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Cross-Country Variation in Obesity Patterns among Older Americans and Europeans

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Cross-Country Variation in Obesity Patterns among Older Americans and Europeans

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Abstract

While the fraction of obese people is not as large in Europe as in the United States, obesity is becoming an important issue in Europe as well. Using comparable data from the Survey of Health, Aging and Retirement in Europe (SHARE) and the Health and Retirement Study in the U.S. (HRS), we analyze the correlates of obesity in the population ages 50 and above, focusing on measures of energy intake and expenditure as well as socio-economic status. Our main results are as follows: 1) Obesity rates differ substantially on both sides of the Atlantic and across European countries, with most of the difference coming from the right tail of the weight distribution. 2) Part of the difference in obesity prevalence between the U.S. and Europe is explained by a higher fraction of food eaten away from home and notably lower time devoted to cooking in the U.S. 3) Sedentary lifestyle or a lack of vigorous and moderate physical activity may also explain a substantial share of the cross-country differences. 4) Differential SES patterns of energy intake and expenditure across countries cannot fully account for the observed cross-country variation in the SES gradient in obesity.

JEL codes: I12

Key words: Body Mass Index, International Comparison, SHARE

[1] Earlier versions of this paper benefited from comments by Anna Sanz-de-Galdeano, Darius Lakdawalla, Tullio Jappelli and other participants at the 2005 RTN AGE workshop held in Frankfurt. This paper uses data from Release 1 of SHARE 2004. Corresponding author: Pierre-Carl Michaud, 1776 Main Street, P.O. 2138, 90407-2138 Santa Monica CA; michaud@rand.org.

1. Introduction

Many studies have shown that people who are overweight or obese have a larger probability of developing chronic diseases and other health problems than people of normal weight (National Institutes of Health, 1998).[2] The World Health Organization (WHO) estimates that worldwide, more than 1.6 billion adults are now overweight and, in addition, 400 million are obese. In the United States, the prevalence of obesity has almost doubled from an average of 15% in 1971-1975 to an average of 28% in the period of 1988-1994 (Cutler, Glaeser and Shapiro, 2003). In Europe, obesity rates are generally lower than in the U.S. (Andreyeva et al., 2007; Sanz-de-Galdeano, 2005), but the rising trend in obesity is seen as a serious threat to public health and an important factor driving up health care costs.[3] Data from the U.S. have shown that obesity has other negative economic consequences including higher work absenteeism, higher unemployment and disability payments, and lower wages.[4]

Most studies to date have used time and geographical variation within the U.S. to explain the rise of obesity rates in the U.S. (Lakdawalla et Philipson, 2002; Chou et al., 2004). Few studies have focused on the cross-country variation in obesity patterns with the exception of research drawing on aggregate national statistics from WHO or OECD (Bleich et al., 2007).

[2] The common definitions of overweight and obesity are based upon the body mass index (BMI), defined as weight in kilograms over height in meters squared. Overweight is defined as having BMI of 25 and above and obesity as having BMI of 30 and above.
[3] According to IOTF and EASO (2002), in Europe, "the costs of obesity have been estimated at up to 8% of overall health budgets and represent an enormous burden both in individual illness, disability and early mortality as well as in terms of the costs to employers, tax payers and society." Finkelstein et al. (2004) estimate alarming costs of obesity for Medicare and Medicaid programs in the United States.
[4] See, for example, a review in Finkelstein et al. (2005).

This paper analyzes the correlates of obesity in the older population of the U.S. and 10 European countries. To our knowledge, no other cross-country study has been performed using comparable nationally representative micro-data. For adults ages 50 and above, the Survey of Health, Ageing and Retirement in Europe (SHARE) offers new rich individual data on health, body height and weight, physical activity, and socio-economic status, including detailed reports on wealth, income, and food expenditures. These data are comparable both across European countries and with measures from the U.S. Health and Retirement Study (HRS), a widely used dataset to study issues related to health and well-being of older Americans.

Our main findings are as follows. There are large differences in the body mass index distribution of older adults across European countries and between the U.S. and Europe, and they are particularly large in the right tail of the BMI distribution. The cross-Atlantic differences in obesity can partly be explained by widespread reliance of Americans on food eaten away from home and little time spent cooking. Differences in physical activity and time spent in sedentary activities like watching television are another important contributor to the observed differences in obesity among older adults between the U.S. and Europe. Some of the European variation in obesity appears to be captured by cross-country differences in physical activity, particularly among females. The well-known SES differences in the prevalence of obesity vary across countries, but in a way that cannot be fully explained by SES differences in food expenditure or physical activity.

The remainder of this paper is organized as follows. Section 2 describes the data. In section 3, we investigate factors associated with obesity within each country and identify patterns that are likely to explain the observed cross-country differences in obesity. Section 4 presents results from multivariate regression analysis. Finally, section 5 concludes.

2. Prevalence of Obesity in Europe and the United States

2.1 Data Sources

The Survey of Health, Ageing and Retirement in Europe (SHARE) was launched in 2004[5] to provide representative samples of the population aged 50 and above and their spouses in 10 European countries.[6] The total sample includes more than 22,000 participants. The questionnaire covers a variety of issues ranging from income, consumption and wealth to family networks, well-being, and mental and physical health, including self-reported height and weight. For the United States, we use the 2004 wave of the HRS, a representative sample of several older population cohorts with a similar multi-disciplinary questionnaire. In fact, SHARE was modeled after the HRS to ensure comparability between the datasets.

We restrict our sample to respondents born before 1954 focusing on the population aged 50 and above. We perform all analyses by gender to account for gender differences in obesity rates across countries. For descriptive statistics, we use sampling weights at the respondent level to obtain nationally representative estimates for the relevant age group in each country.[7] This is particularly important for the U.S. sample since the HRS combines samples first drawn in 1992 and 1998, which are likely to have suffered from selective attrition in 2004 and previous waves. Appendix A reports the sample size for each country. We decided not to include Switzerland in

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[5] See Boersch-Supan et al. (2005) for an overview of this data set and some first results.
[6] Austria (AU), Germany (D), Sweden (SE), Netherlands (NL), Spain (E), Italy (IT), France (FR), Denmark (DK), Greece (GR), and Switzerland (CH). Belgium is also part of SHARE but the data was not available in Public Release 1, which we used for the analysis.
[7] Since no sampling weights are available for Austria, we set all weights for Austria equal to 1.

our analysis because its sample size is too small, and the survey response rate was under 40% raising concerns about the sample representativeness.[8]

Obesity is a matter of excess adipose tissue. It is costly to measure, particularly in large-scale household surveys where interviewers visit respondents at home. As a consequence, most of the literature relies on a measure of obesity based upon weight normalized by height, the body-mass index (BMI). Although imperfect, the correlation between the precise medical measure and the index is very high (Revicki and Israel, 1986). Self-reports are known to be biased downward for overweight people and upward for underweight individuals (Palta et al., 1982; Kuczmarski et al., 2001).

These biases tend to increase with age, particularly for height. This leads to underestimation of BMI and obesity rates based on self-reported weight and height. Cawley and Burkhauser (2006) regressed objective measurements of height and weight on a quadratic in self-reported measures and a quadratic in age. These relationships are allowed to differ by gender, race and ethnicity. In order to use these estimates to correct our measures for Europe, we need to assume that the measurement error relationship is constant across countries. To the best of our knowledge, there are no studies that look at cross-national differences in the reporting of weight and height. A number of studies look at the measurement error in other counties than the U.S. (e.g. Niedhammer et al., 2000; Spencer at al., 2002; Nyholm et al., 2007). However, comparability across studies is difficult. For example, it is hard to isolate differences in reporting styles from other differences such as the population under study (e.g. age group, metropolitan vs. rural area, etc).

[8] See De Luca and Peracchi (2005).

The correction for the self-report bias increases the average BMI and obesity rates in all countries but does not change the order of countries on the obesity prevalence rank. Appendix B gives details on the construction of adjusted weight/height measures and its impact on BMI and obesity. We compared our BMI estimates with data from the International Obesity Task Force (IOTF) (where available). Results in Appendix B show that the prevalence of obesity is generally well-approximated by this correction.

2.2 Distribution of BMI across Countries

Figures 1a and 1b show cross-country box plots of BMI for men and women aged 50 and above in 2004. The shaded rectangles delimit the interquartile range (from the 25th to the 75th percentile), while the tips of the whiskers delimit the 99th and first percentile of each distribution. For men, the median BMI is in the overweight range between 25 and 28 in all countries. The WHO and medical literature typically define the BMI range of 18.5-25 as optimal for health, whereas higher or lower BMI levels are associated with increased health risks.

Median BMI among men is higher in the U.S. than in any other country. Within Europe, there is a somewhat higher median BMI among men in Spain, Greece, Italy, and Austria than in the other (Northern European) countries. We can reject the hypothesis that BMI distributions are the same in all countries or all European countries based on a comparison of the quantile estimates.[9] For women, the median BMI in Spain is similar to the one in the U.S.[10] The difference between the U.S. and

[9] This is done non-parametrically using a pooled simultaneous quantile regression where we test the equality of the different quantile estimates (Buchinsky, 1998). The estimates are available upon request.

[10] The high level of BMI in Spain is not as much due to higher average weight but rather too much lower average height. For example, the median Spanish woman is almost 10 cm shorter than the median Dutch woman.

Spanish median BMI is statistically insignificant (at the 5% level), whereas the median BMI is significantly lower in the U.S. than in all other European countries.

Table 1 provides a more detailed summary of the same data, using what is commonly known as the WHO classification of obesity. People with BMI below 18.5 are considered underweight, those with BMI of 18.5-24.9 are considered normal weight, respondents in the BMI category of 25-29.9 are considered overweight, BMI of 30-34.9 indicates moderate obesity, and BMI of 35+ refers to severe obesity. Table 1 suggests similar conclusions as Figure 1. The prevalence of obesity in men is much higher in the U.S. than anywhere else. There is no clear North-South gradient among men, as Italy and France have much lower obesity rates than countries like Greece and Spain. The North-South gradient is more salient for women. The obesity rate among Spanish women is similar to the one for American women, but severe obesity is more prevalent in the U.S. than in Spain. Underweight among men is quite rare, and generally represents a very unhealthy group in this age group. For women, underweight is somewhat more prevalent. In all countries, only a minority of men and women are normal weight. Hence, the conclusion from this exercise is that most differences in obesity across countries come from the right-tail of the BMI distribution.

3. Correlates of Obesity: Energy Intake and Expenditure

Weight increases when more calories are consumed than burned. Short-term fluctuations in calorie intake or expenditure are likely to be washed away by an individual's metabolism, which is elastic up to a certain level of daily variation. However, when the excess calorie gain is more permanent, calorie imbalance materializes in weight gain. This makes an "energy accounting" approach as used by Cutler et al. (2003) to explain the growth of obesity in the U.S. an appropriate conceptual framework for multivariate regression analysis of obesity as a function of individual characteristics. Alternatively, one can also think of BMI as a health outcome, which is the result of choices made in a health production model (see for example Lakdawalla and Philipson, 2002).

As SHARE is currently only a cross-section, we cannot adopt a dynamic empirical approach but rather have to rely on a steady-state or cumulative interpretation of the energy-accounting equations. We assume that the steady state BMI of respondent *i* is determined by

$$w_i = x_i\beta + \gamma f_i + \delta e_i + \varepsilon_i \quad (1)$$

where f_i measures food consumption, e_i is physical activity or exercise, and x_i is a vector of individual characteristics. Finally, ε_i is a measure of unobservables. This steady-state interpretation is generally consistent with the view that body weight has "settled" or stabilized in the older population we are looking at, and that health behaviors have also been stable for some time. Under these conditions, health behaviors past the age of 50 should correlate with obesity if these behaviors actually impact long-term imbalances in energy intake and expenditure. Since body weight also affects demand for energy intake and expenditure, some of that relationship is unlikely to be causal. It will rather reflect "equilibrium conditions". With that in mind, we now look at how the SHARE and HRS measures of health behaviors correlate with obesity under the assumption that the data reflect this equilibrium.

3.1 Energy Expenditure

Cutler et al. (2003) explored the conjecture that different patterns of time allocation and reductions in time spent on energy-intensive activities could explain the rising obesity rates in the U.S. They reported that an increase in time watching TV from a daily average of 89 minutes in 1965 to 151 minutes in 1995 was one of the most important changes in time use amongst the population aged 15-64. This has come at the expense of other social activities but not so much at the cost of time spent doing sports or exercise. On average, daily time spent on exercise/sports went up from 6 minutes in 1965 to 18 minutes in 1995. The degree of physical intensity in employment might explain obesity trends in the U.S. The inclusion of physical work in the time spent on vigorous activity is therefore important.

Each survey asks respondents about the frequency of vigorous and moderate physical activity. Table 2 links the prevalence of obesity with participation in physical activity among men and women. In virtually all countries but Greece men are physically more active than women. At the same time, obesity rates are higher among women than among men for each level of physical activity. The fraction of females who hardly ever engage in vigorous physical activity is the highest in Spain and the U.S., which are also the countries with highest prevalence of obesity among women. Men from Spain and Italy are most often physically inactive, but obesity is less prevalent among them than among the somewhat more active American men. Obesity is weakly associated with physical activity among Southern Europeans while the association is strong in the U.S. The linkage between vigorous physical activity and obesity appears much stronger among men in the U.S. than in Europe.

As the frequency of participation in vigorous physical activity is a rough indicator of time use in physical and sedentary activities, we also analyze diary data from the Multinational Time Use Study (MTUS), conducted by the Center for Time

Use Research at the University of Oxford.[11] MTUS includes five countries from our analysis (France, Netherlands, the U.S., Italy, Germany, and Austria). The survey harmonizes answers to provide comparable measures of time use across countries. We consider minutes spent per day doing sports, walking, and watching TV or listening to the radio. The only available measure for an SES-stratified analysis is education. In line with our HRS/SHARE sample, we focus on adults ages 50 and above. Table 3 highlights large cross-country differences in the average time devoted to physical activity like sports or walking, and sedentary activities like TV watching or listening to the radio. In the U.S., men and women of any education level watch notably more TV or listen to the radio than their peers in European countries. For example, American men who did not finish high school spend on average 253 minutes daily on these sedentary activities compared to 189 minutes per day in France, which has the highest level among the European countries considered. Education-related differences in time watching TV are particularly large in the U.S. vs. the rest of the sample with substantially higher rates of sedentary activities among less educated men and women. There is less consistency across education groups with respect to walking time, as highly-educated people walk least in some countries and not in others. Finally, the data on engaging in sports also show substantial differences across countries, with the lowest time on sports spent in Italy, particularly among women. At the same time, men and women in the U.S. spend on average as much time doing sports or exercise as older people in some European countries. The education gradient in time use in sports is steeper in the U.S. than in most European countries, with the least educated spending less than half as much time on sport and exercising as the most educated adults.

[11] http://www.iser.essex.ac.uk/mtus/

3.2 Energy Intake

Both SHARE and HRS collect information on household expenditure on food consumed at home and away from home. This may convey important information, although food expenditure is probably a poor proxy for the quantity and quality of food consumed. To date, few studies have collected and analyzed nationally comparable data on food expenditure across countries. Young and Nestle (2002) focused on the importance of food eaten away from home and larger portion sizes to explain the rising trend in obesity in the U.S. We adjust for purchasing power parity differences and, using the standard equivalence scales, also for cross-country differences in household composition. To the best of our knowledge, there is no international food price index, as the available price index for European countries does not include the U.S. prices.

The first four columns of Table 4 show expenditure patterns (along with obesity rates) by country. Expenditure on food consumed away from home is particularly high in the U.S. vis-à-vis other countries both in absolute (e.g., weekly $46.8 vs. $19.2 in France) and relative terms (e.g., the average share of food away from home spending is 37% in the U.S. and 22% in France). This reveals that consumption patterns are quite different on both sides of the Atlantic. Figure 2 shows the cross-country distribution of the share of total food expenditure spent away from home. The median American household spends 24% of all food expenditure on food eaten outside home. Almost every fourth American household spends more than 30% of their food expenditure on food away from home. This fraction is much lower in European countries from a minimum in Southern Europe (Spain and Italy) to higher levels in Austria and Germany (e.g., 13%-14%).

Food taxes are relatively low in the U.S. compared to other countries (most states do not tax retail food). In a similar fashion, Spain and Greece give examples of high obesity rates and relatively low food taxes. At the same time, the two countries with the lowest obesity rates, Denmark and Sweden, have a particularly sizeable burden of food taxation. Still, other countries like the Netherlands have both low food taxes and low obesity rates, so that the negative relation between obesity and food taxes is not unambiguously clear.

Another measure of eating patterns is the time spent on eating at restaurants, consuming meals at home, and cooking. Table 5 presents cross-national data from the MTUS on time use in food-related activities by education and gender. One interesting observation is that Americans do not spend much time at restaurants despite a large fraction of food expenditure spent on food away from home. This suggests that much of that food spending is for food consumed in a short period of time or fast food. French respondents spend more time in restaurants than Americans despite paying less for food consumed away from home. Americans spend very little time eating meals at home, just over an hour a day, which is half of the time spent by the French and Italians. Finally, there are large differences between the U.S. and European countries in the average daily time of cooking, particularly among women. For example, American women cook on average for 54 min daily, which is about one half of the time spent cooking by women in European countries. Much lower cooking time among women in the U.S. correlates with high obesity rates in the U.S. Cutler et al. (2003) emphasized the importance of time spent preparing meals at home and argued that a reduction in the U.S. cooking time may explain a large proportion of the U.S. rise in obesity. It is interesting to note that time spent on eating at restaurants, consuming meals at home and cooking does not vary considerably by education. The exception is cooking among women, where we observe a negative association between education and cooking time in all countries but the U.S. In this case, the larger education gradient probably reflects higher opportunity cost of time (wages at work).

4. Multivariate Analysis

In order to account for several factors at the same time, we must resort to multivariate analysis of the relation between obesity (BMI≥30) and food intake and energy expenditure. We estimate individual level logit models of whether the respondent is obese using the SHARE and HRS data. We consider three model specifications. The baseline specification includes SES controls like wealth, income and education along with demographic characteristics. The second model adds in weekly expenditure on food away from home and food consumed at home. The third specification includes measures of vigorous and moderate (walking) physical activity. We do this step-by-step exercise to see the relative contribution of each set of variables to the probability of obesity. Furthermore, we check whether the SES differences in energy intake and expenditure can explain the observed differences in obesity prevalence across SES groups.

Table 6 presents point estimates along with t-values for men and women in the U.S. As a replica of this structure for the SHARE countries, Table 7 presents results from regression estimations where we pool data from each country and add country fixed effects. In Table 8, we relax the assumption of equal parameters across countries and perform regression analysis for each country individually.

Results from the base specification in Tables 6 and 7 accord with our expectations. Large SES differences in the prevalence of obesity are observed on both sides of the Atlantic with higher obesity rates among the least educated and least wealthy respondents. The relationship between obesity and SES appears to be stronger for females than for males. The relationship between obesity and income, keeping wealth, education, and demographics constant, is less definitive, as it is sometimes positive for American males, non-existent for European males, and negative for females in both Europe and the U.S. For the older age group considered, income may not be the best lifetime SES measure since public pensions are highly redistributive in some countries, whereas private pensions are not always annuitized but rather transferred to financial assets. Overall, there is strong evidence that low SES is associated with increased risks of obesity, particularly when SES is measured with wealth or education.

Adding food intake to the model produces several results (column 2, Tables 6-7). American males who spend more on food eaten outside home are more likely to be obese. The point estimate suggests a relative risk ratio of obesity of 1.016 for a $10 increase in weekly spending on food consumed away home. Together with the differences in expenditures in food eaten away from home (Table 4), this would explain a difference of about 6% in the prevalence of obesity between the US and Europe. In Europe, we find no effect of food eaten away from home on obesity among males, suggesting that the type or quality of food eaten away from home in the U.S. and Europe is different. This is only a conjecture since our measure of food intake is quite rough. Moreover, no significant association between obesity and spending on food away from home is found for females, and the point estimate is negative rather than positive. This might mean that the type of food eaten away from home in the U.S. varies by gender.

Results from the third model reveal that hardly doing any vigorous physical activity is associated with a high risk of obesity. Males who hardly ever engage in vigorous physical activity have 66% higher odds of obesity (exp(0.503) = 1.66). This association is statistically significant for both males and females in the U.S. and Europe. Results for moderate physical activity are similar. Hence, differences in the prevalence of physical activity across countries may explain a large portion of the cross-country variation in obesity. For example, 61.6% of Spanish females and 60.9% of American females report hardly ever doing physical activity, whereas the rates of physical inactivity are around 40% in the Northern European countries and 50% elsewhere in our European sample. This is in line with the North-South gradient in obesity, with much lower obesity rates in the Northern vis-à-vis Southern countries. Hence, differences in energy expenditure could explain a large share of the cross-country variation in obesity.

Interestingly, the SES differences in obesity do not disappear when we add behavioral measures in the analysis, even though the prevalence of physical activity and patterns of food intake are known to vary by SES. This result may indicate that reasons behind the SES differences in obesity should be searched for elsewhere, for example, in the environment, family background or early life events. On the other hand, it should be admitted that our measures of energy intake and expenditure are very aggregate and it is therefore possible that part of the variation in energy intake and expenditure remains unobserved in our data, and is instead captured by SES indicators in the regressions.

5. Conclusion

This paper analyzed the prevalence of obesity and its determinants among the population aged 50 and above in the United States and 10 European Countries. Three main findings emerge. Large differences in body weight of older adults exist across European countries and between the U.S. and Europe, and they are particularly large in the right tail of the BMI distribution. Cross-country differences in obesity prevalence often vary markedly by gender. Second, our results suggest that the cross-Atlantic differences in obesity seem to be partly explained by widespread reliance of Americans on food eaten away from home and little time spent in preparation meals at home. Cross-country differences in physical activity and time spent in sedentary activities like TV watching are another important contributor to the observed cross-country variation in obesity. Some of the European differences in the prevalence of obesity appear to be partly captured by the cross-country differences in physical activity. Our third result is that the well-known SES gradient in the prevalence of obesity differs across countries but in a way that cannot be fully explained by the national variation in food expenditure or physical activity.

Policy implications of our results are suggestive rather than definitive, because with the cross-section data from SHARE, the regressions may not always reflect causal pathways. Still, some of the observed cross-country differences in health behaviors and the relationships reported in our paper suggest a possible explanation for the large cross-country variation in obesity that deserve further research. One potential research avenue is to improve data on energy intake and expenditure in household surveys so that we could learn from the cross-country variation in the energy balance and design policies to address the alarming increase in obesity in the developed world.

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Appendix A

Table A.1 Sample Size by Gender and Country

country	female	male	total
United States	8,783	7,188	15,971
Austria	1,077	801	1,878
Germany	1,560	1,366	2,926
Sweden	1,291	1,146	2,437
Netherlands	1,491	1,337	2,828
Spain	1,242	945	2,187
Italy	1,356	1,115	2,471
France	915	749	1,664
Denmark	840	749	1,589
Greece	1,060	894	1,954
Total	19,615	16,290	35,905

Notes: respondents aged 50+ in 2004

Appendix B: Correction of BMI for Self-Report Bias

It is well known that individuals tend to underreport their weight. Hence, self-reported measures of obesity are likely to lead to an underestimate of the prevalence of obesity. Cawley and Burkhauser (2006) use the NHANES for the U.S. to assess how objectively measured height and weight is related to self-reported height and weight. The NHANES asks respondents to report their weight and height and then proceeds with measurement. The authors use a regression of objectively measured weight and height on self-reported weight/height controlling for certain demographic characteristics (e.g., age). The regression is

$$TRUEw_{ij} = \alpha_{0j} + \alpha_{1j} X_{ij} + \alpha_{2j} SELFw_{ij} + \varepsilon_{ij}$$

where *i* denotes an observation and *j* is a demographic group. The authors perform these regressions by gender and race/ethnicity for weight and height. We use the estimated coefficients from their study to correct self-reported measures in SHARE and HRS. This approach assumes transferability across surveys and countries. Since regressions are done by race/ethnicity, we have to assign groups to European respondents. This is somewhat arbitrary. People of Hispanic/Latin origin (Spain, Italy and Greece) are assigned as having the same relationship between objectively measured and self-reported weight/height as Hispanics in the U.S. For other European countries, we assign the relationship of white respondents from the U.S. The matrix of coefficients used is presented below.

Table B.1 NHANES regression Results from Cawley and Burkhauser (2006)

	female			male		
true weight	white	black	hispanic	white	black	hispanic
self weight	1.207	1.247	1.337	0.940	0.866	0.918
self weight^2	-0.0004	-0.0005	-0.0009	0.0002	0.0005	0.0003
age	-0.080	0.166	-0.084	0.214	-0.027	0.239
age^2	-0.0001	-0.003	0.0001	-0.002	0.0004	-0.003
constant	-13.479	-23.054	-24.421	-1.394	4.598	0.395
true height	white	black	hispanic	white	black	hispanic
self height	0.226	-0.211	-1.295	-0.290	-0.619	-2.211
self height^2	0.005	0.008	0.016	0.009	0.010	0.022
age	0.079	0.056	0.027	0.036	0.042	0.027
age^2	-0.001	-0.001	0.000	-0.001	-0.001	-0.001
constant	27.451	44.861	78.608	47.486	62.128	115.732

Notes: regression coefficients from Cawley and Burkhauser (2006).

The table below shows that applying these coefficients to the self-reported weight and height in the HRS and SHARE has a large impact on obesity rates for the population aged 50+ (and similarly for the average BMI).

countries	female		male		Total	
	self-report	corrected	self-report	corrected	self-report	corrected
United States	0.320	0.379	0.276	0.307	0.299	0.344
Austria	0.197	0.269	0.180	0.198	0.189	0.237
Germany	0.174	0.229	0.168	0.186	0.171	0.210
Sweden	0.147	0.215	0.136	0.158	0.142	0.188
Netherlands	0.165	0.232	0.131	0.153	0.149	0.195
Spain	0.256	0.336	0.203	0.208	0.231	0.276
Italy	0.169	0.234	0.151	0.156	0.161	0.199
France	0.151	0.203	0.150	0.162	0.150	0.185
Denmark	0.131	0.182	0.142	0.175	0.136	0.179
Greece	0.223	0.312	0.169	0.192	0.198	0.256

Notes: Sample age 50+ weighted. Corrected measure by applying regression coefficients from Cawley and Burkhauser (2006)

It is difficult to determine whether the correction "works" because few studies have been done on the older population thus far (except for the U.S.). Official estimates from the International Obesity Task Force (IOTF), which are based on measured BMI, are generally for the population aged 15-64. the European Community Household Panel (ECHP) is another survey that provides similar self-reported measures for the population aged 15+. Hence, we can verify whether the correction applied on the ECHP matches the IOTF numbers. In other words, we use the ECHP as a cross-walk to validate the SHARE numbers. We use the ECHP wave of 2001. The data is available for Austria, Denmark, Greece, Italy, and Spain. This group of countries spans most of the variation in obesity rates in Europe and enables us to test the hypothesis whether applying the Hispanic correction in Italy, Spain and Greece provides a good approximation to the data. The next table gives a comparison of the measures from the IOTF and ECHP (using the correction above) for the general population (15-64) and the comparison between the ECHP and SHARE for the population aged 50+.

	Males				Females			
	Age 15-64		Age 50+		Age 15-64		Age 50+	
	IOTF	ECHP 2001	ECHP 2001	SHARE 2002-2004	IOTF	ECHP 2001	ECHP 2001	SHARE 2002-2004
Austria	10.0%	10.5%	19.3%	19.8%	14.0%	10.8%	22.4%	26.9%
Denmark	12.5%	10.4%	14.1%	17.5%	11.3%	13.9%	20.1%	18.2%
Greece	20.0%	11.1%	14.3%	19.2%	15.0%	14.0%	25.7%	31.2%
Italy	9.3%	8.3%	14.8%	15.6%	8.7%	9.8%	21.3%	23.4%
Spain	13.4%	12.7%	18.2%	20.8%	15.8%	14.5%	33.4%	33.6%

Notes: Own calculations SHARE 2004. Ana Sanz-de-Galdeano provided the estimates for the ECHP. Cross-sectional weights applied from all surveys. ECHP and SHARE Estimates corrected for self-report bias using estimates from Cawley and Brukhauser (2006). IOTF estimates from http://www.iotf.org/database/GlobalAdultsAugust2005.asp.

The correction applied to the ECHP provides a good match to the IOTF estimates in all countries but Greece. The difference is considerable only for Greek males. The problem appears to be rather in the representativeness of the ECHP data (which is a panel and may be affected by attrition) rather than the correction itself. In the population aged 50+, the ECHP and SHARE estimates do not match (14.3% in ECHP vs. to 19.2% in SHARE). We conclude that the corrected SHARE numbers are close proxies of the IOTF estimates based on measured weight and height.

Appendix C: Complete Logit Results by Gender

Table C.1 Males

Variable	AU	DE	SE	NL	SP	IT	FR	DK	GR
age 57-59 (ref: age 52-56)	-0.511	0.100	-0.270	0.211	-0.250	-0.475	0.620	0.665	-0.260
	-1.59	0.39	-0.96	0.9	-0.84	-1.73	1.79	2.22	-0.9
age 60-64	-0.318	0.226	0.187	-0.080	-0.293	-0.387	0.235	0.100	-0.193
	-1.17	1.02	0.74	-0.32	-1.03	-1.5	0.7	0.31	-0.66
age 65-69	-0.582	0.131	0.031	0.140	-0.030	-0.407	0.091	0.286	-0.251
	-1.88	0.58	0.11	0.55	-0.11	-1.48	0.25	0.83	-0.83
age 70-71	-1.298	-0.205	-0.642	-0.617	-0.413	-0.437	-0.053	-0.415	-0.902
	-4.2	-0.87	-2.31	-2.39	-1.6	-1.72	-0.17	-1.25	-2.93
married	0.309	0.166	-0.154	0.207	-0.019	0.001	0.109	-0.252	1.045
	1.19	0.74	-0.57	0.82	-0.08	0	0.4	-1.04	2.93
ever smoked (ref: never smoke)	-0.849	-0.342	-0.282	0.390	-0.005	0.185	-0.182	-0.610	-0.337
	-3.08	-1.65	-0.98	1.67	-0.02	0.8	-0.56	-2.16	-1.49
stopped smoking	0.427	0.152	0.390	0.459	-0.019	0.696	0.362	0.155	0.088
	2.01	0.96	2.1	2.14	-0.1	3.63	1.53	0.64	0.41
high school or GED (ref: l.t. high sc.)	-0.016	-0.415	-0.081	-0.449	-0.392	-0.291	0.031	-0.462	-0.312
	-0.06	-1.63	-0.39	-1.17	-1.24	-1.16	0.12	-1.24	-1.33
college & more	-0.461	-0.740	-0.895	-0.344	-0.525	-0.525	-0.483	-0.446	-0.688
	-1.47	-2.64	-3.46	-1.94	-1.49	-1.41	-1.41	-1.62	-2.5
wealth 1st q	0.936	-0.061	0.384	0.657	-0.268	0.113	0.767	0.145	-0.213
	2.67	-0.27	1.33	2.64	-1.07	0.44	2.24	0.44	-0.73
wealth 2nd q. (3rd ommitted)	1.093	0.050	0.411	0.267	-0.652	-0.102	0.594	0.051	-0.513
	3.52	0.23	1.5	1.06	-2.59	-0.39	1.87	0.15	-1.81
wealth 4rd q.	0.467	-0.348	0.296	0.048	-0.703	0.070	-0.349	-0.154	-0.549
	1.47	-1.57	1.07	0.18	-2.68	0.29	-0.96	-0.47	-1.98
wealth 5th q.	0.782	-0.262	0.286	0.148	-0.671	-0.302	-0.347	-0.181	-0.240
	2.45	-1.15	1.01	0.56	-2.58	-1.12	-0.93	-0.55	-0.88
income 1st q	0.074	-0.014	0.266	0.277	0.202	-0.020	0.180	0.782	-0.215
	0.24	-0.06	0.94	1.1	0.65	-0.07	0.56	2.21	-0.68
income 2nd q. (3rd ommitted)	-0.483	0.311	-0.033	0.094	-0.016	0.014	-0.064	0.658	0.382
	-1.54	1.46	-0.12	0.38	-0.06	0.06	-0.2	1.78	1.33
income 4th q	-0.088	0.039	0.161	0.117	-0.094	-0.096	0.044	0.519	-0.019
	-0.31	0.17	0.6	0.47	-0.37	-0.4	0.13	1.48	-0.06
income 5th q.	-0.425	-0.133	0.259	-0.145	0.193	-0.322	-0.451	0.700	0.009
	-1.39	-0.52	0.96	-0.54	0.72	-1.16	-1.15	1.99	0.03
food away from home ($ per week)	0.018	-0.315	0.138	-0.070	0.072	0.076	-0.067	0.051	-0.254
	0.76	-2.84	1.81	-1.21	1	1.12	-1.13	1.26	-1.73
food at home ($ per week)	0.021	0.082	-0.100	0.018	-0.030	-0.057	-0.055	-0.018	0.173
	0.64	1.75	-1.13	0.86	-0.67	-1.43	-1.14	-0.26	3.04
vig. Phys. act. once per week (ref:1+)	0.336	-0.129	0.503	0.133	-0.096	-0.345	0.426	-0.456	-0.601
	1.16	-0.59	2.08	0.49	-0.25	-1.05	1.2	-1.33	-1.82
vig. Phys. act. 1-3 tm month	0.629	0.487	0.104	0.335	-0.067	-0.099	0.173	0.347	-0.192
	2.03	2.11	0.35	0.97	-0.14	-0.29	0.41	0.95	-0.68
mod. Phys. act. Hardly ever	0.695	0.375	-0.033	0.315	0.357	0.038	0.397	0.486	0.547
	2.56	2.05	-0.15	1.67	1.83	0.19	1.45	1.78	2.35
mod. Phys. act. once per week (ref:1+)	0.087	0.362	0.452	0.174	0.020	-0.016	0.372	-0.005	0.074
	0.33	1.79	1.81	0.77	0.07	-0.06	1.33	-0.01	0.3
mod. Phys. act. 1-3 tm month	0.224	-0.107	0.661	0.591	0.030	-0.017	-0.337	0.040	0.054
	0.67	-0.33	1.5	1.6	0.07	-0.05	-0.7	0.07	0.16
mod. Phys. act. Hardly ever	-0.017	-0.152	0.398	0.507	-0.270	-0.133	0.099	-0.335	-0.010
	-0.05	-0.47	1.01	1.75	-0.99	-0.53	0.28	-0.76	-0.03
Pseudo R2	0.079	0.046	0.053	0.047	0.029	0.032	0.081	0.056	0.073
N	800	1363	1144	1337	943	1115	748	745	893

Table C.2 Females

Variable	AU	DE	SE	NL	SP	IT	FR	DK	GR
age 57-59 (ref: age 52-56)	0.518	0.419	-0.030	0.296	0.482	0.633	-0.023	0.062	0.366
	2.05	1.85	-0.13	1.52	2.23	2.9	-0.08	0.21	1.51
age 60-64	0.185	0.054	0.005	0.256	0.372	0.463	-0.158	-0.063	-0.159
	0.77	0.26	0.02	1.27	1.71	2.2	-0.53	-0.2	-0.62
age 65-69	0.283	0.364	0.355	0.137	0.383	0.344	0.297	-0.103	-0.267
	1.09	1.73	1.49	0.6	1.77	1.51	1.02	-0.29	-1.07
age 70-71	-0.318	0.123	-0.156	-0.238	0.102	0.238	-0.401	-0.684	-0.217
	-1.27	0.57	-0.67	-1.12	0.52	1.08	-1.54	-2.23	-0.9
married	0.225	0.204	-0.005	-0.071	0.338	0.378	0.186	0.090	0.253
	1.36	1.27	-0.03	-0.43	2.26	2.32	0.93	0.39	1.53
ever smoked (ref: never smoke)	-0.421	-0.382	-0.262	-0.373	-0.479	-0.695	-0.599	-0.688	-0.537
	-1.87	-1.72	-1.28	-2.08	-1.79	-3.09	-1.67	-2.8	-2.54
stopped smoking	0.022	0.342	0.136	0.159	-0.017	0.032	0.119	0.222	0.134
	0.09	1.93	0.84	1.07	-0.06	0.16	0.44	1.03	0.53
high school or GED (ref: l.t. high sc.)	-0.390	-0.027	-0.147	-0.702	-0.090	-0.758	0.122	0.026	-0.484
	-2.43	-0.18	-0.83	-2.07	-0.35	-3.11	0.57	0.09	-2.25
college & more	-0.572	-0.405	-0.266	-0.357	-1.189	-0.874	-0.702	-0.276	0.161
	-2.45	-1.98	-1.31	-2.29	-2.98	-2.28	-2.06	-1.18	0.64
wealth 1st q	0.391	0.246	0.417	0.511	0.293	0.350	0.771	-0.171	-0.025
	1.72	1.24	1.88	2.61	1.49	1.78	2.72	-0.6	-0.12
wealth 2nd q. (3rd ommitted)	0.168	0.181	0.327	0.181	0.294	0.011	0.793	0.163	0.186
	0.73	0.9	1.49	0.88	1.49	0.06	2.82	0.59	0.87
wealth 4rd q.	0.184	-0.059	-0.233	-0.103	0.102	-0.333	0.125	-0.787	0.285
	0.81	-0.29	-0.96	-0.48	0.52	-1.54	0.41	-2.38	1.28
wealth 5th q.	-0.284	-0.417	-0.196	-0.332	-0.015	-0.404	0.210	-0.385	0.113
	-1.1	-1.88	-0.79	-1.48	-0.07	-1.79	0.66	-1.19	0.48
income 1st q	0.169	0.077	0.204	-0.031	-0.256	-0.010	0.247	0.242	0.188
	0.78	0.41	0.97	-0.16	-1.35	-0.05	0.98	0.81	0.92
income 2nd q. (3rd ommitted)	-0.527	-0.021	0.004	0.070	-0.283	0.491	-0.021	0.474	0.197
	-2.37	-0.11	0.02	0.35	-1.44	2.52	-0.08	1.61	0.95
income 4th q	-0.140	-0.328	-0.324	-0.102	-0.193	0.318	-0.567	-0.194	-0.147
	-0.61	-1.58	-1.37	-0.47	-0.95	1.52	-1.89	-0.6	-0.64
income 5th q.	-0.509	-0.395	-0.474	0.029	-0.263	-0.046	-0.065	-0.469	-0.069
	-2.08	-1.67	-1.82	0.14	-1.22	-0.19	-0.21	-1.31	-0.27
food away from home ($ per week)	-0.081	-0.121	-0.082	0.003	-0.025	-0.062	0.021	-0.071	-0.172
	-1.34	-1.22	-0.68	0.13	-0.5	-1.06	0.75	-0.73	-1.86
food at home ($ per week)	0.029	-0.022	-0.007	-0.011	-0.023	0.022	0.000	-0.011	0.031
	1.5	-0.58	-0.14	-0.73	-0.73	1.41	0.01	-0.29	1.57
vig. Phys. act. once per week (ref:1+)	0.072	-0.197	-0.501	0.207	0.201	0.046	0.701	-0.379	-0.120
	0.28	-0.94	-2.07	1.09	0.8	0.19	2.23	-1.25	-0.61
vig. Phys. act. 1-3 tm month	0.112	-0.050	-0.259	-0.059	-0.224	0.099	-0.088	-0.729	0.194
	0.41	-0.22	-0.99	-0.16	-0.78	0.4	-0.21	-1.53	0.94
mod. Phys. act. Hardly ever	0.169	0.175	-0.103	0.406	0.276	0.064	0.672	0.093	0.241
	0.82	1.05	-0.6	2.55	1.7	0.35	2.72	0.39	1.12
mod. Phys. act. once per week (ref:1+)	0.270	0.162	0.115	0.244	0.127	-0.011	0.179	0.576	0.425
	1.31	0.83	0.48	1.2	0.61	-0.05	0.72	1.97	2.26
mod. Phys. act. 1-3 tm month	0.025	-0.354	1.119	-0.006	-0.246	0.461	0.500	-0.121	0.893
	0.09	-0.96	3.26	-0.02	-0.73	1.66	1.52	-0.23	3.14
mod. Phys. act. Hardly ever	0.734	0.543	-0.236	0.305	0.500	0.238	0.676	0.396	0.663
	3.38	2.53	-0.74	1.46	2.94	1.38	2.87	1.17	2.79
Pseudo R2	0.058	0.048	0.046	0.043	0.044	0.065	0.085	0.064	0.046
N	1075	1555	1290	1489	1242	1355	915	839	1059

Figures

Figure 1a

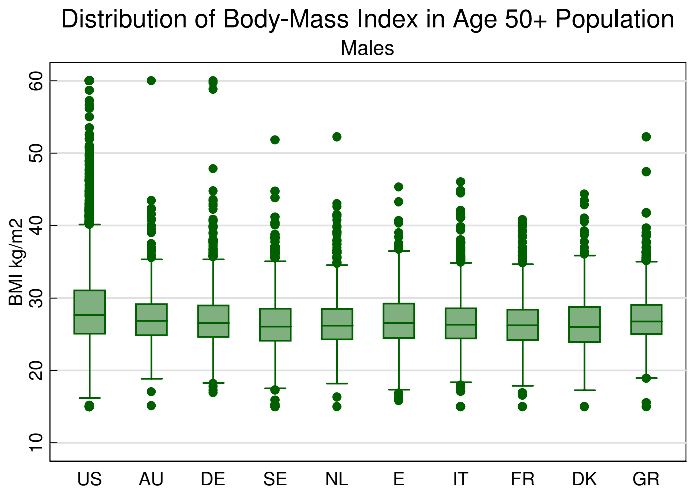
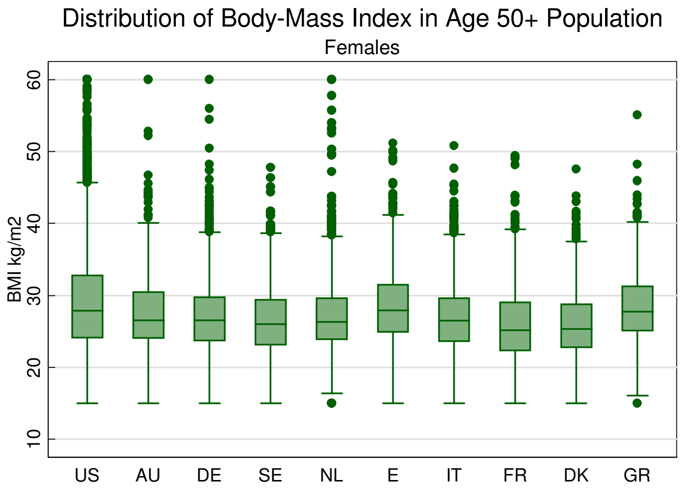
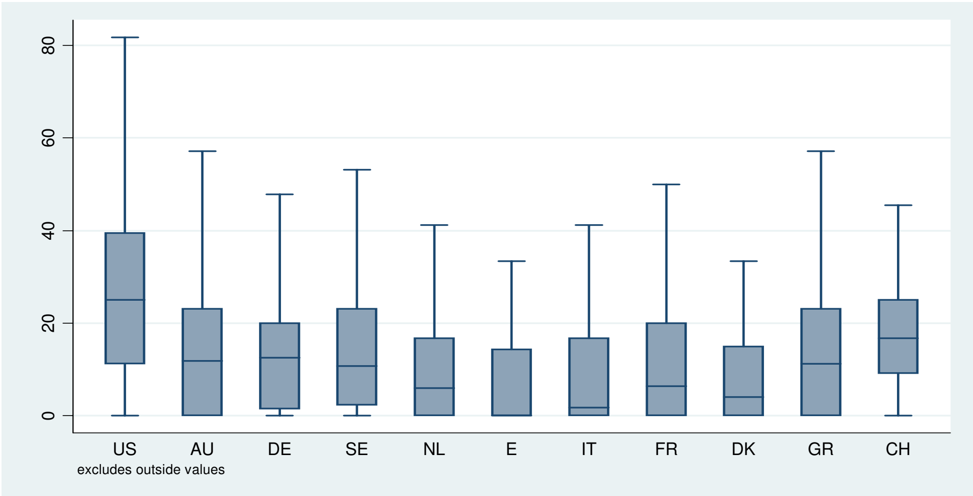


Figure 1b



Notes: Individual sampling weights used from each survey. US = United States, AU = Austria, D = Germany, SE = Sweden, NL = Netherlands, E = Spain, IT = Italy, FR = France, DK = Denmark, GR = Greece, CH = Switzerland.

Figure 2 Fraction of Total Food Spending on Food Consumed Away From Home



Notes: Sampling weights used. Fraction of total food consumption consumed away from home. The box plots exclude outside values (values above the 99th and below the 1st Percentile. US = United States, AU = Austria, D = Germany, SE = Sweden, NL = Netherlands, E = Spain, IT = Italy, FR = France, DK = Denmark, GR = Greece, CH = Switzerland.

Tables

Table 1: Corrected Self-Reported Body Mass Index (kg/m^2) among Individuals Aged 50+

Males						
	WHO Classification					obesity rate
fraction (%)	<18.5	18.5-25	25-30	30-35	35+	BMI>30
United States	0.52	24.08	44.71	20.97	9.72	0.307
Austria	0.3	26.16	53.71	15.55	4.28	0.198
Germany	0.48	28.71	52.21	14.62	3.98	0.186
Sweden	0.74	34.28	49.18	12.89	2.91	0.158
Netherlands	0.3	33.73	50.7	12.89	2.38	0.153
Spain	1.17	29.78	48.23	17.13	3.69	0.208
Italy	1.05	29.62	53.69	12.5	3.15	0.156
France	0.85	35.17	47.74	13.64	2.6	0.162
Denmark	0.61	36.21	45.63	14.88	2.67	0.175
Greece	0.21	24.43	56.19	16.21	2.97	0.192
Total Europe	0.75	30.63	51.01	14.28	3.33	0.176
Females						
	WHO Classification					obesity rate
fraction (%)	<18.5	18.5-25	25-30	30-35	35+	BMI>30
United States	2.03	29.45	30.66	20.06	17.81	0.379
Austria	1.7	33.07	38.31	19.56	7.36	0.269
Germany	1.15	35.63	40.34	15.87	7.01	0.229
Sweden	1.68	39.78	37	16.75	4.8	0.215
Netherlands	1.45	34.5	40.83	17.19	6.03	0.232
Spain	0.75	25.7	39.94	23.66	9.96	0.336
Italy	2.58	33.36	40.7	17.69	5.66	0.234
France	4.09	44.65	30.98	14.83	5.46	0.203
Denmark	3.22	44.5	34.1	13.81	4.37	0.182
Greece	0.88	23.8	44.16	22.7	8.46	0.312
Total Europe	2.04	35.3	38.46	17.48	6.72	0.242

Notes: Sample weights used. Corrected BMI.

Table 2: Frequency of Vigorous Physical Activity and Obesity among Individuals Aged 50+

	Females				Males			
obesity r. (fraction pop)	more than once a week	once a week	1 to 3 times a month	hardly ever	more than once a week	once a week	1 to 3 times a month	hardly ever
United States	0.284	0.298	0.357	0.428	0.230	0.308	0.326	0.352
	(0.235)	(0.078)	(0.078)	(0.609)	(0.309)	(0.114)	(0.099)	(0.479)
Austria	0.217	0.250	0.266	0.296	0.155	0.210	0.213	0.223
	(0.216)	(0.135)	(0.123)	(0.525)	(0.328)	(0.180)	(0.152)	(0.341)
Germany	0.208	0.164	0.218	0.269	0.159	0.160	0.230	0.228
	(0.339)	(0.136)	(0.096)	(0.429)	(0.450)	(0.163)	(0.107)	(0.280)
Sweden	0.225	0.179	0.209	0.222	0.151	0.204	0.161	0.146
	(0.334)	(0.139)	(0.094)	(0.433)	(0.476)	(0.132)	(0.098)	(0.294)
Netherlands	0.191	0.223	0.186	0.281	0.132	0.151	0.194	0.173
	(0.397)	(0.162)	(0.036)	(0.406)	(0.459)	(0.112)	(0.055)	(0.375)
Spain	0.283	0.322	0.239	0.369	0.199	0.160	0.195	0.222
	(0.221)	(0.089)	(0.074)	(0.616)	(0.343)	(0.076)	(0.036)	(0.546)
Italy	0.219	0.198	0.318	0.232	0.177	0.101	0.168	0.154
	(0.217)	(0.123)	(0.098)	(0.562)	(0.298)	(0.103)	(0.073)	(0.526)
France	0.118	0.220	0.118	0.248	0.127	0.182	0.138	0.191
	(0.237)	(0.123)	(0.083)	(0.557)	(0.346)	(0.138)	(0.092)	(0.423)
Denmark	0.185	0.144	0.114	0.207	0.160	0.136	0.220	0.217
	(0.422)	(0.157)	(0.063)	(0.358)	(0.504)	(0.157)	(0.084)	(0.256)
Greece	0.279	0.265	0.345	0.369	0.196	0.098	0.149	0.256
	(0.302)	(0.246)	(0.196)	(0.257)	(0.359)	(0.142)	(0.189)	(0.311)
Total Europe	0.204	0.208	0.235	0.273	0.161	0.154	0.188	0.195
	(0.277)	(0.131)	(0.092)	(0.501)	(0.379)	(0.129)	(0.087)	(0.403)

Notes: sample weights used. Corrected self-report BMI. First figure in cell is the obesity rate while the number in parenthesis underneath is the fraction of the sample in that cell.

Table 3: Time Use in Sports, Walking and TV/Radio by Education Level
Data from Multinational Time Use Study (MTUS)

		Males (Education level)				Females (Education Level)			
Country	minutes/day	< sec.	secondary	> sec.	total	< sec.	secondary	> sec.	total
France	sport	12.30	18.58	17.35	16.79	3.63	5.09	6.89	5.02
	walking	34.92	30.06	24.65	29.81	22.46	20.44	19.61	20.85
	TV or Radio	189.25	173.52	134.32	167.16	182.02	152.80	124.54	155.72
Netherlands	sport	31.22	27.30	33.45	30.83	13.59	15.52	13.54	13.98
	walking								
	TV or Radio	158.38	137.65	109.22	141.28	139.70	118.89	101.94	130.12
United States	sport	10.51	18.02	23.86	19.72	8.48	9.30	16.61	12.15
	walking								
	TV or Radio	252.88	211.89	185.04	205.14	248.92	195.23	152.93	188.59
Italy	sport	7.38	7.59	9.56	7.48	1.11	1.73	2.09	1.15
	walking	43.56	43.64	35.96	43.29	15.80	19.60	17.27	15.99
	TV or Radio	147.03	138.95	123.50	145.56	123.42	112.53	128.15	123.04
Germany	sport	11.77	15.42	13.35	14.36	7.24	9.96	11.95	9.54
	walking	15.80	19.02	15.18	17.29	13.91	16.05	10.54	14.40
	TV or Radio	170.29	148.68	135.78	144.96	143.12	132.37	109.05	131.15
Austria	sport	17.07	22.27	20.73	18.05	6.14	11.83	9.59	7.01
	walking	34.13	24.49	29.16	32.40	22.67	21.53	34.09	22.70
	TV or Radio	153.56	145.94	114.82	150.46	139.31	138.81	100.62	138.58

Notes: Own calculations from harmonized MTUS sample of aged 50+ respondents. France sample from 1998, Netherlands 1995, USA pooled 1992-94-98, Italy 1989, Germany 1992, Austria pooled 1992-1997 samples.

Table 4: Food Consumption, Relative Prices and Obesity

		$ per week		price	Value added Tax on Food		
	obesity rate	food away	food home	big mac	retail	VAT	VAT
United States	0.344	46.8	78.7	1	0	0-7	0-7
Austria	0.237	12.4	51.0	0.94	10	10	10
Germany	0.210	9.5	47.4	0.94	7 or 16	16	7
Sweden	0.188	7.2	37.5	1.08	12 or 25	25	12
Netherlands	0.195	12.3	56.2	0.94	6	6	6
Spain	0.276	8.1	55.7	1.04	4 or 7	7	7
Italy	0.199	11.3	62.1	1.04	4 or 10	10	10
France	0.185	19.2	67.8	0.86	5.5 or 19.6	19.6	5.5
Denmark	0.179	5.6	39.8	1.23	25	25	25
Greece	0.256	9.0	49.0	0.83	9	9	9
Total Europe	0.214	10.5	51.8	1.0	12.5	14.2	10.2

Notes: First 4 columns from SHARE/HRS. Price of BigMac obtained from The Economist 2001. Value added Tax on food for Europe obtained from VAT rates applied in the Member States of the European Community 2005 DOC/1636/2005. For the U.S. this information varies by state. Average computed from Tax Institute's 2006 Facts and Figures report.

Table 5: Time Use in Eating in Restaurants, at Home and Cooking among Individuals Aged 50+

		Males (Education level)				Females (Education Level)			
Country	minutes/day	< sec.	secondary	> sec.	total	< sec.	secondary	> sec.	total
France	restaurant	15.1	17.7	27.9	19.7	10.2	15.2	24.8	15.6
	meal home	122.6	121.4	110.9	119.0	116.5	118.4	106.7	115.7
	cooking	29.5	32.5	28.0	30.7	110.2	109.8	87.1	105.7
Netherlands	restaurant	3.0	5.7	10.0	5.4	3.0	4.5	5.9	3.7
	meal home	88.6	90.7	76.9	86.2	85.9	81.9	77.7	83.9
	cooking	51.3	46.1	37.5	46.7	104.8	79.7	74.2	95.3
United States	restaurant	12.1	12.7	19.4	16.0	6.2	13.1	15.6	12.8
	meal home	60.6	73.9	73.6	71.6	67.3	65.2	69.3	67.3
	cooking	22.2	25.4	18.8	21.6	51.8	60.4	49.9	54.3
Italy	restaurant	17.1	10.2	8.5	16.3	1.5	2.9	3.4	1.6
	meal home	112.5	97.8	106.5	111.1	110.4	99.1	101.1	109.8
	cooking	20.4	19.0	26.2	20.5	167.4	139.7	133.7	165.6
Germany	restaurant	7.4	5.9	5.3	5.8	4.4	4.1	5.3	4.4
	meal home	91.1	91.8	90.0	91.0	90.8	89.7	79.5	88.1
	cooking	23.6	34.7	33.6	33.5	111.9	108.2	92.3	106.3
Austria	restaurant	5.5	7.9	6.0	5.9	3.1	5.1	7.8	3.5
	meal home	96.6	88.9	90.7	95.2	93.0	92.0	80.9	92.6
	cooking	19.1	19.4	23.8	19.3	119.2	102.8	75.3	116.1

Notes: Own calculations from harmonized MTUS sample of aged 50+ respondents. France sample from 1998, Netherlands 1995, USA pooled 1992-94-98, Italy 1989, Germany 1992, Austria pooled 1992-1997 samples.

Table 6: U.S. Correlates of Obesity among Individuals Aged 50+

	male			female		
Variable	base	+ food	+ activity	base	+ food	+ activity
age 57-59 (ref: age 52-56)	-0.015	-0.017	-0.045	-0.052	-0.052	-0.057
	-0.12	-0.14	-0.35	-0.46	-0.46	-0.50
age 60-64	0.070	0.059	0.023	0.020	0.020	-0.032
	0.71	0.6	0.23	0.21	0.2	-0.32
age 65-69	-0.256	-0.273	-0.315	-0.406	-0.404	-0.470
	-2.48	-2.64	-3.02	-3.84	-3.81	-4.36
age 70-71	-0.516	-0.535	-0.650	-0.584	-0.582	-0.711
	-4.99	-5.15	-6.14	-5.31	-5.27	-6.28
married	0.284	0.327	0.325	0.103	0.109	0.087
	3.31	3.63	3.57	1.46	1.51	1.18
black	0.013	0.007	-0.005	0.637	0.639	0.606
	0.13	0.08	-0.05	7.28	7.3	6.81
ever smoked (ref: never smoke)	-0.462	-0.455	-0.559	-0.678	-0.676	-0.756
	-3.39	-3.34	-4.03	-5.83	-5.81	-6.42
stopped smoking	0.373	0.380	0.355	0.283	0.285	0.276
	2.98	3.04	2.81	2.62	2.65	2.54
hispanic	-0.038	-0.034	-0.016	-0.095	-0.098	-0.074
	-0.32	-0.28	-0.13	-0.78	-0.8	-0.59
high school or GED (ref: l.t. high sc.)	-0.007	-0.001	0.005	-0.077	-0.076	-0.011
	-0.07	-0.01	0.05	-0.81	-0.8	-0.12
college & more	-0.361	-0.360	-0.347	-0.150	-0.147	-0.021
	-3.54	-3.53	-3.35	-1.37	-1.34	-0.18
wealth 1st q	0.078	0.084	-0.015	0.394	0.393	0.303
	0.72	0.78	-0.13	3.87	3.85	2.92
wealth 2nd q. (3rd ommitted)	-0.007	-0.007	-0.060	0.316	0.314	0.263
	-0.07	-0.07	-0.62	3.25	3.23	2.67
wealth 4rd q.	-0.304	-0.310	-0.289	-0.311	-0.308	-0.287
	-3.17	-3.24	-2.99	-3.02	-2.99	-2.76
wealth 5th q.	-0.470	-0.491	-0.442	-0.590	-0.581	-0.532
	-4.58	-4.78	-4.26	-5.27	-5.19	-4.71
income 1st q	-0.215	-0.195	-0.244	0.085	0.078	-0.002
	-1.88	-1.7	-2.09	0.81	0.75	-0.02
income 2nd q. (3rd ommitted)	-0.160	-0.154	-0.174	-0.075	-0.079	-0.104
	-1.61	-1.54	-1.72	-0.76	-0.79	-1.04
income 4th q	0.249	0.243	0.238	-0.114	-0.112	-0.107
	2.63	2.57	2.49	-1.14	-1.11	-1.05
income 5th q.	0.162	0.142	0.163	-0.396	-0.383	-0.355
	1.56	1.36	1.55	-3.58	-3.46	-3.17
food away from home ($ per week)		0.016	0.016		-0.010	-0.010
		2.87	2.94		-1.54	-1.5
food at home ($ per week)		0.003	0.003		0.001	0.001
		0.59	0.69		0.17	0.18
vig. Phys. act. once per week (ref:1+)			0.332			-0.154
			2.87			-1.03
vig. Phys. act. 1-3 tm month			0.554			0.138
			4.52			1.01
mod. Phys. act. Hardly ever			0.508			0.317
			6.17			3.68
mod. Phys. act. once per week (ref:1+)			0.226			0.322
			2.63			3.52
mod. Phys. act. 1-3 tm month			0.331			0.337
			3.13			3.22
mod. Phys. act. Hardly ever			0.424			0.691
			4.57			8.05
Pseudo R2	0.040	0.041	0.056	0.074	0.075	0.093
N	5295	5295	5295	5040	5040	5040

Table: 7 European Correlates of Obesity among Individuals Aged 50+

	male			female		
Variable	base	+ food	+ activity	base	+ food	+ activity
age 57-59 (ref: age 52-56)	-0.006	-0.006	-0.023	0.323	0.322	0.317
	-0.06	-0.07	-0.25	4.28	4.26	4.2
age 60-64	-0.002	-0.002	-0.020	0.168	0.165	0.149
	-0.03	-0.02	-0.23	2.26	2.21	1.99
age 65-69	-0.002	-0.002	-0.034	0.263	0.259	0.221
	-0.02	-0.02	-0.37	3.38	3.33	2.83
age 70-71	-0.398	-0.398	-0.484	0.041	0.039	-0.106
	-4.61	-4.6	-5.4	0.58	0.55	-1.42
married	0.131	0.122	0.136	0.167	0.173	0.189
	1.71	1.53	1.69	3.08	3.1	3.37
ever smoked (ref: never smoke)	-0.155	-0.155	-0.170	-0.462	-0.463	-0.472
	-1.97	-1.98	-2.16	-6.44	-6.45	-6.54
stopped smoking	0.264	0.264	0.265	0.094	0.095	0.107
	4.09	4.09	4.1	1.46	1.47	1.65
high school or GED (ref: l.t. high sc.)	-0.205	-0.203	-0.196	-0.272	-0.268	-0.240
	-2.59	-2.57	-2.48	-4.26	-4.19	-3.74
college & more	-0.530	-0.527	-0.522	-0.469	-0.464	-0.435
	-6.35	-6.3	-6.25	-6.37	-6.28	-5.86
wealth 1st q	0.244	0.244	0.217	0.366	0.365	0.327
	2.75	2.74	2.42	5.18	5.16	4.6
wealth 2nd q. (3rd ommitted)	0.075	0.076	0.067	0.244	0.244	0.235
	0.87	0.89	0.78	3.43	3.43	3.28
wealth 4rd q.	-0.150	-0.149	-0.146	-0.063	-0.061	-0.046
	-1.69	-1.68	-1.65	-0.85	-0.82	-0.62
wealth 5th q.	-0.138	-0.136	-0.107	-0.249	-0.246	-0.225
	-1.53	-1.5	-1.18	-3.16	-3.11	-2.84
income 1st q	0.122	0.122	0.125	0.055	0.057	0.038
	1.33	1.33	1.34	0.81	0.84	0.56
income 2nd q. (3rd ommitted)	0.092	0.091	0.091	0.004	0.007	0.001
	1.05	1.04	1.04	0.07	0.1	0.01
income 4th q	0.031	0.032	0.041	-0.161	-0.159	-0.159
	0.35	0.37	0.46	-2.16	-2.13	-2.12
income 5th q.	-0.067	-0.063	-0.061	-0.259	-0.253	-0.263
	-0.74	-0.69	-0.66	-3.27	-3.2	-3.31
food away from home ($ per week)		-0.007	-0.006		-0.022	-0.024
		-0.3	-0.25		-1.39	-1.51
food at home ($ per week)		-0.001	-0.001		0.006	0.006
		-0.07	-0.1		0.96	0.97
vig. Phys. act. once per week (ref:1+)			-0.040			-0.028
			-0.43			-0.36
vig. Phys. act. 1-3 tm month			0.173			0.005
			1.69			0.05
mod. Phys. act. Hardly ever			0.307			0.195
			4.31			3.21
mod. Phys. act. once per week (ref:1+)			0.174			0.214
			2.11			3.07
mod. Phys. act. 1-3 tm month			0.079			0.248
			0.65			2.4
mod. Phys. act. Hardly ever			-0.006			0.446
			-0.05			6.33
Pseudo R2	0.020	0.020	0.024	0.036	0.037	0.043
N	9088	9088	9088	10819	10819	10819

Table 8: European Results by Country among Individuals Aged 50+

Variable	AU	DE	SE	NL	SP	IT	FR	DK	GR
age 57-59 (ref: age 52-56)	0.116	0.280	-0.129	0.274	0.207	0.218	0.218	0.320	0.077
	0.59	1.67	-0.73	1.85	1.19	1.29	0.99	1.54	0.43
age 60-64	-0.043	0.139	0.101	0.146	0.140	0.154	0.041	0.032	-0.118
	-0.24	0.93	0.6	0.93	0.82	0.94	0.19	0.15	-0.62
age 65-69	-0.065	0.250	0.237	0.179	0.241	0.056	0.220	0.075	-0.208
	-0.34	1.64	1.29	1.05	1.44	0.32	1	0.31	-1.09
age 70-71	-0.641	-0.032	-0.348	-0.341	-0.098	-0.034	-0.257	-0.576	-0.411
	-3.33	-0.2	-2.01	-2.1	-0.62	-0.2	-1.29	-2.64	-2.24
married	0.218	0.174	-0.094	-0.013	0.185	0.213	0.191	-0.094	0.381
	1.59	1.34	-0.63	-0.09	1.51	1.6	1.21	-0.57	2.62
male	-0.320	-0.100	-0.368	-0.463	-0.634	-0.560	-0.230	0.065	-0.704
	-2.51	-0.92	-3.31	-4.37	-4.95	-4.9	-1.5	0.45	-5.31
ever smoked (ref: never smoke)	-0.612	-0.338	-0.312	-0.103	-0.226	-0.361	-0.424	-0.636	-0.417
	-3.53	-2.27	-1.92	-0.77	-1.39	-2.37	-1.84	-3.51	-2.8
stopped smoking	0.250	0.239	0.201	0.187	-0.151	0.261	0.208	0.179	0.059
	1.7	2.05	1.7	1.61	-1.02	2.05	1.21	1.14	0.38
high school or GED (ref: l.t. high sc.)	-0.319	-0.170	-0.094	-0.598	-0.274	-0.587	0.089	-0.192	-0.409
	-2.37	-1.31	-0.72	-2.4	-1.4	-3.35	0.56	-0.87	-2.62
college & more	-0.583	-0.489	-0.497	-0.345	-0.786	-0.776	-0.617	-0.335	-0.239
	-3.24	-3.1	-3.14	-2.93	-3	-2.88	-2.61	-1.91	-1.36
wealth 1st q	0.567	0.119	0.436	0.564	0.066	0.285	0.718	-0.034	-0.107
	2.98	0.79	2.52	3.75	0.43	1.87	3.37	-0.16	-0.62
wealth 2nd q. (3rd ommitted)	0.477	0.105	0.376	0.194	-0.063	-0.001	0.691	0.133	-0.072
	2.64	0.72	2.23	1.22	-0.41	-0.01	3.31	0.63	-0.43
wealth 4rd q.	0.261	-0.177	0.029	-0.051	-0.207	-0.137	-0.085	-0.465	-0.055
	1.44	-1.19	0.16	-0.31	-1.35	-0.86	-0.37	-2.05	-0.32
wealth 5th q.	0.136	-0.345	0.039	-0.135	-0.273	-0.352	-0.051	-0.292	-0.013
	0.69	-2.19	0.21	-0.78	-1.68	-2.06	-0.21	-1.29	-0.07
income 1st q	0.099	0.046	0.243	0.062	-0.108	-0.048	0.221	0.460	0.071
	0.56	0.32	1.48	0.4	-0.69	-0.3	1.11	2.05	0.42
income 2nd q. (3rd ommitted)	-0.485	0.121	0.006	0.081	-0.215	0.294	-0.037	0.588	0.208
	-2.71	0.87	0.04	0.53	-1.42	1.95	-0.18	2.62	1.24
income 4th q	-0.087	-0.164	-0.100	-0.007	-0.154	0.155	-0.295	0.150	-0.062
	-0.5	-1.09	-0.57	-0.05	-1	0.99	-1.34	0.64	-0.35
income 5th q.	-0.481	-0.258	-0.151	-0.072	-0.053	-0.152	-0.236	0.174	-0.003
	-2.57	-1.52	-0.83	-0.43	-0.32	-0.84	-1.02	0.72	-0.02
food away from home ($ per week)	0.007	-0.210	0.065	-0.012	0.003	-0.019	-0.006	-0.001	-0.192
	0.27	-2.78	1.13	-0.63	0.09	-0.47	-0.21	-0.05	-2.35
food at home ($ per week)	0.019	0.022	-0.031	-0.004	-0.027	0.011	-0.005	-0.018	0.049
	1.25	0.75	-0.84	-0.37	-1.12	0.78	-0.36	-0.43	1.77
vig. Phys. act. once per week (ref:1+)	0.204	-0.175	-0.065	0.191	0.112	-0.116	0.590	-0.410	-0.248
	1.07	-1.17	-0.38	1.24	0.55	-0.62	2.59	-1.85	-1.56
vig. Phys. act. 1-3 tm month	0.328	0.178	-0.130	0.170	-0.223	0.036	0.010	-0.135	0.041
	1.62	1.08	-0.66	0.67	-0.92	0.19	0.03	-0.47	0.25
mod. Phys. act. Hardly ever	0.367	0.246	-0.068	0.374	0.284	0.052	0.583	0.240	0.374
	2.25	1.97	-0.51	3.13	2.3	0.39	3.32	1.31	2.33
mod. Phys. act. once per week (ref:1+)	0.193	0.259	0.329	0.202	0.106	0.037	0.238	0.366	0.319
	1.21	1.86	1.93	1.36	0.62	0.24	1.31	1.56	2.19
mod. Phys. act. 1-3 tm month	0.122	-0.194	0.963	0.216	-0.146	0.263	0.198	0.007	0.538
	0.59	-0.82	3.64	0.86	-0.56	1.29	0.74	0.02	2.63
mod. Phys. act. Hardly ever	0.526	0.319	0.067	0.386	0.283	0.129	0.443	0.113	0.379
	2.92	1.82	0.28	2.31	2.09	0.96	2.35	0.42	1.99
Pseudo R2	0.06	0.04	0.04	0.05	0.04	0.04	0.07	0.04	0.05
N	1875	2918	2434	2826	2185	2470	1663	1584	1952