

# Worth Your Weight? Re-examining the Link between Obesity and Wages

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Since 1960, the percentage of American adults who are overweight or obese has risen from 46 percent to 74 percent.<sup>1</sup> The clinically overweight are those with a body mass index (BMI)<sup>2</sup> between 25 and 30; the clinically obese have a BMI greater than 30. Not only are heavier individuals at greater risk for coronary heart disease, hypertension and other health problems, but, according to obesity specialists Rebecca Puhl and Chelsea Heuer, are “highly stigmatized ... [and this] weight bias translates into inequities in employment settings, health-care facilities and educational institutions ... leaving [them] vulnerable to social injustice, unfair treatment and impaired quality of life.”<sup>3</sup>

If such a stigma exists, does this mean that your weight can affect your wage?

Although wage penalties may exist because of stigma, they may also exist because of differences in productivity or perceived productivity. Overweight or obese individuals, for example, might receive lower wages if employers believe that their weight could affect their health and, thereby, their productivity. Others contend that—because weight is tied to appearance—an overweight/obesity wage penalty is the flip side of the beauty premium. Finally, wage differentials might reflect differences in socioeconomic status and education, as the rates of obesity/overweight are higher among groups with lower socioeconomic status.

## The Obesity Penalty?

Economic studies relating wages and weight suggest that obese women are less likely to be employed, relative to “normal” weight individuals (BMI of 20 to 25). Among the employed, heavier women tend to earn less. These penalties have not only increased

over the past few decades, but continue to increase as women age.

The wage penalty for women also varies by race. Economist John Cawley estimates that overweight and obese white women earn 4.5 and 11.9 percent less, respectively, than normal weight white women. Among African-American and Hispanic women, on the other hand, obese women earn between 6 and 8 percent less than those of the same race with a BMI under 25; there is no penalty for black or Hispanic women who are only overweight. A similar study by economists Christian Gregory and Christopher Ruhm found that the wages of white women peak at a BMI of 22.5 (well within the normal range), while wages for black women peak at a BMI of 26.1 (just above the normal range).

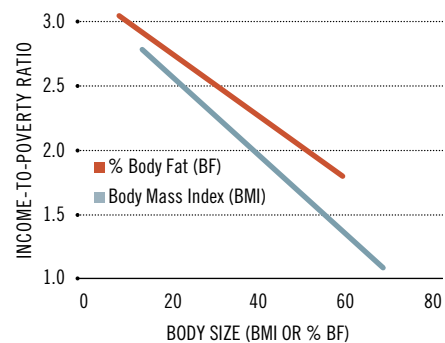
Unlike the findings for women, which consistently indicate the presence of a weight-wage penalty, the results for men are

more ambiguous. Some studies found that underweight and obese white males earn less than their normal weight counterparts, while overweight white males earn more. Not only is the relationship between earnings and weight inconsistent across weight categories, but inconsistent across races. To illustrate, a 2004 study estimated that obese Hispanic males earn less than normal weight Hispanic males, but obese African-American males earn more than normal weight black males. Other studies found that overweight/obese status rarely affects hourly wages for males but does decrease the likelihood of being employed for all males except African-Americans.<sup>4</sup>

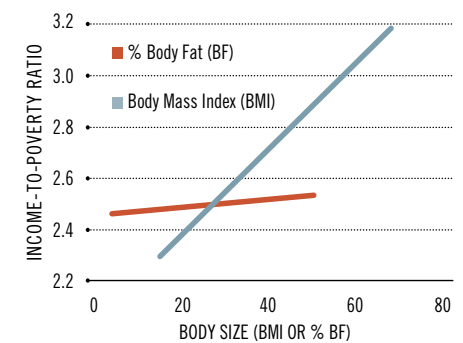
## Is BMI the Wrong Measure?

The apparent discrepancy between the genders, however, may be misleading. Most studies that examine the relationship

**FIGURE 1**  
**Women’s Income and Body Size**



**FIGURE 2**  
**Men’s Income and Body Size**



SOURCE: National Health and Nutrition Examination Survey.

For the poverty index in the charts, a value below 1 indicates that the family’s income is below the poverty threshold. (For example, a value of 0.87 would indicate that the family’s income is 87 percent of the poverty threshold.) A value above 1 indicates that the family’s income is above the poverty threshold. (A value of 1.87 would indicate that the family’s income is 187 percent of the poverty threshold.)

between weight and wages use BMI, which categorizes individuals based solely on weight and height. The medical literature, however, argues that BMI is problematic because it is largely arbitrary: It emerged because the insurance industry wanted a measure for the mortality risk associated with weight gain. As such, the “normal” range for BMI was defined because of its correlation with the lowest risk of death (based on life insurance tables).<sup>5</sup> Further, BMI is a poor proxy for excess fat, as the index provides no information on body shape and has no way to distinguish body fat from lean body mass.

In a study last year, economists Joanna Parks, Aaron Smith and Julian Alston recommended using a measurement of body fat that takes into account weight, height and body composition, rather than using BMI. According to these economists’ measures, BMI overestimates the prevalence of underweight, normal weight and overweight males, while underestimating the prevalence of obese males because BMI understates differences in body fat. Among women, BMI overestimates the prevalence of underweight and normal weight women, while underestimating the prevalence of overweight and obese women. As a result, approximately 60 percent of men and 45 percent of women are misclassified into weight categories when using BMI as opposed to using percent body fat or percent fat-free mass. This finding indicates that national health statistics are likely to underestimate the true prevalence of people who are overweight or obese.

### Alternative to BMI Changes Results

The accompanying figures show the relationship between an individual’s weight and household income-to-poverty ratio using data from the National Health and Nutrition Examination Survey. The panels depict how the weight-wage relationship changes depending on the measure used.


Figure 1 shows the relationship between income-to-poverty ratios and both BMI and percent body fat for women. This relationship is more pronounced when using BMI. Regardless of the measure used, there remains a negative relationship between body size and economic status. Since the income-to-poverty ratio is a proxy for socioeconomic status, this finding may imply that studies attributing a wage penalty to a woman’s body

weight may be picking up on unmeasurable differences in social class.

Figure 2 shows a clear, positive relationship between higher body mass and higher income-to-poverty ratios for men. For body fat, however, the relationship with wages is much less apparent. Instead, there appears to be very little association between economic standing and body fat. Regardless, Figure 2 suggests that BMI may overestimate the relationship between wages and weight, or that the estimated correlation between wages and weight may be spurious.

Because of the potential problems with using BMI as a measure of obesity, a 2010 study by economists Roy Wada and Erdal Tekin used percent body fat and percent fat-free mass to examine the weight-wage gap. This study found that increases in body fat reduce wages but that increases in fat-free mass increase wages. For example, a one kilogram increase in body fat was associated with approximately a 1 percent decrease in wages for all groups except black males. At the same time, a one kilogram increase in fat-free mass increases wages between 1.4 and 1.8 percent for males and between 0.3 to 0.5 percent for females.

### Summary

Studies that use BMI as a measure of body fat find inconsistent evidence for an obesity wage penalty both across genders and races. However, later studies that examine wages and weight controlling for body composition find that, regardless of gender and race, excess weight due to fat is statistically related to lower wages, but excess weight due to muscle is statistically related to higher wages, regardless of occupation. These findings indicate that there is, in fact, a consistent wage penalty for body fat and a wage premium for muscle, but discrimination might not necessarily be the cause. While the results support the notion that appearance is an important determinant of wages, the average wage differentials could exist if employers believed health and productivity were related and/or if high body fat were taken as a signal of possible long-term poor health. 

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### ENDNOTES

- <sup>1</sup> See [www.cdc.gov/NCHS/data/hestat/obesity\\_adult\\_07\\_08/obesity\\_adult\\_07\\_08.pdf](http://www.cdc.gov/NCHS/data/hestat/obesity_adult_07_08/obesity_adult_07_08.pdf)
- <sup>2</sup> Calculated as mass / height<sup>2</sup>. Mass is in kilograms, and height is in meters.
- <sup>3</sup> See Puhl and Heuer.
- <sup>4</sup> Nonetheless, Cawley’s findings are attributable to unobserved heterogeneity: Lighter white males have more human capital than heavier white males, while heavier black males have more human capital than lighter black males.
- <sup>5</sup> See Parks, Smith and Alston.

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