Food Purchasing Patterns by Household Body Weight Status, Income, and Demographics

Elina T. Page, USDA Economic Research Service elina.t.page@usda.gov

Sabrina K. Young, USDA Economic Research Service sabrina.young@usda.gov

Abigail Okrent, USDA Economic Research Service abigail.okrent@usda.gov

Megan Sweitzer, USDA Economic Research Service megan.sweitzer@usda.gov

Selected Poster prepared for presentation at the 2022 Agricultural & Applied Economics Association Annual Meeting, Anaheim, CA; July 31-August 2

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Elina T. Page, Sabrina K. Young, Abigail Okrent, and Megan Sweitzer, USDA, Economic Research Service

Background

- The high prevalence of obesity in the United States has significant health, social, and economic costs.
- The quantities and types of foods consumed are major contributing factors to obesity.
- Household scanner data (IRI Consumer Network and IRI MedProfiler) provide an opportunity to analyze retail food purchases by household body weight status.

Research Aims

- Validate and develop adjustments for self-reported height and weight measures available in household scanner data.
- Compare the share of household spending across food categories by body weight status.

Data

- The IRI Consumer Network is a nationally representative annual panel of households that provide a detailed account of their retail food purchases.
- The IRI MedProfiler is an opt-in survey for the Consumer Network on individual health and medical conditions and includes self-reported height and weight.
- The National Health and Nutrition Examination Surveys (NHANES) includes both measured and self-reported height and weight data.

Adjusting Body Mass Index (BMI) for Self-Reported Measurement Bias

Using NHANES as a validation dataset, we predict measured BMI in the IRI MedProfiler with a linear regression of measured BMI values on the percentile rankings of self-reported BMI values in NHANES (see Courtemanche et al., 2015).

Table 1

Mean BMI and distribution of adults (age 20+) by body weight class

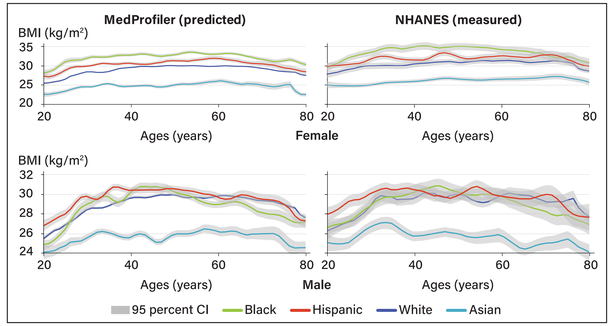
	NHANES (measured)	NHANES (reported)	MedProfiler (reported)	Predicted MedProfiler
Sample size	20,409	20,409	320,682	320,682
Mean BMI (kg/m2)	29.23 (0.12)	28.49* (0.11)	28.86* (0.013)	29.27 (0.01)
Distribution of population by body weight class (percent)				
Underweight	1.53 (0.10)	1.57* (0.12)	1.94* (0.02)	1.08* (0.02)
Normal weight	27.43 (0.64)	31.00* (0.69)	29.89* (0.08)	27.86 (0.08)
Overweight	32.33 (0.54)	33.52* (0.56)	33.17 (0.08)	32.42 (0.08)
Obese	38.71 (0.75)	33.90* (0.74)	35.00* (0.08)	38.64 (0.09)

Notes: For adults, a BMI below 18.5 is underweight, between 18.5 and 24.9 is normal weight, between 25.0 and 29.9 is overweight, and 30.0 and above is obese. Asterisk (*) indicates that the t-test of a difference compared to NHANES (measured) is significant at the 1-percent level.

Sources: USDA, Economic Research Service calculations based on 2011–18 National Health and Nutrition Examination Surveys (NHANES) and the 2012-18 IRI MedProfiler Survey. Sample weights and projection factors are used in all calculations.

Figure 1

Relationship between age and BMI for adults (age 20+) in NHANES (measured) and the predicted MedProfiler by gender and demographics



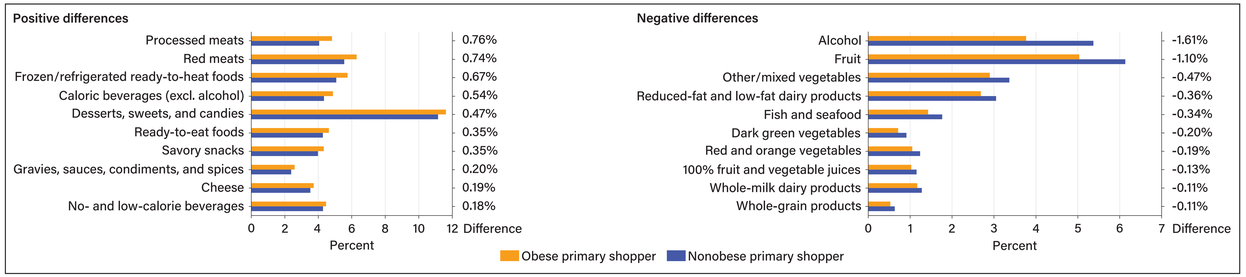
Sources: USDA, Economic Research Service calculations based on local polynomial smoothing and the 2011-18 National Health and Nutrition Examination Surveys (NHANES) and the 2012–18 IRI MedProfiler Survey data. Sample weights and projection factors are used in all calculations.

Household Food Expenditure Shares by Body Weight Class

We categorize household food expenditures using the USDA, Economic Research Service (ERS) Food Purchase Groups (EFPGs) and compare shares by the body weight status of the primary shopper.

Figure 2

Categories with the largest positive and negative differences



Note: Approximately 10.3 percent of retail food expenditures could not be categorized using the EFPGs.

Sources: USDA, Economic Research Service calculations using 2016–18 IRI Consumer Network and MedProfiler data and BMI adjustments using the 2011-18 National Health and Nutrition Examination Surveys (NHANES) and the 2012–18 IRI MedProfiler Survey. Sample weights and projection factors are used in all calculations.

Discussion and Next Steps

Predictions of measured BMI in the MedProfiler based on measured and self-reported percentile rankings in NHANES performed well. The distribution of predicted BMI in the MedProfiler for almost all gender and demographic groups is the same as the distribution of measured BMI in NHANES.

Households with an obese primary shopper spent a greater share of their food budget on processed meats, red meats, prepared meals, and caloric beverages. They spent less on alcohol, fruit, vegetables, and reduced-fat dairy products.

We plan to examine purchases by body weight status and income level, race and ethnicity, and household composition, including household size, households with children, female headed households, and senior-only households.

References

Courtemanche, C., J.C. Pinkston, and J. Stewart. 2015. "Adjusting Body Mass for Measurement Error with Invalid Validation Data." *Economics and Human Biology* (19): 275–293.

USDA Economic Research Service
U.S. DEPARTMENT OF AGRICULTURE

This research was supported by the intramural research program of the U.S. Department of Agriculture, Economic Research Service.

Presented at the 2022 Agricultural and Applied Economics Association (AAEA) Annual Meeting. July 31–August 2, 2022