



Obesity and health expenditures: Evidence from Australia



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ABSTRACT

Rising rates of obesity are a public health concern in every industrialized country. This study investigates the relationship between obesity and health care expenditure in Australia, where the rate of obesity has tripled in the last three decades. Now one in four Australians is considered obese, defined as having a body mass index (BMI, kg/m²) of 30 or over. The analysis is based on a random sample survey of over 240,000 adults aged 45 and over that is linked at the individual-level to comprehensive administrative health care claims for the period 2006–2009. This sub-population group has an obesity rate that is nearly 30% and is a major consumer of health services. Relative to the average annual health expenditures of those with normal weight, we find that the health expenditures of those with a BMI between 30 and 35 (obese type I) are 19% higher and expenditures of those with BMI greater than 35 (obese type II/III) are 51% higher. We find large and significant differences in all types of care: inpatient, emergency department, outpatient and prescription drugs. The obesity-related health expenditures are higher for obese type I women than men, but in the obese type II/III state, obesity-related expenditures are higher for men. When we stratify further by age groups, we find that obesity has the largest impact among men over age 75 and women aged 60–74 years old. In addition, we find that obesity impacts health expenditures not only through its link to chronic diseases, but also because it increases the cost of recovery from acute health shocks.

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1. Introduction

According to the World Health Organization (WHO), the worldwide rate of obesity has doubled since 1980 and today it is estimated that over 500 million adults are obese (WHO, 2013). Although the highest rates of obesity are found in the US, some data suggest that obesity is growing faster in other countries. This is particularly true in

Australia, where between 1980 and 2008, the percentage of adults who are obese tripled, from 8% to 24% (Australian Institute of Health and Welfare, 2010).

Because obesity is related to a variety of medical conditions, rising rates of obesity contribute to increased health expenditures. Several US studies using cross-sectional survey data find evidence of such an effect (Sturm, 2002; Finkelstein et al., 2003; Thorpe et al., 2004; Finkelstein et al., 2009; Cawley and Meyerhoefer, 2012). The results of some of these studies also suggest that spending is higher for overweight adults as compared to those of normal weight, though in some cases this difference is not statistically significant (Finkelstein et al., 2003; Thorpe et al., 2004). Similarly, sub-group analyses testing for differences across weight categories,

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demographic groups or types of health care spending, often yield imprecise results because of small sample sizes.

In addition to having higher rates of obesity than other countries, the US is unique in terms of the financing and delivery of health care. In particular, private insurance plays a much more important role in the US than in any other country. In theory, the public financing of health care in other countries may contribute to obesity since individuals do not bear the incidence of higher health care utilization in the same way they would in a system based on risk-rated insurance premiums (Bhattacharya and Sood, 2011). Even if this type of “ex ante moral hazard” effect is not important empirically, the public financing of health care means that obesity-related health spending has important fiscal and distributional consequences. Therefore, it is important to understand how obesity and health expenditures are related in non-US countries where health care is financed predominantly by the public sector.

Research on the relationship between obesity and health expenditures from such countries is quite limited. Most non-US studies use a prevalence-based cost-of-illness methodology that indirectly estimates the weight-expenditure relationship by assuming a relationship between obesity and specific diseases and attributing a portion of the treatment cost of those diseases to obesity (e.g., Anis et al., 2010; Wang et al., 2011; Detournay et al., 2000; Müller-Riemenschneider et al., 2008). There are fundamental limitations to this approach, which pieces together information on obesity, disease prevalence and health spending from prior studies conducted in different countries in different years. Studies that use individual-level data to estimate multivariate regression models provide much stronger evidence on the relationship between obesity and health expenditures.

In this paper, we directly estimate the relationship between body mass index (BMI) and health care spending in Australia, focusing on adults aged 45 and older, an age group that includes heavy utilizers of health care services. The main aims of the study are to document the relationship between obesity and health expenditures for this population and to investigate how this relationship varies with age and gender and type of health care service.

Australia is an interesting case to study, given its rapidly growing rates of obesity and the fact that its health system is representative of many systems outside the US.¹ In addition, our analysis is based on a uniquely rich data set that links several years of administrative claims databases with a survey of over 240,000 individuals, selected randomly from the 45+ population. The combined data set has several important advantages over the data used in prior studies, including those from the US. The administrative databases, which are obtained from public and private hospitals and the public insurance system

that covers all Australians, provide comprehensive information on spending for inpatient care, ambulatory care and prescription drugs. Unlike the self-reported utilization data that are typically used in this literature (e.g., Wolfenstetter, 2012 for Germany), administrative claims data are not subject to recall error and do not impose assumptions that an individual's cost is equal to the average costs, and therefore provide more accurate measures of an individual's health expenditures. The survey data, the 45 and Up Study, includes an extensive set of questions on individual characteristics, allowing us to condition on various demographic and socioeconomic factors that are often missing in past studies.

Another important strength of the survey data is its size. Our sample is more than 10 times as large as the largest sample size used by previous studies (Finkelstein et al., 2009). This large sample makes it possible to estimate differences between narrowly defined BMI categories. We are also able to obtain precise estimates for specific types of care and to stratify the analysis by relatively narrow age groups. For instance, 16% of our sample is aged 75 and over (over 38,000 individuals), allowing us to accurately estimate the health care cost of obesity in older age.

Our empirical strategy centers on prospective models in which health spending is regressed on BMI-based weight categories measured in a previous year. The model is similar to ones used for the purpose of risk-adjusting payments to insurers or providers (see, for example, Van de Ven and Ellis, 2000; Pope et al., 2004). Because a prospective model is more useful for predicting future expenditures than a concurrent model it is more informative for health sector budgeting. In the context of our analysis, an important advantage of a prospective model is that it mitigates potential bias arising from reverse causality running from acute health shocks to weight.²

The association between obesity and chronic conditions such as diabetes and hypertension is an important explanation for a positive relationship between obesity and health expenditures. Additionally, obese individuals may have more difficult recoveries from acute health shocks, even if those shocks were not directly related to obesity. For example, after breaking a bone due to an accident, obese individuals may recover more slowly, require more physical therapy and experience more complications than non-obese patients. Numerous medical studies have found that obesity is negatively related to the recovery and rehabilitation process (e.g., Vincent and Vincent, 2008; Naylor et al., 2008; Gendall et al., 2007). Because we are able to link a survey respondent's BMI to multiple years of claims data we can test for this type of interaction effect. To the best of our knowledge, no prior study on the relationship between obesity and health expenditures has attempted to distinguish between acute and chronic conditions in this way.

¹ Australia's universal public health system, known as Medicare, provides comprehensive coverage for inpatient hospital treatment, out-of-hospital medical services and pharmaceuticals. In 2009, health spending in Australia accounted for 8.7% of total GDP. This is slightly below the average for OECD countries (9.5%) and roughly half the amount that the US spent as a share of GDP (OECD, 2011).

² Bias from reverse causality can be positive or negative. On one hand, the onset of severe illness may lead to significant weight loss either directly or as a side effect of treatment—e.g., cancer and chemotherapy. Alternatively for other conditions, such as depression, the effect may go in the opposite direction (Cawley and Meyerhoefer, 2012).

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