Association between the Multidimensional Poverty Measure and COVID-19 mortality in Colombia

unCoVer

Pérez Bedoya JP[1], Mendoza Cardozo OI[1], Pérez Aguirre CA[2], Ruiz Galvis LM[1], Sánchez Escudero JP[2], Cardona Jimenez J[2], Rodríguez Rey BA[3], Barengo NC[4], Diaz Valencia PA[1] on behalf of the unCoVer network
[1]Epidemiology Group. National School of Public Health, University of Antioquia, Medellín, Colombia. [2]Statistics Institute, National University of Colombia, Medellín, Colombia. [3]Physics Institute, University of Antioquia, Medellín, Colombia [4]Herbert Wertheim College, Florida International University, Miami, EEUU

KEY MESSAGE

- Only a few studies exist in South America on social determinants in health and COVID-19. This study provides evidence to understand the impact of poverty measures on mortality in COVID-19 patients.
- Multidimensional poverty measure at the municipal level was associated with increased COVID-19 mortality in a large cohort of patients from the Colombian population.

BACKGROUND

Different socioeconomic aspects have been related to mortality from COVID-19. For this reason, the objective of this study was to analyze the association between the Multidimensional Poverty Measure at the municipal level (MPM) and the clinical outcome of mortality in the resident population of Colombia with a diagnosis of COVID-19.

METHODS

Observational, non-concurrent cohort study of confirmed cases of COVID-19 reported in Colombia by August 2021. The main outcome variable was mortality from COVID-19, and the main exposure variable was MPM. The covariates included in the analysis were patient's sex, age, and municipality of residence. Unadjusted and adjusted logistic models were used using balanced random samples of deaths and recovered patients, calculating odds ratios (OR) and 95% confidence interval ranges (CI) (Figure 1).
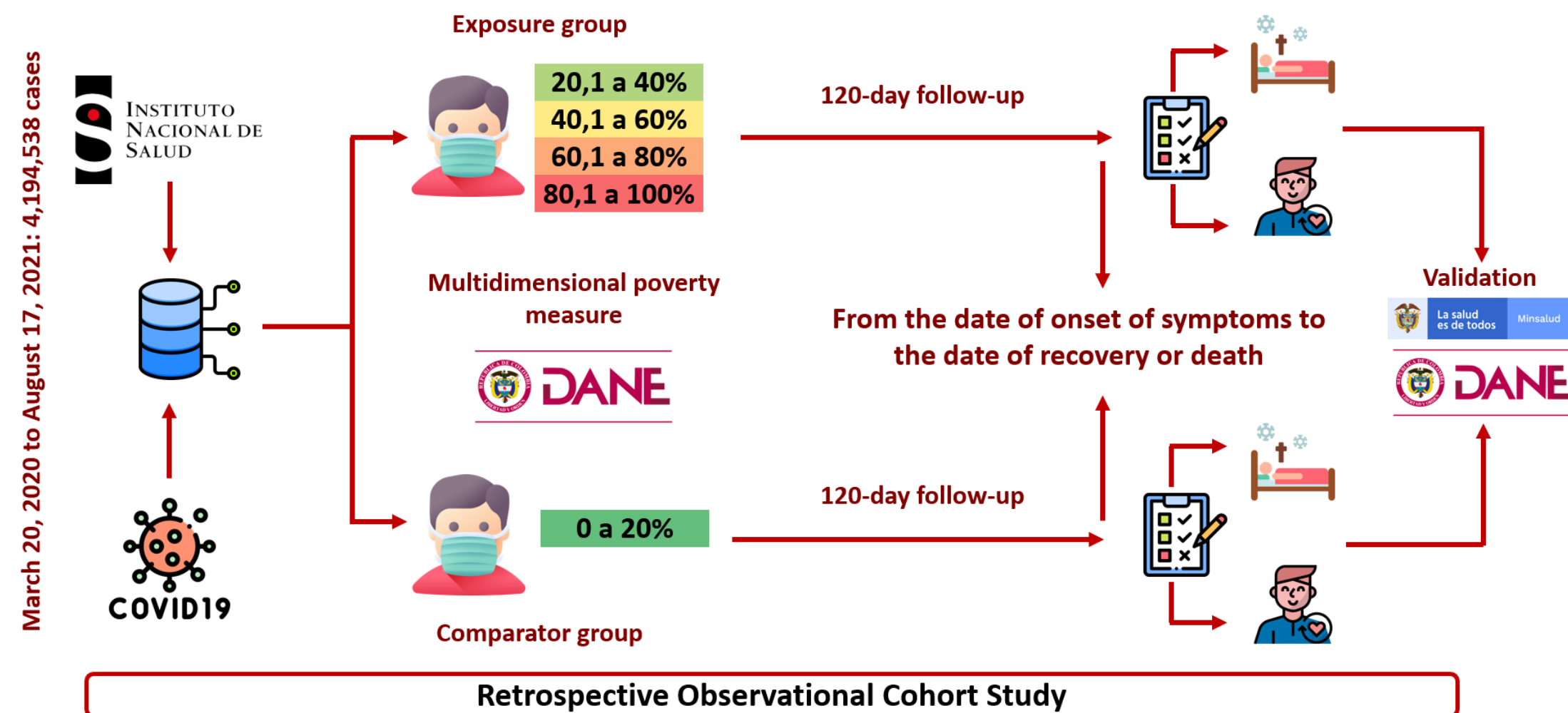

Figure 1. Epidemiological design of the study

RESULTS

In total, 4,194,538 cases of COVID-19 were included in the analysis, of which approximately 3% died. According to the adjusted multivariate analysis, it was found that patients who live in municipalities with an MPM between 20 to 40%, 41 to 60%, 61 to 80% and more than 80% had an OR of 1.6 (95% CI 1.4 to 1.8), 1.6 (95% CI 1.3 to 1.9), 1.7 (95% CI 1.2 to 2.5), and 2.2 (95% CI 0.7 to 7.8), respectively, for mortality from COVID-19 compared with an MPM of less than 20%. When analyzing the data according to sex for the MPM from 20 to 40%, 41 to 60%, 61 to 80% and more than 80%, an OR for women of 1.7 (95% CI 1.5 to 2.0), 1.8 (95% CI % 1.5 to 2.1), 1.9 (95% CI 1.3 to 2.6) and 2.8 (CI 0.9 to 10.1) respectively. For men, an OR of 1.5 (95% CI 1.3 to 1.7), 1.4 (95% CI 1.2 to 1.7), 1.6 (95% CI 1.1 to 2.3) and 1.9 (95% CI 0.6 to 6.0) respectively compared to a MPM less than 20% (Figure 2)

Odds Ratio for COVID-19 mortality according to MPM categories

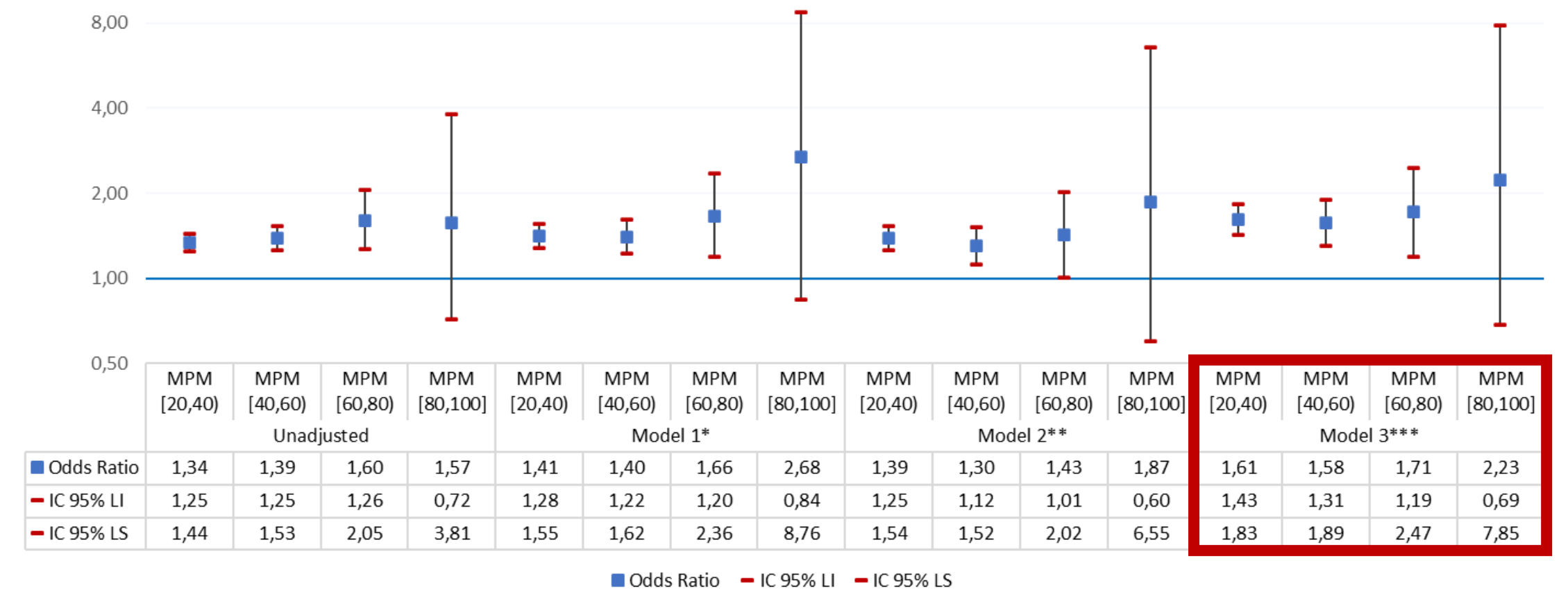|	MPM [20,40]	MPM [40,60]	MPM [60,80]	MPM [80,100]	MPM [20,40]	MPM [40,60]	MPM [60,80]	MPM [80,100]	MPM [20,40]	MPM [40,60]	MPM [60,80]	MPM [80,100]	MPM [20,40]	MPM [40,60]	MPM [60,80]	MPM [80,100]
	Unadjusted				Model 1*				Model 2**				Model 3***			
Odds Ratio	1,34	1,39	1,60	1,57	1,41	1,40	1,66	2,68	1,39	1,30	1,43	1,87	1,61	1,58	1,71	2,23
IC 95% LI	1,25	1,25	1,26	0,72	1,28	1,22	1,20	0,84	1,25	1,12	1,01	0,60	1,43	1,31	1,19	0,69
IC 95% LS	1,44	1,53	2,05	3,81	1,55	1,62	2,36	8,76	1,54	1,52	2,02	6,55	1,83	1,89	2,47	7,85

Odds Ratio   IC 95% LI   IC 95% LS

Figure 2. Odds Ratio results for mortality according to MPM categories

*Model 1: Age and sex, **Model 2: Age, Sex plus municipal prevalence of chronic diseases, ***Model 3: Model 2 plus contagion rate and population density

CONCLUSION

The risk of mortality from COVID-19 in Colombia increased in municipalities with higher multidimensional poverty index. Social determinants of health could explain part of the differences in the mortality observed during the COVID-19 Pandemic.