Decomposing socioeconomic inequalities in childhood obesity: Evidence from Ireland

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ABSTRACT

The objective of this paper is to quantify and decompose the socioeconomic gradient in childhood obesity in the Republic of Ireland. The analysis is performed using data from the first wave of the Growing Up in Ireland survey, a nationally representative survey of 8568 nine-year-old children conducted in 2007 and 2008. We estimate concentration indices to quantify the extent of the socioeconomic gradient in childhood obesity and undertake a subsequent decomposition analysis to pinpoint the key factors underpinning the observed inequalities. Overall the results confirm a strong socioeconomic gradient in childhood obesity in the Republic of Ireland. Concentration indices of obesity (CI = −0.168) and overweight/obese (CI = −0.057) show that the gradient is more pronounced in obese children, while results from the decomposition analysis suggest that the majority of the inequality in childhood obesity is explained by parental level variables. Our findings suggest that addressing childhood obesity inequalities requires coordinated policy responses at both the child and parental level.

1. Introduction

Obesity is a significant and growing public health problem in many countries. In the Republic of Ireland, approximately 18% of adults are now obese (National Taskforce on Obesity, 2005), with recent evidence suggesting that prevalence rates are increasing (Madden, 2013). This has significant consequences for both the individuals, in terms of morbidity (Renehan et al., 2008) and reduced quality of life (Jia and Lubetkin, 2005; Forste and Moore, 2012), as well as for society in terms of higher healthcare expenditures and lost output (Wang et al., 2011; Cawley and Meyerhoefer, 2011). Obesity is seen as a key contributor to a number of diseases with, for example, 44% of the diabetes burden, 23% of the ischaemic heart disease burden and between 7% and 41% of the burden of certain cancers being attributed to overweight and obesity (Renehan et al., 2008; Van Baal et al., 2008). Of further concern is the fact that childhood obesity has also grown rapidly in recent years, thereby escalating the burden of both immediate and long-term health effects. For example, while most of the costs associated with obesity among children will be incurred in the future, research in the United States (US) has shown that obesity related problems amongst children cost the health service as much as $14.1 billion annually (Trasande and Chatterjee, 2009). Recent studies in Ireland have suggested that overweight and obese patients have €24 million higher primary care costs than those of recommended weight patients, with potential economic costs of obesity being as high as €1.13 billion annually (Doherty et al., 2012; Perry, 2012). In this context, there has been an increased focus by policymakers on targeting childhood obesity, with a view to reducing both the current and future costs associated with obesity.

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A number of studies in the US and Europe have reported significant childhood obesity rates, and while obesity rates in the US exceed those in Europe, there is considerable variation across European countries. For example, a clear division between southern (Mediterranean) and northern countries has emerged. Studies have shown that Portugal, Spain, Malta, Greece and Italy have the highest obesity rates among 7–9 year olds in Europe at approximately 10%, with rates twice as high as seen in the Netherlands, Denmark, Germany and Sweden (Lobstein et al., 2005; Valdés Pizarro and Royo-Bordonada, 2012; Chrzanowska et al., 2007).[1] In comparison, obesity rates in Ireland and the United Kingdom are estimated to lie between these two groups (Whelton et al., 2007). In addition to examining prevalence rates, studies in Europe (Stamatakis et al., 2010) and the United States (Singh et al., 2008) have also reported a significant socioeconomic gradient in childhood obesity rates, i.e. the incidence of obesity increases as socioeconomic status falls. Indeed, the evidence suggests that while obesity rates may be levelling off in some cases, a more pronounced socioeconomic gradient is emerging across many European countries (Knai et al., 2012), though there may well be some heterogeneity in these observed inequalities (Bammann et al., 2012).

In order to formulate targeted and effective policies to reduce the prevalence of childhood obesity, policymakers must first fully understand the extent of the problem, as well as its determinants. In Ireland, two studies to date have focussed on the prevalence of childhood obesity and the factors associated with it. Whelton et al. (2007) found that approximately 6% of children in the Republic of Ireland and Northern Ireland were obese, and that the prevalence of obesity increased as children aged. Furthermore, the overall prevalence of overweight and obesity was found to be higher among girls than boys in both jurisdictions. However, no socioeconomic gradient was found by Whelton et al. (2007) for the Republic of Ireland, using free access to primary health care (access to which is primarily based upon low income) as a proxy for socioeconomic status.

In a more recent and comprehensive study, Layte and McCrory (2011) found that 19% of 9-year-old children in Ireland were overweight, while 7% were obese, with prevalence rates of the latter greater amongst girls than boys (8% versus 5%). A range of obesity risk factors were examined, including levels of dietary quality, physical activity and sedentary behaviours, as well as the influence of the local food environment and socioeconomic factors. In contrast to Whelton et al. (2007), the study found "pronounced social-class inequalities in the prevalence of overweight and obesity" with significantly higher proportions of both boys and girls from semi-skilled and unskilled social-class households being classified as either overweight or obese, when compared to boys and girls from professional households. Given this, they conclude that the "health behaviours (unhealthier diets and less physical exercise) and higher levels of obesity among working-class children suggest that resources for interventions should be heavily targeted at lower socio-economic schools and communities."

Thus, effective policies to target overweight and obesity should be informed by an assessment of the factors driving socioeconomic gradients. In this context, the concentration index is now one of the most important methods used to quantify socioeconomic inequalities in health service utilisation and health issues such as obesity amongst adults (Madden, 2013) and childhood obesity (Zhang and Wang, 2007). It shows how a health outcome, such as obesity, varies according to some measure of socioeconomic status, such as income, providing a single measure of any income related inequality. Madden (2013) has utilised this method when analysing the social gradient in obesity in Irish adults, but to date it has not been used to examine obesity in Irish children. Concentration indices can also be decomposed into separate contributions where the impact of individual level regressors (e.g. social class or parental BMI) on the gradient can be computed. This means that the factors which drive the income-related inequality can be pinpointed at the individual level. This is in contrast to the Blinder Oaxaca decomposition where differences are observed between distinctive groups (e.g. boys and girls).

While Layte and McCrory (2011) clearly demonstrate a pronounced socioeconomic gradient in childhood overweight and obesity in Ireland, the study did not quantify the extent of this inequality using a concentration index, nor did it seek to decompose the factors which might be driving the gradient. In fact, while a number of previous studies have decomposed the determinants of the socioeconomic gradient in adult obesity, very few have done likewise in the context of childhood obesity, while none have done so for Ireland. This paper fills this gap using the same dataset as utilised by Layte and McCrory (2011). It estimates concentration indices to quantify the extent of the social gradient in childhood obesity in Ireland and undertakes a decomposition analysis to pinpoint the factors that drive the observed inequalities. To the best of our knowledge, this is the first paper to utilise the decomposition technique to quantify the main determinants of childhood obesity in a developed country. The findings have implications for the formulation of policies which seek to reduce the prevalence of, and socioeconomic inequalities in, overweight and obesity in Ireland and other countries.

The paper proceeds as follows: Section 2 sets out our materials and methods, including an overview of the dataset and a discussion of the concentration index of obesity and decomposition analysis techniques that are employed. Section 3 sets out the key results and findings from the analysis, while the Section 4 presents our discussion and concluding remarks.

2. Materials and methods

2.1. Data

The data analysed is from the first wave of the Growing Up in Ireland (GUI) survey conducted in 2007 and early

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[1] The obesity rates referenced here are based on the International Obesity Taskforce (IOTF) methodology.