

# The Socioeconomic Determinants and Consequences of Women's Body Mass

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## Abstract

The prevalence rate of obesity in the US in 2003-2004 was 31.1% (Ogden et al., 2006). Obesity is associated with major diseases, including type 2 diabetes mellitus, coronary artery disease, stroke, sleep apnea, and certain types of cancer (Kasper et al., 2005). Obesity-related medical expenditures in the US in 1998 were \$75 billion, about 1/2 of which were paid for by Medicaid and Medicare (Finkelstein et al., 2004).

Obesity is also associated with important socioeconomic outcomes. Data on white women from the National Longitudinal Survey of Youth 1979 (NLSY79) show that obese women at age 30 have completed 0.89 fewer school grades, are less likely to participate in the labor market by 9 percentage points, and have wages that are lower by 17%. Furthermore, they are more likely never to have been married by 7 percentage points, have spousal incomes that are lower by 27%, and are less likely to be divorced (conditional on having been married) by 4 percentage points.

Because of the variety of causal and selective pathways linking directly or indirectly body mass and socioeconomic outcomes, interpreting these (observational) facts poses numerous problems, which have not been (comprehensively) addressed in economics or epidemiology before. In particular, (a) current body mass may affect labor- and marriage-market opportunities, which---contributing to family income---may feed back into future body mass. (b) By altering the value of not working and being single, body mass may influence the propensity to participate in the labor and marriage markets, making accepted wages and spousal incomes a selected sample of wage and spousal income offers. (c) Unobservable genetic and family background factors, potentially correlated with schooling attainment, may determine both body mass and labor- and marriage-market skills---an omitted variables problem.

I address these inferential problems by (a) modeling the process of body mass accumulation as part of a decision process in which, from the time they leave school, heterogeneous individuals make joint sequential decisions about their body mass, labor market participation, and marital status; and (b) structurally estimating the model by the method of Simulated Maximum Likelihood using data on white women born in 1960-1964 from the NLSY79.

In particular, I specify and estimate a model in which wage and spousal income offers, as well as the arrival probability of marriage offers, depend on body mass, and individuals make decisions to maximize their lifetime expected utility. The utility function represents preferences over consumption, body mass, labor market participation, and marital status, where preferences over body mass capture the psychic costs of keeping the balance between energy intake and energy expenditure. Such costs depend on current family income, recent fertility history, and schooling attainment; reflecting the role played by genetic and family background factors in the accumulation of body mass,

they also depend on unobservable permanent traits, potentially correlated with preferences over participation, labor- and marriage-market skills, and initial conditions. Preferences over participation and marital status are affected by body mass.

I exploit the estimated model to quantify the consequences of body mass in the labor and marriage markets and answer the following questions: (a) What fraction of the variation in body mass across individuals is explained by genes and family backgrounds? (b) What is the effect of schooling attainment on body mass and through which pathways does this effect unfold over the life cycle? (c) How effective in preventing obesity would be policies that eliminated overweight at the time of school leaving, manipulated the monetary incentives to invest in body mass, or subsidized family income?

I find that obese white women do not face significant penalties in the labor market, but do face significant penalties in the marriage market: being obese is associated with a 35% decline in the odds ratio of receiving a marriage offer and a 22% decline in spousal income offers. Permanent traits formed prior to leaving school explain 43% (25%) of the cross-sectional variation in obesity (body mass) at age 30, and about 1/2 of the difference in the prevalence of obesity between high school and college graduates would remain if such traits were held constant across schooling attainments. A program that eradicated overweight at the time of school leaving would not have a very long-lasting impact. Wage offers that took into account the burden borne by employers to finance the health costs of obese workers would provide a fairly strong incentive not to gain weight.