Causal Effects of Socioeconomic Status on Central Adiposity Risks:
Evidence using panel data from Urban Mexico,

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1. Backgrounds:

- **Overweight, obesity and chronic diseases** reached **endemic levels** in the developing world, particularly among emerging countries. **Mexico** is one of the most affected by this nutritional unbalance. Several **socioeconomic issues** determine this unbalance. The impact of socioeconomic status (SES) on nutritional patterns **depends on the level of a country's development** (Sobal and Stunkard, 1989). The relationship between obesity and SES appears to be **negative** in developed countries, whereas the **opposite** holds in the developing world (McLaren, 2007). Nevertheless, in emerging economies this relationship is not so clear. According to Fernald (2007), the relationship between SES and obesity in Mexico appears to be **non-linear**, assuming an **inverted U-shaped curve**. If this assumption is verified, the nutrition transition could most affect a **new middle class** rising from extreme poverty.

2. Objective:

- To identify the **causal influence of household socioeconomic classes on central adiposity** among adults (15-60), using Mexican panel data.

3. Methods & Data:

- In order to determine the non-linearity of the model we use a **two-step method**:

(i) We **classify Mexican households** according to their socioeconomic status (SES) using a clustering method based on household income, and education and occupational status of the household head.

(ii) We measure the **impact of belonging to these socioeconomic classes on anthropometric health**, using the Hausman-Taylor estimator. Two outcome indicators are used : the **Body-Mass Index** (BMI) as measure of general bodyweight & the **Waist-to-Height Ratio** (WHtR) as measure of central adiposity.

- The analysis relies on panel data from the ***Mexican Family Life Survey*** (MxFLS), which provides **three survey waves** (2002, 2005-2006 and 2009-2012). Household clustering is based only on the first wave, whereas outcome variables are observed at several points in time. Therefore we assume that socioeconomic clusters are time-invariant for the period, but that nutritional status of their members might change.

4. Result Highlights:

- **Four socioeconomic groups** of households are identified in urban Mexico: a **poor class** (group A); a **lower-middle class** (group B); an **upper-middle class** (group C); a **rich class** (group D).
- The relationship between socioeconomic and nutritional status seems **nonlinear** in Mexico, but **we do not observe an inverted U-shaped curve**:

(i) Mexicans from the poorest socioeconomic class are the thinnest, whereas individuals from the lower-middle class are the fattest.

(ii) Anthropometric indicators are higher among Mexicans from the rich class than individuals from the upper-middle class.

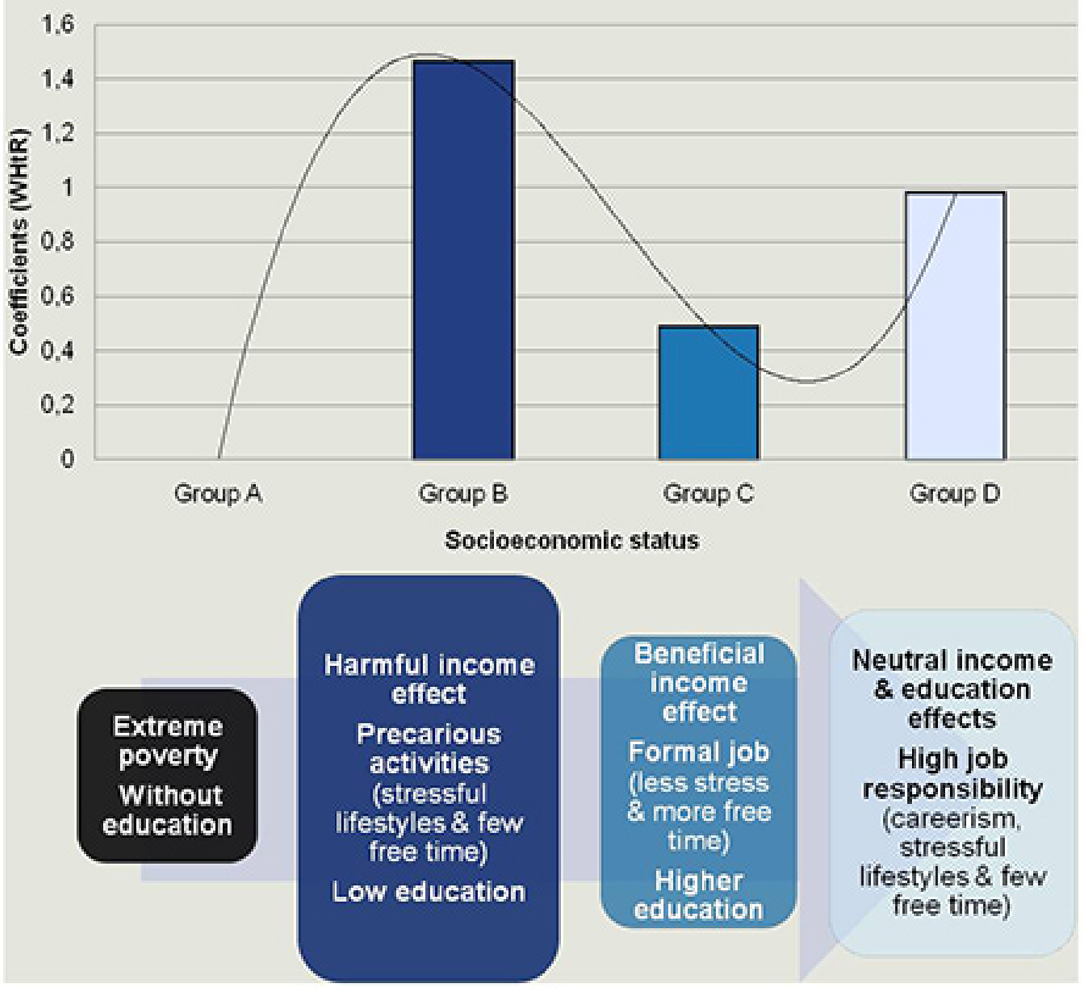
- **Gender-specific subsamples** follow the same trend as estimates among all adults. Nevertheless, the impact of SES on the WHtR seems **more pronounced for men** than for women.

4.bis

	ALL ADULTS		MEN		WOMEN	
Based on Poor class	**BMI**	**WHtR**	**BMI**	**WHtR**	**BMI**	**WHtR**
Lower-middle class (group B)	50.8564**	1.4611***	25.8015	1.1453**	13.5127	0.5709*
	(2.07)	(2.88)	(1.51)	(2.28)	(1.18)	(1.91)
Upper-middle class (group C)	17.0248**	0.4830***	9.5672	0.4219**	5.9145	0.2000*
	(2.02)	(2.63)	(1.48)	(2.02)	(1.31)	(1.65)
Rich class (group D)	33.0620**	0.9797***	22.0165	1.2855**	13.1696	0.4523*
	(2.09)	(2.83)	(1.41)	(2.49)	(1.38)	(1.81)

Control variables:
Time-varying exogenous: Age; Age squared; Marital status; Smoking; Higher urbanization; Region; Survey waves.
Time-varying endogenous: Members by room; Household assets; Time of sedentary activities.
Time-invariant exogenous: Gender; Ethnicity of HH; Government support; Infrastructure development; Primary school's number.

5. Protective & Risk Factors:



6. Contributions:

- The influence of SES on anthropometric outcomes follows a **N-shaped curve** in urban Mexico.
- Our findings highlight the **limitations of the BMI** as exclusive indicator of bodyweight in social sciences.
- The **multidimensional** definition of SES, using a clustering procedure, shows that, at the household level, income, educational and occupational components have decisive and interdependent effects on anthropometric health indicators. We can suggest that, above a certain threshold, it may not be the income per se which deteriorates anthropometric status, but rather the use that individuals make of it (the **income** thus takes on an **instrumental role**). Therefore, **education** should be a **key factor** because it has a potential impact on healthcare patterns. Nevertheless, lifestyles are also determined by **work status**. As we have seen, some jobs (positions with high levels of responsibility, precarious and informal activities) and career-orientated lifestyles can be related to **stress, anxiety and little free time**, often resulting in an unhealthy way of life.

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