Differences in Country-Level COVID-19 Mortality Across the Western Hemisphere

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BACKGROUND

Country-level differences in reported COVID-19 mortality rates and their risk factors have been studied in some regions, however, country and region-level variations in COVID-19 mortality rates within the Western Hemisphere are not well understood.

METHODS

Data sources and measures

- Using data reported from each country's health ministry, we obtained COVID-19 mortality rates across countries and regions in the Western Hemisphere starting from the first reported death to December 31, 2021.
- To account for additional country-level variations in mortality rates, we collected publicly available data on underlying medical conditions associated with higher risk for severe COVID-19 (identified by the Centers for Disease Control), as well as demographic and socioeconomic factors.

Statistical analyses

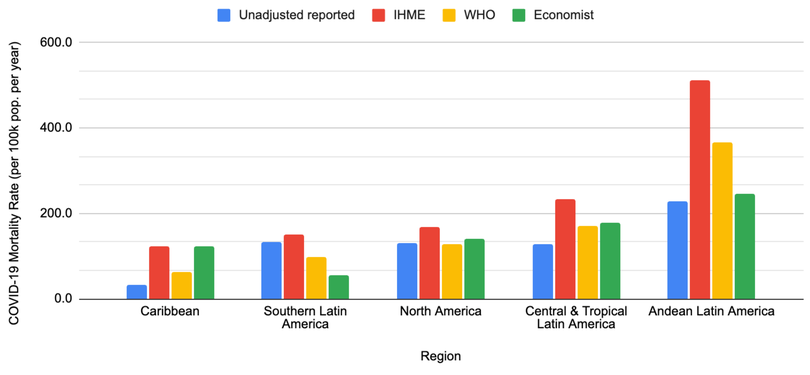
- We adjusted for underreporting using three models developed by the Institute for Health Metrics and Evaluation (IHME), the World Health Organization (WHO), and the Economist.
- Age-adjusted analysis was performed to control for the association between COVID-19 mortality and older age.
- Univariate analyses were conducted to evaluate associations between each risk factor and adjusted COVID-19 mortality.

Countries in Andean Latin America consistently had the highest COVID-19 mortality rates, even after accounting for underreporting and age difference.

RESULTS

- The annualized reported COVID-19 mortality rate was 131.3/100,000 people in the Western Hemisphere, ranging from 31.4/100,000 in the Caribbean to 227.7/100,000 in Andean Latin America (Figure 1).
- Country-level mortality rates ranged from 1.8/100,000 (Nicaragua), 3.8/100,000 (Haiti), and 10.2 (Venezuela); to 142.4 (Argentina), 160.1 (Brazil), and 340.2 (Peru).
- After adjusting for underreporting, mortality rates increased between 20% and 64% depending on the model used, with the Caribbean having the lowest rates and Andean Latin America the highest (Figure 1).
- With adjustment for underreporting and age, Andean Latin America had the highest mortality rate, and the Central and Tropical Latin American region had the second-highest mortality rate in all three models (Figure 2).
- After adjusting for underreporting and age, the countries with the highest mortality rates were Bolivia, Peru, Ecuador, and Mexico.
- In univariate regression analyses, GDP emerged as a significant predictor of COVID-19 mortality.

Figure 1. COVID-19 Mortality Rates Adjusted for Underrporting by Regions in the Western Hemisphere



CONCLUSIONS

- Countries in Andean Latin America consistently had the highest COVID-19 mortality rates, even after accounting for underreporting and age difference.
- Country-level differences were largely attributed to socioeconomic status, with lower- and middle-income countries having the highest rates of COVID-19 mortality in the Western Hemisphere.
- There are unexplained differences in adjusted COVID-19 mortality that we require better data in order to understand.

Figure 2. COVID-19 Mortality Rates Adjusted for Underreporting and Age by Regions in the Western Hemisphere

