Examining the multigenerational effects of obesity in a Latin American middle income country: The case of Colombia

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Extended Abstract

Introduction

The examination of multigenerational effects on health in Latin American populations from grandparents to their grandchildren is a fruitful area for research, which has not yet been fully explored. Within this context, understanding the multigenerational impact of obesity—an important health concern both within the Latin American and Caribbean areas and internationally—merits further consideration. In general, research efforts have often focused on individual lifestyle to explain obesity and only recently, has there been evidence regarding the possibility of an intergenerational transmission of obesity (Davis et al., 2008; Kelleher et al. 2014; Nielsen et al., 2015). In the case of obesity, there is a complex interplay between environmental, behavioral, genetic, and epigenetic mechanisms explaining differences in the risk of developing this condition (Gluckman & Hanson, 2005; Somer & Thummel). Evidence suggest that a mother´s diet may have a long-lasting influence on the health of upcoming generations, including the propensity to obesity and diabetes, independently of later diet changes (Cooney, 2006; Cropley et al., 2006).

Understanding causal multigenerational effects requires data with adequate information across generations. Recent studies that examine the net effects of grandparents using survey data (Warren & Hauser, 1997; Davis et al., 2008) provide an improved understanding of multigenerational effects on different outcomes. Demographers need to consider the value of multigenerational studies that not only examine the net ("causal") effects of grandparents on their grandchildren but also examine these effects within the context of generations that have experienced large social and demographic transitions (Mare 2011). In that regards, populations from the Latin American and the Caribbean region have experienced dramatic demographic changes during the last century---changes, which produced increasing survivors of poor early life conditions and which potentially are influencing adult health today, including the increasing prevalence of obesity in these populations (Palloni et al., 2006). It is these populations, which may hold promise to understanding multigenerational effects on health during large demographic transitions.

Colombia is an important setting because it is a large middle income country with a growing population of older adults and increasing prevalence of obesity and chronic

conditions (Cano-Gutierrez et al. 2015). It also has several large household surveys with a wealth of information on health of individuals within households.

We start with basic questions regarding health and obesity:

1. What is the overall health profile of Colombian households across generations? By population concentration? By region?
2. What is the pattern of obesity prevalence across generations?
3. Does grandparent obesity predict grandchildren obesity? Does obesity in one generation predict obesity in another generation?

Data and methods

Data

The data come from two large national surveys of households in Colombia: **ENDS** (National Survey of Demography and Health/Encuesta Nacional de Demografía y Salud) and **ENSIN** (National Survey of the Nutritional Situation/Encuesta Nacional de la Situación Nutricional). ENDS is a household survey carried out by ProFamilia in Colombia (profamilia.org.co/investigaciones/ends/ on a recurring 5-year basis since 1990 and is comparable to other Demographic and Health surveys from other countries. ENSIN, administered by the Colombian Institute for Family Wellbeing (www.icbf.gov.co/portal/page/portal/PortalICBF/bienestar/nutricion/ensin), has extensive information on nutrition on a recurring 5-year basis.

We select 2010 because the selected sample was the same for both surveys and we can draw upon the comprehensiveness of each survey to obtain in-depth profiles of the health of family members. In addition, the 2010 ENDS survey included an expanded section for older adults. ENDS and ENSIN 2010 sampled 51,447 households and 204,459 individuals. Because only individuals within the household 64 years and younger were measured for height and weight, our final sample for analysis for obesity excludes those 65+ years and older. Nevertheless our sample contains over 36,000 multigenerational households with nearly 164,000 individuals (Table 1).

Measures

ENDS and ENSIN contain a wealth of information on households and individuals. Basic variables such as age, gender, years of education, population concentration of household, and a wealth index are available for all households and individuals. Key life course measures that we will use for multigenerational analyses are shown in Table 2 and include early life conditions, health, and aspects of nutrition.

Analyses, discussion

For our final paper, we will use the guiding framework of questions posed at the beginning of the abstract to produce comparative health profiles and associations of households and generations with obesity with the intent to better understand the multigenerational effects of obesity on subsequent generations. We use a series of logistic regression models to predict childhood obesity as a function of grandparent/parent obesity, grandparent/parent education, aspects of nutrition, early life conditions, health, age, and gender, household wealth and population concentration. Ultimately, we expect to answer the question: does obesity in one generation predict obesity in subsequent generations?

Table 1: Households and individuals according to household type

Household Type	Households	Individuals
Two generations	29,150	119,162
Three+ generations	7,351	44,642
Total	36,501	163,804

Source: ENDS and ENSIN 2010, Colombia.

Notes: Includes only those individuals with measurement for height and weight.

Table 2: Key life course variables in multigenerational households

Variable/Generation	First	Second (18+ yrs)	Third & Fourth (0-4 yrs)	Third & Fourth (0-17)
Maternal nutritional status & risk factors (e.g. birth intervals, age of mom at birth); infant & child mortality			X	
Malnutrition (height for age, weight for height)			X	X
Early life conditions (hgt, education)	X	X	X	X
Obesity (Height, weight)	X	X	X	X
Waist circumference	X	X		
Chronic conditions	X (60+)	X (60+)		
Self-reported health	X	X	X	X
Disability status	X	X	X	X
Food insecurity (household-ELCSA)	X	X	X	X
Food expenditure (household)	X	X	X	X
Frequency of food consumption	X	X	X	X

Notes: First generation (grandparents), second generation (parents), third generation (grandchildren), fourth generation (great grandchildren). Additional variables found in the survey data include age, gender, years of education, wealth index, population concentration (4 principal cities, intermediate cities, small cities, rural). ELCSA is the Latin American and Caribbean Household Food Security Measurement Scale (Escala Latinoamericana y Caribeña sobre Seguridad Alimentaria.