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Working Paper

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GLO Discussion Paper, No. 1354

Provided in Cooperation with:
Global Labor Organization (GLO)

Suggested Citation: Belloc, Ignacio; Molina, José Alberto; Velilla, Jorge (2023) : Household Wealth and Body Mass Index: Towards a Healthy Ageing?, GLO Discussion Paper, No. 1354, Global Labor Organization (GLO), Essen

This Version is available at:
https://hdl.handle.net/10419/280282

Household Wealth and Body Mass Index: Towards a Healthy Ageing?*

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Abstract

Studying the impact of exogenous wealth shocks on health-related outcomes can help policymakers in the design and evaluation of social programs that provide income to certain groups. This paper analyzes the impact of unexpected inheritances on Body Mass Index, using data from the Survey of Health, Ageing and Retirement in Europe, including 15 countries from 2004 to 2017. The results show that the receipt of an inheritance is negatively associated with BMI, and being overweight among females. When we account for individual heterogeneity, we find that the receipt of an unexpected inheritance reduces the probability of being overweight by 2.8% among women, and it increases the probability of women engaging in activities that involve moderate physical activity, and increases the amount spent on eating out. These results suggest that large increases in wealth may improve current weight problems and maintain higher life standards among women in later life, so policymakers may include the potential health-related benefits when implementing redistribution programs within those households.

Keywords Body Mass Index · Unexpected inheritances · Ageing · Europe · SHARE

JEL classification G51 · I12 · J14 · O52

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Funding: This paper has benefitted from funding from the Consolidated Research Group S32_23R of the Government of Aragón. I. Belloc gratefully acknowledges funding from the Spanish Ministry of Science, Innovation and Universities, under Grant number FPU20/03564.

Declarations of competing interest: None.

1. Introduction

Changes in the demographic structure of countries, due to the ageing of the population and increasing longevity, combined with declining fertility, are among the most concerning challenges for many countries (Eurostat 2020, 2023; OECD 2022). They have given rise to a series of reforms in most developed economies to guarantee the financial stability of state welfare programs through prolonging working lives (European Commission 2021). In Europe in 2019, approximately 33 percent of the population were aged 55 or over, and projections suggest that by 2050 this population group will account for 40 percent of the total population (Eurostat 2020). Given the demographic transition in Europe, a major concern for policymakers is maintaining the health of the older aged, and the figures do not suggest a similar increase in the proportion of life in good health (WHO 2022).

Numerous studies indicate a positive cross-sectional relationship between individual socioeconomic status and health (Villar and Quintana-Domeque 2009; Chetty et al. 2016; Merino Ventosa and Urbanos-Garrido 2016; Salmasi and Celidoni 2017; Mathieu-Bolh 2022), suggesting a socioeconomic-health gradient. In this context, an emerging group of studies examines the channels underlying this strong relationship and focuses on the health impacts of economic resources by exploiting exogenous variations in income or wealth. Existing research generally concludes that those who receive a positive unexpected shock to income or wealth report better health status (Gardner and Oswald 2007; Carman 2013; Apouey and Clark 2015; Kim and Koh 2021), and that well-being improvements are long-lasting in certain specific contexts (Lindqvist et al. 2020).

Despite that existing research has already analyzed the effects of unexpected wealth changes on health outcomes, little work has been done on weight measures, as results are not conclusive and analyses are restricted to single countries, which limit their external validity. This is an important subject as obesity, together with the adverse health conditions associated with excessive levels of fat, is one of the greatest public health challenges for the current century. The prevalence of obesity nearly tripled between 1975 and 2016 worldwide (WHO 2021), and it is well-established that weight increases over lifetime (Eurostat 2019) due to its known stock nature. Specifically, the figures indicate that the proportion of overweight adults in Europe peaks in the 65-74 age group, at 66 percent. Hence, considering jointly the current demographic and health trends,

understanding how certain factors and economic incentives may affect the weight of older adults, is relevant in reducing the epidemic obesity indicators observed worldwide, to expand healthy life in older ages and save on medical care costs.

Inheritances are a source of wealth (Crawford and Hood 2016; Wei and Yang 2022; Nekoei and Seim 2023) and they may affect weight through several channels. Based on the influential human capital model of the demand for health (Grossman 1972, 2000), we can consider two competing scenarios. On the one hand, inheritances are associated with more income, which relaxes the recipient's budget constraint. This increase in income may increase the demand for health behaviors that give utility to the consumer, such as through a shift in consumption towards healthier and more nutritious – less calorie-dense – food choices, which are, traditionally, more expensive. Inheritances also relax recipients' time constraints by decreasing market work or elderly care time, thus reducing the opportunity cost of time for investing in health-promoting activities (e.g., physical exercise, active volunteering, time in house repairs, gardening, rest, preparing food at home), with consequences particularly concentrated among those in sedentary forms of work.[1] By contrast, alternative channels emerge from engagement in unhealthy behaviors (van Kippersluis and Galama 2014), such as alcohol consumption and smoking, consumption-types that are negatively correlated with health. In addition, other individuals could also become less active than during their working ages, since work is one of the primary forms of physical activity for some individuals and the increase in leisure time upon retirement could decrease the incentives to invest in health in order to boost individual productivity and earnings, since retiree pension income does no longer depend on their health.

Within this framework, this paper addresses the relationship between inheritances receipt and Body Mass Index (BMI), using data from the Survey of Health, Ageing and Retirement in Europe (SHARE), from 2004 until 2017 for a total of 15 countries. Specifically, we analyze how individual BMI, being overweight and obesity are related to inheritance receipt. After controlling for inheritance expectations, we assume that the receipt of an inheritance is completely unexpected and thus an exogenous wealth shock.

[1] The receipt of an inheritance could encourage adults to exit the labor force and adjust their retirement behavior, especially at older ages close to retirement (Blau and Goodstein 2016; Kindermann et al. 2020; Belloc et al. 2023). On the other hand, for elderly care, inheritances are closely related to the death of a parent, and this may relax time constraints for parents.

Given the panel dimension of our dataset, we also control for individual unobserved heterogeneity and study the impact of unexpected inheritances on BMI.

Our results suggest that inheritances have an impact on BMI. Specifically, receiving an inheritance is negatively associated with BMI and being overweight, but only among women. Quantitatively, the receipt of an unexpected inheritance is associated with a decrease of 1.4 percent in BMI and 3.3 percent in the probability of being overweight among women. When we control for unobserved time-invariant heterogeneity, the receipt of an unexpected inheritance reduces being overweight by 2.8 percent among women. These estimates are concentrated among women without financial problems, who have low education levels, and are not employed. Consequently, pooled estimates omit significant heterogeneity within the sample and analyses point to the importance of gender behind the estimates, suggesting that only a subset of the overall population is likely to change their healthy behaviour in response to wealth shocks. This result speaks to the various incentives to improve health status among women and men. We examine some potential channels for these effects, and show that the receipt of an unexpected inheritance increases the current amount spent on eating out and participation in moderate-energy activities for women, but has no effect on vigorous physical activity.

To the best of our knowledge, the studies closest to our work are Kim and Ruhm (2012), Au and Johnston (2015) and Costa-Font and Györi (2023). Kim and Ruhm (2012) and Au and Johnston (2015) study the effects of inheritances on individual BMI in the US and Australia, respectively. Kim and Ruhm (2012) do not document any statistically significant effect of household inheritances on obesity, using pooled data from the Health and Retirement Study (HRS). Au and Johnston (2015), with a focus on specific gender effects and younger cohorts, show a positive effect of a composite index for lottery wins and inheritances on individual BMI among women, exploiting the panel structure of the Household, Income and Labour Dynamics in Australia (HILDA). More recently, Costa-Font and Györi (2023) show a negative lagged effect of lottery wins on individual BMI and being overweight, using the British Household Panel Survey (BHPS) estimating individual fixed-effects models. All in all, there is only one study that explicitly focuses on inheritances and BMI for older people, that of Kim and Ruhm (2012) in the US, in which no significant estimates are reported.

The contributions of this paper are threefold. First, we contribute to the literature by examining how inheritances impact BMI in European countries. While prior studies have

looked at single country datasets, ours is the first to use a cross-national panel survey of a total of 15 countries (14 European countries and Israel). We use a large, cross-national, representative panel survey, harmonized and homogenized, and we provide estimates that are valid for several European countries. Second, we examine whether there is heterogeneity in our results across different subgroups. We pay attention to certain individual and household characteristics that may affect how inheritances affect recipients' health, and report heterogeneity depending on the maximum education level achieved, the current employment status, and past household finances. Finally, we explore the possible mechanisms through which inheritances could contribute to weight, such as healthy lifestyle (i.e., frequency of physical activity) and dietary changes (i.e., amount spent on food).[2]

The rest of the paper is organized as follows. In Section 2, we present a review of the literature. Section 3 describes the data, sample criteria, and variables used in the analysis. In Section 4, we detail our econometric specification, and Section 5 reports our main results. Finally, Section 6 concludes.

2. Literature review

Prior research has studied the effects of a range of unexpected income and wealth shocks on individual health status, via psychological, mental, and physical health measures. For measures of unexpected income and wealth shocks, most studies have focused on lottery wins and inheritances. In this section, we present a literature review of the most relevant works on the health-related impacts of inheritances and lottery wins.

First, we pay attention to the identification strategies used by prior studies, as different assumptions should be made to properly identify these two shocks as unexpected, and disentangle the effect of an exogenous increase in income and wealth on individual health status. On the one hand, lottery wins are completely random events, once lottery ticket spending is accounted for (i.e., the frequency of playing the lottery). This is known as the lottery-tickets (LT) bias in the well-being literature (for more details, see Kim and Oswald (2021)). Unfortunately, this information is not gathered in many surveys, such as well-

[2] We acknowledge that Kim and Ruhm (2012) and Au and Johnston (2015) also explore part of those mechanisms regarding amount spent on eating out (Au and Johnston 2015) and frequency of physical activity (Kim and Ruhm 2012; Au and Johnston 2015).

known panel surveys like the BHPS or the German Socio-Economic Panel (SOEP). This problem has forced researchers adopt individual fixed-effects models to identify the effect of lottery wins on health, net of unobserved individual heterogeneity in preferences that may lead to endogeneity issues, due to omitted variable bias, under the assumption that lottery ticket purchases and individual preferences are relatively constant through time (van Kippersluis and Galama 2014; Apouey and Clark 2015; Raschke 2019; Costa-Font and Györi 2023). By contrast, inheritances are received by a wide range of the population. Nevertheless, it is well-known that inheritances can be anticipated some time in advance, so their effect may be expected to appear prior to receipt (Adams et al. 2003; Carman 2013; Bø et al. 2019). Within this context, inheritance expectations should be controlled for in the regressions. Unlike lottery ticket purchases, this information is readily available in ageing surveys, such as the HRS, the English Longitudinal Study of Ageing (ELSA) or SHARE, which focus on older people who are more likely to inherit.

Gardner and Oswald (2007) show that medium-sized lottery wins in the UK positively affect psychological health, by exploiting a General Health Questionnaire (GHQ) score using 12 questions (GHQ-12 questions) measuring mental well-being, in the BHPS, a nationally representative survey across Great Britain. Specifically, these authors find that those who get a lottery win of £1,000 or more exhibit an improvement in mental health of 1.4 GHQ points – on a 36-point Likert scale – two years after a lottery win, and a larger improvement is observed for men. Carman (2013) uses the Panel Study of Income Dynamics (PSID) from 1984 to 2007 and investigates the relationship between inheritances (both through two variables of inheritance amount and receipt, respectively) and self-assessed health status (potential answers: ‘excellent’, ‘very good’, ‘good’, ‘fair’, or ‘poor’) in the US, showing a positive relationship between inheritance receipt (in the last one/two/five year(s)) and health status, whereas no effect appears in the individual fixed-effects specification, suggesting no change in health due to an inheritance receipt. For the inherited amount, no significant effects are reported on self-reported health status in both the fixed-effects and no fixed-effects specifications. In additional heterogeneity analyses, the author finds that the receipt of an inheritance one year ago decreases the log odds of better health status by 22 percent, and an inheritance in the last two years decreases the log odds of better health status by 12.2 percent for men, relative to women. Additional lags do not display statistically significant values. Expected inheritances

increase the likelihood of reporting better health by 18.3 percent one year later and 16.1 percent five years after the receipt.

Apouey and Clark (2015) analyze the impact of lottery wins on both mental and physical health using the BHPS, and report a positive effect on mental health, giving support to Gardner and Oswald (2007). More concretely, these positive effects concentrate on happiness, life satisfaction, concentration, sleep quality, and absence of pressure measures. Raschke (2019) uses the SOEP for the survey years 2000-2011 and shows that mental health declines contemporaneously after a lottery win (i.e., a decrease of 22 percent of a standard deviation in an index of mental health, where higher values indicate a better mental health, and an increase of 7.7 percent in the probability that the individual evaluate her/his own health status as bad or very bad). These effects are particularly driven by low-educated and low-financial-literacy individuals (i.e., those who do not own stocks, bonds, or other similar financial assets before winning the lottery). The mental health effect is short-lived and disappears after a year, whereas the effect on the probability of reporting bad health persists until 3 years later.

These three lottery studies focus on short-run health responses to lottery wins (i.e., until three years after the prize). Lindqvist et al. (2020) provide new insights into these relationships with long-run well-being, and study psychological well-being responses up to 22 years after a lottery event, using data from a survey of large lottery players in Sweden (3,362 players). The authors focus on life satisfaction and show a positive effect of large ($100,000) lottery wins on life satisfaction of around 0.037 standard deviation units – on a 11-point scale – and that this effect persists for over a decade and does not fade with time, whereas the effects on happiness and an index of mental health (GHQ-12) – two distinct affective measures about the frequency that the respondent has experienced a range of pleasant and unpleasant emotions – are smaller, around 0.016 and 0.013, and not statistically significant at standard levels, suggesting that income effects are not equal for affective and cognitive well-being measures. Kim and Koh (2021) use pooled data from the Singapore Life Panel (SLP) for Singaporeans aged 50-70 from the November 2016 and 2017 survey waves, where information about lottery ticket purchases is available, and find a positive effect of a S$10,000 lottery win on individual self-reported health and the probability of reporting excellent, very good, or good health, by a standard deviation of 0.18 and 0.15, respectively. These effects are larger among those

who are under 55 years, who are not allowed to withdraw a portion of their pension wealth and thus experience stronger liquidity constraints.[3]

For studies of lottery wins and BMI, we can cite Cesarini et al. (2016) and Costa-Font and Györi (2023). Cesarini et al. (2016) focus on children's weight and, using their well-known Swedish lottery players dataset, find that lottery wins reduce childhood obesity risk at the age of 18. More recently, Costa-Font and Györi (2023) exploit the panel nature of the BHPS and estimate individual fixed-effects models, showing that lottery wins lead to a contemporaneous increase in BMI of 0.246 units, and that a £1,000 lottery win in the previous year reduces BMI by 0.414 units and the probability of being overweight by up to 3 percentage points. In final heterogeneity analyses, they obtain that a contemporaneous £1,000 lottery win among low-educated individuals reduces the probability of being overweight by 4.6 percentage points. These estimates are also heterogeneous depending on working times, since those who work longer hours – more than 35 hours per week – experience an increase in both BMI and being overweight following a contemporaneous £1,000 lottery win, while after a year an individual's BMI decreases slightly.

To the best of our knowledge, only two studies have specifically focused on inheritances and weight, those of Kim and Ruhm (2012) and Au and Johnston (2015), who focus on adult weight. Kim and Ruhm (2012) study how inheritances are related to mortality, health status, and health behaviors, using data from the first eight waves of the HRS in the US, for respondents born from 1931 to 1941. For obesity indicators, the authors find that inheritances over $10,000 have a negative effect on two indicators for obesity and severe obesity, although they do not display statistically significant values. In their main estimates, they do not exploit the information regarding inheritance expectations nor the panel dimension of the survey, but they do control for these two issues and obtain similar magnitudes (even though they are not reported in the manuscript). Au and Johnston (2015) use data from HILDA from 2006 to 2011 for persons aged 30-70 and show that wealth improvements, through a composite indicator of inheritances and lottery wins during the past 12 months, increase weight by 725 grams, BMI by 0.9 percentage points, and obesity by 2.1 percentage points for women, estimating individual fixed-effect models. For men, no significant effects are found on

[3] To the best of our knowledge, this dataset represents a unique publicly available source with lottery ticket purchases information.

weight. Furthermore, this effect differs by initial wealth and weight, since if the wealth shock is received by initially poor and obese women, weight and BMI increase by 4.4 kilograms and 4.7 percentage points, respectively, with this latter effect persisting up to 37 months after the wealth shock for the initially obese group.

The latter study is not without limitations. First, a composite index for wealth shocks, although unambiguously informative, could potentially omit significant differences across these two different wealth-shock sources but the HILDA survey does not allow the authors to distinguish explicitly the nature of the windfall that a given individual receives. Thus, the results from Australia and the UK may not be fully applicable to the case of inheritances and older adults in Europe. Second, lottery ticket spending and inheritance expectations are typically time-varying, and individual fixed-effects estimates may not totally control for these characteristics.[4] Our identification strategy overcomes these two important shortcomings and confirms these two claims.

Consequently, there are only two studies that have explicitly focused on inheritances and BMI, although their estimates and geographical context covered – the US and Australia – differ. Against this background, we contribute to this strand of the literature by taking a broad perspective and focusing on 14 European countries plus Israel, for the first time in the literature. We therefore do not focus on one specific country like other studies, which gives external validity to our findings. We also limit our analysis to older individuals, who are an emerging population group in contemporary societies and generally are more likely to inherit than the young (Carman 2013; Sila and Sousa 2014; Bø et al. 2019), as done in Kim and Ruhn (2012) for the US. Finally, the rich breadth of information covered by SHARE allows us to control for inheritance expectations, which is important in mitigating potential omitted variable biases.

3. Data

We use data from SHARE[5], a representative, cross-national panel survey, conducted every two years on average, that contains the largest body of data about older individuals

[4] In fact, the authors mention that capturing time-varying unobserved heterogeneity is difficult and they devote some space to discussing this issue.

[5] This paper uses data from SHARE Waves 1, 2, 4, 5, 6 and 7 (https://doi.org/10.6103/SHARE.w1.800, https://doi.org/10.6103/SHARE.w2.800, https://doi.org/10.6103/SHARE.w4.800, https://doi.org/10.6103/SHARE.w5.800, https://doi.org/10.6103/SHARE.w6.800,

in 28 European countries and Israel, from 2004 until 2021. It is coordinated by the Munich Center for the Economics of Aging, with the technical support of CentERdata at Tilburg University, and is based on the HRS of the US and the ELSA of the UK. The target population of the survey is individuals aged 50 or older and their spouses or partners, and data is collected through homogeneous computer-assisted personal interviews using questionnaires that are ex-ante standardized to allow for cross-country comparisons.[6]

SHARE collects harmonized information about demographics, physical and mental health, current socio-economic status, social networks, family relationships, financial transfers, and expectations, for respondents aged 50 and above and their spouses or partners, irrespective of their age in a representative sample of the European population. All respondents who were interviewed in any previous wave are part of the longitudinal sample and are traced and re-interviewed. Consequently, this survey is particularly well suited for studying European countries and, because it focuses on older individuals who generally have a greater chance of receive inheritances, for our analysis.

The survey is organized into different data modules per wave (up to 32 modules per wave) and we exploit BMI and inheritance information in survey waves 2 through 7, while the information on inheritance expectations within the next 10 years is used for survey waves 1 through 6 (see Bergmann et al. (2019) for response and retention rates during those specific survey waves).[7] For this analysis, we impose minimal sample restrictions. Specifically, we keep individuals aged 50 years old and older at the time of their first interview, and drop those observations with missing values on the set of key variables, which leaves a sample of 115,694 observations (person X wave), corresponding

https://doi.org/10.6103/SHARE.w7.800) see Börsch-Supan et al. (2013) for methodological details. The SHARE data collection has been funded by the European Commission, DG RTD through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812), FP7 (SHARE-PREP: GA N°211909, SHARE-LEAP: GA N°227822, SHARE M4: GA N°261982, DASISH: GA N°283646) and Horizon 2020 (SHARE-DEV3: GA N°676536, SHARE-COHESION: GA N°870628, SERISS: GA N°654221, SSHOC: GA N°823782, SHARE-COVID19: GA N°101015924) and by DG Employment, Social Affairs & Inclusion through VS 2015/0195, VS 2016/0135, VS 2018/0285, VS 2019/0332, and VS 2020/0313. Additional funding from the German Ministry of Education and Research, the Max Planck Society for the Advancement of Science, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG005842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_04-064, HHSN271201300071C, RAG052527A) and from various national funding sources is gratefully acknowledged (see www.share-project.org).

[6] The ex-ante harmonization procedure of SHARE consists of one common generic questionnaire that is translated in the national languages of the participating countries (Börsch-Supan et al. 2013).

[7] The 3rd wave, commonly known as SHARELIFE, is excluded because it is dedicated to constructing life histories of SHARE respondents and does not contain information for the key variables used in our analysis.

to 39,783 individuals (17,396 men and 22,387 women) who are observed for at least two consecutive waves (2.9 waves on average).[8] The analysis covers Austria, Belgium, Czech Republic, Denmark, Estonia, France, Germany, Greece, Israel, Italy, The Netherlands, Slovenia, Spain, Sweden and Switzerland.

We initially focus on BMI at the survey date, using the information provided by the survey on individual weight and height and dividing a respondent's weight in kilograms by the square of height in meters, $BMI = kg/m^2$. Weight is obtained from the question "Approximately how much do you weigh?", while the information for height is obtained from "How tall are you?". (These two self-reported variables are available on all regular SHARE waves, enabling the calculation of BMI.) We define other standard weight status, namely being overweight (a dummy variable taking value 1 if $BMI \geq 25$, and 0 otherwise) and obesity (a dummy taking value 1 if $BMI \geq 30$, and 0 otherwise), following the suggestions made by the World Health Organization (WHO) for adults.[9]

Our key explanatory variables are the receipt of an inheritance since the previous interview, and the subjective probability of receiving an inheritance within the next ten years. For inheritance receipt, we define a dummy variable that takes value 1 for those households who have received an inheritance larger than 5,000 Euros since the previous interview, 0 otherwise. This information is collected through the Financial Transfers Module, completed by the financial respondent of the household, who answers the question "Not counting any large gift we have already talked about, have you [or your husband/wife/partner] ever received a gift or inherited money, goods, or property worth more than 5,000 Euros?". This variable is then defined at the household level, as has been done in prior research using the HRS (Kim and Ruhm 2012; van Kippersluis and Galama 2014), the PSID (Carman 2013), the SOEP (Doorley and Pestel 2020) and the SHARE (Ferrari 2020; Suari-Andreu 2023). To properly define inheritance receipt between survey

[8] We consider wave 2 and wave 4 as consecutive waves, and assume that the relationship between a two-years period (wave 1 and 2, wave 4 and 5, wave 5 and 6, wave 6 and 7) is the same as a four-years period (wave 2 and 4). The number of observations dropped due to respondents aged under 50 years old is minimal, about 5,762 observations from a total of 270,754 pooled observations for waves 1-7. We impose the restriction of (at least) two consecutive periods in order to properly interpret inheritances as a shock, as detailed below.

[9] We use the standard cutoffs provided by the WHO, which indicate that individuals with BMI ≥ 30 are classified as obese, and those with BMI ≥ 25 are classified as overweight, including those who are obese. For more details, we refer to https://www.who.int/health-topics/obesity#tab=tab_1 (accessed in September 2023).

waves, we also use the question "In which year did you [or your husband/wife/partner] receive this gift or inheritance?", to avoid doble counting of specific transfers.[10]

For inheritance expectations, we use the Expectations Module that explores each respondent expectations (for all respondents in a given household, financial or non-financial), and ask the question "Thinking about the next ten years, what are the chances that you will receive any inheritance, including property and other valuables?". The potential answers range from 0 to 100, where 0 indicates no chance of inheriting and 100 means that the person is absolutely certain that an inheritance will be received during the next 10 years. Other answers include "don't know" or "refuse", and individuals with these responses are eliminated from the final sample. The question for inheritance expectations is available from waves 1 to 4. From wave 5 (6 years until wave 7, on average) this question was no longer asked in the SHARE. Then, we assign the last observation of inheritance expectations per individual to the next waves we observe for that same individual, since the question looks at expectations over the next 10 years. We then must acknowledge a limitation, as although we are covering a 6-year timespan, inheritance expectations may change over time and we cannot account for that change. Our sample is therefore restricted to individuals who enter at any time between waves 1 and 4, when information for inheritance expectations is available.

Besides these key variables, we control for other explanatory variables that may be related to BMI and could be correlated with inheritances, based on the prior literature (Kim and Ruhm 2012; Carman 2013; Au and Johnston 2015; Costa-Font and Györi 2023), to minimize any potential omitted variable bias in the estimates. These variables include respondent's gender, age, the highest level of education attained, and employment status. For gender, we define a dummy that takes value 1 if the respondent is a woman, 0 if the respondent is a man. We define respondents' age as a continuous variable measured in years. The maximum level of education is based on the 1997 International Standard Classification of Education (ISCED-97) and divided into 7 dummy variables: Pre-primary education (ISCED-97 0), Primary education or first stage of basic education (ISCED-97 1), Lower secondary or second stage of basic education (ISCED-97 2), Upper secondary education (ISCED-97 3), Post-secondary non-tertiary education (ISCED-97 4), First

[10] SHARE also provides information regarding inheritance amounts ("What was the value of this gift or inheritance at the time you [or your husband/wife/partner] received it?"), but it is only available for inheritances received in waves 1 and 2.

stage of tertiary education (ISCED-97 5) and Second stage of tertiary education (ISCED-97 6). The reference category for education attainment is lack of education (i.e., Pre-primary education; ISCED-97 0). We also control for employment status and define a dummy variable that takes value 1 for those whose current situation is employed or self-employed (including working for a family business), and the value 0 if the respondent is not working, either because he/she is inactive (e.g., retired, permanently sick or disabled, homemaker, other) or unemployed.

At the household level, we define household income, household wealth (net worth), respondent's marital status, the number of household members, the number of children, and whether the respondent's parents are living. Total household income is obtained through summing household earnings from employment and self-employment, annual old age or early retirement pensions, annual private occupational pensions, annual disability pension and benefits, annual unemployment benefits and insurance, annual payment from social assistance, sickness benefits and pensions, and interest or dividends received from bank accounts, bonds, stocks, or mutual funds. Household wealth is the sum of all financial assets (e.g., bank accounts, stock, bonds) and non-financial assets (e.g., housing, car, own businesses, other real estate), net of debts. For marital status, we define a dummy taking value 1 for individuals married or in a partnership (0 if never married, divorced, or widowed). Finally, for the living situation of the respondent's parents, as the receipt of an inheritance is closely related to the death of a parent, and the person's weight could be affected by the death of a parent, we define a dummy variable that takes value 1 if the respondent's father or mother has died since the previous interview, and 0 otherwise.[11]

Table 1 provides the summary statistics of the variables for the total sample we use in our analysis. The mean BMI for the pooled sample is 26.799, slightly above the overweight threshold of 25, and around 62.2 percent of our sample is overweight, while another 20.8 percent of the overall sample are at risk of obesity. Around 5.4 percent of the households have received an inheritance since the previous wave, and the average inheritance expectation is 14.969 percentage points. Women are 56.2 percent of the sample and the average age of the sample is 67.907 years. In terms of maximum educational attainment, 3.7 percent of individuals have a pre-primary education level, 22 percent a primary education level, 18.3 percent a lower secondary education level, 30.7

[11] An individual's weight may be related to the death of a parent, due to a reallocation of time use by releasing elderly care time, for example.

percent an upper secondary education level, 4 percent a post-secondary education level, 20.7 percent have completed a first stage of tertiary education, and 0.6 percent have a second stage of tertiary education. 21.2 percent of our sample is in the labor market. The mean household income is €1,817,867, while the mean household net worth is €943,753.[12] Married individuals are 69.7 percent of the sample. For the remaining household variables, the average household size is 2.033 individuals and the average number of children per household is 2.218. Finally, 5 percent of respondents have lost a parent since the previous wave.

4. Econometric strategy

To study how unexpected inheritances relate to BMI we estimate, using Ordinary Least Squares (OLS), the following linear regression model:

$$Y_{ijct} = \beta_0 + \beta_1 INHERITANCE_{ijct} + \beta_2 EXPECTATION_{ijct-1} + X'_{ijct}\beta_3 + \xi_c + \mu_t + \varepsilon_{ijct}, \quad (1)$$

where i denotes the individual, j refers to the household, c to the country of residence, and t the survey wave. The dependent variable, Y_{ijct}, represents the log-of-BMI, the overweight status, or the obesity status of individual i in household j of country c at time t. BMI is defined in logarithms following Au and Johnston (2015), Salmasi and Celidoni (2017), Triaca et al. (2020), Aranda et al. (2021) and Sato (2021), among others, to make interpretations easier (i.e., coefficients can be interpreted directly as (semi-)elasticities). $INHERITANCE_{ijct}$ is a dummy variable taking value 1 if the corresponding observation received an inheritance since the previous wave, 0 otherwise, and $EXPECTATION_{ijct-1}$ represents inheritance expectations, dichotomized in a dummy taking value 1 if the expected probability of receiving an inheritance in the next 10 years (one period lagged, $t-1$) is greater than 0, and value 0 otherwise (Brown et al. 2010; Suari-Andreu 2023).

X_{ijct} is a vector of observable characteristics including the control variables, namely gender, age (and age squared to properly account for the common non-linear relationship of age with individual weight), education, employment status, log-household income, log-

[12] In the econometric analyses, we add a minimal value of 0.001 for household income and household wealth in order to keep observations where respondents report zero or negative values.

wealth (lagged one period), marital status, household size, number of children, and death of a parent since the previous wave.[13] ξ_c denotes a vector of country fixed-effects to control for national legislation and any unobserved time-invariant country-specific heterogeneity (Israel is the reference country), μ_t represents wave fixed-effects (wave 7 is the reference wave), and ε_{ijct} represents unmeasured factors. All the estimates include robust standard errors, clustered at the individual level to account for heteroskedasticity and serial correlation of the error terms.

Because of the nature of the dependent variables, we use linear probability models for ease of interpretation for those specifications that include as dependent variable a dichotomic variable for overweight or obesity status, although the results using an ordered estimator, such as a logit or probit model, yield similar conclusions in terms of sign and significance, and are available upon request.

In all specifications, the coefficient of interest is β_1, which represents how household unexpected inheritances relate to the dependent variable (BMI, overweight, or obesity). The fact that we include an indicator for whether the respondent expects to receive an inheritance within the next 10 years, allows us to account for whether individuals change their health behavior in anticipation of receiving inheritances. Specifically, in our identification strategy we consider that an individual who receives an inheritance that he/she did not absolutely expect in the previous wave receives a shock to his/her wealth, as this timing is largely unexpected. Consequently, we interpret the coefficient β_1 net of inheritance expectations as the relationship, in percentage points, between unexpected inheritances, on the one hand, and an individual's BMI, overweight, or obesity status, on the other.

5. Results

5.1. Main estimates

Table 2 shows the results of estimating Eq. (1) for BMI, overweight, and obesity. We are interested in the parameters of inheritance receipt. For BMI (Column 1) and overweight (Column 2), we observe a negative relationship with inheritance receipt since the previous

[13] We emphasize that we include household net worth one period lagged, in order to avoid double counting inheritance receipt since the previous interview.

wave. However, these magnitudes are not statistically significant at standard significance levels. By contrast, for obesity status (Column 3), we observe a coefficient equal to -0.014, statistically significant at the 5% level. This suggests that the receipt of an unexpected inheritance since the previous wave is correlated with a decrease of 1.4% in the probability of being obese.

These estimates for the pooled sample could omit heterogeneity within the sample, and in Table 3 we include an interaction between inheritance receipt and being female to explore gender differences within the sample. When we include this interaction variable, we observe significant heterogeneity within the sample. Specifically, the receipt of an inheritance is related to a decrease of 1.4% in the BMI of females, and to a decrease of 3.3% in the probability of being overweight for the females. For males the receipt of an unexpected inheritance is significantly correlated with an increase of 0.8% in the BMI and an increase of 2.4% in the probability of being overweight. These results suggest important differences among individuals in the sample, and that pooled results mask significant heterogeneities within the sample.

Until now, the survey waves have been employed as repeated cross-sections and we have pooled together all data from six different waves of SHARE. The results show that there is a strong negative relationship between household unexpected inheritances and individual weight, particularly among the females' subsample. However, it is possible that these relationships are driven by the presence of individual time-invariant heterogeneity (e.g., taste for leisure, risk aversion). Consequently, we examine whether this pattern holds for the same individuals across time. That is, we estimate individual fixed-effects models that account for unobserved time-invariant heterogeneity between those who inherit, against those who do not, and also capture potential omitted variable biases. The results from the fixed-effects estimator are reported in Tables 4 and 5.[14]

We find that including individual fixed-effects strongly affects the results, since the estimates are completely different from those reported in Tables 2 and 3. Specifically, estimates in Table 4 suggest that there is no change in BMI, being overweight, and obesity after an inheritance receipt, and the relationship completely disappears for the pooled sample. However, when we include the interaction between females and inheritance

[14] Given that no individual in our data moves between countries, the individual fixed-effects also capture country-specific effects.

receipt in Table 5, we find that the receipt of an inheritance decreases the probability of being overweight by 2.8% for females, with this magnitude being statistically significant at the 5% level.[15]

5.2. Heterogeneity analyses

We run three alternative heterogeneity analyses. First, as it is reasonable that household finance could impose significant constraints on the lifestyles of recipients, we perform a heterogeneity check depending on the financial situation of the household in the period prior to inheriting, according to whether the household was liquidity constrained. To do this, we exploit the question "Thinking of your household's total monthly income, would you say that your household is able to make ends meet?", with the potential answers are "With great difficulty", "With some difficulty", "Fairly easily", or "Easily". This question is answered by the household respondent on behalf of the whole household. We split this sample into two subgroups: those who declare "Fairly easily" or "Easily" in the period prior to inheriting, whom we refer to as those who are not liquidity constrained, and those who declare "With great difficulty", or "With some difficulty", whom we refer to as households who are liquidity constrained prior to inheriting. The underlying intuition is that those who are not liquidity constrained prior to inheriting could use the wealth shock to engage in other healthy behaviors more easily. The results in Table 6 suggest that females decrease their probability of being overweight by 2.7% if they were not liquidity constrained in the period before inheriting, confirming our initial hypothesis that liquidity constraints may prevent use of household wealth to reduce weight and those without liquidity constraints are more likely to change lifestyles. Consequently, our results regarding the negative impact of inheritances on overweight are concentrated among females residing in households without financial difficulties.

We also split the sample and estimate models separately for two groups based on educational attainment: highly educated (ISCED-97 3-6) and low educated individuals (ISCED-97 0-2) and display results in Table 7. Low-educated individuals may have less knowledge about good health, and this can restrict them in improving their weight status by joining certain activities. However, estimates suggest that low-educated females

[15] We also control for health at baseline (e.g., weight, overweight, or obesity prior to the receipt), following Kim and Ruhm (2012), and the main results remain.

reduce their BMI by 1.1% and their probability of being overweight by 5.2% due to the receipt of an inheritance, while estimates for highly educated individuals do not display any statistically significant values. These results fit with Costa-Font and Györi (2023), who find that a lottery win reduces an individual's overweight among people with low educational attainment (primary education or less) in the UK. All this suggests that low education individuals appear to respond differently to wealth and income shocks.

It may be that an inheritance may release recipients' time constraints, either by quitting the labor force or by reducing elderly care time. Thus, we consider whether there is any heterogeneity according to the respondent's employment status, as it is quite reasonable that being employed imposes considerable restrictions on engaging in certain healthy activities, such as exercise or home production. That is, we split our sample according to the respondent's current working status by considering whether the respondent is working for pay or not. Table 8 shows the estimates for these two different subsamples. We observe that the previous estimates suggesting a negative impact of inheritance receipt on overweight among females are driven by those who are currently not employed. Consequently, those non-employed females can adjust their time allocation by engaging in healthy activities to improve their weight. Numerically, estimates suggest that the receipt of an unexpected inheritance reduces the probability of being overweight by 3.4% for females who are not employed, while estimates display no statistically significant coefficient for women who are employed.

5.3. Underlying mechanisms

In this section, we further investigate potential mechanisms behind our main results. According to that, we identify a heterogenous response to inheritance by gender, since inheritance receipt has a negative effect among women, with the probability of being overweight, whereas no effect appears for men's weight. In this section we analyze the underlying specific channels behind this effect and through which inheritances may affect women's physical health. To do this, given the richness of the SHARE data, we pay attention to different measures of food consumption and physical activity, the two main factors that may explain our overall results.[16]

[16] SHARE does not have information about individual food consumption, but there is data on food consumption of the whole household.

For food consumption, we use the Consumption (CO) Module of the survey which asks the following two questions at the household level: "Thinking about the last 12 months: about how much did your household spend in a typical month on food to be consumed at home?" and "Still thinking about the last 12 months: about how much did your household spend in a typical month on food to be consumed outside home?".[17] These two questions are answered by the household respondent on behalf of the whole household, and the potential responses refer to amount spent on food in a typical month. Given the sample selection covered, we can imagine two competing results. Given that the receipt of an inheritance, worth more than 5,000 Euros, is a significant improvement in household resources, a positive statistically significant relationship with the amount spent on food (i.e., expensive nutritious goods), both outside or inside the home, due to a pure income effect, under the assumption that food is a normal good, given the greater availability of resources to spend and that wealth exerts a strong impact on consumption capacity. By contrast, given that the receipt of an inheritance is more common among the older aged, the sample covered by our dataset, this population may have developed rigid patterns throughout their life cycle with respect to consumption and food expenditure patterns inside/outside home (Celidoni and Rebba 2017), and no effect should appear in this case.

As for physical activity frequency, given that physical activity has many health benefits, such as weight management, especially at advanced ages, we use two questions from the Behavioural Risks (BR) Module: "How often do you engage in vigorous physical activity, such as sports, heavy housework, or a job that involves physical labour?" and "How often do you engage in activities that require a low or moderate level of energy such as gardening, cleaning the car, or doing a walk?", which are answered by all the respondents of the survey.[18] Inheritance receipt may affect daily routines, through quitting the labor force, reducing time use constraints due to elderly care, or promoting certain activities due to the financial situation improvement. By eliminating these time-specific demands, it could result in an increase in time available for other activities such as exercise or home production, typical healthy and active lifestyles, that have an impact

[17] Consequently, these questions do not measure the quantity of food consumed.

[18] Prior research has also studied the effect of a wealth shock, either through a lottery win in the BHPS, SOEP or SLP, and an inheritance in the HRS, on unhealthy behaviors such as alcohol drinking and smoking (Kim and Ruhm 2012; van Kippersluis and Galama 2014; Apouey and Clark 2015; Au and Johnston 2015; Raschke 2019; Kim and Koh 2021).

on the prevalence of being overweight and obesity. However, older people may be less prone to change their lifestyle since they have had more time to develop specific time use patterns. The responses to these two questions are in four distinct categories: "More than once a week", "Once a week", "One to three times a month", or "Hardly ever, or never".[19] We dichotomize these last two questions into two dummy variables that take value 1 if the respondent reports "More than once a week", and value 0 if they report "Once a week" or less (Müller and Shaikh, 2018).

Table 9 shows the results from six models that use all these as dependent variables, while the rest of the specification remains, as in Eq. (1), by adding the individual fixed-effects. For the total amount spent on food at home (log-transformed), we document no effects of inheritance receipt on consumption inside home. Nevertheless, the receipt of an unexpected inheritance does increase the monthly amount spent on food outside the home by 6.9%. In our context, this effect can be related to individuals who go to restaurants of higher quality, that are more expensive. We find that the receipt of an inheritance increases the probability of participating in activities that involve moderate levels of energy by 3.5% among women, and this effect is statistically significant at the 5% level. The fact that inheritances do not involve any change in the probability of engaging in activities involving vigorous levels of exercise is reasonable, given the age range covered by our sample, as this question refers to activities such as sports, heavy housework, or jobs that involve physical labor, while the question regarding activities that involve moderate levels of energy include other activities, such as walking or home production activities.

6. Conclusions

This paper analyzes the impact of household wealth on Body Mass Index (BMI), using a sample of older individuals in Europe, drawn from the Survey of Health, Ageing and Retirement in Europe (SHARE), and focusing on unexpected inheritances receipt. Prior research has analyzed this relationship in the US (Kim and Ruhm 2012) and Australia (Au and Johnston 2015), but the findings are mixed. We differ from prior research by

[19] We acknowledge a limitation regarding recall bias of these measures based on stylized questionnaires (Gimenez-Nadal and Molina 2022). At this point, information from time diaries could reduce such measurement error.

taking a wider perspective and studying the relationship through harmonized data for older individuals in Europe. The breadth of our data also permits us to examine potential underlying channels.

Our results suggest a negative relationship between inheritance receipt and females' BMI. Specifically, the receipt of an unexpected inheritance is related to a reduction of 1.4 percent in individual BMI and 3.3 percent in the probability of being overweight, but only among women. When we control for individual unobserved heterogeneity, we obtain that the receipt of an inheritance decreases the probability of being overweight by 2.8% for women. In addition, the negative effect of inheritances on the probability of being overweight is driven by females who were not liquidity constrained prior to the shock, have a low education level, and are not currently working. For potential mechanisms, we find that the receipt of an inheritance since the previous interview increases the current household amount spent on eating out and participation in activities that involve moderate physical effort among women. Hence, these effects are probably mediated by changes in diet and physical activity. Thus, family resources play an important role in descending cohorts health, even late in the life cycle. These results can assist policymakers to design cash transfers and social programmes to alleviate current overweight problems in Europe and maintain high levels of welfare, along with the current gains in life expectancy, since policies aimed at increasing actual wealth may create positive health benefits and promote healthy lifestyles, particularly among women in later life.

This study is not without limitations. First, inheritance receipt is ultimately a rare event in our sample, although thousands of respondents are involved in the final sample, which preclude us performing an additional analysis on a country-by-country basis, due to low statistical power. We believe that a cross-country analysis would be a significant contribution to the current literature on health-related impacts of unexpected wealth shocks, but ultimately in our sample around 5.4 percent of respondents receive inheritances between survey waves. As a result, we interpret our estimates as average effects. Furthermore, information regarding the amount of inheritances is only available in the initial two waves of the survey. Finally, the information regarding weight and height is self-reported, as is common with many health surveys. Although they contain useful information, we acknowledge that BMI – particularly self-reported weight – may be measured with error due to social stigmatization (Burke and Carman 2017; Bellido et al. 2023) and affect the precision of the estimates.

Future research should focus on other health outcomes, such as depression or other mental health measures. At this point, health data in SHARE are very rich and include both subjective and objective measures of health. In addition to BMI, the SHARE collects detailed information concerning other health outcomes, such as self-reported general health status, diagnoses of diseases by a doctor, and the Euro-D depression index based on 12 depression symptoms. We plan to consider these indicators of health in the future. Our knowledge of negative wealth shocks is quite limited, and existing research has primarily focused on positive wealth shocks. Examining these alternative measures is a promising avenue for future research, to check whether the effects of positive and negative wealth shocks on health are asymmetric. Finally, we also suggest as a natural extension of our analysis to study other regional contexts, using sister ageing surveys harmonized with SHARE.

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Table 1. Summary statistics

Variables	Observations (person-wave)	Mean	Std. Dev.
Dependent variables			
BMI (kg/m^2)	115,694	26.799	4.573
Overweight (BMI ≥ 25)	115,694	0.622	0.485
Obese (BMI ≥ 30)	115,694	0.208	0.406
Independent variables			
Inheritance since the previous wave	98,927	0.054	0.225
Inheritance expectation	115,694	14.969	30.222
Female	115,694	0.562	0.496
Age	115,694	67.907	9.540
Pre-primary education	115,694	0.037	0.188
Primary education	115,694	0.220	0.414
Lower secondary education	115,694	0.183	0.387
Upper secondary education	115,694	0.307	0.461
Post-secondary education	115,694	0.040	0.196
First stage of tertiary education	115,694	0.207	0.405
Second stage of tertiary education	115,694	0.006	0.079
Employed	115,694	0.212	0.409
Household income	115,694	1,817,867	132,000,000
Household net worth	115,694	943,753.300	79,500,000
Married	115,694	0.697	0.459
Household size	115,694	2.033	0.912
Number of children	115,694	2.218	1.398
Parent death since the previous wave	98,627	0.050	0.219
Number of individuals	**39,783**		

Notes: Authors' calculations. Data come from the Survey of Health, Ageing and Retirement in Europe (SHARE), waves 1-7. Sample is restricted to individuals aged +50 years old with at least two consecutive waves.

Table 2. Relationship between household unexpected inheritance and BMI/overweight/obese

	BMI	Overweight	Obese
Inheritance since the previous wave	-0.004	-0.006	-0.014**
	(0.003)	(0.008)	(0.006)
Expectation > 0 (one wave lagged)	-0.008***	-0.023***	-0.013**
	(0.002)	(0.006)	(0.005)
Female	-0.028***	-0.107***	0.004
	(0.002)	(0.005)	(0.005)
Age	0.016***	0.048***	0.019***
	(0.001)	(0.004)	(0.003)
$Age^2/100$	-0.013***	-0.037***	-0.017***
	(0.001)	(0.003)	(0.002)
Primary education	-0.023***	-0.054***	-0.058***
	(0.005)	(0.013)	(0.014)
Lower secondary education	-0.042***	-0.085***	-0.103***
	(0.006)	(0.014)	(0.014)
Upper secondary education	-0.050***	-0.111***	-0.120***
	(0.006)	(0.014)	(0.014)
Post-secondary education	-0.063***	-0.137***	-0.133***
	(0.007)	(0.019)	(0.018)
First stage of tertiary education	-0.082***	-0.192***	-0.176***
	(0.006)	(0.015)	(0.014)
Second stage of tertiary education	-0.102***	-0.216***	-0.199***
	(0.011)	(0.036)	(0.025)
Employed	-0.012***	-0.009	-0.037***
	(0.003)	(0.007)	(0.006)
Log of household income	-0.001*	-0.001	-0.003***
	(0.000)	(0.001)	(0.001)
Log of household net worth (one wave lagged)	-0.002***	-0.004***	-0.005***
	(0.000)	(0.001)	(0.001)
Married	-0.005*	-0.002	-0.013**
	(0.002)	(0.007)	(0.006)
Household size	0.003***	0.008**	0.004
	(0.001)	(0.003)	(0.003)
Number of children	0.007***	0.015***	0.011***
	(0.001)	(0.002)	(0.002)
Parent death since the previous wave	-0.002	0.001	-0.002
	(0.003)	(0.008)	(0.007)
Constant	2.900***	-0.712***	-0.093
	(0.047)	(0.134)	(0.107)
Observations	75,911	75,911	75,911
Number of individuals	39,783	39,783	39,783

Notes: OLS estimates in Column (1), LPM estimates in Columns (2-3). Robust standard errors clustered at the individual level are reported in parentheses. Data come from the Survey of Health, Ageing and Retirement in Europe (SHARE), waves 1-7. Sample is restricted to individuals aged +50 years old with at least two consecutive waves. Estimates also include wave and country fixed-effects, but not shown for brevity. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3. Relationship between household unexpected inheritance and BMI/overweight/obese

	BMI	Overweight	Obese
Inheritance since the previous wave	0.008**	0.024**	-0.003
	(0.003)	(0.012)	(0.009)
Inheritance since the previous wave * Female	-0.022***	-0.057***	-0.021*
	(0.005)	(0.016)	(0.013)
Expectation > 0 (one wave lagged)	-0.008***	-0.023***	-0.013**
	(0.002)	(0.006)	(0.005)
Female	-0.027***	-0.104***	0.005
	(0.002)	(0.005)	(0.005)
Age	0.015***	0.048***	0.019***
	(0.001)	(0.004)	(0.003)
$Age^2/100$	-0.013***	-0.037***	-0.017***
	(0.001)	(0.003)	(0.002)
Primary education	-0.023***	-0.054***	-0.058***
	(0.005)	(0.013)	(0.014)
Lower secondary education	-0.041***	-0.084***	-0.103***
	(0.006)	(0.014)	(0.014)
Upper secondary education	-0.050***	-0.111***	-0.120***
	(0.006)	(0.014)	(0.014)
Post-secondary education	-0.063***	-0.137***	-0.133***
	(0.007)	(0.019)	(0.018)
First stage of tertiary education	-0.082***	-0.191***	-0.176***
	(0.006)	(0.015)	(0.014)
Second stage of tertiary education	-0.102***	-0.215***	-0.199***
	(0.011)	(0.036)	(0.025)
Employed	-0.012***	-0.009	-0.037***
	(0.003)	(0.007)	(0.006)
Log of household income	-0.001*	-0.001	-0.003***
	(0.000)	(0.001)	(0.001)
Log of household net worth (one wave lagged)	-0.002***	-0.004***	-0.005***
	(0.000)	(0.001)	(0.001)
Married	-0.004*	-0.002	-0.013**
	(0.002)	(0.007)	(0.006)
Household size	0.003***	0.008**	0.004
	(0.001)	(0.003)	(0.003)
Number of children	0.007***	0.015***	0.011***
	(0.001)	(0.002)	(0.002)
Parent death since the previous wave	-0.002	0.001	-0.002
	(0.003)	(0.008)	(0.007)
Constant	2.901***	-0.709***	-0.091
	(0.047)	(0.134)	(0.107)
Observations	75,911	75,911	75,911
Number of individuals	39,783	39,783	39,783

Notes: OLS estimates in Column (1), LPM estimates in Columns (2-3). Robust standard errors clustered at the individual level are reported in parentheses. Data come from the Survey of Health, Ageing and Retirement in Europe (SHARE), waves 1-7. Sample is restricted to individuals aged +50 years old with at least two consecutive waves. Estimates also include wave and country fixed-effects, but not shown for brevity. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4. Effects of household unexpected inheritance on BMI/overweight/obese, individual fixed-effects estimates

	BMI	Overweight	Obese
Inheritance since the previous wave	-0.000	-0.003	-0.003
	(0.001)	(0.006)	(0.005)
Expectation > 0 (one wave lagged)	-0.000	0.002	0.007
	(0.002)	(0.008)	(0.007)
Age	0.016***	0.038***	0.017***
	(0.002)	(0.006)	(0.005)
$Age^2/100$	-0.012***	-0.031***	-0.012***
	(0.001)	(0.003)	(0.003)
Employed	0.002	0.002	-0.005
	(0.002)	(0.007)	(0.006)
Log of household income	-0.000	-0.001	-0.001
	(0.000)	(0.001)	(0.001)
Log of household net worth (one wave lagged)	0.000	0.000	-0.000
	(0.000)	(0.001)	(0.001)
Married	0.008**	0.014	0.019*
	(0.003)	(0.013)	(0.011)
Household size	0.000	-0.002	-0.003
	(0.001)	(0.004)	(0.004)
Number of children	0.001	0.004	0.006*
	(0.001)	(0.004)	(0.003)
Parent death since the previous wave	-0.001	-0.001	0.003
	(0.001)	(0.006)	(0.005)
Constant	2.768***	-0.506	-0.425
	(0.095)	(0.376)	(0.312)
Observations	75,911	75,911	75,911
Number of individuals	39,783	39,783	39,783

Notes: Individual fixed-effects OLS estimates in Column (1), individual fixed-effects LPM estimates in Columns (2-3). Robust standard errors clustered at the individual level are reported in parentheses. Data come from the Survey of Health, Ageing and Retirement in Europe (SHARE), waves 1-7. Sample is restricted to individuals aged +50 years old with at least two consecutive waves. Estimates also include wave fixed-effects, but not shown for brevity. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 5. Effects of household unexpected inheritance on BMI/overweight/obese status, individual fixed-effects estimates

	BMI	Overweight	Obese
Inheritance since the previous wave	0.001	0.012	-0.002
	(0.002)	(0.009)	(0.006)
Inheritance since the previous wave * Female	-0.002	-0.028**	-0.002
	(0.002)	(0.012)	(0.009)
Expectation > 0 (one wave lagged)	-0.000	0.002	0.007
	(0.002)	(0.008)	(0.007)
Age	0.016***	0.038***	0.017***
	(0.002)	(0.006)	(0.005)
$Age^2/100$	-0.012***	-0.031***	-0.012***
	(0.001)	(0.003)	(0.003)
Employed	0.002	0.001	-0.005
	(0.002)	(0.007)	(0.006)
Log of household income	-0.000	-0.001	-0.001
	(0.000)	(0.001)	(0.001)
Log of household net worth (one wave lagged)	0.000	0.000	-0.000
	(0.000)	(0.001)	(0.001)
Married	0.008**	0.014	0.019*
	(0.003)	(0.013)	(0.011)
Household size	0.000	-0.002	-0.003
	(0.001)	(0.004)	(0.004)
Number of children	0.001	0.004	0.006*
	(0.001)	(0.004)	(0.003)
Parent death since the previous wave	-0.001	-0.001	0.003
	(0.001)	(0.006)	(0.005)
Constant	2.769***	-0.500	-0.424
	(0.095)	(0.376)	(0.312)
Observations	75,911	75,911	75,911
Number of individuals	39,783	39,783	39,783

Notes: Individual fixed-effects OLS estimates in Column (1), individual fixed-effects LPM estimates in Columns (2-3). Robust standard errors clustered at the individual level are reported in parentheses. Data come from the Survey of Health, Ageing and Retirement in Europe (SHARE), waves 1-7. Sample is restricted to individuals aged +50 years old with at least two consecutive waves. Estimates also include wave fixed-effects, but not shown for brevity. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 6. Heterogeneity analysis: liquidity constraints before the receipt (individual fixed-effects estimates)

	Liquidity constraints			No liquidity constraints		
	BMI	Overweight	Obese	BMI	Overweight	Obese
Inheritance since the previous wave	-0.001	0.007	-0.037*	0.001	0.011	0.001
	(0.006)	(0.022)	(0.022)	(0.002)	(0.010)	(0.007)
Inheritance since the previous wave * Female	-0.006	-0.017	0.047	0.001	-0.027**	-0.001
	(0.009)	(0.033)	(0.032)	(0.003)	(0.013)	(0.010)
Observations	23,877	23,877	23,877	49,865	49,865	49,865
Number of individuals	16,516	16,516	16,516	26,885	26,885	26,885

Notes: Robust standard errors clustered at the individual level are reported in parentheses. Data come from the Survey of Health, Ageing and Retirement in Europe (SHARE), waves 1-7. Sample is restricted to individuals aged +50 years old with at least two consecutive waves. Estimates also include wave fixed-effects and socio-demographics, but not shown for brevity. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 7. Heterogeneity analysis: high- vs. low-educated individuals (individual fixed-effects estimates)

	Highly educated			Low educated		
	BMI	Overweight	Obese	BMI	Overweight	Obese
Inheritance since the previous wave	0.000	0.010	0.003	0.003	0.019	-0.012
	(0.002)	(0.011)	(0.008)	(0.003)	(0.015)	(0.012)
Inheritance since the previous wave * Female	0.002	-0.017	-0.003	-0.011**	-0.052**	0.003
	(0.003)	(0.014)	(0.011)	(0.005)	(0.021)	(0.017)
Observations	42,188	42,188	42,188	33,723	33,723	33,723
Number of individuals	22,626	22,626	22,626	17,157	17,157	17,157

Notes: Robust standard errors clustered at the individual level are reported in parentheses. Data come from the Survey of Health, Ageing and Retirement in Europe (SHARE), waves 1-7. Sample is restricted to individuals aged +50 years old with at least two consecutive waves. Estimates also include wave fixed-effects and socio-demographics, but not shown for brevity. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 8. Heterogeneity analysis: employed vs. non-employed individuals (individual fixed-effects estimates)

	Employed			Non-employed		
	BMI	Overweight	Obese	BMI	Overweight	Obese
Inheritance since the previous wave	0.002	0.019	0.011	0.001	0.010	-0.004
	(0.003)	(0.018)	(0.014)	(0.002)	(0.011)	(0.008)
Inheritance since the previous wave * Female	0.001	-0.032	0.011	-0.005	-0.034**	-0.011
	(0.005)	(0.027)	(0.021)	(0.003)	(0.014)	(0.011)
Observations	13,527	13,527	13,527	62,384	62,384	62,384
Number of individuals	9,439	9,439	9,439	32,857	32,857	32,857

Notes: Robust standard errors clustered at the individual level are reported in parentheses. Data come from the Survey of Health, Ageing and Retirement in Europe (SHARE), waves 1-7. Sample is restricted to individuals aged +50 years old with at least two consecutive waves. Estimates also include wave fixed-effects and socio-demographics, but not shown for brevity. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 9. Mechanism analyses: Household food consumption and physical activity frequency (individual fixed-effects estimates)

	log(Consumption inside home)		log(Consumption outside home)		Vigorous physical activity	Moderate physical activity
Inheritance since the previous wave	0.007	0.013	0.038	0.069**	0.002	-0.019
	(0.011)	(0.017)	(0.024)	(0.034)	(0.014)	(0.012)
Inheritance since the previous wave * Female	-	-0.012	-	-0.059	0.028	0.035**
		(0.022)		(0.045)	(0.019)	(0.016)
Observations	67,597	67,597	34,150	34,150	75,399	75,414
Number of individuals	36,500	36,500	18,961	18,961	39,628	39,635

Notes: Individual fixed-effects OLS estimates in Columns (1-4), individual fixed-effects LPM estimates in Columns (5-6). Dependent variable is natural log of monthly food spending, inside and outside home, in Columns (1-4), while a dummy variable taking value 1 for "More than once a week" in Columns (5-6). Robust standard errors clustered at the individual level are reported in parentheses. Data come from the Survey of Health, Ageing and Retirement in Europe (SHARE), waves 1-7. Sample is restricted to individuals aged +50 years old with at least two consecutive waves. Estimates also include wave fixed-effects and socio-demographics, but not shown for brevity. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.