and variations in COVID-19 induced mortality around the world may be shaped by income inequality (Davies 2021, Wildman 2021, Sepulveda and Brooker 2021).

Research Question: Does income inequality explain disparities in COVID-19 mortality across nations?

Hypothesis 1: Income inequality is a socioeconomic factor explaining the unequal impact of COVID-19 on mortality across countries, even after controlling for demographic, regional, and economic factors.

Hypothesis 2: The effect of income inequality on mortality from COVID-19 is mediated by pre-existing health disparities: pre-existing comorbidities and unequal access to healthcare.

Data and Methods

Data	Several international data sources (Our World in Data tracker, SWIID, World Bank data, Polity5) are linked to build a dataset that contains a sample of 70 countries
Period of study	First year of the pandemic (1 January, 2020 – 31 January, 2021)
Variables	Dependent: COVID-19 mortality, measured by cumulative excess deaths per million Independent: income inequality measured by Gini coefficient Control variables: demographic, regional, epidemic specific, economic, democracy, health related variables
Methods	1) multi-variate OLS regression 2) mediation analysis to assess to what extent the association between income inequality and COVID-19 mortality is attributable to pre-existing comorbidities and health behaviors

Results

Multivariate regression results: All models show robust positive significant associations between the income inequality indicator and COVID-19 mortality measured by excess deaths.

Mediation analysis results: After testing for the mediation criteria, only two variables were employed in the mediation analysis: hospital beds per thousand of population as a proxy for access to care and cardiovascular death rates as a variable that represents comorbidity in case of COVID-19 disease.

The study did not support the second hypothesis about the mediating role of the accessibility of adequate care and hospital capacity as a pathway between income inequality and excess mortality.

Table 2. OLS Regression Results for Excess Deaths per Million for 70 Countries during the First Year of Pandemic (January 1, 2020- January 31, 2021)

Variable	Model 1 β (SE)	Model 2 β (SE)	Model 3 β (SE)	Model 4 β (SE)
Income inequality				
GINI index	35.473* (17.053)	37.394* (14.280)	40.096* (17.420)	40.836* (17.289)
Region (reference 0 = Europe, 1 = not Europe)	946.034*** (250.865)	1039.543*** (233.148)	1144.009*** (260.656)	991.373** (295.620)
Control variables				
Log GDP per capita		-484.676** (162.928)	-486.611** (162.449)	-358.558 (261.144)
Percent of population aged 65+		43.247 (25.839)	11.936 (32.809)	30.867 (30.906)
Population density		-0.071 (0.053)	(-0.032) (0.057)	-0.014 (0.052)
Stringency index		9.196* (4.521)	9.046 (4.859)	11.498* (5.653)
Democracy index (POLITY)		-73.243** (24.038)	-70.836** (21.820)	-72.314** (22.103)
Health system characteristics				
Government health expenditure (% of GDP)			53.087 (58.738)	33.186 (59.383)
Number of hospital beds per thousand			62.307 (39.322)	69.858 (39.726)
Pre-existing comorbidities				
Life expectancy at birth				-40.314 (44.789)
Cardiovascular disease death rate				1.135 (1.395)
Diabetes prevalence				26.857 (33.564)
Share of female smokers				14.880 (10.289)
Share of male smokers				-20.185* (9.772)
Constant	-753.203 (695.944)	3427.487 (1856.217)	3049.594 (2008.323)	4607.514 (3812.574)
N	70	70	70	70
R²	0.194	0.382	0.411	0.474

Discussion

This study found a positive association between income inequality and excess deaths during the first year of the pandemic, thus providing evidence that mitigating the pandemic crisis and limiting mortality can be challenged by unequal income distribution in society.

Other findings:

Positive role of social capital

Robust negative association between the democracy index and mortality supports the finding regarding the positive role of trust in institutions and the government's higher accountability in mitigating the pandemic's adverse health effects.

Connection with poverty

Accounting for absolute income did not reduce the strength of the association between income inequality and COVID-19 excess mortality, bringing about the argument in support of the more significant role of relative deprivation than absolute deprivation.

Contact

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References

- Curran, M., & Mahutga, M. C. (2018). Income Inequality and Population Health: A Global Gradient? *Journal of Health and Social Behavior*, 59(4), 536–553. <https://doi.org/10.1177/0022146518808028>
- Davies, J. B. (2021). Economic inequality and Covid-19 death rates in the first wave, a cross-country analysis. *Covid Economics*, 73, 53–80.
- Karlinsky, A., & Kobak, D. (2021). Tracking excess mortality across countries during the COVID-19 pandemic with the World Mortality Dataset. *eLife*, 10, e69336. <https://doi.org/10.7554/eLife.69336>
- Our World in Data. (2021). Coronavirus Pandemic (COVID-19) available at: <https://ourworldindata.org/coronavirus>
- Ram, R., (2006). Further examination of the cross-country association between income inequality and population health. *Soc. Sci. Med.* 62, 779–791. <https://doi.org/10.1016/j.socscimed.2005.06.034>.
- Sepulveda, E. R., & Brooker, A.-S. (2021). Income inequality and COVID-19 mortality: Age-stratified analysis of 22 OECD countries. *SSM - Population Health*, 16, 100904.
- Wildman, J. (2021). COVID-19 and income inequality in OECD countries. *The European Journal of Health Economics*, 22(3), 455–462. <https://doi.org/10.1007/s10198-021-01266-4>
- Wilkinson, Richard G. (1996). *Unhealthy Societies: The Afflictions of Inequality*. London: Routledge