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Does social status predict adult smoking and obesity? Results from the 2000 Mexican National Health Survey

(Running head: Smoking and obesity among Mexican adults)

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Abstract

Socioeconomic status is generally associated with better health, but recent evidence suggests that this 'social gradient' in health is not universal. This study examines whether social gradients in smoking and in obesity in Mexico—a country in the midst of rapid socioeconomic change—conform to, or diverge from, results for richer countries. Using a nationally-representative sample of 39 129 Mexican adults, we calculate the odds of smoking and of being obese by educational attainment and by household wealth. We find that higher education is associated with more smoking among women. Household assets are also associated with more smoking for women and for rural men. Increased education is associated with lower obesity for urban women, while obesity among rural women has a non-linear relationship to education. There is no relationship between education and obesity for men. Household wealth is associated with increased obesity for all groups except urban women. We conclude that socioeconomic determinants of smoking and obesity in Mexico are complex, with some flat gradients, and some strong positive or negative gradients. As household incomes, education, and urbanization continue to increase in Mexico, these patterns suggest potential targets for public health intervention now and in the future.

Keywords: *Smoking, obesity, Mexico, social disparities*

Introduction

Past research in industrialized countries has shown that socioeconomic status (SES) is generally associated with better health and healthier behaviours (Link and Phelan 1995, Marmot et al. 1997, Smith 1999, Goldman 2001). Recent evidence suggests, however, that this 'social gradient' in health is not universal. For example, the relationship between SES and various health behaviours among Hispanic and other immigrant populations in the United States appears considerably weaker than those for native-born groups (Chang and Lauderdale 2005, Goldman et al. 2006, Kimbro et al. 2008). These patterns prompt questions about the shape of the SES-health gradient in immigrant sending countries, particularly in Mexico, the origin of the largest volume of migrants to the USA.

There are several reasons that a positive association between SES and healthy behaviours may not be universal, particularly in developing countries like Mexico. First, income levels among the poor are considerably lower than wealthy countries. Thus, low income Mexicans may not be able to afford cigarettes, processed or high fat foods, and similar goods. Second, low SES Mexicans are more likely to have physically active jobs (e.g. farming), thus reducing obesity risk. Third, health information, which may reduce risky behaviour among higher SES individuals in wealthy countries, may be less available or influential in Mexico.

Finally, the process of socioeconomic change itself may produce flat or weak gradients. For example, the relationship between SES and smoking appears to change with socioeconomic development from a positive association between education and smoking early in the tobacco epidemic (when smoking is a status symbol) to a negative association later on (when health knowledge encourages more educated individuals to avoid smoking). For obesity, this change may occur as poor populations transition from an insufficient calorie diet to a calorie-dense but

nutrient-poor processed diet (Popkin 2006). Gradients observed in the middle of these transitions may appear flat.

In this paper, we examine social gradients in smoking and obesity in Mexico by two distinct SES measures, education and household assets. Changes in Mexico's epidemiological profile make investigation of the social determinants of health behaviours such as smoking and obesity particularly important. Until recently, undernutrition and infection accounted for much of the country's disease burden. Now chronic conditions including diabetes mellitus and cardiovascular disease (CVD) make up a much higher proportion of morbidity and mortality. Obesity, a major risk factor for diabetes, CVD, and other noncommunicable conditions, is increasing rapidly, e.g. obesity among women 18-49 years increased by more than 150% during the 1990s, from 9% to 24% (Rivera et al. 2006). While smoking prevalence is declining among men and older women, it is rising among younger women. For example, the proportion of Mexican women ages 18-29 who report daily smoking increased 20% from 1988 to 2002, while the proportion of women ages 45-65 who report daily smoking declined 32% over the same time period (Franco-Marina 2007). Approximately 20% of youths ages 13-15 report current smoking (Valdés-Salgado et al. 2005).

Previous research has shown that higher-SES Mexicans smoke more than lower-SES individuals (Caballero et al. 1999, Antonio-Rincón et al. 2002, Vázquez-Segovia et al. 2002). A comprehensive study of obesity among Latin American women (Martorell et al. 1998) found that secondary education is associated with lower odds of obesity in Mexico, Brazil, and the Dominican Republic, but not in less rapidly developing countries, e.g. Haiti and Guatemala. This study did not identify a relationship between assets and obesity. Several studies in Latin America have also investigated social gradients in health behaviour by different dimensions of

SES. In rural, poor Mexican communities, Fernald (2007) found that more education, good housing conditions, and more assets are all associated with higher BMI for both men and women. For older Mexican adults, Smith and Goldman (2007) concluded that education protects against obesity in urban areas but is a risk factor in rural areas. Income is associated with higher rates of obesity and smoking, and wealth with increased smoking only in rural areas

We extend this literature on smoking and obesity epidemiology in Latin American in several ways. First, we examine SES gradients in health behaviours separately by gender and urban residence to determine whether the gradients vary by demographic groups. Second, we explore two dimensions of SES (education and wealth) and their potentially different effects on health behaviours. Third, while other studies report the prevalence of smoking and obesity in Mexico, ours is the first to examine the association of both risk factors with educational attainment and household wealth using a large, nationally-representative survey of the adult population.

Data and Methods

Participants

Data are drawn from the 2000 Mexican National Health Survey (ENSA 2000). ENSA 2000 sampled 47 360 households based on a stratified multistage sample that is representative of the Mexican population at the state level. Sample weights adjust for nonresponse and design effects. One adult (age 20 or older) was randomly selected from each household to answer a detailed questionnaire on health risk factors, health conditions, and health care services utilization. Trained anthropometrists weighed and measured each respondent. The most knowledgeable respondent in the household reported household asset ownership and other sociodemographic

characteristics. Detailed information on ENSA 2000 is available elsewhere (Valespino et al. 2003).

We used an analytic sample of 38 901 adults ages 20-69 with complete data on sex, age, urban residence, educational attainment, asset ownership, current smoking status, height and weight. From 45 294 total adults, we excluded 3 267 adult ages 70 and over to minimize recall and survivor bias. Of the remaining 42 027 adults ages 20-69, 3 126 (7.4%) were excluded due to missing or outlier values on education, assets, smoking status, or BMI. This included 2.9% missing smoking status, and 5.3% missing BMI. BMI outliers were defined as more than three interquartile ranges below the first quartile or more than three interquartile ranges above the third quartile (Larson 2006).

Measures

Current smoking was a dichotomous measure indicating whether the respondent reported currently smoking tobacco. Obesity was defined as having a Body Mass Index (BMI)$\geq$ 30 kg/m^2, based on measured height and body weight.

Socioeconomic status (SES) was measured by completed education and household assets. Education was grouped into five categories that reflect the attainment of specific milestones in the Mexican educational system: no education (including illiteracy), incomplete primary (1-5 years), complete primary or some secondary (6-8 years), complete secondary or some high school (9-11 years), and completed high school or more education (12 or more years).

An index of household assets, a reliable proxy of a household's long-run economic status or wealth (Filmer and Pritchett 2001), was derived from ownership of nine items: radio/stereo, TV, VCR, blender, refrigerator, washer, telephone, water heater, and car/truck. Factor analysis

was used to combine these variables into a single index ranging from 0 to 1 (Cronbach's alpha = .83) (Costello and Osborne 2005). A similar scale has been used to examine socioeconomic status and BMI among adults in poor rural communities in Mexico (Fernald 2007). The household asset index was subsequently categorized as low (0-0.39), medium (0.40-0.69), or high (0.70-1.0) asset ownership.

Control variables included gender, age, and community size. Age was classified into three ten-year groups (20-29, 30-39, and 40-49) and a fourth group of 50-69 year olds (exploratory analyses having shown no difference in smoking or obesity prevalence between the 50-59 and the 60-69 age groups). Following the ENSA sampling scheme and the official Mexican definition, we defined rural communities as those with fewer than 2 500 residents. Semi-urban and urban communities (2 500 or more residents) are referred to as urban.

Analysis

We used logistic regression to estimate the odds of current smoking and obesity. In the first set of models, we estimated odds ratios for smoking and obesity by education. In the second set, we estimated the corresponding odds ratios by household asset category. Finally, we included both education and assets in a 'net effects' model. Analyses are stratified by gender and by urban residence and control for age.

To illustrate the magnitude of the differentials, we next calculated predicted probabilities of smoking and obesity for each subpopulation using the net effects models. We present the predicted probabilities by each of the two SES measures, assigning the middle category for the level of the other SES measure. Predicted probabilities are shown for the oldest (ages 50-69) and

youngest (ages 20-29) cohorts to highlight age differences in the probability of smoking and obesity.

All regression models were estimated in Stata version 10 (StataCorp 2007). Descriptive statistics and regressions were adjusted for the ENSA survey design. Adjusted Wald tests were used to assess the joint significance of sets of categorical variables (i.e., all levels of education or all levels of assets). F-tests and p-values from these tests are reported in Tables II and III.

Results

Weighted descriptive statistics for the analytic sample are presented in Table I. Column 1 shows the characteristics of the analytic sample, and Columns 2-5 present results separately for urban women, urban men, rural women, and rural men respectively. Twenty-three percent of respondents report current smoking, 24% are obese, while five percent are both current smokers and obese. Current smoking is most common among urban males (40%), and obesity among urban females (30%). Over 60% of the adults live in communities with 2 500 people or more (defined above as 'urban').

[Insert Table I about here]

Smoking

Table II presents odds ratios for current smoking for the four subpopulations. In the columns labelled 'Gross Effect', the models include only one SES measure; in the columns labelled 'Net Effect', the models include both education and assets. Results for urban respondents are shown in the top panel, and rural respondents in the bottom panel.

[Insert Table II about here]

With a few exceptions, we found similar results for smoking in urban and rural areas. For women, both higher educational attainment and greater wealth are generally associated with a higher prevalence of smoking (column 1). The reduction of the odds ratios for education in the net effects model (column 2) suggests that some of the observed association between education and smoking can be accounted for by wealth. This attenuation of the education coefficients is particularly striking among rural women. In contrast, the wealth coefficients change little in the presence of controls for education.

Results for men are quite different. In both urban and rural areas, increased education is associated with slight *reductions* in the odds of smoking (column 3). This relationship is significant only in the case of urban men, and is due primarily to men with 12+ years of education. In contrast to women, wealth is not significantly associated with men's smoking. The net effects for both education and wealth (column 4) differ little from the gross effects in urban areas; however, both sets of SES coefficients are jointly significant in rural areas in the presence of controls for the other SES variable. These net effect estimates reveal that rural men with *high* levels of education and *low* levels of assets are less likely to smoke than their respective counterparts.

Figure 1, which presents the predicted probabilities of smoking for the youngest and oldest women, highlights the positive slopes of both the education and asset gradients for urban women. For rural women, asset ownership is also associated with smoking. Figure 2 also highlights the fact that younger and older women in urban areas have the same probability of

smoking, while in rural areas smoking is more common among older women. Figure 2 shows the same set of predicted probabilities of smoking for men. The negatively-sloped education gradients are clear for both urban and rural men, while the asset gradients are flat for urban men and positive for rural men. Smoking prevalence is higher among younger compared to older men, and among urban compared to rural men.

[Insert Figures 1 and 2 about here]

Obesity

The odds ratios for obesity are presented in Table III. Among urban women, higher educational attainment is associated with significantly lower odds of obesity (column 1). In rural areas, education has a non-monotonic relationship with obesity: women with moderate levels of education are those most likely to be obese. The wealth effects are not significant for urban women, but higher asset levels are significantly associated with higher obesity prevalence for rural women. These results change little in the net effects models, with the exception that highly educated rural women have lower odds of obesity than uneducated women (column 2).

For men, most of the estimates in columns (3) and (4) of Table III suggest that *education* matters little for obesity, particularly net of wealth effects. In contrast, household *wealth* is positively and significantly associated with obesity for both urban and rural men (whether or not education is included in the model).

[Insert Table III about here]

Figures 3 and 4 show predicted probabilities of obesity for the youngest and oldest age groups. In Figure 3, the steep negative gradient for education urban is contrasted with the slight positive asset gradients. Rural women have a distinct inverted U-shaped education gradient, with obesity prevalence highest among women of low-to-moderate educational attainment. Rural women also have a steep positive asset gradient. Figure 4 shows the flat education gradient but steep positive asset gradient for both urban and rural men. The higher prevalence of obesity among older as compared to younger adults (double in some cases) can be seen in both Figures 3 and 4.

[Insert Figures 3 and 4 about here]

Discussion

We have examined SES-health differentials in obesity and smoking in a nationally-representative sample of Mexican adults, using two distinct measures of socioeconomic status. Our results indicate that the predominant negative relationships between SES and smoking and obesity are not universal. Particularly striking is the positive association between smoking and SES for women. More educated women and those with higher household assets are more likely to smoke in both urban and rural areas. These results suggest that the tobacco epidemic is still in an early stage in Mexico, with higher SES women adopting smoking as an innovative behaviour (Pampel 2003, 2006). In contrast, for men – who are far more likely to smoke than women in general – those living in urban areas smoke significantly *less* if they are highly educated. The same is true for rural men when household assets are held constant. For obesity, women show the 'standard' pattern seen in high-income countries– higher education is associated with lower obesity.

However, for urban and rural men and rural women, higher assets are associated with *greater* obesity – suggesting greater dietary intake, a change in food quality, and/or a more sedentary lifestyle.

A second important finding is that education and household assets can have quite different relationships with health behaviour. For example, for rural women, higher education is protective for obesity, but higher assets increase the obesity risk. The same pattern emerges for smoking among urban men. These findings echo similar results from Brazil (Monteiro et al. 2001), and highlight the importance of examining the effects of components of SES rather than focusing on aggregate indices.

A limitation of our analysis is our use of cross-sectional data. We are not able to examine change over time nor make causal statements about the role of education and assets in determining health. We do not consider smoking intensity, which other research indicates is relatively low in Mexico even among groups where prevalence is high (Franco-Marina 2007). Our data do not include dietary intake or physical activity measures that would allow us to investigate the determinants of obesity in more detail. An important extension of the work could incorporate qualitative measures of adult knowledge, attitudes, and preferences around smoking, diet and physical activity to enhance our understanding of health behaviors in this population..

Despite these constraints, our results provide insight into the future trajectory of smoking and obesity in Mexico. Mexico is experiencing increases in education attainment (particularly among women and in rural areas) and in income, and is undergoing rapid urbanization (Wong and Palloni forthcoming). If the patterns revealed in our analysis persist, our results clearly point to a sizable increase in smoking among women as education and incomes rise. Smoking prevalence among men will depend on the extent to which the protective effects of education are

outweighed by increases in smoking related to higher wealth. Similarly, obesity is likely to rise substantially for men and rural women with increases in income, which may outweigh any protective effects of education. Although not tested here, the education and income gradients in smoking and obesity may also differ by cohort.

The results also highlight potential public health targets. At the moment, more educated Mexican women are a key target for anti-smoking programs. The increase in smoking, but decrease in obesity, at higher levels of education for women suggests that social norms about body size and smoking behaviour may be important. Programs designed to change social norms about smoking and to provide information about its dangers could prevent a dramatic increase in smoking among women as educational attainment rises in successive cohorts. However, as the tobacco epidemic progresses in Mexico, the direct relationship between SES and smoking is likely to shift to an inverse relationship (Pampel 2003, 2006), at which time prevention and cessation efforts will need to be targeted at lower SES women.

Middle and higher income men are a potential target group for obesity prevention programs. Net of assets, education and obesity are unrelated for men, but men with higher assets have consistently higher rates of obesity. We speculate that one cause of higher obesity prevalence for men with higher household assets is sedentary occupations and little exercise outside of work. Thus, exercise programs focused on this group could have an important effect in reducing the obesity epidemic in Mexico. Higher income rural women should also be a focus of these efforts.

Future health behaviours are also likely to be affected by the regulatory environment in Mexico. Compared to wealthy countries such as the USA, the adoption of regulations and programs in Mexico that promote healthy lifestyles are relatively recent. Mexican law did not

prohibit the sale of cigarettes to youth under age 18 until 1984, and progress on tobacco control under the Framework Convention for Tobacco Control has been slow in recent years. Tobacco taxes also remain low (Bianco et al. 2005). Meanwhile, federal nutritional policies still focus almost exclusively on securing food sufficiency among the poor (Barquera et al. 2001). Mexico, like many developing countries, has undergone rapid dietary shifts in recent decades, away from whole grains, fruits and vegetables and towards edible oils and caloric sweeteners (Popkin 2003, 2006) Agriculture and trade policies may therefore offer some leverage in promoting healthier diets. More generally, stronger policies and focused attention by the public health community are needed to stem increases in obesity and smoking in Mexico, and to safeguard against growing social inequalities in these important health behaviours.

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Table I Selected sociodemographic characteristics, Mexican adults ages 20-69.

	Total sample	Urban		Rural	
		Women	Men	Women	Men
	(1)	(2)	(3)	(4)	(5)
Gender					
Female (%)	53	100	0	100	0
Male (%)	47	0	100	0	100
Residence					
Urban (%)	62	100	100	0	0
Rural (%)	38	0	0	100	100
Age					
20-29 (%)	37	37	39	38	33
30-39 (%)	27	27	26	28	29
40-49 (%)	18	18	18	17	18
50-69 (%)	18	18	17	18	19
Years of completed education					
0 (or illiterate) (%)	7	5	2	14	9
1-5 (%)	22	17	11	35	34
6-8 (%)	25	25	23	27	26
9-11 (%)	24	26	30	17	20
12+ (%)	22	27	34	8	11
Household assets					
Low (%)	24	11	9	47	48
Medium (%)	36	36	34	36	35
High (%)	40	53	56	17	17
Current smoker = Yes (%)	23	15	40	3	31
Obese (BMI > 30 kg/m2) = Yes (%)	24	30	21	25	15
Current smoker and obese (%)	5	4	7	1	4
N (unweighted)	38 901	14 668	6 433	12 431	5 369

Source: Own calculations using Mexican National Health Survey (ENSA) 2000. Table shows weighted percentages and unweighted Ns. Household asset categories are based on a household asset scale ranging from 0-1 based on ownership of nine common household items. Asset scale scores are grouped into 'Low' (0-.39), 'Medium' (.40-.69) and 'High' (.70-1.00) categories.

Table II Odds ratios (95% confidence intervals) for logistic regression models[a] of the association between socioeconomic status and current smoking, adults ages 20-69, Mexican National Health Survey (ENSA) 2000.

	Urban			
	Women		Men	
	Gross Effect (1)	Net Effect (2)	Gross Effect (3)	Net Effect (4)
Education (completed years)				
0	1.00	1.00	1.00	1.00
1-5	1.34 (0.89-2.01)	1.29 (0.86-1.94)	0.81 (0.51-1.29)	0.79 (0.50-1.28)
6-8	2.44 (1.62-3.67)	2.24 (1.48-3.40)	0.99 (0.63-1.54)	0.96 (0.61-1.52)
9-11	2.59 (1.69-3.97)	2.27 (1.48-3.49)	0.82 (0.53-1.26)	0.79 (0.51-1.23)
12+	3.15 (2.07-4.79)	2.58 (1.67-3.99)	0.63 (0.41-0.97)	0.61 (0.38-0.96)
F-statistic[b] *(p value)*	***17.85 (<.01)***	***11.82 (<.01)***	***4.42 (< .01)***	***4.21 (<.01)***
Household asset ownership				
Low	1.00	1.00	1.00	1.00
Medium	1.13 (0.86-1.48)	1.01 (0.77-1.32)	1.09 (0.85-1.40)	1.15 (0.89-1.48)
High	1.77 (1.37-2.30)	1.41 (1.08-1.83)	1.00 (0.78-1.28)	1.15 (0.88-1.49)
F-statistic[b] *(p value)*	***21.90 (<.01)***	***10.36 (<.01)***	*0.56 (.57)*	*0.61 (.54)*
N (unweighted)	14 668	14 668	6 433	6 433
	Rural			
	Women		Men	
	Gross Effect	Net Effect	Gross Effect	Net Effect
Education (completed years)				
0	1.00	1.00	1.00	1.00
1-5	1.73 (1.18-2.54)	1.39 (0.94-2.05)	0.97 (0.73-1.28)	0.93 (0.69-1.24)
6-8	2.24 (1.45-3.46)	1.56 (1.00-2.46)	0.88 (0.63-1.23)	0.82 (0.58-1.14)
9-11	2.48 (1.52-4.04)	1.47 (0.89-2.44)	0.94 (0.66-1.34)	0.83 (0.57-1.19)
12+	3.88 (2.34-6.43)	1.96 (1.18-3.26)	0.64 (0.42-0.96)	0.53 (0.34-0.81)
F-statistic[b] *(p value)*	***7.15 (<.01)***	*1.78 (.13)*	*1.61 (.17)*	***2.75 (.03)***
Household asset ownership				
Low	1.00	1.00	1.00	1.00
Medium	1.91 (1.41-2.58)	1.78 (1.30-2.43)	1.19 (1.00-1.43)	1.28 (1.06-1.54)
High	3.51 (2.53-4.86)	3.06 (2.19-4.28)	1.19 (0.93-1.53)	1.37 (1.06-1.78)
F-statistic[b] *(p value)*	***28.68 (<.01)***	***21.92 (<.01)***	*2.04 (.13)*	***4.25 (.01)***
N (unweighted)	12 431	12 431	5 369	5 369

Source: Own calculations using Mexican National Health Survey (ENSA) 2000 (N=39 129). [a]Gross Effect models include one SES measure (education or household assets). Net Effect models include both SES measures. All models control for age. All models are weighted and confidence intervals are adjusted to account for the ENSA sampling scheme and clustering at the community level. [b]The reported F-statistics are from adjusted Wald tests of the joint significance of the set of categorical variables immediately above. Bolded F-statistics indicate that the set of categorical variables is jointly significant at the 5% level.

Table III Odds ratios (95% confidence intervals) for logistic regression models[a] of the association between socioeconomic status and obesity, adults ages 20-69, Mexican National Health Survey (ENSA) 2000.

	Urban			
	Women		Men	
	Gross Effect (1)	Net Effect (2)	Gross Effect (3)	Net Effect (4)
Education (completed years)				
0	1.00	1.00	1.00	1.00
1-5	1.02 (0.80-1.29)	1.00 (0.78-1.27)	0.90 (0.52-1.54)	0.84 (0.48-1.45)
6-8	0.91 (0.72-1.13)	0.87 (0.70-1.09)	1.06 (0.63-1.77)	0.94 (0.56-1.60)
9-11	0.68 (0.53-0.86)	0.64 (0.51-0.82)	0.92 (0.54-1.54)	0.78 (0.46-1.32)
12+	0.57 (0.45-0.73)	0.54 (0.41-0.69)	1.04 (0.61-1.75)	0.83 (0.49-1.42)
F-statistic[b] *(p value)*	***15.02 (<.01)***	***15.03 (<.01)***	*0.51 (.73)*	*0.61 (.65)*
Household asset ownership				
Low	1.00	1.00	1.00	1.00
Medium	1.07 (0.90-1.27)	1.17 (0.98-1.40)	1.38 (0.98-1.94)	1.41 (1.00-1.97)
High	0.96 (0.81-1.15)	1.22 (1.00-1.47)	1.70 (1.22-2.36)	1.76 (1.27-2.45)
F-statistic[b] *(p value)*	*1.71 (.18)*	*1.97 (.14)*	***5.68 (<.01)***	***6.44 (<.01)***
N (unweighted)	14 668	14 668	6 433	6 433
	Rural			
	Women		Men	
	Gross Effect	Net Effect	Gross Effect	Net Effect
Education (completed years)				
0	1.00	1.00	1.00	1.00
1-5	1.57 (1.31-1.89)	1.38 (1.15-1.66)	1.27 (0.88-1.84)	1.12 (0.78-1.60)
6-8	1.63 (1.33-1.99)	1.30 (1.05-1.61)	1.33 (0.87-2.04)	1.03 (0.68-1.55)
9-11	1.39 (1.06-1.81)	0.99 (0.75-1.31)	1.40 (0.86-2.31)	0.96 (0.59-1.57)
12+	1.11 (0.84-1.47)	0.72 (0.53-0.96)	2.22 (1.39-3.54)	1.26 (0.79-2.02)
F-statistic[b] *(p value)*	***8.99 (<.01)***	***9.79 (<.01)***	***3.52 (.01)***	*0.62 (.65)*
Household asset ownership				
Low	1.00	1.00	1.00	1.00
Medium	1.54 (1.33-1.79)	1.59 (1.36-1.84)	1.82 (1.42-2.33)	1.81 (1.41-2.31)
High	1.85 (1.57-2.19)	2.02 (1.69-2.41)	2.87 (2.13-3.86)	2.78 (2.06-3.76)
F-statistic[b] *(p value)*	***29.13 (<.01)***	***32.87 (<.01)***	***24.74 (<.01)***	***23.15 (<.01)***
N (unweighted)	12 431	12 431	5 369	5 369

Source: Own calculations using Mexican National Health Survey (ENSA) 2000 (N=39 129). [a]Gross Effect models include one SES measure (education or household assets). Net Effect models include both SES measures. All models control for age. All models are weighted and confidence intervals are adjusted to account for the ENSA sampling scheme and clustering at the community level. [b]The reported F-statistics are from adjusted Wald tests of the joint significance of the set of categorical variables immediately above. Bolded F-statistics indicate that the set of categorical variables is jointly significant at the 5% level.

Figure 1 Predicted probability of currently smoking by urban residence, age group, and educational attainment or household asset ownership, Mexican women, 2000.

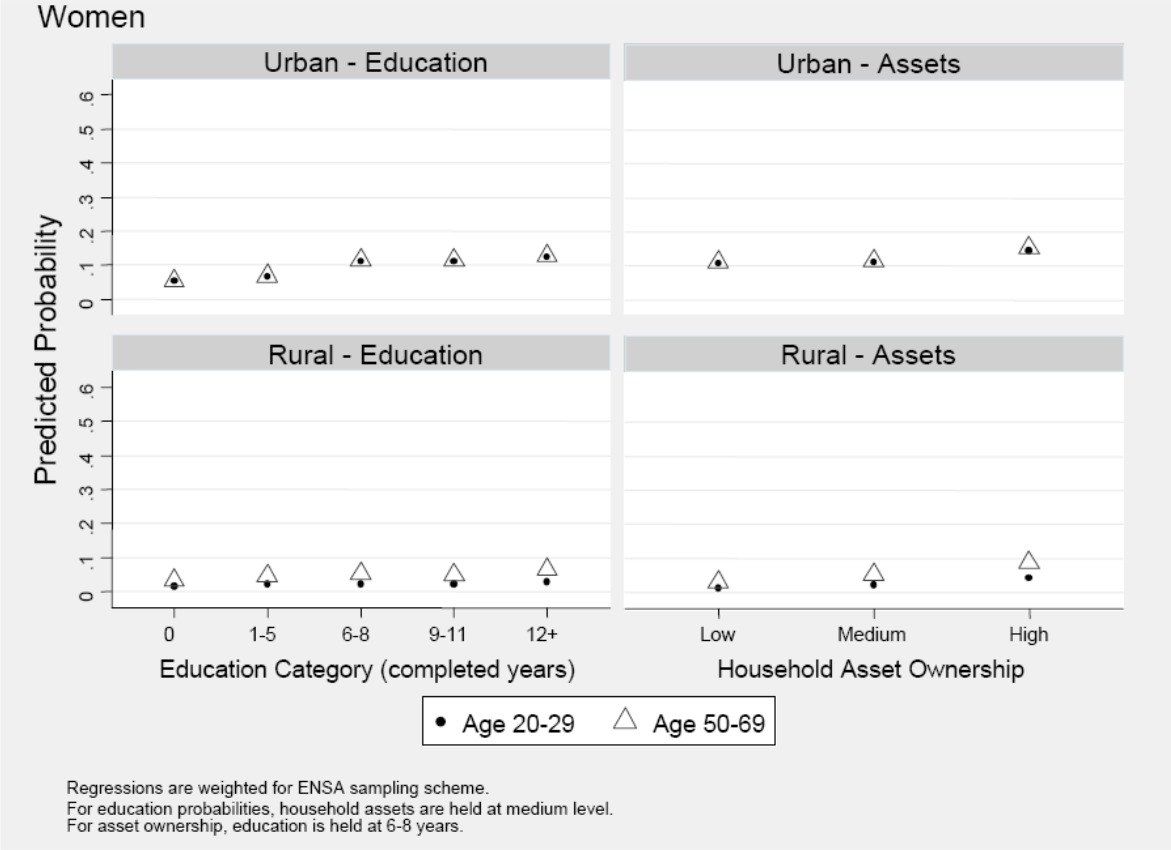

Figure 2 Predicted probability of currently smoking by urban residence, age group, and educational attainment or household asset ownership, Mexican men, 2000.

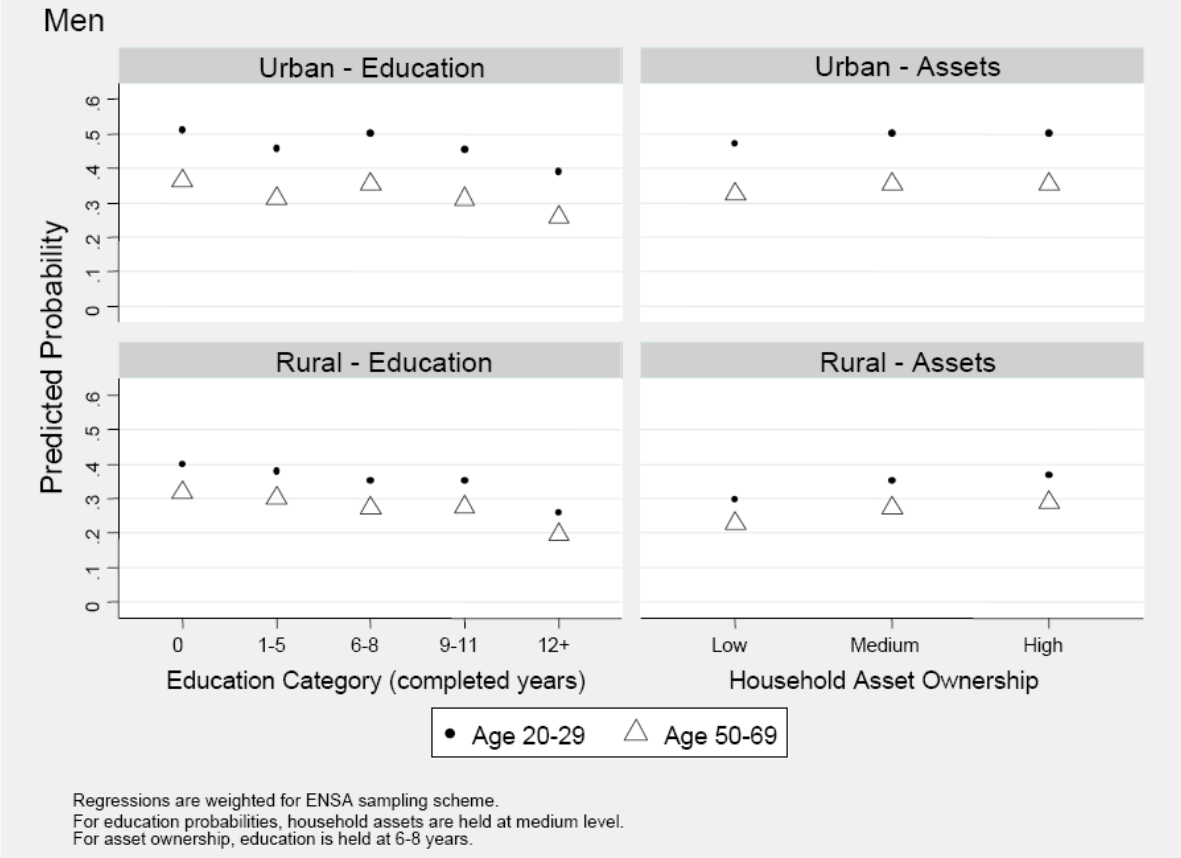

Figure 3 Predicted probability of obesity by urban residence, age group, and educational attainment or household asset ownership, Mexican women, 2000.

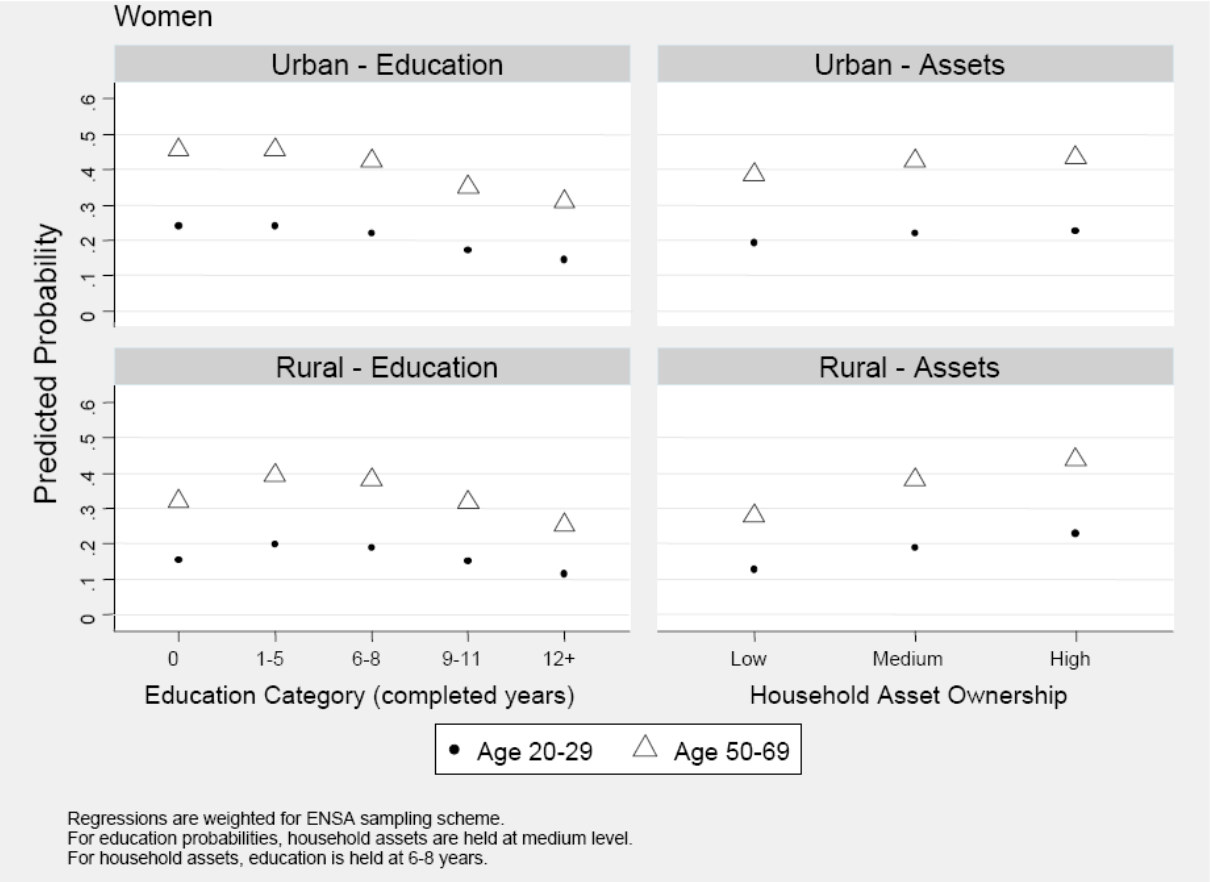

Figure 4 Predicted probability of obesity by urban residence, age group, and educational attainment or household asset ownership, Mexican men, 2000.