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Investigating the poverty-obesity paradox in Europe

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ABSTRACT

This paper investigates the effect of income- and wealth-based poverty on the probability of being obese for the elderly in Europe by analysing data drawn from the Survey of Health, Ageing and Retirement (SHARE) and the English Longitudinal Study of Ageing (ELSA). We use early-life economic conditions and regional circumstances as instruments for poverty later in life to account for endogeneity issues. After controlling for a large set of covariates at the individual, household, regional and country level, the results show that poverty significantly increases the probability of being obese and the Body Mass Index (BMI), for men and women. The results show that, accounting for endogeneity with a bivariate probit model, poor individuals are from 10 to 20% points more likely to be obese than non-poor individuals. The effect on BMI ranges from 0.295 points (2.39 kg) to 0.395 points (2.75 kg). These results are robust to a series of checks and suggest that anti-poverty interventions might have positive side effects in terms of reducing food-related health inequalities.

1. Introduction

Poverty is usually associated with a lack of financial resources and the inability to secure food and adequate nutrition, conditions that are likely to produce underweight problems. This is generally what people have in mind when they think about poverty and the effects on nutrition and health. However, this seems to be just one side of the same malnutrition coin in more developed countries. Recently it has been observed that not only hunger but also obesity can be associated with low income. Although the correlation between unhealthy weight and low socio-economic status can be considered another expression of the well-documented health-wealth gradient, there is still no consensus about causality.

Obesity has drawn the attention of medicine, epidemiology and economics researchers, especially in the last few decades, because obesity has reached epidemic proportions and relevant economic and public health consequences[1] (Cutler et al., 2003; Philipson and Posner, 2008; Brunello et al., 2009; Bhattacharya and Sood, 2011; World Health Organization, 2007; Pieroni and Salmasi, 2014). Among OECD countries, the United States has the highest obesity rate characterised by a marked increasing dynamic: According to Cutler et al. (2003) obesity is twice as high as that at the beginning of the 70s. European obesity rates are lower and have increased less rapidly, becoming a concern for public health only recently (Brunello et al., 2009). OECD (2012) has illustrated the alarming rise of this phenomenon, reporting that since 1980, obesity rates have

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[1] The potential consequences related to overweight or obesity include risk of hypertension, stroke, type 2 diabetes, osteoarthritis, respiratory problems and breast, prostate, and colon cancers (see the National Heart, Lung, and Blood Institute, 1998) for a list of health problems associated).

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doubled or even tripled in many countries and *in more than half of OECD countries, 50% or more of the population is now overweight, if not obese*. Understanding the causes, as well as the consequences, is therefore relevant from a policy perspective.

Obesity can be the result of several interacting changes that could be either socio-demographic or economic. Therefore, an assessment of what extent they cause increases in body weight is important information. Governments could exploit it to tackle the phenomenon, for instance, in terms of health education and promotion, regulation and fiscal measures or counseling in primary care.

According to Brunello et al. (2011), the main public interventions proposed thus far are information campaigns, advertising and labeling rules and regulation of nutritional claims. While those interventions certainly better inform people about food characteristics, it is still not clear whether information can effectively induce people to make healthier choices. An overview of the economic justifications for public intervention highlights that information deficiencies are not a major issue in this context, as *the majority of individuals are aware of the health consequences of obesity and rarely declare that having limited information makes it hard for them to follow a healthy diet* (Brunello et al., 2009). For poor individuals especially, where obesity seems to be concentrated, Philipson and Posner (2008, p. 979) say that *[...] the problem is not that disadvantaged persons cannot read labels and are unaware that obesity is bad for their health but that uneducated persons have less incentive to invest in their health because their longevity and their utility from living are below the average*. These statements reduce information policies as anti-obesity measures in developed countries, suggesting interventions should be more focused on improving the welfare of poorer individuals. Policy interventions in this context, based on equity considerations, are justified only if there are circumstances, beyond individuals' control that make them more likely to be obese. This is the focus of this paper.

In the literature, several papers have estimated the causal impact of weight on earnings and wages, e.g. Cawley (2004), Morris (2006), Lundborg et al. (2007) and Brunello and D'Hombres (2007), whereas less attention has focused on estimating the reverse link. This could be because understanding whether income (in our case, very low income) has a causal effect on obesity is not straightforward to assess. Some authors have exploited exogenous policy variations. However, estimates are unlikely to capture long-run effects and are limited to relatively small and selected sub-samples of the population (Schmeiser, 2009; Cawley et al., 2010). Even if these studies find limited significant effects of income on weight, there is some evidence that economic insecurity (Offer et al., 2010) and stress (De Vriendt et al., 2009) contribute to obesity by increasing calorie intake and decreasing physical activity. From a policy perspective in this context causality is crucial but not easy to assess. If a cause-and-effect link between poverty and unhealthy weight exists, governments that are interested in tackling obesity and mitigating socio-economic status differences could exploit interventions based on equity considerations for returns also in terms of health inequality and public expenditure reductions.

Similarly to Schmeiser (2009) and Cawley et al. (2010), to some extent we investigate the role of (low) income on obesity (and Body Mass Index – BMI - in general) but differs in terms of identification strategy and countries analysed. We are interested in understanding the long-run role of low (or lack of) income[2] on the probability of being obese in Europe. To do that, we use the circumstances to which an individual is exposed during his life-course as an instrument for poverty, controlling for country, regional, household and individual characteristics. We use data drawn from the Survey of Health, Ageing and Retirement in Europe (SHARE) and the English Longitudinal Study of Ageing (ELSA) that contain detailed economic and health as well as retrospective information for individuals aged 50 or over. Similar to Cawley et al. (2010) we consider a vulnerable group of the European population, elderly individuals, and the effect of being in the lower part of income and wealth distribution on obesity and BMI.

This paper is organised as follows. In section 2, we review the relevant literature. In section 3, we describe the data used, in section 4, we present the empirical strategy and in section 5 we comment on the results. In section 6, we conclude.

2. Literature review

A complex link exists between socio-economic conditions and obesity (and health in general; see Adams et al. (2003), O'Donnell et al. (2015)). In low-income countries, for instance, obesity is generally more prevalent among the better off, whereas disadvantaged groups are increasingly affected as the country grows richer (Sassi et al., 2009, p. 9).

This evidence suggests that poor individuals are threatened not only through limited economic resources but also in terms of poor health. Averett and Smith (2014) found that financial hardship has significant effects on the probability of being obese, whereas Young (2014) found that lack of income is associated with childhood obesity, and Tafreschi (2015) investigated income body weight gradients in China. The correlation between poverty and health has also been investigated at later stages in life (see, for instance, Dahl and Birkelund, 1997; Huisman et al., 2003; Adena and Myck, 2014). Kok et al. (2008) found that low levels of wealth and poor education are positively associated with specific health outcomes: heart attack and diabetes.

Regarding obesity, as Cawley et al. (2010) observe, the effect of income on weight depends on how income affects food consumption and time allocation. A certain category of food can be an inferior good and have a negative income elasticity of demand because of its quality (pork consumption, for example, can be substituted with another type of meat when income increases). In addition, health and

[2] As we are looking at individuals who age 50 or older, mostly retired, income or wealth is likely to reflect the individuals' long-term economic resources.