

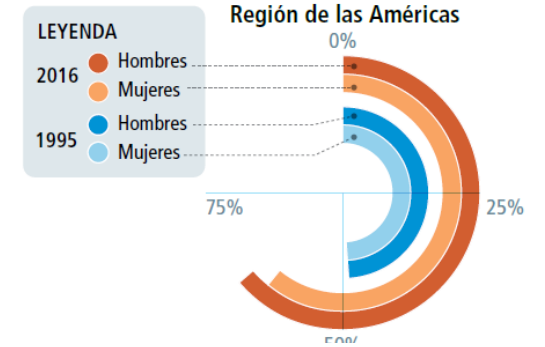
Educational inequalities in obesity: a multilevel analysis of survey data from cities in Latin America

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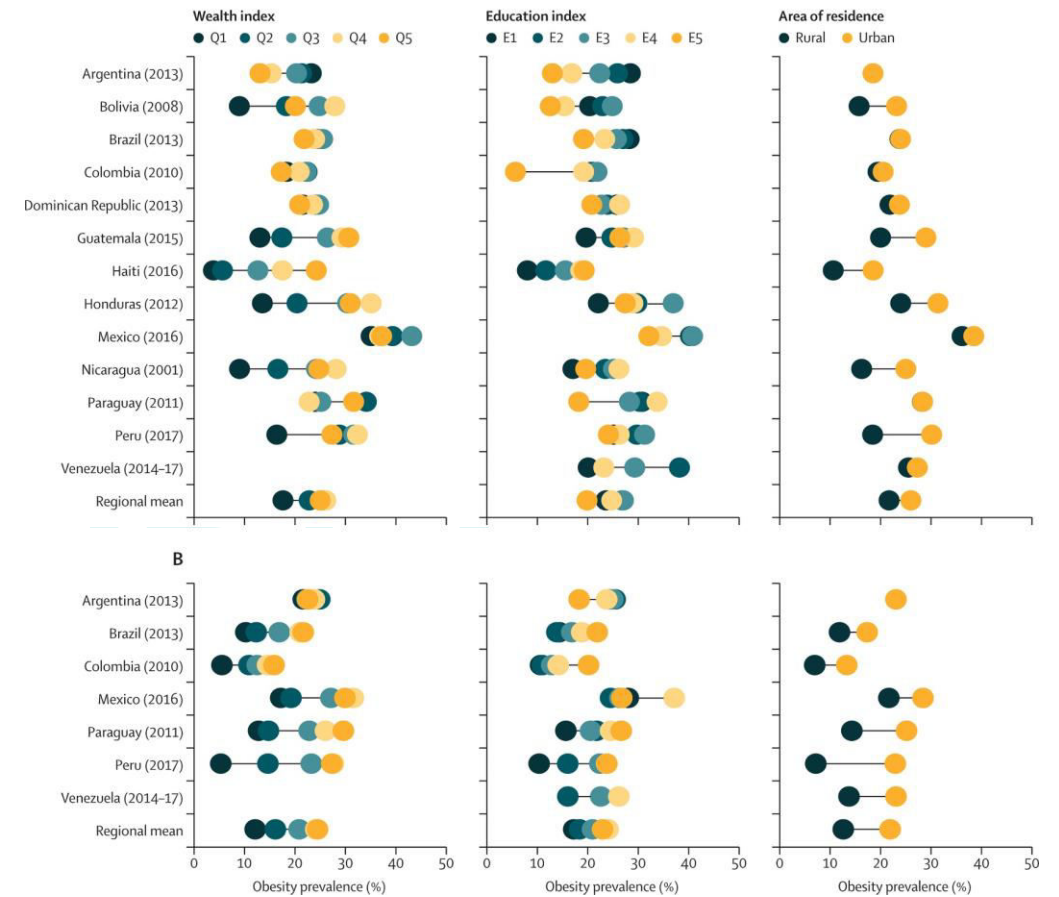
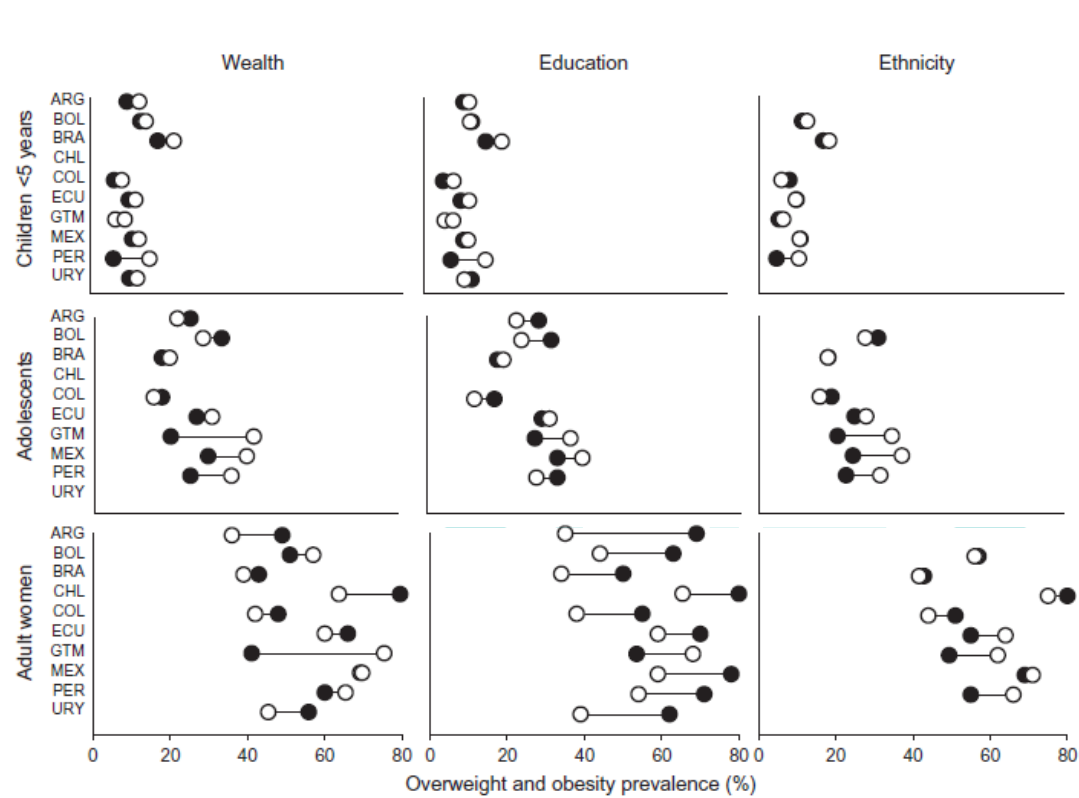
The Salud Urbana en América Latina (SALURBAL)/ Urban Health in Latin America project is funded by Wellcome Trust [205177/Z/16/Z]



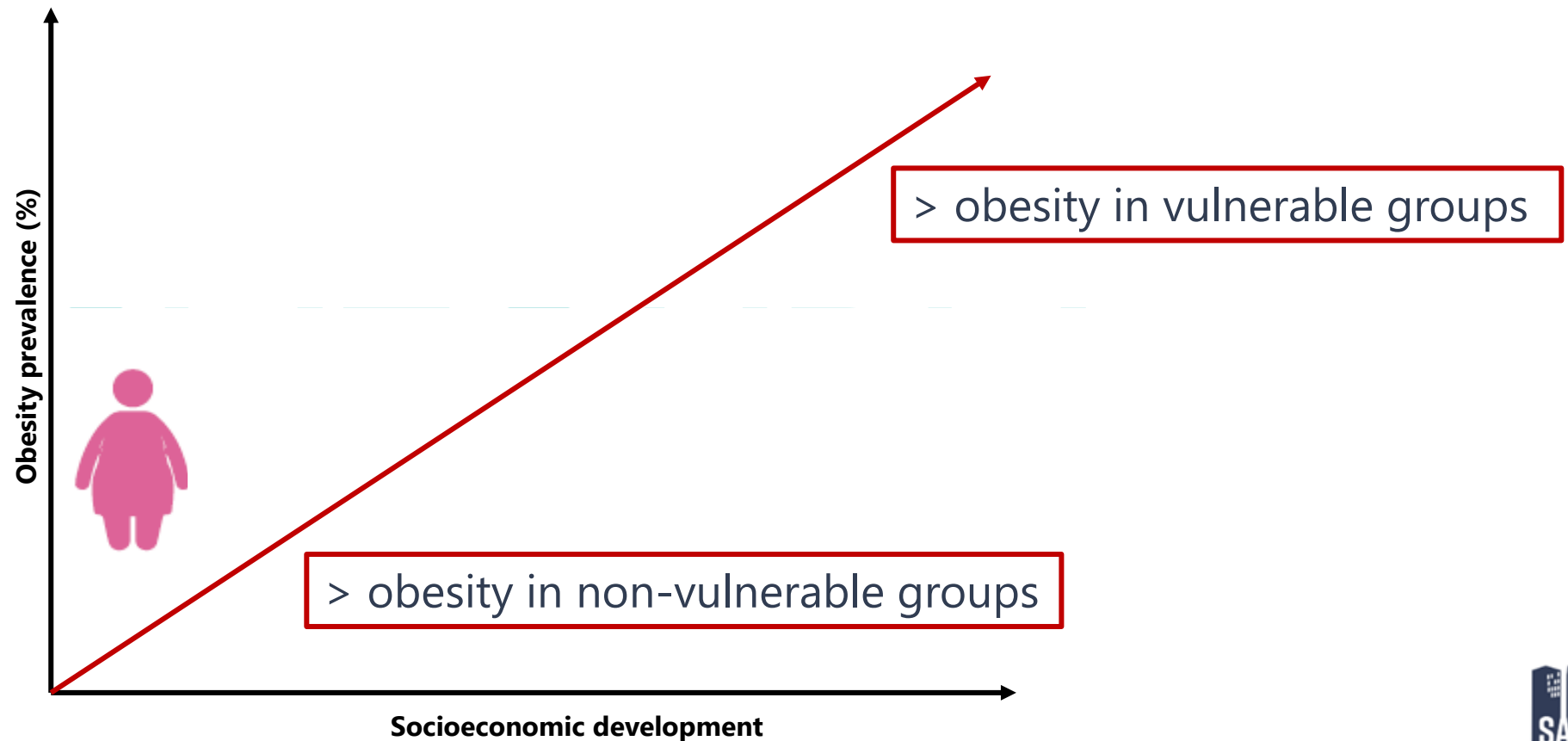
Obesity in Latin America



Obesity and educational level



Obesity and country-level socioeconomic development



Research aims

1 To estimate educational inequalities in obesity in Latin American cities.

2 To examine whether a city-level economic development index modifies the social gradient in obesity.

Methodology



- SALURBAL Project: compiled and harmonized data on cities with a population above 100 000 in eleven Latin American countries
- 176 cities in eight countries (BR, CH, CO, CR, ELS, GT, MX, PE)
- Health survey data and census data
 - Data vary from 2002-2017

Methodology

Exposure

▶ Individual-level educational attainment
(<Primary, Primary, Secondary, University+)

Outcome

▶ Individual-level obesity (BMI ≥ 30 kg/m²)

Individual age and sex

Covariates

▶ City-level socioeconomic development index: sum of the standardized Z-scores of five social variables (reversing overcrowding): water access, sanitation, durable walls, contextual education and overcrowding.

Index categorized in tertiles:

Tertile 1: low socioeconomic development

Tertile 2: middle socioeconomic development

Tertile 3: high socioeconomic development

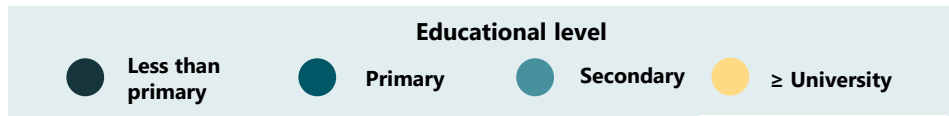
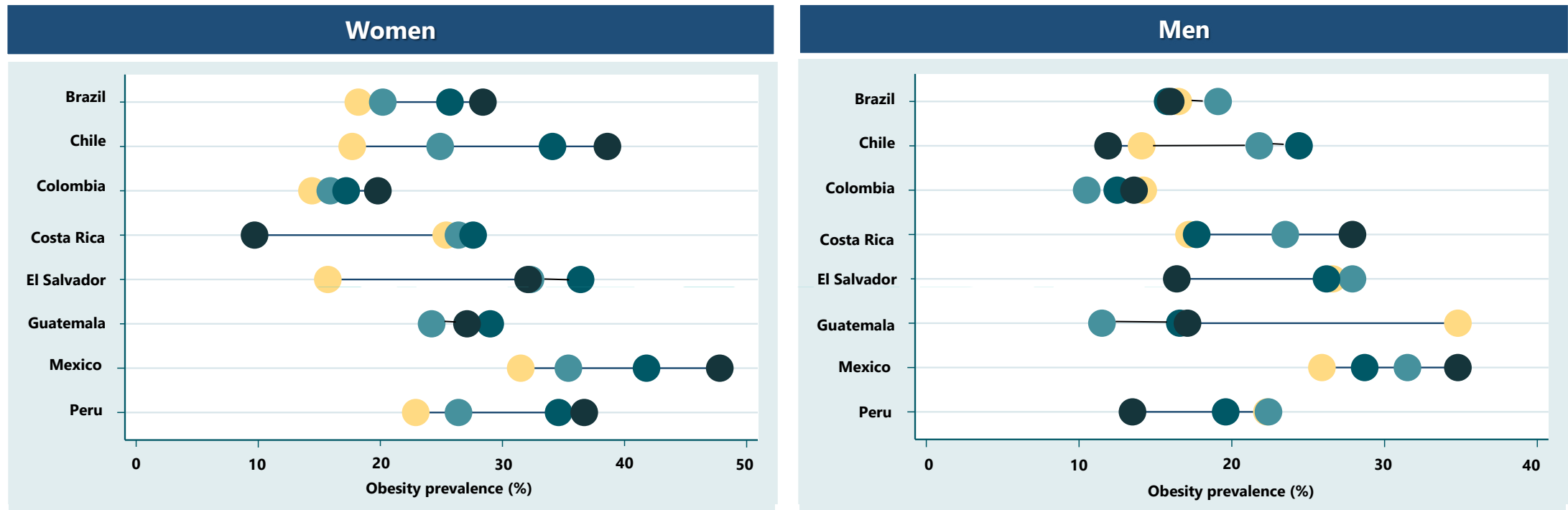


Analytical approach

- Age-adjusted proportion of obesity (95% CI) at city-level
 - The WHO standard population was used as the standard population
- Educational inequalities on obesity
 - Absolute difference in obesity for higher versus low educational categories
 - Relative Index of Inequality, which is a regression-based measure and take into account whole population rather than only concentrating on two extreme education categories
- Two-level mixed-effects logistic regression models stratified by sex (individuals nested within cities)
 - Empty model
 - Model 1 (unadjusted)
 - Model 2 (age-adjusted and fixed effect for country)
 - Model 3 (Added a city-level measure of social environment)
 - We assessed potential effect measure modification by examining the association between education and obesity stratified by city-level socioeconomic development index

Educational inequities in obesity

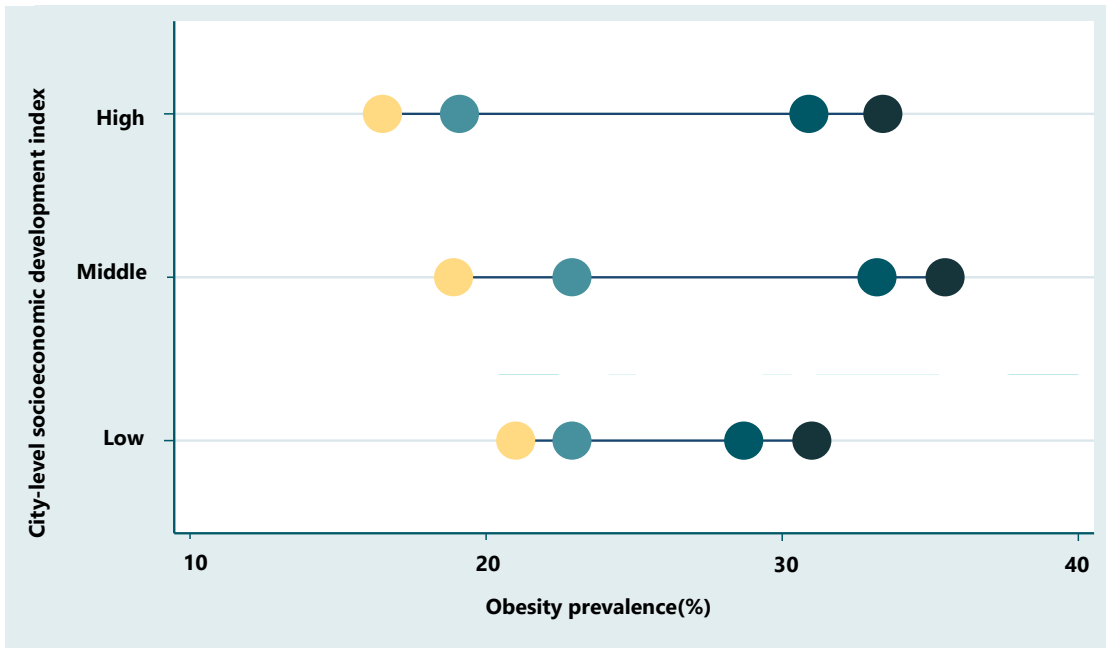
Age-standardized obesity proportion by educational level in 176 Latin American cities (by country)



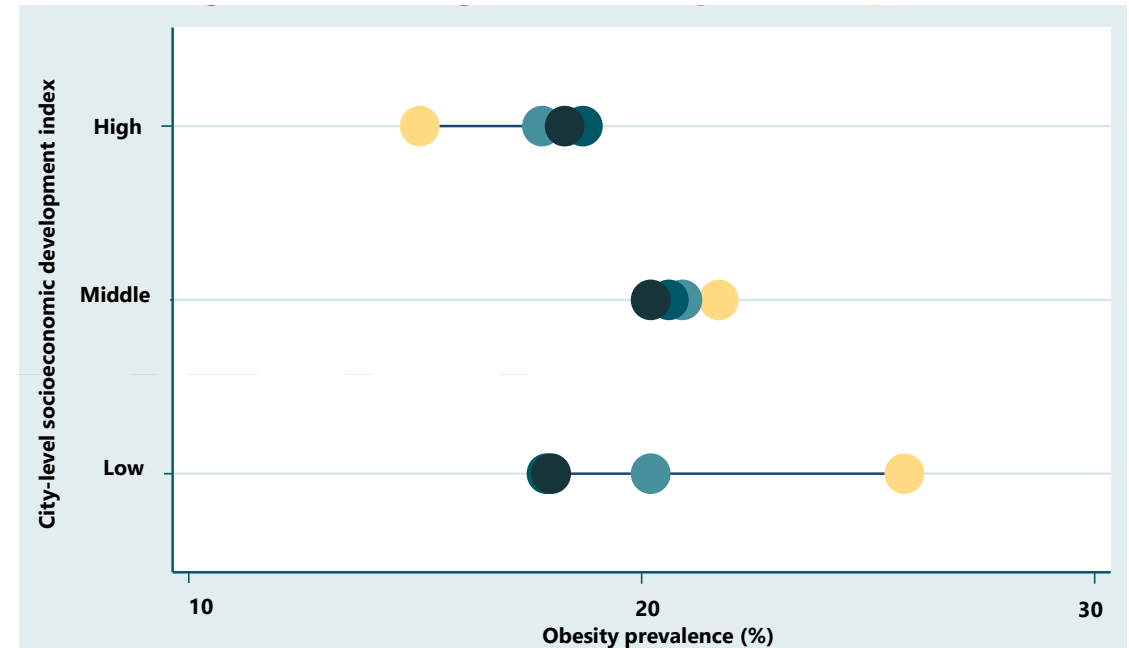
Obesity by city-level socioeconomic development

Age-standardized obesity proportion by educational level classified by city-level socioeconomic development index

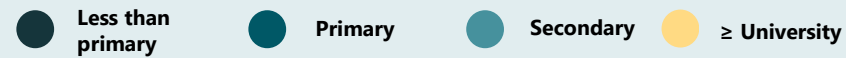
Women



Men



Educational level



OR (95% CI) for obesity according to education, stratified by sex and city-level socioeconomic development index

	Socioeconomic Development Index		
	Low	Medium	High
Women			
Educational level			
Less than primary	Reference	Reference	Reference
Primary	1.10 (0.96, 1.24)	1.00 (0.83, 1.19)	0.93 (0.77, 1.12)
Secondary	0.85 (0.74, 0.97)*	0.84 (0.71, 0.99)*	0.78 (0.64, 0.94)*
University	0.71 (0.60, 0.85)*	0.77 (0.61, 0.97)*	0.71 (0.55, 0.91)*
Men			
Educational level			
Less than primary	Reference	Reference	Reference
Primary	1.24 (1.02, 1.51)*	0.99 (0.75, 1.29)	0.96 (0.71, 1.28)
Secondary	1.47 (1.23, 1.77)*	0.89 (0.68, 1.19)	0.90 (0.69, 1.20)
University	1.89 (1.51, 2.37)*	0.70 (0.52, 0.94)*	0.51 (0.36, 0.72)*

Complex way in which socio-economic development, sex and education interact to shape obesity

Policy significance

- Large inequalities in obesity within Latin American cities
- Lower education is associated with obesity among women across the socio-economic development spectrum and with men in more developed cities
 - Interventions could be directed to increasing education level and narrowing educational inequalities within cities and countries
 - Combining both population-level interventions and targeted interventions to the most vulnerable to narrow inequalities
- Population-level interventions are more effective and equitable and include community-based strategies and policies that change the environment
 - Food reformulation, active streets, and marketing regulations
- Population level policies require individuals to use a low level of resources (cognitive, psychological, time, and material resources) and make the healthy choice the default choice



Strengths

- Harmonized data from 176 cities in eight countries
- Multilevel approach let us analyze individual and macro-level contextual factors
- Our study provides novel important information on how both individual and contextual factors shape the association between obesity and education

Limitations

- Surveys and sample size differs by country and number of cities differs
 - The association between education and obesity may not reflect the state of their current stage in the epidemiological and nutritional transition
- Meaning of education may vary for different birth cohorts
 - Older cohorts were over represented among those classified as less educated because educational attainment has improved over the years

Key conclusion

The high prevalence of obesity among those less educated suggests the urgent need of equity-based and context-sensitive interventions at population level and policies that anticipate inequalities in obesity-related diseases and avoid widening inequities among social groups.



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