The Labor Market Impacts of Obesity

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Background

Cawley studies the effect of body weight on a person's wage. Previous studies have found a negative relationship between weight and wages, but whether the inverse relationship is due to low wages causing high weight, high weight causing low wages, or a third factor causing both low wages and high weight is unclear.

Cawley uses data from the National Longitudinal Survey of Youth (NLSY). The sample spans 13 years, from 1981 to 2000. Wage was measured by the hourly earning of the respondent at his or her primary job. Three measures of body weight were considered separately as the primary explanatory variable of interest: Body Mass Index (BMI), weight in pounds (controlling for height in inches), and an indicator variable for the clinical classifications underweight (BMI < 18.5), overweight ($25 \leq$ BMI < 30), and obese (BMI $\geq$ 30), where the excluded category is healthy weight ($18.5 \leq$ BMI < 25).

Weight and height are self-reported in the NLSY and may be biased as a result. To correct for this reporting error, true height and weight in the NLSY were predicted using information on the relationship between true and reported values obtained from Third National Health and Nutrition Examination Survey (NHANES III).

Other explanatory variables were race (Black, Hispanic, and non-Black/non-Hispanic), sex, age, the age of a woman's youngest child and the total number of children to whom she has given birth, a measure of general intelligence based on 10 Armed Services Vocational Aptitude Battery tests administered in 1980, highest grade completed, mother's highest grade completed, father's highest grade completed, years of actual work experience (defined as weeks of reported actual work experience divided by 50), job tenure, and indicator variables for marital status, region of residence, whether the respondent's occupation is white collar or blue collar, current school enrollment, county unemployment rate, and whether the respondent's job is part-time, as well as a linear time trend.

Methods and Findings

For each race/ethnic group of females, both BMI and weight in pounds have negative and statistically significant effects on wages. The estimate is largest for White females and smallest for Black females. An increase of two standard deviations (64 pounds) from the mean weight in pounds among White females is associated with a decrease in wages of 9 percent, roughly equal in magnitude to the difference associated with 1.5 years of education or 3 years of work experience.

Among men, the results vary by race-ethnic group. For White males, weight does not affect wages. For Black males, higher body weight is associated with higher wages, while the effect of weight on wages for Hispanic males resembles those for females: negative and statistically significant.

When the effect of weight on clinical weight category indicators is studied, both Black men and Black women who are underweight earn less than their healthy-weight counterparts. The pattern of wage effects across the weight classifications has an inverted U shape for White males.

To address the possibility of reverse causality—i.e., that current wages affect current weight—Cawley estimated a model in which the 7-year lagged value of weight is substituted for its contemporaneous value. The fact that the estimated effects of the lagged measures of BMI and weight in pounds are generally similar to those on current weight is consistent with two explanations: (1) current wages have little impact on current weight, or (2) current wages do affect current weight, but because the timewise correlation is so high in both wages and weight, when even distant BMI is used as an explanatory variable, the effect of wages on weight is measured just as strongly.

To reduce the effect on wages of unobserved variables that stay fixed over time (such as systematic genetic differences), Cawley exploited the longitudinal nature of the data and estimated a "fixed-effects" model. The most dramatic difference is that the negative effects of BMI and weight in pounds on wages are much smaller and no longer statistically significant for Black females, Hispanic females, and Hispanic males. This finding suggests that the results that did not account for unobserved effects for these groups are driven largely by unobserved effects that stay fixed over time.

Some unobserved effects may not be constant, but vary over time. To account for such time-varying unobserved effects, Cawley used the econometric method of instrumental variables. The BMI, age, and gender of a sibling are used as extra variables to explain the respondent's BMI, based on the assumptions that the BMI of a sibling is strongly correlated with the respondent's BMI and that the sibling BMI does not affect the respondent's wage directly. The results show that only for White females do BMIs have a statistically significant effect on wages. The estimated effect on wages is roughly 70 percent higher than the initial simple statistical model. Put another way, an increase of two standard deviations (64 pounds) from the mean weight in pounds is associated with a decrease in wages of 18 percent, which is roughly equal in magnitude to the difference associated with 3 years of education, or 6 years of work experience.

Discussion

Results from the simplest statistical model indicate that the relationship between weight and wages varies by race and sex: Heavier Black men earn more, while heavier Black women, as well as both Hispanic men and women, earn less. When the individual fixed effects are removed to eliminate the influence of time-invariant unobserved differences among respondents on weight and wages, the negative correlation between weight and wages is eliminated for all but White females, casting doubt on the hypothesis that

weight plays a causal role in determining wages for the other groups. This result is further confirmed when time-varying unobserved effects are removed by exploiting the correlation of the respondent's BMI with his or her sibling's BMI.

The sociological literature yields one possible explanation for the difference in results between White, Black, and Hispanic females: that obesity has a more adverse impact on the self-esteem of White females than on that of Black and Hispanic females, who report perceiving higher weight as a signal of power and stability. Averett and Korenman (1999) studied 1990 data from the NLSY and found that obesity is associated with lower self-esteem among White females, but not among Black females. However, they also found that controlling for the difference in self-esteem did not explain differences across race in the relationship between obesity and wages.

Future Research

The reason for the differences across race-ethnic and sex categories with regard to the relationship between weight and wages remains to be investigated. In particular, why does weight appear to lower wages for White women but not for other groups? More generally, has the labor market impact of obesity changed as the prevalence of obesity has risen? Will cross-country comparisons yield insight into the relationship between health behavior and labor market outcomes? In terms of public policy, the recent coincident rise in disability insurance rolls and obesity prevalence deserves further attention. Understanding the true effect of obesity on labor market outcomes may be helpful in formulating better disability insurance policy with respect to obesity.