The Labor Force Participation Effect of Old-Age Obesity

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A. Abstract

Old-age obesity is prevalent and increasing; there is no systematic research on the economic well-being generally, and employment outcome particularly, of obese elders, a vulnerable subpopulation that is growing rapidly. I propose to analyze the impact of obesity on employment among white men aged 70-79 using data from the Health and Retirement Study with panel econometrics allowing for individual fixed-effects and endogeneity of obesity. I explore potential pathways through which the obesity-work relationship operates. This research will inform efforts to improve the well-being of obese elders, and the impact of rising elderly obesity trend on Social Security and Medicare funds.

B. Research question

Old-age obesity is prevalent and increasing, most rapidly in severe obesity. During the period of 1994-2004, among white men aged 70-79, an average of about 47% were overweight and 17% obese, including 13% mildly obese, 3% moderately obese and 0.5% severely or morbidly obese (author's calculation)[1]; however, the prevalence of mild obesity increased more than 60%, moderate obesity doubled, and morbid obesity tripled. Social Security Administration regulations state that obesity is in itself medically determinable impairment when it significantly limits an individual's physical or mental ability to do basic work activities. Obesity is a health hazard and associated with numerous chronic diseases, resulting in productivity loss and elevated healthcare costs that increase with the degree of obesity. Old-age obesity with its rising trend presents a tremendous challenge to the health and economic well-being of aging individuals, as well as the solvency of Social Security and Medicare. However, there is no systematic research on the well-being in general and labor supply outcomes in particular, of obese elders, a subpopulation that is vulnerable economically but growing rapidly in size. During the period of

[1] According to the Centers for Disease Control and Prevention, adults are characterizes as underweight or normal weight if the Body Mass Index (BMI, defined as body weight in kilograms squared over height in meters) is under 20, normal weight if BMI $\geq$ 20 and BMI $<$ 25, overweight if BMI $\geq$ 25 and BMI $<$ 30, and obese if BMI $\geq$ 30. Those with BMI of 30-35 are referred to as mildly or class I obese, 35-40 moderately or class II obese and 40 and above severely or morbidly or class III obese.

1994-2004, an average of about 22% of white men aged 70-79 worked; the need for additional income through earnings is amplified by sharp declines in wealth brought about by the economic crisis. I propose to use data from the Health and Retirement Study to analyze the following specific questions:

1. Are obese elders more like to participate in labor force than non-obese elders?
2. What are the potential pathways that explain elders' obesity-work relationship?

The elders' obesity-work relationship is an empirical question and may operate through multiple pathways. This is because obesity could reduce employment because of obesity-induced physical or mental impairments to work, or increase employment because of obesity-associated financial inadequacy, necessitating prolonged employment or labor force re-entrance post-retirement. As discussed in more detail below, the answers to these questions will provide information about the economic well-being of obese elders as well as the impact of the rising elderly obesity trend on the financial health of Social Security and Medicare funds.

C. Methods

The basic setup to analyze the impact of obesity on employment is to link obesity to employment. I use an individual fixed-effects panel model to purge out the unobserved permanent individual heterogeneity for the baseline estimation, and an instrument variables approach within the fixed-effects panel model to address the potential endogeneity of obesity using individuals' own lagged obesity as instrument variables (Avertt and Korenman 1996; Conley and Glauber 2005). The potential issue of weak or just-identified instruments (Han et al. 2008) can be empirically assessed using specification tests, and may be circumvented by the use of multiple obesity lags or further instead of immediate lag of obesity when afforded by the data.

In addition, I allow the obesity-work relationship to be heterogeneous by demographic characteristics by performing subgroup analysis by demographic characteristics, as well as nonlinear along the severity of obesity by alternative construction of body mass index (BMI) including BMI linear spline; obesity categories (underweight, normal weight, overweight, and obesity); and fine categories of obesity (underweight, normal weight, mild obesity, moderate obesity, and morbidly obesity).

I explore the following three potential pathways that may mediate the elders' obesity-work relationship: the ability to work, the necessity of working, and the preference for work. The

ability to work refers to whether one *can* work, that is, whether one possesses the physical and cognitive capacities sufficient to make him a productive worker in the workplace. I consider the following health capacities: health status, functional limitations, chronic conditions, and cognitive performance. The necessity of working refer to whether one *has* to work, that is, whether one's wealth and non-earnings incomes are sufficient to maintain the quality of life without participating in the labor market. I consider the following income factors: private pensions and annuity incomes, social security retirement incomes, public disability insurance incomes, and other government transfers, in addition to various measures of household wealth. Importantly related is the availability of employer-provided health insurance that is often associated with labor market participation. I consider out-of-pocket medical expenditures as part of income (or consumption) factors in the budget constraint in the employment decision. Lastly, mediators that represent the preference for work refer to whether one *wants* to work, but preferences are mostly unobservable, difficult to measure and unavailable in the data. The individual fixed effect accounts for unobserved factors including preferences for work, but assumes these unobserved factors remain unchanged throughout the study period. It is possible that individuals alter their preferences for work during ages 70-79, though there has no evidence documented in the literature.

D. Data

The Health and Retirement Study data (1994-2004) provide the detailed longitudinal information on labor market outcomes, body weight and height, health morbidities, disabilities, pension incomes and earnings, and medical expenditures of older individuals. I restrict the study sample to white men aged 70-79 because this is a relatively homogeneous subpopulation for several reasons. A primary reason is that old-age labor market activities are strongly influenced by the economic incentives and disincentives provided by Social Security, and Social Security underwent several major changes targeting the population aged 65-69 during the same study period. The spillover effects of these changes on the 70-79 population are possible but are likely to be negligible. Other reasons are many substantial gender and racial differences in labor force participation, and increasing selective survival issues within the 80+ population. The dependent variable is labor force participation, and can be constructed by several survey questions including working for pay, labor force status of partial/full retirement versus working part-/full-time and

work hours. Obesity is represented in body mass index, continuous and categorical. Discarding missing observations with key demographic variables, I have 3773 respondents with 9589 person-wave observations to analyze the first question.

E. Contribution to the research literature

The proposed project contributes to the research literature in three different areas: older adults' labor market outcomes, economic consequences of obesity, and economic well-being in retirement. The voluminous literature on the labor supply of older adults has primarily focused on the effects of financial incentives (Gordon and Blinder 1980; Burkhauser and Quinn 1983; Diamond and Hausman 1984; Stock and Wise 1990; Rust and Phelan 1997; Gruber and Wise 1999 and 2004; Gustman and Steinmeier 1986, 2000, and 2005), health insurance (Rust and Phelan 1997; Gustman and Steinmeier 1994; Blau and Gilleskie 2001a, 2003, and 2004), and poor health (Burkhauser and Quinn 1983; Diamond and Hausman 1984; Gustman and Steinmeier 1986; Bound 1989; Bound, et al. 1998; Rust and Phelan 1997; Bound et al. 1999; Currie and Madrian 1999; Lumsdaine and Mitchell 1999; Blau and Gilleskie 2001b). The labor market outcome of obese elders, which has been largely unexplored, is the focus of this study.

Studies on economic consequences of adult obesity have focused on the impact of obesity on two areas. One is the employment and wages of young and middle-aged adults (Register and Williams 1990; Avertt and Korenman 1996; Cawley 2000; Behrman and Rosenzweig 2001; Baum and Ford 2004; Cawley 2004; Conley and Glauber 2005; Norton and Han 2008; Atella et al. 2008; Han, Norton and Stearns 2008). The other is the claim behavior of public assistance and pension programs, such as disability insurance program enrollment, and early receipt of Social Security retirement benefits, of the under-65 population (Burkhauser and Cawley 2004; Burkhauser and Cawley 2006; Burkhauser, Cawley, and Schmeiser 2008). My proposed research attempts to fill the gap in the literature by addressing the impact of obesity on labor market outcomes of the Social Security-eligible 65+ population. Other contribution is methodological whereby I employ individual fixed-effect model and over-identification instruments to address individual heterogeneity and potential endogeneity of obesity.

Much of the literature on economic well-being in retirement has centered on the question of whether individuals' saving and financial investment behavior is "optimal" to enable smooth consumption over time (e.g., Lusardi and Mitchell 2005 and 2006; Scholz et al. 2006; Munnel et

al. 2007). The literature also has largely ignored the particularly vulnerable subpopulations, such as obese elders. My research attempts to address this imbalance by focusing on the well-being of elders with challenging health and financial difficulties.

F. Policy Relevance

The findings of this study have direct policy relevance for the design and management of Social Security, Medicare, and other public aging policies that target improving the quality of elderly life. If obesity increases labor supply, then there is a potential positive direct effect on the cash flow and the solvency of Social Security and Medicare funds, because working obese elders continue to contribute to Social Security through payroll taxes, and because their healthcare expenditures are shared between Medicare and employer-provided health insurance plans; an analogous negative effect on Social Security and Medicare can follow if obesity decreases labor supply. There might be an indirect effect on Social Security and Medicare resulting of the labor supply behavior of obese elders, but this indirect effect is uncertain and depends on, in part, the expected longevity and health of those working obese elders compared to the non-working counterparts. For example, labor force participation might help sustain the cognitive functioning and delay cognitive declines in aging under the premise of "use it or lose it" in the literature of cognitive reserve; consequently, reduces the burden on Medicare as healthcare costs for cognitively impaired elders are expected to grow rapidly and become considerably sizable.

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