



# Mortality shocks and household consumption: the case of Mexico

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## Abstract

We study the effect of within-household mortality on the evolution of household per capita consumption. Relying on a panel survey of Mexican households, we find that these households were capable of perfectly smoothing the shock into their consumption caused by the death of a household member. Our findings indicate that a household's ability to smooth consumption depends neither on the characteristics of the deceased household member nor on the income of a particular household. We find no clear temporal pattern in the evolution of the shock caused by within-household mortality. Our results provide strong support for the hypothesis that the evolution of household consumption is not affected by within-household mortality.

**Keywords** Consumption · Consumption smoothing · Death · Mortality

**JEL classification** D12 · D15 · I15 · O12

## 1 Introduction

The effect of within-household mortality on the evolution of household consumption significantly differs from other shocks households have to face during their lifetime. Shocks such as droughts, illnesses or pro-longed periods of unemployment affect household consumption by afflicting the resources available to an individual household. Unlike these shocks, within-household mortality also leads to a permanent change in the composition of the household, as noted by Grimm (2010). Quantifying its effect on the evolution of household consumption can provide valuable insight into the consumption smoothing behavior of households.

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Its assessment can also influence both the structure and targeting of government programs. Unfortunately, existing evidence is limited and suffers from numerous shortcomings.

In this article we study how within-household mortality affects the evolution of household per capita consumption. We focus primarily on whether the magnitude and significance of the associated shock depends on the characteristics of the deceased household member, an aspect which has received only limited attention thus far. We also provide evidence on the persistence of the shock and on the extent to which a household's ability to smooth consumption depends on the characteristics of the household in question. To study these issues, we rely on the longitudinal Mexican Family Life Survey (MxFLS) database. The MxFLS provides data on household consumption spanning nearly a decade. Furthermore, it allows us to consider a variety of classifications of within-household mortality.

We base our empirical approach on a household-level fixed-effects model. We control for a variety of confounding factors such as additional shocks encountered by the household or multiple household characteristics. We rely on a fixed-effects model in order to control for unobserved household-level characteristics which might influence both the evolution of consumption and within-household mortality. These include e.g., a household's health care consumption preferences. Due to high attrition in the MxFLS we also test for the presence of attrition bias. We adopt an approach proposed by Wooldridge (2002) and find statistically significant evidence for the presence of attrition bias. To obtain unbiased estimates we deploy the Inverse Probability Weight methodology previously used by Chapoto and Jayne (2008) in a similar context. Furthermore, we rely on clustered standard errors.

Our findings indicate that throughout the duration of the study period Mexican households were capable of perfectly smoothing shocks into their consumption caused by within-household mortality. In all considered model specifications we fail to reject the null hypothesis of perfect consumption smoothing. Furthermore, the statistical significance of the shock is not affected by the characteristics of the deceased household member. Nevertheless, we find that the magnitude and direction of the estimated effects vary according to the characteristics of the deceased. However, these effects are not statistically significant. The magnitude of the estimated effects also depends on household characteristics. We find differences in the effects of within-household mortality between households with below and above median income. Overall, we believe that our findings present strong evidence in support of the hypothesis that households are capable of protecting their consumption against shocks caused by within-household mortality. Our findings are robust against a variety of robustness checks.

This article provides multiple contributions to currently available literature. To the best of our knowledge, it is the only study alongside Grimm (2010) which studies the extent to which the effects of within-household mortality depend on the characteristics of the deceased household member. A majority of existing studies either considered only a general indicator of within-household mortality (Dercon et al., 2005) or narrowed their focus to the effects of prime-age adult mortality (Kadiyala et al., 2011). Contrary to the findings of Grimm (2010) we do not identify a positive effect of certain types of deaths on the evolution of household consumption. Furthermore, we study the persistence of the shock caused by within-household

mortality, an area where information has been severely lacking. We also study how a household's ability to smooth the shock into consumption depends on its characteristics. Contrary to findings established by Khan et al. (2015) we conclude that household characteristics have only a limited impact on the ability to smooth consumption shocks caused by within-household mortality.

The remainder of this article is organized as follows. Section 2 contains a brief review of the relevant literature while section 3 presents our empirical strategy. Section 4 presents our data set. In section 5 we present our main results. Section 6 presents the robustness checks we have considered in order to check the representativeness of our results. The final section concludes the study.

## 2 Related literature

The relationship between within-household mortality and the evolution of household consumption is supported by both economic theory and empirical evidence. A model developed by Deaton (1992) indicates that household demography is one of the main parameters affecting the desirability of consumption. Consequently, when faced with within-household mortality, households must restructure their economy. In doing so they sometimes deploy strategies which may have lasting effects on their welfare. Morduch (1995) provides multiple examples of such strategies. Based on a survey of Pakistani households Heltberg and Lund (2009) find that nearly 80% of households do not fully recover from the shock caused by the death of a household member. Furthermore, according to Wagstaff and Lindelow (2014), the death of a household member leads to the loss of approximately 400% of average annual per capita food consumption in Vietnamese households.

The evidence on the effects of within-household mortality on the evolution of household consumption is mixed. Available empirical studies report negative, null, as well as positive effects. This variation likely stems from differences in country settings and empirical strategies of the respective studies. They further differ in the types of considered mortality. Also only few studies distinguish between deaths based on the characteristics of the deceased household member. However, Mather et al. (2004) find that the effects of within-household mortality vary with respect to the characteristics of the deceased household member. Furthermore, findings established by studies assessing the effect of health shocks on the evolution of household consumption, such as Asfaw and Braun (2004) provide only limited insights into this issue. Both Grimm (2010) and Beegle (2005) note that the shock caused by mortality differs from health shocks such as illness as it necessarily leads to permanent changes in the composition of the afflicted household.

A considerable portion of available empirical evidence suggests that households are capable of perfectly smoothing consumption. Dercon et al. (2005) find that Ethiopian households are capable of perfectly smoothing shocks into their consumption caused by within-household mortality. Nevertheless, the authors only consider a general indicator of within-household mortality, which significantly limits their findings, especially as we expect that the effects of within-household mortality will depend on the characteristics of the deceased household member. Alem and Söderbom (2012) find that the evolution of household consumption is not

affected by within-household mortality. Kadiyala et al. (2011) focus on the mortality of prime-age adults (15 to 54 years of age) and find that households are capable of perfectly smoothing the associated shock. Furthermore, Dercon and Krishnan (2000) do not find sufficient evidence to reject perfect consumption smoothing of shocks caused by within-household mortality. However, even Dercon et al. (2005) and Kadiyala et al. (2011) find marginally significant effects of within-household mortality on household consumption when distinguishing between households based on their characteristics.

There exists evidence to support the hypothesis that within-household mortality negatively affects the evolution of household consumption. Wagstaff (2007) studies the case of Vietnam and finds that the death of a working-age household member leads to a decrease in household food consumption for both rural and urban households. Non-food consumption is statistically significantly affected only in the case of urban households. Nevertheless, the results are not robust against variation in equivalence scales used to measure consumption.

Multiple studies find a positive effect of within-household mortality on the evolution of household consumption. Grimm (2010) finds that total and non-food consumption are statistically significantly affected by the death of a child (0 to 14 years old), adult male (15 to 59 years old), or person over 60 years of age. These deaths have a statistically significant positive impact on the growth of consumption. The death of an adult woman (15 to 59 years old) does not have a statistically significant effect. Shocks into food consumption and non-medical consumption are perfectly smoothed. Khan et al. (2015) consider the case of urban poor in Bangladesh. The authors find that the death of a household member leads to an increase in non-food household consumption for relatively rich households. According to their results, the consumption of relatively poor households is not affected by within-household mortality. However, the authors consider only a general indicator of within-household mortality.

Social and cultural differences between countries limit the comparability of available estimates. The effect of within-household mortality on consumption depends for example on the prevalent household structure as well as on the social system of the respective country. Available studies cover a heterogeneous group of countries. These include among other Ethiopia (e.g., Dercon et al., 2005), Indonesia (e.g., Kim & Prskawetz, 2010), Vietnam (e.g., Wagstaff, 2007) and Bangladesh (e.g., Khan et al., 2015). It is therefore essential to consider how the Mexican context might influence our estimates.

Variety of country-specific factors can influence the estimated effect of within-household mortality. Household structure affects the respective household's ability to smooth consumption. García-Andrés et al. (2021) find that 42% of Mexican 25-35 years old reside with their parents or parents-in-law. The presence of multi-generational households might facilitate consumption smoothing. Remittances may further enhance consumption smoothing abilities of Mexican households. Ambrosius and Cuecuecha (2013) find that they can serve as a substitute for credit, while Mora-Rivera and van Gasteren (2021) find that remittances significantly contribute to the reduction of food insecurity among Mexican households. The effect of mortality on consumption can influence other characteristics of Mexican households. For example, the effect of within-household mortality on consumption can alter the

distribution of decision-making power in Mexican households. Au Yong Lyn (2021) finds that women enjoy higher decision-making power over the consumption of food. Reduction in its consumption due to within-household mortality can therefore result in a reduction of the total decision-making power of Mexican women.

The effects of within-household mortality are likely to vary with respect to the characteristics of the deceased household member even in the Mexican context. For example, Talamas (2020) finds that Mexican grandmothers are significant childcare providers. Their death thus has a negative effect on female employment as it leads to significant restructuring of the affected household. Their mortality can thus affect household consumption through different channels than mortality of other household members. Consequently, we have to consider the characteristics of the deceased household member even in the Mexican context.

This study aims to contribute to the existing body of literature focusing on the effects of within-household mortality on the evolution of household consumption in several ways. First, only a limited number of studies have assessed how the shock into consumption depends on the characteristics of the deceased household member. For example, Dercon et al. (2005) and Khan et al. (2015) consider only a general indicator of within-household mortality, while Kadiyala et al. (2011) and Wagstaff (2007) study specific types of deaths. However, as shown by Grimm (2010), the effect of the shock depends on the characteristics of the deceased household member. Second, not all studies assess whether the effects of within-household mortality differ between food and non-food consumption of the respective household. This is an important shortcoming as households may decide to limit non-food consumption in order to smooth the shock into food consumption. On the other hand, as pointed out by Khan et al. (2015), non-food consumption may react differently as it might take the affected household longer to adjust. Third, information on how a household's ability to smooth consumption following the death of a household member depends on the characteristics of the affected household is limited. Fourth, only limited evidence is available on the persistence of the shock.

### 3 Empirical strategy

The specification of our model stems from approaches adopted in relevant consumption smoothing studies. Since the influential works of Cochrane (1991) and Townsend (1995), a variety of empirical specifications has been employed to assess households' abilities to smooth consumption. Ravallion and Chaudhuri (1997) provide a discussion of alternative specifications, while Skoufias and Quisumbing (2005) show how a specific empirical model can be derived from the model of Deaton (1992) in which households maximize inter-temporal utility over consumption while facing uncertainty.

The assessment of the effects of within-household mortality on the evolution of household per capita consumption introduces a number of methodological difficulties. The main issue is that both the evolution of household consumption and within-household mortality likely depend on unobservable household characteristics. Consequently, we rely on a household-level fixed-effects model. Our model is inspired by models employed by Grimm (2010) and Beegle et al. (2008). Equation (1) gives a

full specification of the model. Similarly to Grimm (2010), our dependent variable is the average change in the log of household per capita consumption. We estimate separate models for total, food, and non-food consumption. Household-level fixed-effects are denoted by  $\eta_i$ :

$$\begin{aligned} \Delta \log(c_{i,t}) = & \sum_j \alpha_j * D_{i,j,t} + \sum_l \delta_l * S_{i,l,t} + \sum_m \lambda_m * H_{i,m,t} + \sum_n \gamma_n * X_{i,n,t} \\ & + T_t + \eta_i + \epsilon_i \end{aligned} \quad (1)$$

We are interested in measuring the effect of death. Therefore we introduce a matrix  $D_{i,j,t}$  which indicates all type  $j$  deaths which occurred in household  $i$  during period  $t$ . The parameter  $\alpha_j$  indicates whether households were capable of smoothing the shock into consumption caused by within-household mortality. Under the null hypothesis  $\alpha_j = 0$  within-household mortality does not affect the evolution of household per capita consumption. We consider multiple specifications of  $D_{i,j,t}$ . First, we consider a general indicator of within-household mortality as well as  $j$  types of death based on the relationship of the deceased household member with the head of a given household, as this is the only classification of deaths directly provided by the Mexican Family Life Survey. This set of results represents our baseline results. Second, we consider a general indicator of any type of death but we distinguish between deaths based on the time that elapsed since they occurred. Third, as a robustness check, we also consider a classification of deaths based on a proxy measure of the age of the deceased household member.

The evolution of household consumption is influenced by multiple factors. Consequently, we introduce a set of control variables. Table A.1 in Appendix A lists all considered control variables.  $S_{i,l,t}$  is a matrix of  $l$  shocks other than mortality faced by household  $i$  during period  $t$ . These include all shocks covered by the Mexican Family Life Survey: unemployment of a household member, natural disaster, loss or robbery or death of production animals, disease or accident or hospitalization of a household member, and loss of crops.  $H_{i,m,t}$  controls for all migration in a given household. We distinguish between the migration of children (0 to 14 years of age), adults (15 to 64), and old household members (over 65). The category of children effectively also contains newly born household members.  $X_{i,n,t}$  contains all remaining control variables. These include the age, sex, and education of the household head, and a dummy variable indicating the presence of any household member who belongs to an indigenous group. Nevertheless, as these variables only exhibit limited variation, they are included only in interaction with the dummy indicator of death. We also control for the change in the value of assets owned by a respective household.

We consider a set of robustness checks. In addition to changing the classification of deaths as described above we consider a variety of alternative model specifications. The model outlined in Eq. (1) assumes that changes in income do not affect household consumption. Though according to the model outlined by Deaton (1992) this condition is verified, there is also a strong literature on the relationship between income and consumption. However, as pointed out by Cochrane (1991), the inclusion of income among control variables results in a variety of econometric issues. Nevertheless, as a robustness check we also consider a set of models with various income specifications included among right-hand side variables. We also

consider a specification where we control for changes in variables measured in real terms instead of nominal terms. Furthermore, as households facing multiple deaths may have difficulties with smoothing consumption, we also consider a model where we control for the occurrence of multiple deaths within a household. We also provide additional results for more detailed consumption aggregates, i.e., clothes, durables, non-durables. Finally, we also have to consider potential issues caused by attrition in our data.

Attrition constitutes a significant issue when working with longitudinal datasets. Non-random attrition can result in estimates which are not representative of a given population. Furthermore, attrition may be caused by within-household mortality as households which break up as a result may not be systematically relocated. It is thus necessary to check for the potential presence of attrition bias. We follow the approach proposed by Wooldridge (2002). We construct both probit and logit models by regressing a dummy indicator of whether a household remained in the dataset on a set of variables controlling for baseline characteristics of a given household. These include income, education, the sex and age of the household head, and an indicator of whether the household head had a job during the first wave interview.

We find statistically significant evidence for the presence of attrition bias. Table A.2 in Appendix A reports results from both probit and logit models. The regression is based on 7670 households which report all relevant variables during the first wave of the survey. We rely on the Inverse Probability Weighting (IPW) approach to treat the potential presence of attrition bias. IPW was used for example by Chapoto and Jayne (2008) in a similar context. With the use of the estimated probit model, we predict the probability of each household remaining in the final sample. We then take the inverse values of the estimated probabilities and use them as weights for all observations in the final regression.

We provide an additional set of results based on imputations of the data. We follow the approach of Ambrosius and Cuecuecha (2013) who also relied on the MxFLS database. Similarly to the authors we deploy the mice algorithm developed by Van Buuren and Groothuis-Oudshoorn (2011). We impute all variables with the exception of outcome variables and indicators of within-household mortality. The imputation method accounts for the variable type. In case of derived variables such as dummy indicators of the household head education we impute the underlying variable from which the dummy indicator is derived. We re-estimate the complete set of baseline models based on the imputed data set.

## 4 Mexican Family Life Survey

We base our analysis on the MxFLS database. This section provides a brief overview of the MxFLS and its key variables. We provide more details in Appendix B. MxFLS is a longitudinal survey which was conducted in three waves by the National Institute of Statistics and Geography (INEGI). Data were collected during the course of in-person interviews with household members. A first wave was conducted in 2002 using a representative sample of 8440 households. A household was defined as a person or group of people biologically related or unrelated living together in a dwelling or its part who usually buy food using a common budget and prepare it on

the same stove or oven using the same tools. Efforts to recontact the households included in the first wave were subsequently made on two occasions. A second data collection wave was officially conducted in 2004 and 2005, while a third officially took place between 2009 and 2012. However, some portions of the data were collected outside of these official periods. The survey includes only the original longitudinal households surveyed during the first wave and households subsequently started by members of households covered by the first wave of the survey. No new households were added to the sample.

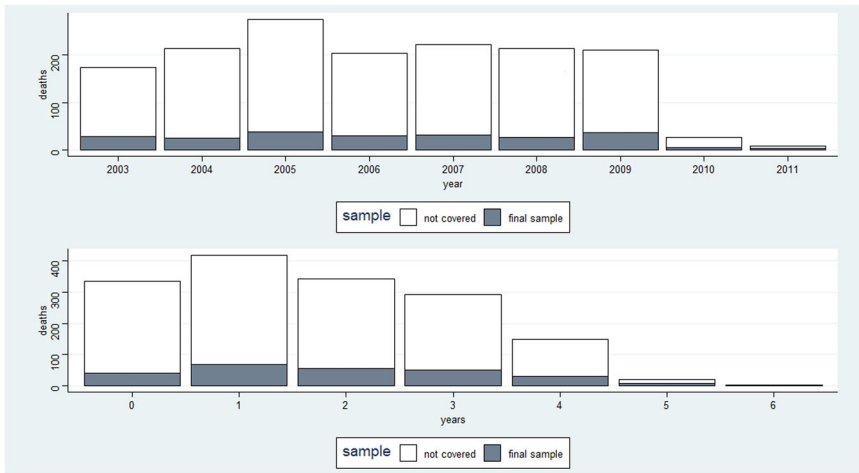
Our final sample consists of 1,433 households. There are two main reasons for truncation of the sample relative to the coverage of the MxFLS. First, observations were lost due to attrition in the sample. We identified 7,203 longitudinal households which were covered by all three waves of the survey. This amounts to an attrition of 14.7%. We consider attrition to be an absorbing state. Second, a significant portion of households not excluded due to attrition were excluded due to non-response. Non-response occurs when a household participates in the follow up survey rounds, but for some reason refuses or is incapable of answering a given survey question.

Non-response is the main reason responsible for truncation of our final sample. Out of the 7,203 longitudinal households covered during all three waves of the MxFLS, only a limited number provided answers for all questions required by our research. Only 3,788 households provide complete information about their consumption. Furthermore, only 6,320 households provide sufficient information about within-household mortality, i.e., who and when died. Overlapping these two household sets yields a sample of 3,440 households for which we are able to both accurately measure the evolution of consumption and control for within-household mortality. Nevertheless, we have to control for a variety of additional factors that influence the evolution of household consumption. These include controls for the characteristics of the household head, other economic shocks faced by the household, changes in the household structure, and a control for the change in the value of owned assets. The first three sets of variables have only a limited effect on the truncation of the final sample as they are fully reported by 6,193, 6,148, and 6,558 households respectively. However, only 2,527 households fully report the value of all owned assets during all three waves of the survey. In total, 1,433 households fully report all required variables. These constitute our final sample. The imputation sample consists of 3,440 households as it includes only households that report complete information about both within-household mortality and the evolution of their consumption.

#### 4.1 Within-household mortality

The MxFLS includes two sources which allow us to measure within-household mortality. First, we can rely on individual-level data from each wave. These report whether a given household member died between different waves. Second, we can rely on a section of the survey in which households report specific economic shocks which they faced during the past five years. These also include specific questions on within-household mortality. While the first source provides detailed information about the characteristics of the deceased, it does not cover all deaths that occurred





**Fig. 1** Distribution of deaths. This figure depicts the number of deaths reported between the first and third wave of the MxFLS. The top panel provides a breakdown according to the year in which individual deaths occurred. The bottom panel provides a breakdown according to the number of years since individual deaths occurred. The shaded area indicates the amount of deaths included in our final sample. Difference between the total volume of reported deaths and the volume of deaths included in our final sample are due to households not providing sufficient information to construct all required variables. Source: Author based on the Mexican Family Life Survey

within a given household. As there is a considerable difference in the volume of deaths covered by the first source relative to the second source, namely 919 deaths versus 1,472, we choose to rely on the second source. The difference is caused by the fact that the former source covers neither new born deaths nor the deaths of elderly relatives who moved to the household between waves and deceased before they were covered by the survey. Consequently, we have to trade-off the detail of information about within-household mortality for being able to cover all deaths that occurred within households in our sample. The second source provides information only about the year during which the death occurred and about the relationship of the deceased with the respondent.

Our final sample includes 262 deaths. Figure 1 shows the distribution of all deaths reported by all households between the first and third survey waves. We do not consider deaths that happened before the first wave as we do not have data on household consumption for any period of time prior to the first wave. Only deaths reported by households that participated in all three waves of the survey and report sufficient information to construct all considered control variables are included in the final sample. Non-response in consumption leads to a loss of 654 deaths while non-response in deaths leads to a loss of 189 deaths. This amounts to a total loss of 781 deaths as the sets of households non-responding in consumption and death are not disjoint. The imputation sample thus covers 691 deaths. Non-responses in economic shocks, characteristics of the household head, characteristics of household members, and owned assets result in a loss of 167, 219, 103 and 983 deaths respectively. Combined with the 781 deaths lost due to non-response in consumption and death this amounts to a total loss of 1,210 deaths. Out of the 262 deaths, 94 deaths

happened between the first and second wave, while 168 deaths happened between the second and third wave.

Our baseline classification of deaths is based on the relationship of the deceased household member with the respondent. This classification is provided by the MxFLS. Nevertheless, as the respondent is not always the head of the household, we convert the remaining cases so that they provide us with the relationship of the deceased household member with the head of the household. Appendix B provides a more detailed description of our approach. We are capable of distinguishing between the death of the head of the household and the death of a spouse, child, parent, parent in law, sibling or sibling in law, of a household head while also including a general category of other deaths which include all deaths that cannot be classified as any of the previous cases. This classification has considerable limitations. For example, the death of the parents of the household head will likely contain deaths of prime-age adults as well as deaths of elderly household members. Consequently, it is difficult to predict the impact of deaths classified in this manner on the evolution of household consumption. Given these limitations, we consider an alternative classification of deaths based on a proxy measure of the age of the deceased household member.

As a robustness check we introduce an alternative classification of deaths based on a proxy measure of the age of the deceased household member. We thus rely on information on the age of the household head and the relationship of the deceased with the household head. We distinguish between three categories of deceased household members based on their age: young (0–14 years), adult (15–64), and senior household members (65+). We assume, that all deceased other than children, parents, and parents in law can be classified in the same category as the household head. We classify children, parents, and parents in law by relying on the mean age of mothers at birth, which according to the OECD stood at 26.6 years in 2008. We classify the death of a child as the death of a young person (i.e., 0–14) in case the household head in question was either 41 years old or younger, otherwise their deaths are classified as deaths of adults. We classify the death of either a parent or a parent in law as the death of a senior household member in case the household head was either 39 years old or older. If the household head is older than 65, we classify all deaths with the exception of child deaths as the deaths of senior household members. Since no death of a child of a household head older than 85 years was reported, all child deaths are classified either as young or adult household member deaths. Appendix B provides a more detailed discussion of this approach.

## 4.2 Consumption

The MxFLS provides a detailed coverage of household consumption. It covers food consumption as well as various items of non-food consumption. Appendix B contains a detailed description of the items covered by the MxFLS and the recall periods used for the individual items. Nevertheless, as the MxFLS does not provide an aggregate measure of total household consumption, we have to construct one. To obtain annual household consumption, we scale individual values using an appropriate factor. For example, food consumption which is reported with a weekly recall period is scaled by a factor of 52 in order to reach annual household food consumption expenditure. This raises potential issues caused by the seasonality of size

and composition of consumption. However, as shown in Appendix B, the influence of these factors seems to be highly limited.

The composition of household consumption is stable over time. During all three waves, food consumption represents approximately three fourths of household consumption, while the rest is devoted to non-food consumption. Furthermore, reported data indicate that households increased their consumption between the first and second survey wave, while reported consumption generally decreased between the second and third wave.

We consider three additional consumption aggregates as a robustness check. These are household consumption of clothes, durable items, and non-durable items. Durable items include for example electronic appliances, while non-durable items include for example cleaning items. Appendix B contains a detailed specification of the additional consumption aggregates.

### 4.3 Control variables

The MxFLS contains a variety of variables which may be used to control for potentially confounding factors. Table 1 provides the descriptive statistics of individual control variables. We observe that while the majority of households in the final sample are headed by a male household head, the share of female

**Table 1** Mexican Family Life Survey—descriptive statistics

	MxFLS 1		MxFLS 2		MxFLS 3	
	Mean	SD	Mean	SD	Mean	SD
HH head, male	82.24%		80.95%		77.9%	
HH head, age	44.63	14.36	47.62	13.9	51.29	13.94
HH head education—elementary	60.66%		60.76%		59.39%	
HH head education—secondary	30.43%		30.28%		32.26%	
HH head education—tertiary	8.78%		8.82%		8.35%	
HH head worked in last 12 months	85.92%		81.62%		76.42%	
Shock—death	9.12%		6.42%		10.36%	
Shock—crop loss	4.83%		2.47%		4.14%	
Shock—hospitalization	13.47%		10.76%		13.1%	
Shock—natural disaster	2.28%		0.6%		0.74%	
Shock—loss of farm animals			0.87%		0.87%	
Shock—unemployment	7.17%		6.08%		10.7%	
Relatives in the USA	48.75%		45.91%		54.45%	
Indigenous	6.25%		17.2%		19.6%	
Male population	48.31%		48.14%		48.62%	
HH composition						
Children (0–14)	1.57	1.43	1.48	1.43	1.28	1.37
Prime-age adults (15–64)	2.52	1.33	2.69	1.44	2.99	1.63
Senior members (65+)	0.19	0.48	0.23	0.52	0.28	0.57

Source: Author based on the Mexican Family Life Survey

household heads increases with each subsequent survey wave. We also observe an increase in household head age as well as changes in the composition of households which indicate the ageing of the sample. This is logical given the longitudinal design of the survey.

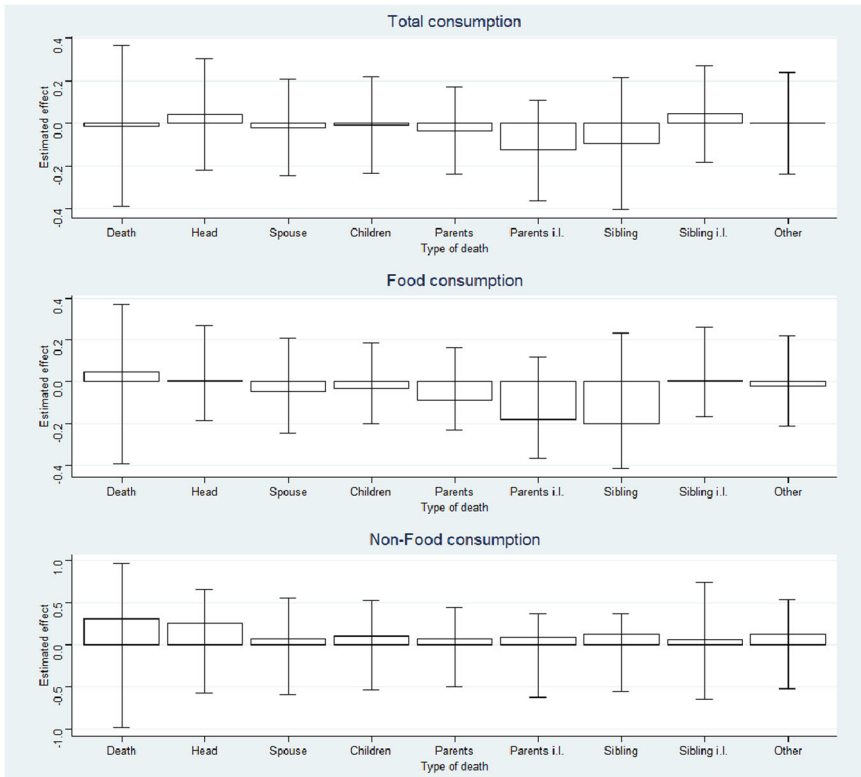
While within-household mortality is one of the most frequently encountered shocks, the most frequent economic shock reported by households throughout the individual waves of the MxFLS is the hospitalization of a household member. It is also the most frequent shock covariate with within-household mortality. Of the shocks covered by the MxFLS, households affected by within-household mortality most frequently also report being affected by the hospitalization of a household member. Unfortunately, we are unable to identify, whether this shock covers the same household member or not. Consequently, we have considered using indicators of the health of individual household members reported by the survey to control for cases in which mortality might be a consequence of long-lasting illness. This is desirable as such households might be able to better smooth their consumption than households affected by a sudden household member death. Unfortunately, there seems to be little to no correlation between the self-reported indicators of individual health and within-household mortality. Therefore, in the final regression we control only for the hospitalization of a household member.

We also control for the evolution of the value of assets owned and the income of a given household. The assets covered by the MxFLS include ownership of up to two houses, a bicycle, motor vehicle, electronic device, washing machine or stove as well as other domestic appliances, financial assets, machinery or a tractor, and multiple types of farm animals. As a robustness check we also consider a model in which we control for the evolution of household income. Our final measure of income includes wages, income from assets (rent, dividends), as well as government transfers and income from self-employment. We thus believe that the indicator of income is sufficiently comprehensive in its coverage in order to provide a sufficiently precise control for the evolution of household income. Due to our model being specified in logarithms we impute income or assets of one peso to households that report having zero income or assets within any given wave.

## 5 Results

We combine the longitudinal MxFLS database with a household level fixed-effects model to study the effects of within-household mortality on the evolution of household consumption. We first consider a model specification which controls only for within-household mortality and time. Table C.1 reports the estimates. While results based on a general indicator of within-household mortality suggest that death of a household member statistically significantly affects consumption, this effect mostly disappears when we consider a more detailed classification of deaths based on the characteristics of the deceased household member. Furthermore, these estimates might be affected by the fact that we do not control for a variety of potentially confounding factors. We thus consider a set of more detailed models.

According to our baseline model, households were capable of perfectly smoothing the shock into household consumption caused by within-household mortality.



**Fig. 2** Effects of death on consumption. The figure displays the estimated effects of all considered types of deaths on all considered types of consumption. The first type of death is a general indicator of within-household mortality. All remaining categories are based on the relationship of the deceased household member with the head of household. Error bars represent 95% confidence intervals. Source: Author's calculations based on the Mexican Family Life Survey

Figure 2 presents the estimates on all coefficients of interest, while Table C.2 in Appendix C reports complete estimation results. Results based on a general indicator of within-household mortality support the findings of Dercon et al. (2005), indicating that household consumption is not affected by the death of a household member. Nevertheless, as we have previously noted, the characteristics of the deceased household member can influence both the statistical significance and the magnitude of the shock. However, estimated effects based on the classification of deaths according to the relationship of the deceased household member and the household head indicate that households are capable of perfectly smoothing the respective shock into consumption. We reach the same conclusion for all considered types of consumption.

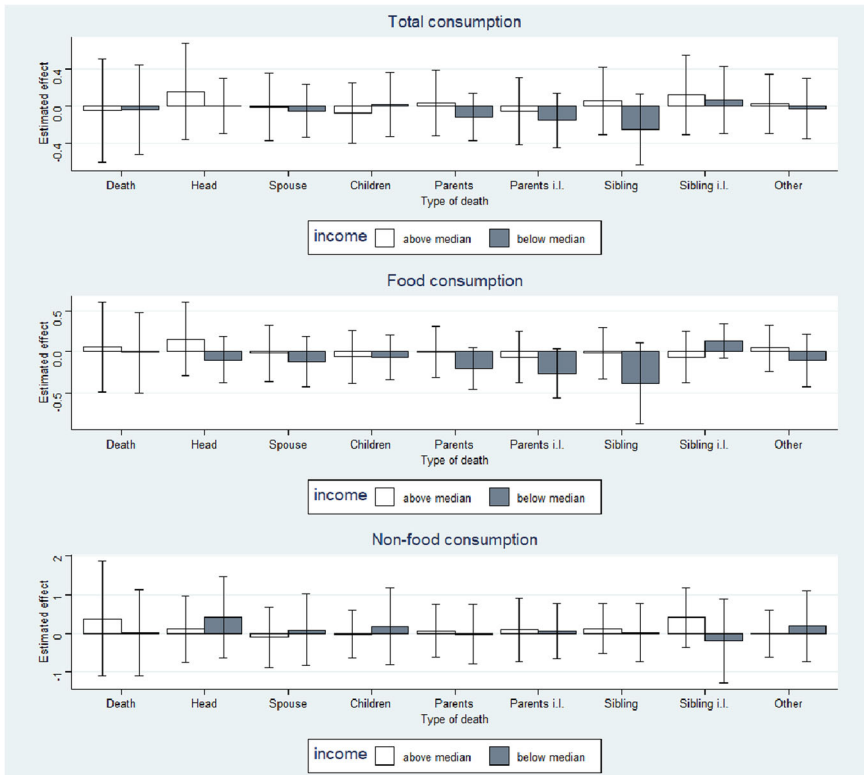
We find only limited evidence to support the hypothesis that the effect of within-household mortality depends on the characteristics of the deceased household member. Though we fail to reject the null hypothesis of perfect consumption smoothing even at the 10% significance level, we observe variation in the size and direction of the effects of different classes of deaths. Death of a household member likely to be in the position of the breadwinner, such as the spouse of the household

head, has a negative effect on the evolution of household consumption. We observe that the estimated effects differ based on the considered types of consumption. All considered types of death have a positive effect on the evolution of non-food consumption. However, the effect of within-household mortality on the evolution of food consumption varies with characteristics of the deceased household member. We must reiterate that significant heterogeneity may occur with respect to deaths covered by certain categories, such as the death of the children or parents of the household head. Consequently, in the following section we consider an alternative classification of deaths based on a proxy measure of the age of the deceased household member as a robustness check.

Households seem to be capable of perfectly smoothing consumption shocks regardless of income. We considered two household types, defined according to whether they were above or below median in terms of per capita income during the first wave of the survey. Based on these two separate samples we constructed a model which contains only a general indicator of within-household mortality as well as a model which makes a distinction between deaths based on the characteristics of the deceased household member. Figure 3 presents the results of the coefficients of interest, while Tables C.3 and C.4 contain complete estimation results. In agreement with the baseline model we fail to reject the null hypothesis of perfect consumption smoothing even at the 10% significance level.

The evolution of the shock into household consumption caused by within-household mortality provides us with no clear pattern. To clarify the issue, we considered an alternative specification of the previously used model. Instead of classifying deaths by the characteristics of the deceased, we classify deaths as follows: deaths which took place less than one year ago; deaths occurring one to two years ago; those which took place two to three years ago, and so on until deaths which occurred between six and seven years ago. We model separately changes in food, non-food and total household consumption. Figure 4 presents the results of the coefficients of interest while Table C.5 presents complete estimation results. The results indicate that households are capable of smoothing the shock into consumption caused by within-household mortality regardless of the time which elapsed since death. Though evidence in favor of perfect consumption smoothing seems strong, our results might be driven by the fact that due to the detail of the data at hand we can only identify the number of years since a given death. It is possible that though consumption is affected by within-household mortality, households manage to smooth consumption in a shorter period of time, i.e., months rather than years. If consumption was smoothed by the time the relevant data were collected, the effects might not be identifiable in the available data.

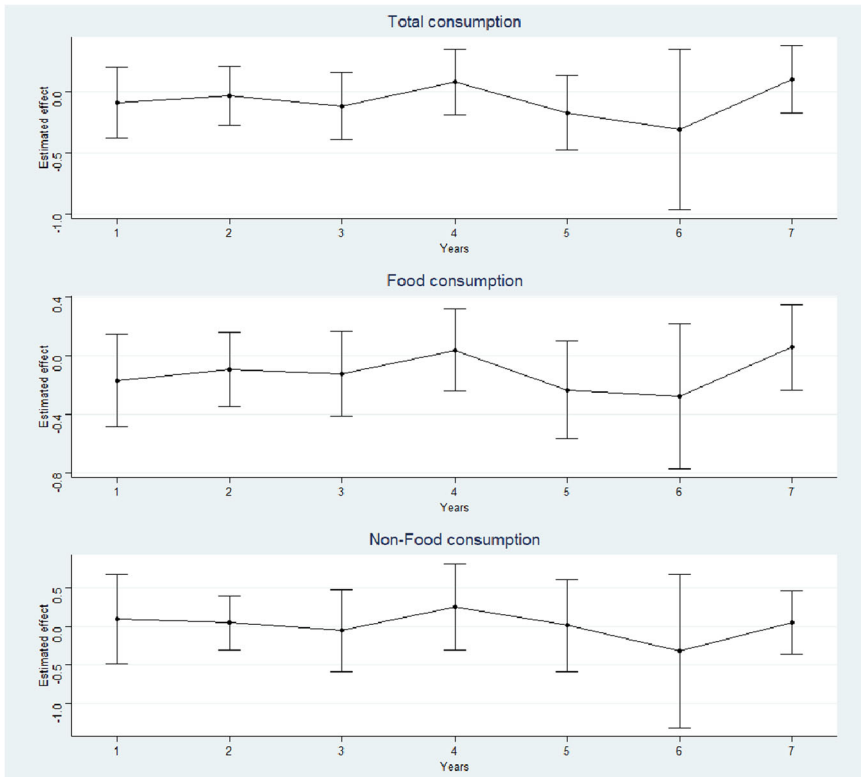
Our results indicate that Mexican households were capable of perfectly smoothing shocks into their consumption caused by within-household mortality during the considered period. Our results thus support the findings of perfect consumption smoothing identified by Dercon and Krishnan (2000) and Dercon et al. (2005). Contrarily, Beegle et al. (2008) and Wagstaff (2007) reject the hypothesis of perfect consumption smoothing. We believe that the difference between the findings of Beegle et al. (2008) and ours can be attributed to the authors' focus on HIV/AIDS mortality. Ardington et al. (2014) argue that households affected by HIV/AIDS mortality may systematically differ from unaffected households in ways that can



**Fig. 3** Death—effect of household characteristics. The figure displays how the estimated effect of within-household mortality depends on household income. We consider two groups of households based on income reported during the first wave of the MxFLS, i.e., those with above and those with below median income. The panels represent our estimates for all considered types of consumption. The first type of death is a general indicator of within-household mortality. All remaining classes are based on the relationship of the deceased household member with the household head. Error bars represent 95% confidence intervals. Source: Author's calculations based on the Mexican Family Life Survey

influence their ability to smooth consumption. In this case, a household's ability to smooth the shock into consumption may also be hindered by a stigma associated to HIV/AIDS as this may result in a lesser degree of support provided by other relatives. Furthermore, Beegle (2005) notes a lack of formal credit and insurance markets in the region studied by Beegle et al. (2008). This might further explain the difference with respect to our results.

We identify two differences between our findings and the findings of other studies that do not find a negative effect of within-household mortality on the evolution of household consumption. First, we find that Mexican households perfectly smooth shocks into all considered types of consumption. Grimm (2010) and Khan et al. (2015) find a positive effect of within-household mortality on the evolution of non-food consumption. Second, our results suggest that the significance of the shock does not vary with respect to household type. However, Kadiyala et al. (2011) and Khan et al. (2015) identify differences in the effects between poor and non-poor households. Our study differs from these mainly in terms of the setting. We study the



**Fig. 4** Death—temporal dimension. The figure displays the estimated persistence of the shock caused by within-household mortality. Deaths were classified based on the number of years that occurred since them. Error bars represent 95% confidence intervals. Source: Author's calculations based on the Mexican Family Life Survey

effects of within-household mortality in a significantly more developed country. Mexican GDP per capita was more than double the GDP per capita of the countries studied in the other works (Indonesia, Ethiopia, Bangladesh) during the considered time period. In the case of Khan et al. (2015) the focus on urban poor further accentuates this difference. Consequently, Mexican households likely had access to better developed credit and insurance markets.

Multiple factors contribute to the capacity of Mexican households to perfectly smooth consumption. García-Andrés et al. (2021) finds that a significant portion of young Mexican adults reside with their parents. The young adults can thus facilitate consumption smoothing. Furthermore, households might not have to face the difficulty of attracting new household members. Remittances likely contribute further to the ability to smooth the shock into consumption. According to Amuedo-Dorantes and Pozo (2011) the principal reason for remitting is food and maintenance expenditure. Mora-Rivera and van Gameren (2021) find that remittances significantly reduce food insecurity. This suggests that remittances are an important consumption smoothing instrument. Furthermore, Amuedo-Dorantes and Pozo (2011) find that remittances likely equalize health expenditure for households with and without health



care coverage. This can partly explain the lack of differences in the effects of within-household mortality with respect to household income.

Since our results may be affected by a variety of factors we consider a number of robustness checks.

## 6 Robustness checks

We consider multiple robustness checks to assess the reliability of our results. The specification of our model as well as the construction of the control variables involves numerous assumptions. Consequently, we alter these assumptions in order to observe, whether or not our results are driven by our methodological choices. First, we consider a specification of the model in which we measure variables in real rather than in nominal terms. Second, we test whether or not a household's ability to smooth consumption is affected by the fact that multiple deaths occur within a given household. Third, we consider an alternative classification of deaths based on a proxy measure of the age of the deceased household member. Fourth, we consider a set of more detailed consumption aggregates. Fifth, we estimate a set of alternative models in which we control for the evolution of household per capita income.

Our baseline results are based on variables expressed in nominal terms. However, it is possible that households are primarily concerned with optimizing their real consumption. Consequently, it is possible that we fail to identify a statistically significant consumption shock because we are not accounting for the effects of inflation. For example, we may observe that in nominal terms, household per capita consumption remained unaffected by within-household mortality, while in real terms we might observe a decrease in household per capita consumption. Therefore, we re-estimate the baseline model, while relying on variables expressed in real terms. For that purpose, we rely on inflation rates provided by the World Bank.

Even when expressed in real terms, consumption is not statistically significantly affected by within-household mortality. Table C.6 presents complete results of the model expressed in real terms. Alongside expressing consumption in real terms, we also express inheritance and the value of assets in real terms. This change in the specification of the model leads to no variation in the statistical significance of the parameters of interest.

Households' ability to smooth consumption can also be affected by multiple deaths occurring within a given household. Therefore we consider an alternative specification of our baseline model in which we introduce a control variable to control for multiple deaths happening within a given household. Table C.7, which shows the complete results of this specification indicates that controlling for multiple deaths within a given household does not alter the statistical significance of the estimated effects of within-household mortality. Furthermore, the fact that multiple deaths occur within a given household does not have a statistically significant effect on a household's ability to smooth consumption.

We also check whether or not our results are affected by the considered classification of deaths. In our baseline model we rely on the relationship of the deceased

household member with the household head. However, this classification might be a poor proxy for the actual economic relevance of the deceased household member. Therefore, we consider an alternative classification of deaths based on a proxy measure of the age of the deceased household member. Specifically, we distinguish between young (0–14 years), adult (15–64 years), and senior household members (65+). We provide a detailed description of this classification in section 4.

We fail to reject the null hypothesis of perfect consumption smoothing for all types of death even when relying on the alternative classification of deaths. Similarly to the baseline model, we consider total consumption as well as separate models for food and non-food consumption. Table C.8 reports the complete estimation results for the baseline model with deaths classified according to the age of the deceased household member. We also estimate separate models for households with above and below median incomes. Tables C.9 and C.10 report complete results for below and above median income households. Even in this specification the results indicate that households are capable of perfectly smoothing consumption shocks caused by within-household mortality.

Consumption is not statistically significantly affected by within-household mortality even when measured at a more detailed level. We consider three additional consumption groups. These are consumption of clothes, durables, and non-durables. Table C.11 presents complete results for the baseline model. We can see that even consumption of these items is perfectly smoothed by the affected households.

In our baseline model we do not control for the evolution of household income. We have adopted this decision due to both theoretical and econometric issues caused by the inclusion of income. Nevertheless, we also consider an alternative specification of the model in which we control for the evolution of income. We rely on two specifications of income. First, we consider a broad definition of income, in which we include all components of income described in section 4 as well as inheritance. Second, we consider a model in which we control for more narrowly defined income, i.e., income excluding inheritance received by the household. We also include a dummy variable indicating whether a given household has relatives in the USA to control for the possible effect of remittances. Furthermore, we consider these two models in both nominal and real terms. As we only consider households which fully report all income components, the inclusion of income in the model leads to the further truncation of the sample. Consequently, models that include income are based on a sample of 1,060 households.

Our findings are not significantly affected by controlling for the evolution of household income. Table C.12 reports complete results of the specification of the model that controls for broadly defined income while Table C.13 presents estimates obtained from a model based on the narrow income specification. Tables C.14 and C.15 contain estimates for models based on variables expressed in real terms for both considered income specifications. As with the preceding robustness checks, we are unable to identify any statistically significant effect of within-household mortality on the evolution of household per capita consumption.

We check the robustness of our results with respect to imputation of missing data. We impute all control variables with the exception of indicators of within-household mortality. Table C.16 presents the results for the baseline model, while Table C.17 presents the results from the model classifying deaths by time. Tables C.18 and C.19

contain estimates of models for below and above median income households. We can see that in all specifications we fail to reject the null hypothesis of perfect consumption smoothing even at the 10% significance level.

We consider an additional set of models which combine the imputed data set with a more detailed household classification. Classifying households based on their position with respect to the median of income distribution might still hide a significant level of heterogeneity. We thus adopt an additional classification which splits households by quartiles of the income distribution. Tables C.20–C.23 present the results based for models based on each quartile of the income distribution. We fail to reject the null hypothesis of perfect consumption smoothing even in this specification.

## 7 Conclusion

We find that Mexican households were capable of perfectly smoothing shocks into household consumption caused by within-household mortality. Our findings are based on the longitudinal MxFLS survey and are robust against a variety of robustness checks. The characteristics of the deceased household member do not affect a household's ability to smooth the shock into consumption. Neither is this ability affected by household income, as both relatively poor and rich households are capable of perfectly smoothing consumption. Furthermore, we do not find any pattern in the temporal evolution of the shock.

Our findings provide strong support for the hypothesis that Mexican households are able to perfectly smooth the shocks into consumption caused by within-household mortality. Multiple factors contribute to this ability. Significant share of young Mexican adults reside with their parents. Their presence might thus enhance the household's ability to smooth consumption. Remittances likely further contribute to the ability of Mexican households to smooth consumption shocks. According to Ambrosius and Cuecuecha (2013) remittances can serve as substitute for formal credit. Mora-Rivera and van Gameren (2021) find that they reduce food insecurity and Amuedo-Dorantes and Pozo (2011) conclude that they may contribute to equalization of household healthcare expenditures.

We illustrate the relevance of our findings beyond the consumption smoothing literature. Recently, Cohen and Dechezleprêtre (2022) found that low-income Mexicans are more vulnerable to weather-induced mortality. We find that Mexican households are capable of smoothing the shock into consumption caused by within-household mortality regardless of their income. Our results thus suggest that weather-induced mortality will not deepen consumption inequality due to lower capacities of poor households to smooth consumption. Au Yong Lyn (2021) finds that the decision-making power of Mexican women over consumption varies based on the type of consumed item. Consequently, households inability to smooth shocks into these items might lead to a decrease in women's overall decision-making power. Our results suggest that this is not the case as households are able to perfectly smooth all considered types of consumption.

We provide multiple contributions to the existing literature. First, our results further support the evidence suggesting that households are able to perfectly smooth

shocks into household consumption caused by within-household mortality. They thus support the findings of Dercon and Krishnan (2000), Dercon et al. (2005), and Kadiyala et al. (2011). Second, the finding of perfect consumption smoothing are at odds with the conclusion of Beegle et al. (2008) who find a statistically significant effect of within-household mortality on the evolution of household consumption. This difference likely stems from the focus of Beegle et al. (2008) on HIV/AIDS mortality. Third, our findings suggest that both poor and rich households are able to smooth the shock into consumption. However, Kadiyala et al. (2011) and Khan et al. (2015) find heterogeneity in the effect of within-household mortality with respect to household income. These findings should thus be attributed to the specifics of the Mexican context.

We further identify questions that should be addressed by future research. We focus on the evolution of household consumption measured in per capita terms. However, recent evidence provided by Brown et al. (2019, 2021) points to unequal sharing of resources within households. Future research should thus focus on studying the welfare implications of within-household mortality on individual rather than household level. Furthermore, households ability to perfectly smooth the shock into consumption raises the question of the mechanisms used for consumption smoothing and their effects as for example, Adhvaryu and Beegle (2012) found that prime-age adult mortality affects the labor supply of senior household members.

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**Compliance with ethical standards**

**Conflict of interest** The author declares no competing interests.

## 8 Appendix

### 8.1 Control variables and attrition bias

#### 8.1.1 Control variables

Tables [A.1](#).

**Table A.1** Control variables

Variable	Description
Death	Any household member died since the last interview (Dummy)
	Household head died (Dummy)
	Spouse of the household head died (Dummy)
	Child of the household head died (Dummy)
	Parent of the household head died (Dummy)
	Parent-in-law of the household head died (Dummy)
	Sibling of the household head died (Dummy)
	Sibling-in-law of the household head died (Dummy)
	Household member with different relationship to the household head, than those listed above died (Dummy)
	Any household member died within the past year (Dummy)
	Any household member died within past one to two years (Dummy)
	Any household member died within past two to three years (Dummy)
	Any household member died within past three to four years (Dummy)
	Any household member died within past four to five years (Dummy)
	Any household member died within past five to six years (Dummy)
Any household member died within past six to seven years (Dummy)	
Income	Change in total household income (per capita)
Inheritance	Change in the total value of inheritance received by household (per capita)
Assets	Change in the total value of household assets
Shocks	Household lost crops since the last interview (Dummy)
	At least one household member was hospitalized since the last interview (Dummy)
	Natural disaster since the last interview (Dummy)
	Household lost any production animals since the last interview (Dummy)
	Any household member was unemployed for a prolonged period of time since the last interview (Dummy)
Household head characteristics	Age
	Sex—female (Dummy)
	Household head worked since the last interview (Dummy)
	Highest achieved education: secondary (Dummy)
	Highest achieved education: tertiary (Dummy)
Household evolution	Change in the number of children (0–14 years of age)
	Change in the number of adults (15–64 years of age)
	Change in the number of old household members (65+)
Relatives in the USA	Household has relatives in the USA (Dummy)
Indigenous	At least one household member is of indigenous origin (Dummy)
Time	Interview was conducted during the third wave of the Mexican Family Life Survey (Dummy)

Source: Author based on the Mexican Family Life Survey

### 8.1.2 Attrition bias

Tables A.2.

**Table A.2** MxFLS—  
Attrition bias

	Final sample	
	Probit (1)	Logit (2)
Initial size	−0.016* (0.010)	−0.029* (0.017)
HH head—age	−0.009*** (0.001)	−0.016*** (0.002)
HH head—female	−0.018 (0.047)	−0.030 (0.084)
HH head—worked	0.151*** (0.054)	0.282*** (0.098)
Income	$-1 \times 10^{-10}$ *** ( $3 \times 10^{-11}$ )	$-2 \times 10^{-10}$ *** ( $6 \times 10^{-11}$ )
Illness	0.041** (0.016)	0.072** (0.029)
Morbidity	0.007 (0.028)	0.015 (0.050)
HH head education—secondary	−0.085** (0.041)	−0.146** (0.073)
HH head education—university	−0.120* (0.061)	−0.215** (0.109)
Constant	−0.555*** (0.107)	−0.906*** (0.189)
Observations	7670	7670

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

## 8.2 Mexican Family Life Survey

In this appendix we provide a more detailed description of the Mexican Family Life Survey (MxFLS). We first focus on the methodology we use for classifying deaths. Second, we provide more details on the reporting of consumption in the MxFLS.

### 8.2.1 Classification of deaths

We rely on two alternative classifications of deaths. The relationship of the deceased household member with the household head, and a proxy measure of the age of the deceased household member. The former classification stems directly from the data provided by the MxFLS, while in case of the latter we have to adopt additional assumptions.

Our first classification of deaths is based on the relationship of the deceased household member with the household head. The MxFLS provides information on the relationship of the deceased household member with the respondent. Consequently, we adjust the cases where the respondent is not the household head so that we obtain a relationship of the deceased household member with the household head.

Figure B.1 summarizes our methodological approach. It provides a graphical representation of all combinations of deceased household members and respondents that occurred during all three waves of the MxFLS. The first node provides all of the possible classifications of deaths. These are the deaths of the respondent, the respondent’s spouse, child, parent, parent-in-law, sibling, sibling-in-law, and all other deaths. The second node identifies the role of the respondent within a household. We obtained this information from individual-level control files of the MxFLS. The third node provides the final classification of deceased household members. For example, in case the death of a child is reported by the spouse of the household head, then this death is classified as the death of the child of the household head.

The classification of the deceased household member is not directly identifiable in a number of cases. For example, when a child of the household head reports the death of a parent, this death can be classified either as the death of the household head or as the death of the spouse of the household head. In these cases we rely on the individual level files in order to correctly identify the deceased household member.

This classification suffers from certain shortcomings. First, it is a proxy measure for the role of the deceased household member within a household rather than a direct indicator of kinship. For example, while we classify the death of a child of the spouse of the household head as the death of a child of the household head, it is possible that the household head was not deceased child’s parent. Consequently, as stated above, this classification provides more of an indicator of the possible role of the deceased household member within a given household.

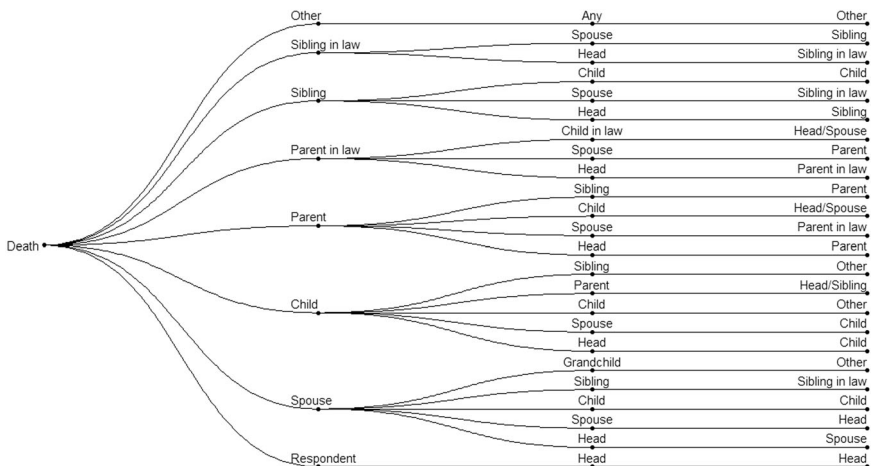


Fig. 5 Classification algorithm. Source: Author

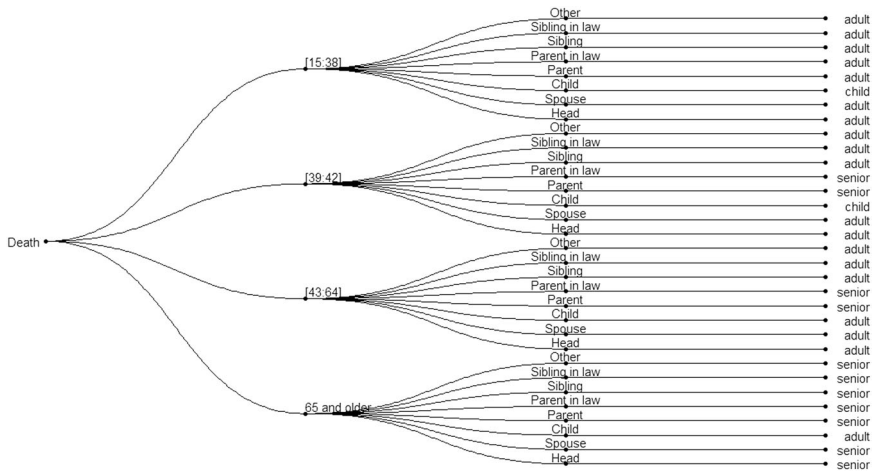


Fig. 6 Classification algorithm (age proxy). Source: Author

We also construct an alternative classification of deaths based on a proxy measure of the deceased household member’s age. Figure B.2 presents the classification, which is based on the previously identified relationship of the deceased household member with the household head and on information about the age of the household head at the time of death. The first node provides the age of the household head at the time of death. The second node indicates the reported type of death, while the last node specifies the resulting classification of the deceased household member. We define three classes of deaths, specifically differentiating between young (0–14 years), adult (15–64 years), and senior household members (65 years and older).

The classification is based on the mean age of Mexican mothers at birth, which according to the OECD stood at 26.6 years in 2008. Deaths classified as the deaths of a spouse, sibling, sibling-in-law, and other are classified in the same category as the death of the household head would be classified. We classify the death of a child as the death of a young person under 15 years of age in case the household head is either 41 years old or younger, otherwise such a death is classified as the death of an adult. We classify the death of either a parent or a parent in law as the death of a senior household member if the household head is either 39 years old or older. If the household head is older than 65 years, we classify all deaths with the exception of a child’s death as the death of a senior household member. Since no death of a child of a household head older than 85 years was reported, all child deaths are classified either as young or adult household member deaths.

### 8.2.2 Consumption

As the MxFLS does not report consumption aggregates, we constructed them. Table B.1 presents all consumption items covered by the MxFLS. As is the practice in consumption surveys, different recall periods are used for different consumption items. Food consumption is reported with a recall period of seven days, while durable



**Table B.1** MxFLS—Consumption categories

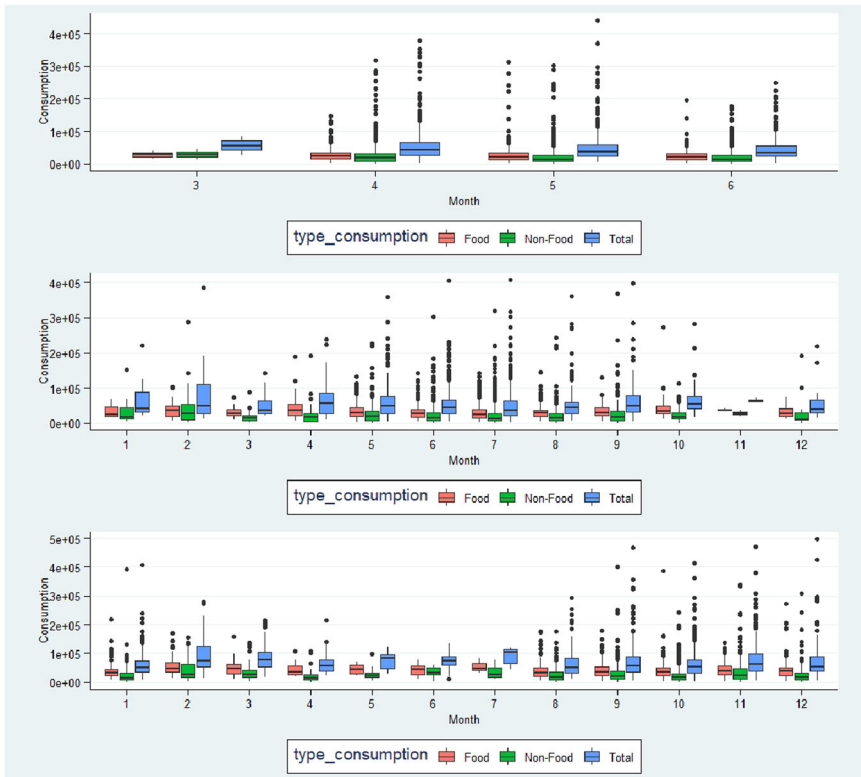
Recall period	Type of good	Comments
Last 7 days	Onions, potatoes, chiles, bananas, apples, oranges, other fruits, other vegetables, soup/pasta, rice, cookies, legumes, other cereals	Gifts/self-production included separately
	Beef, pork, tuna/sardines, fish/seafood, cheese, other dairy products, other animal products, other types of meat	Gifts included separately
	Beverage, coffee, vegetable oil, other industrial packaged products, species, cigarettes/tobacco, transport other than for school, meals outside household	Gifts/business included separately
	Corn tortillas, bread/baguette, chicken, steak/meat, pasteurized milk, chicken eggs, red tomatoes, beans, white sugar, soda	
Last month	Total personal items, personal items men, personal items women, cleaning items <sup>HH</sup> , general services, entertainment/recreation, gambling, media communication, others services <sup>HH</sup> items received/given as gifts	
Last 3 months	Adult men clothes, adult women clothes, boys clothes, girls clothes, baby toy/items, domestic utensils, health services, vehicle services	Produced/received included separately
	Gift/gave items/services	
Last year	Electronic appliances, domestic appliances, furniture/maintenance, farm spending/ISR, vehicle expenditures, gift/payment items, received items School year boys Hhm, school year girls Hhm, school year men/women not Hhm, school supplies men/boys Hhm, school supplies women/girls Hhm, school supplies women/girls not Hhm, 1 month transp to school boy Hhm, 1 month transp to school woman/girl Hhm, 1 month transp to school children/adults Hhm	

Source: Author based on the Mexican Family Life Survey

consumption items as well as consumed services are reported with recall period of one month, three months, or one year depending on the specific item. Based on the reported items we construct indicators of total, food, and non-food household consumption.

We consider three additional consumption aggregates. These are household consumption of clothes, durable items, and non-durable items. Clothes include consumption of adult men, adult women, boys, and girls clothes. Durable items include consumption of electronic appliances, domestic appliances, and furniture. Non-durable items include consumption of personal items, cleaning items, and domestic utensils.

Our final consumption aggregates cover a period of one year. We obtain a consumption aggregate covering a period of one year by scaling the reported consumption expenditure by an appropriate scalar. For example, consumption reported with a recall period of one week is multiplied by 52 in order to obtain annual consumption. We assume that the reported consumption is representative of the respective household's consumption throughout the year. However, in case the reported volume and composition of consumption depend on the year or month



**Fig. 7** Consumption and month of interview. Source: Author based on Mexican Family Life Survey

during which the interview was conducted this could significantly affect the final results unless properly treated.

We study the distribution of consumption in order to check for the presence of seasonality in reported consumption data. Figure B.3 reports the distributions of food, non-food, and total household consumption based on the month of the interview. Figure B.4 reports the distributions for the years during which the interviews were conducted. We can see, that there is little to no variation in the distributions of consumption based on the month or year when the interviews were conducted. Consequently, we believe that our results are not affected by consumption seasonality.

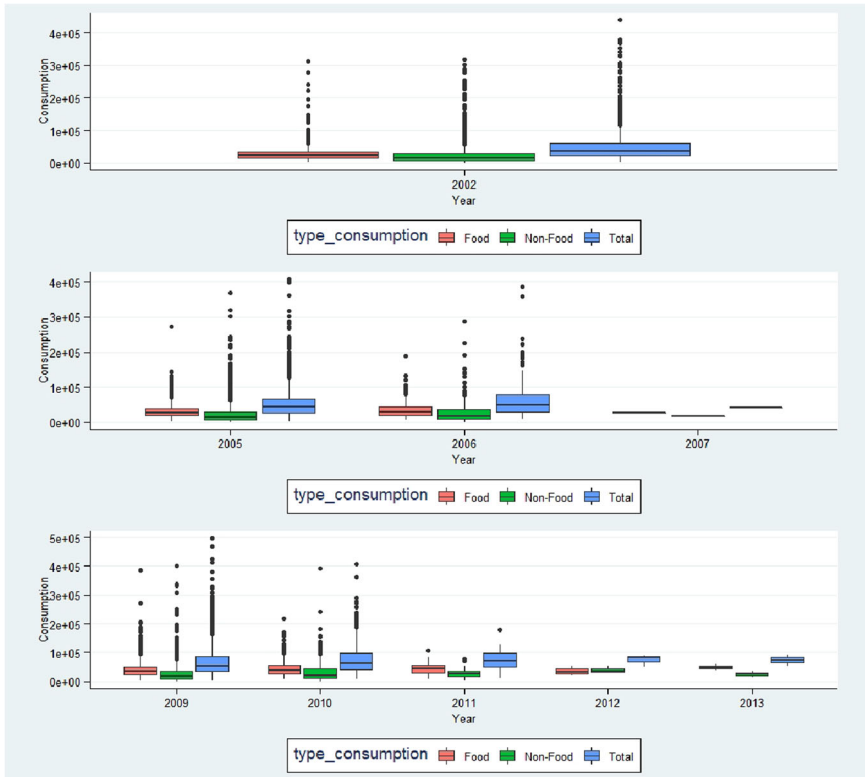


Fig. 8 Consumption and year of interview. Source: Author based on Mexican Family Life Survey

## 8.3 Complete estimation results and robustness checks

### 8.3.1 Baseline model—unconditional

Table C.1.

Table C.1 Unconditional model

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	0.094*** (0.036)		0.072** (0.035)		0.107 (0.093)	
Death spouse		0.103* (0.057)		0.097 (0.061)		0.040 (0.211)
Death children		0.058 (0.080)		0.058 (0.060)		0.038 (0.135)
Death parents		0.130* (0.079)		0.084 (0.075)		0.138 (0.102)
Death other		0.086 (0.099)		0.084 (0.091)		0.093 (0.318)
Death parents i.l.		-0.021 (0.100)		-0.065 (0.105)		0.140 (0.168)
Death sibling		-0.034 (0.149)		-0.134 (0.161)		0.125 (0.152)
Death sibling i.l.		0.143 (0.106)		0.107 (0.120)		0.128 (0.287)
Death head		0.159 (0.103)		0.148* (0.089)		0.211* (0.127)
Time	0.032** (0.013)	0.033** (0.013)	0.009 (0.013)	0.011 (0.013)	0.119*** (0.031)	0.117*** (0.031)
Observations	2866	2866	2866	2866	2866	2866
R <sup>2</sup>	0.310	0.312	0.341	0.344	0.193	0.194

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

### 8.3.2 Baseline model

Table C.2

Table C.2 Baseline model

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	-0.010 (0.192)		0.047 (0.195)		0.306 (0.498)	
Death spouse		-0.019 (0.116)		-0.049 (0.117)		0.070 (0.293)
Death children		-0.006 (0.116)		-0.031 (0.099)		0.101 (0.267)
Death parents		-0.034 (0.104)		-0.091 (0.100)		0.067 (0.241)
Death other		0.003 (0.121)		-0.018 (0.111)		0.120 (0.270)
Death parents i.l.		-0.125 (0.121)		-0.180 (0.125)		0.092 (0.254)
Death sibling		-0.093 (0.159)		-0.201 (0.166)		0.126 (0.236)
Death sibling i.l.		0.047 (0.115)		0.008 (0.111)		0.057 (0.354)
Death head		0.044 (0.134)		0.006 (0.117)		0.258 (0.312)
Disease	0.066** (0.027)	0.067** (0.028)	0.051* (0.027)	0.053* (0.028)	0.123** (0.055)	0.122** (0.055)
Unemployment	-0.058 (0.037)	-0.059 (0.037)	-0.055 (0.035)	-0.058 (0.036)	-0.041 (0.070)	-0.041 (0.071)
Natural disaster	-0.070 (0.118)	-0.064 (0.110)	-0.051 (0.134)	-0.043 (0.120)	-0.037 (0.153)	-0.043 (0.154)
Crop loss	0.040 (0.078)	0.043 (0.077)	0.001 (0.085)	0.007 (0.084)	0.123 (0.104)	0.123 (0.104)
Production animals	-0.002 (0.126)	-0.003 (0.126)	-0.034 (0.124)	-0.036 (0.124)	-0.005 (0.176)	-0.002 (0.176)
Time	0.035*** (0.013)	0.036*** (0.013)	0.012 (0.013)	0.014 (0.013)	0.114*** (0.031)	0.114*** (0.031)
HH head—age (interaction)	0.0001 (0.003)	0.0003 (0.002)	-0.001 (0.003)	0.001 (0.001)	-0.004 (0.008)	-0.002 (0.005)
HH head—female	-0.005	-0.020	0.007	-0.003	-0.152	-0.142

Table C.2 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
(interaction)	(0.069)	(0.067)	(0.068)	(0.069)	(0.176)	(0.182)
HH head—worked	0.069	0.087	0.038	0.090	−0.015	0.043
(interaction)	(0.080)	(0.065)	(0.083)	(0.065)	(0.214)	(0.175)
HH head education—secondary	0.026	0.034	−0.007	0.023	0.103	0.151
(interaction)	(0.082)	(0.086)	(0.076)	(0.080)	(0.160)	(0.188)
HH head education—university	0.159	0.155	0.104	0.116	0.234	0.273
(interaction)	(0.142)	(0.142)	(0.127)	(0.126)	(0.219)	(0.222)
Assets	0.015***	0.015***	0.010**	0.010**	0.036**	0.035**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.015)	(0.015)
Indigenous	−0.042	−0.041	−0.021	−0.018	−0.018	−0.017
(interaction)	(0.072)	(0.069)	(0.072)	(0.066)	(0.208)	(0.212)
Children	−0.031***	−0.031***	−0.034***	−0.033***	−0.017	−0.017
	(0.010)	(0.010)	(0.009)	(0.009)	(0.020)	(0.020)
Adults	−0.030***	−0.030***	−0.029***	−0.029***	−0.011	−0.012
	(0.009)	(0.009)	(0.009)	(0.009)	(0.022)	(0.022)
Seniors	−0.078***	−0.078***	−0.076***	−0.075***	−0.091*	−0.091*
	(0.027)	(0.027)	(0.027)	(0.027)	(0.048)	(0.049)
Observations	2866	2866	2866	2866	2866	2866
R <sup>2</sup>	0.370	0.372	0.388	0.392	0.231	0.232

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

### 8.3.3 Baseline model—households with below median income

Table C.3

Table C.3 Baseline model—households with below median income

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	−0.034 (0.248)		−0.011 (0.253)		0.012 (0.576)	
Death spouse		−0.050 (0.144)		−0.127 (0.157)		0.086 (0.477)
Death children		0.019 (0.176)		−0.068 (0.140)		0.177 (0.509)
Death parents		−0.116 (0.129)		−0.211 (0.130)		−0.027 (0.393)
Death other		−0.023 (0.168)		−0.106 (0.165)		0.196 (0.470)
Death parents i.l.		−0.149 (0.150)		−0.267* (0.156)		0.057 (0.366)
Death sibling		−0.251 (0.194)		−0.388 (0.253)		0.017 (0.380)
Death sibling i.l.		0.069 (0.187)		0.127 (0.108)		−0.199 (0.553)
Death head		−0.001 (0.152)		−0.097 (0.145)		0.417 (0.536)
Disease	0.042 (0.038)	0.042 (0.038)	0.031 (0.040)	0.032 (0.041)	0.097 (0.086)	0.091 (0.089)
Unemployment	−0.061 (0.056)	−0.063 (0.057)	−0.056 (0.052)	−0.059 (0.053)	−0.014 (0.119)	−0.012 (0.123)
Natural disaster	−0.054 (0.124)	−0.042 (0.105)	−0.051 (0.151)	−0.034 (0.120)	0.025 (0.176)	0.034 (0.179)
Crop loss	−0.109 (0.091)	−0.105 (0.089)	−0.122 (0.104)	−0.112 (0.100)	−0.068 (0.128)	−0.079 (0.131)
Production animals	−0.075 (0.075)	−0.074 (0.076)	−0.048 (0.114)	−0.047 (0.114)	−0.267 (0.169)	−0.257 (0.166)
Time	0.030 (0.019)	0.032* (0.019)	0.012 (0.019)	0.015 (0.019)	0.116*** (0.045)	0.116*** (0.046)
HH head—age (interaction)	0.001 (0.003)	0.001 (0.002)	0.001 (0.004)	0.003 (0.002)	0.002 (0.009)	0.0003 (0.007)
HH head—female	−0.060	−0.079	−0.047	−0.061	−0.413	−0.478*

Table C.3 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
(interaction)	(0.088)	(0.091)	(0.101)	(0.103)	(0.260)	(0.279)
HH head—worked	0.112	0.158*	0.065	0.155*	0.200	0.218
(interaction)	(0.106)	(0.088)	(0.111)	(0.092)	(0.276)	(0.268)
HH head education—secondary	0.044	0.041	0.060	0.074	0.106	0.090
(interaction)	(0.133)	(0.129)	(0.132)	(0.125)	(0.324)	(0.315)
HH head education—university	−0.037	−0.052	−0.112	−0.135	−0.061	−0.013
(interaction)	(0.161)	(0.177)	(0.126)	(0.124)	(0.306)	(0.343)
Assets	0.019***	0.019***	0.015*	0.015*	0.041**	0.042**
	(0.007)	(0.007)	(0.008)	(0.008)	(0.021)	(0.021)
Indigenous	−0.118	−0.126	−0.076	−0.084	−0.240	−0.254
(interaction)	(0.090)	(0.087)	(0.092)	(0.085)	(0.273)	(0.276)
Children	−0.032**	−0.030**	−0.034***	−0.032***	−0.025	−0.025
	(0.013)	(0.013)	(0.012)	(0.012)	(0.026)	(0.026)
Adults	−0.020	−0.020	−0.024**	−0.024**	0.019	0.019
	(0.012)	(0.012)	(0.011)	(0.011)	(0.032)	(0.032)
Seniors	−0.102***	−0.103***	−0.092***	−0.095***	−0.136**	−0.128*
	(0.032)	(0.032)	(0.033)	(0.033)	(0.067)	(0.066)
Observations	1434	1434	1434	1434	1434	1434
$R^2$	0.406	0.412	0.404	0.416	0.258	0.261

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$



### 8.3.4 Baseline model—households with above median income

Table C.4

Table C.4 Baseline model—households with above median income

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	−0.043 (0.285)		0.056 (0.281)		0.379 (0.759)	
Death spouse		−0.007 (0.186)		−0.018 (0.176)		−0.110 (0.399)
Death children		−0.070 (0.166)		−0.062 (0.163)		−0.025 (0.311)
Death parents		0.041 (0.180)		−0.002 (0.161)		0.058 (0.347)
Death other		0.026 (0.164)		0.042 (0.145)		−0.021 (0.308)
Death parents i.l.		−0.055 (0.187)		−0.066 (0.160)		0.091 (0.416)
Death sibling		0.059 (0.185)		−0.020 (0.162)		0.120 (0.329)
Death sibling i.l.		0.127 (0.218)		−0.065 (0.160)		0.406 (0.395)
Death head		0.161 (0.266)		0.157 (0.230)		0.117 (0.441)
Disease	0.088** (0.039)	0.085** (0.040)	0.070* (0.037)	0.069* (0.038)	0.140* (0.075)	0.141* (0.077)
Unemployment	−0.050 (0.051)	−0.049 (0.052)	−0.052 (0.050)	−0.053 (0.051)	−0.043 (0.085)	−0.040 (0.087)
Natural disaster	−0.059 (0.162)	−0.058 (0.163)	−0.026 (0.164)	−0.027 (0.165)	−0.141 (0.307)	−0.139 (0.308)
Crop loss	0.296*** (0.094)	0.295*** (0.095)	0.215* (0.114)	0.216* (0.115)	0.456*** (0.152)	0.452*** (0.155)
Production animals	−0.021 (0.196)	−0.020 (0.197)	−0.082 (0.166)	−0.082 (0.167)	0.070 (0.287)	0.069 (0.289)
Time	0.040** (0.018)	0.039** (0.018)	0.012 (0.017)	0.012 (0.017)	0.112*** (0.041)	0.111*** (0.042)
HH head—age (interaction)	0.0002 (0.004)	−0.0002 (0.002)	−0.001 (0.004)	−0.001 (0.002)	−0.006 (0.012)	−0.001 (0.005)
HH head—female	0.035	0.004	0.044	0.033	0.075	0.134

Table C.4 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
(interaction)	(0.112)	(0.105)	(0.095)	(0.094)	(0.209)	(0.241)
HH head—worked	0.038	0.014	0.020	0.032	-0.175	-0.124
(interaction)	(0.124)	(0.102)	(0.125)	(0.094)	(0.305)	(0.227)
HH head education—secondary	0.022	0.013	-0.046	-0.027	0.090	0.131
(interaction)	(0.110)	(0.113)	(0.092)	(0.097)	(0.189)	(0.199)
HH head education—university	0.297	0.292	0.253	0.268	0.460	0.487
(interaction)	(0.208)	(0.206)	(0.170)	(0.172)	(0.344)	(0.364)
Assets	0.011	0.011*	0.004	0.004	0.031	0.031
	(0.007)	(0.007)	(0.005)	(0.005)	(0.021)	(0.022)
Indigenous	0.071	0.095	0.059	0.077	0.302	0.363
(interaction)	(0.110)	(0.119)	(0.102)	(0.102)	(0.288)	(0.339)
Children	-0.030**	-0.029**	-0.033**	-0.033**	-0.006	-0.004
	(0.014)	(0.014)	(0.013)	(0.013)	(0.032)	(0.032)
Adults	-0.044***	-0.043***	-0.034**	-0.034**	-0.048*	-0.049*
	(0.013)	(0.013)	(0.013)	(0.014)	(0.026)	(0.026)
Seniors	-0.048	-0.047	-0.054	-0.053	-0.031	-0.028
	(0.041)	(0.042)	(0.040)	(0.040)	(0.066)	(0.067)
Observations	1432	1432	1432	1432	1432	1432
$R^2$	0.364	0.367	0.398	0.400	0.237	0.238

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

### 8.3.5 Persistence of the shock

Table C.5

Table C.5 Persistence of the shock

	Dependent variable		
	Total consumption (1)	Food consumption (2)	Non-food consumption (3)
Death 1 year	-0.092 (0.147)	-0.167 (0.160)	0.096 (0.296)
Death 2 years	-0.036 (0.123)	-0.092 (0.129)	0.048 (0.180)
Death 3 years	-0.120 (0.140)	-0.122 (0.147)	-0.052 (0.273)
Death 4 years	0.075 (0.137)	0.040 (0.144)	0.255 (0.288)
Death 5 years	-0.174 (0.156)	-0.232 (0.170)	0.016 (0.306)
Death 6 years	-0.312 (0.335)	-0.275 (0.253)	-0.319 (0.510)
Death 7 years	0.098 (0.142)	0.059 (0.150)	0.053 (0.213)
Disease	0.064** (0.028)	0.049* (0.028)	0.120** (0.056)
Unemployment	-0.061 (0.037)	-0.059* (0.036)	-0.044 (0.070)
Natural disaster	-0.061 (0.110)	-0.038 (0.122)	-0.041 (0.154)
Crop loss	0.040 (0.077)	0.004 (0.085)	0.123 (0.103)
Production animals	0.001 (0.126)	-0.031 (0.125)	-0.001 (0.176)
Time	0.037*** (0.013)	0.015 (0.013)	0.114*** (0.031)
HH head—age (interaction)	0.001 (0.002)	0.001 (0.002)	-0.001 (0.005)
HH head—female (interaction)	-0.012 (0.066)	0.003 (0.067)	-0.126 (0.162)
HH head— worked (interaction)	0.084 (0.066)	0.085 (0.067)	0.046 (0.180)

Table C.5 continued

	Dependent variable		
	Total consumption (1)	Food consumption (2)	Non-food consumption (3)
HH head education—secondary (interaction)	0.065 (0.088)	0.044 (0.086)	0.184 (0.185)
HH head education—university (interaction)	0.143 (0.133)	0.095 (0.129)	0.260 (0.220)
Assets	0.015*** (0.005)	0.010** (0.005)	0.035** (0.015)
Indigenous (interaction)	−0.025 (0.068)	−0.004 (0.068)	−0.011 (0.200)
Children	−0.030*** (0.010)	−0.033*** (0.009)	−0.017 (0.020)
Adults	−0.030*** (0.009)	−0.029*** (0.009)	−0.010 (0.022)
Seniors	−0.076*** (0.026)	−0.073*** (0.026)	−0.084* (0.048)
Observations	2866	2866	2866
$R^2$	0.377	0.396	0.234

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

### 8.3.6 Robustness check—modeling in real terms

Table C.6

Table C.6 Robustness check—modeling in real terms

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	−0.012 (0.191)		0.044 (0.194)		0.297 (0.492)	
Death spouse		−0.022 (0.115)		−0.052 (0.116)		0.066 (0.288)
Death children		−0.005 (0.114)		−0.030 (0.098)		0.100 (0.264)
Death parents		−0.039 (0.103)		−0.096 (0.099)		0.061 (0.238)
Death other		−0.004 (0.121)		−0.025 (0.111)		0.110 (0.267)
Death parents i.l.		−0.133 (0.121)		−0.188 (0.125)		0.084 (0.252)
Death sibling		−0.094 (0.158)		−0.202 (0.167)		0.125 (0.233)
Death sibling i.l.		0.054 (0.115)		0.015 (0.107)		0.062 (0.354)
Death head		0.047 (0.134)		0.008 (0.117)		0.254 (0.309)
Disease	0.064** (0.027)	0.065** (0.028)	0.049* (0.027)	0.051* (0.028)	0.121** (0.055)	0.120** (0.055)
Unemployment	−0.059 (0.037)	−0.060 (0.037)	−0.055 (0.035)	−0.058 (0.036)	−0.041 (0.069)	−0.042 (0.070)
Natural disaster	−0.068 (0.121)	−0.061 (0.113)	−0.048 (0.137)	−0.041 (0.122)	−0.035 (0.155)	−0.041 (0.155)
Crop loss	0.040 (0.079)	0.043 (0.078)	0.001 (0.086)	0.007 (0.085)	0.123 (0.104)	0.123 (0.105)
Production animals	−0.001 (0.125)	−0.003 (0.125)	−0.034 (0.124)	−0.035 (0.124)	−0.003 (0.176)	−0.001 (0.177)
Time	0.035*** (0.013)	0.036*** (0.013)	0.012 (0.013)	0.013 (0.013)	0.114*** (0.030)	0.114*** (0.031)
HH head—age (interaction)	0.0001 (0.003)	0.0003 (0.002)	−0.001 (0.003)	0.001 (0.001)	−0.004 (0.008)	−0.002 (0.004)
HH head—female	−0.007	−0.024	0.004	−0.007	−0.153	−0.143

Table C.6 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
(interaction)	(0.069)	(0.067)	(0.068)	(0.069)	(0.174)	(0.179)
HH head—worked	0.069	0.089	0.038	0.091	−0.012	0.046
(interaction)	(0.080)	(0.065)	(0.083)	(0.065)	(0.212)	(0.173)
HH head education—secondary	0.028	0.037	−0.005	0.027	0.104	0.152
(interaction)	(0.081)	(0.086)	(0.075)	(0.080)	(0.159)	(0.186)
HH head education—university	0.165	0.161	0.110	0.122	0.239	0.277
(interaction)	(0.142)	(0.143)	(0.129)	(0.127)	(0.218)	(0.222)
Assets	0.015***	0.015***	0.010**	0.010**	0.036**	0.035**
(real)	(0.005)	(0.005)	(0.005)	(0.005)	(0.015)	(0.015)
Indigenous	−0.040	−0.041	−0.019	−0.018	−0.017	−0.017
(interaction)	(0.072)	(0.070)	(0.073)	(0.067)	(0.206)	(0.210)
Children	−0.032***	−0.031***	−0.035***	−0.034***	−0.018	−0.018
	(0.010)	(0.010)	(0.009)	(0.009)	(0.020)	(0.020)
Adults	−0.030***	−0.030***	−0.029***	−0.029***	−0.012	−0.012
	(0.009)	(0.009)	(0.009)	(0.009)	(0.022)	(0.022)
Seniors	−0.078***	−0.078***	−0.076***	−0.075***	−0.090*	−0.090*
	(0.027)	(0.027)	(0.027)	(0.027)	(0.048)	(0.049)
Observations	2866	2866	2866	2866	2866	2866
$R^2$	0.336	0.339	0.338	0.343	0.233	0.233

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

### 8.3.7 Robustness check—multiple deaths

Table C.7

Table C.7 Robustness check—multiple deaths

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	−0.015 (0.202)		0.061 (0.204)		0.286 (0.501)	
Death spouse		−0.103 (0.158)		−0.092 (0.171)		0.026 (0.344)
Death children		−0.095 (0.170)		−0.076 (0.169)		0.055 (0.351)
Death parents		−0.132 (0.151)		−0.142 (0.159)		0.016 (0.319)
Death other		−0.081 (0.170)		−0.061 (0.173)		0.076 (0.345)
Death parents i.l.		−0.219 (0.161)		−0.228 (0.167)		0.043 (0.339)
Death sibling		−0.191 (0.180)		−0.251 (0.191)		0.075 (0.324)
Death sibling i.l.		−0.032 (0.158)		−0.033 (0.166)		0.016 (0.387)
Death head		−0.042 (0.172)		−0.039 (0.170)		0.213 (0.389)
Disease	0.066** (0.027)	0.067** (0.028)	0.052* (0.027)	0.053* (0.028)	0.123** (0.055)	0.122** (0.055)
Unemployment	−0.059 (0.037)	−0.060 (0.037)	−0.055 (0.036)	−0.058 (0.036)	−0.041 (0.070)	−0.042 (0.071)
Natural disaster	−0.071 (0.116)	−0.070 (0.111)	−0.047 (0.127)	−0.047 (0.119)	−0.042 (0.153)	−0.046 (0.154)
Crop loss	0.040 (0.078)	0.047 (0.077)	−0.00002 (0.086)	0.009 (0.084)	0.125 (0.103)	0.125 (0.104)
Production animals	−0.002 (0.126)	−0.003 (0.125)	−0.035 (0.124)	−0.035 (0.124)	−0.004 (0.176)	−0.002 (0.176)
Time	0.035*** (0.013)	0.035*** (0.013)	0.013 (0.013)	0.013 (0.013)	0.114*** (0.031)	0.114*** (0.031)
HH head—age (interaction)	0.0002 (0.003)	0.001 (0.002)	−0.001 (0.003)	0.001 (0.002)	−0.004 (0.008)	−0.001 (0.005)
HH head—female	−0.002	−0.005	0.001	0.005	−0.143	−0.134

Table C.7 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
(interaction)	(0.070)	(0.069)	(0.068)	(0.070)	(0.181)	(0.189)
HH head—worked	0.068	0.108	0.038	0.100	−0.016	0.054
(interaction)	(0.080)	(0.069)	(0.082)	(0.073)	(0.214)	(0.182)
HH head education—secondary	0.027	0.055	−0.010	0.034	0.107	0.162
(interaction)	(0.081)	(0.086)	(0.076)	(0.079)	(0.158)	(0.179)
HH head education—university	0.160	0.174	0.099	0.126	0.241	0.283
(interaction)	(0.141)	(0.142)	(0.127)	(0.124)	(0.220)	(0.219)
Assets	0.015***	0.015***	0.010**	0.010**	0.035**	0.035**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.015)	(0.015)
Multiple deaths	0.028	0.163	−0.075	0.084	0.107	0.085
	(0.164)	(0.213)	(0.187)	(0.241)	(0.178)	(0.293)
Indigenous	−0.042	−0.042	−0.019	−0.018	−0.020	−0.017
(interaction)	(0.071)	(0.069)	(0.070)	(0.066)	(0.208)	(0.212)
Children	−0.031***	−0.031***	−0.034***	−0.033***	−0.017	−0.017
	(0.010)	(0.010)	(0.009)	(0.009)	(0.020)	(0.020)
Adults	−0.030***	−0.030***	−0.029***	−0.028***	−0.011	−0.011
	(0.009)	(0.009)	(0.009)	(0.009)	(0.022)	(0.022)
Seniors	−0.078***	−0.077***	−0.076***	−0.074***	−0.090*	−0.090*
	(0.027)	(0.027)	(0.027)	(0.027)	(0.048)	(0.049)
Observations	2866	2866	2866	2866	2866	2866
$R^2$	0.370	0.372	0.388	0.392	0.232	0.232

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$



### 8.3.8 Robustness check—alternative classification of deaths

Table C.8

Table C.8 Robustness check—alternative classification of deaths

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	−0.010 (0.192)		0.047 (0.195)		0.306 (0.498)	
Death child		−0.004 (0.198)		0.040 (0.153)		−0.156 (0.344)
Death adult		0.024 (0.069)		−0.017 (0.068)		0.150 (0.129)
Death senior		−0.001 (0.103)		−0.055 (0.113)		0.070 (0.145)
Disease	0.066** (0.027)	0.066** (0.027)	0.051* (0.027)	0.053* (0.028)	0.123** (0.055)	0.123** (0.055)
Unemployment	−0.058 (0.037)	−0.059 (0.037)	−0.055 (0.035)	−0.056 (0.035)	−0.041 (0.070)	−0.041 (0.070)
Natural disaster	−0.070 (0.118)	−0.068 (0.116)	−0.051 (0.134)	−0.048 (0.130)	−0.037 (0.153)	−0.042 (0.154)
Crop loss	0.040 (0.078)	0.039 (0.078)	0.001 (0.085)	0.001 (0.085)	0.123 (0.104)	0.125 (0.104)
Production animals	−0.002 (0.126)	−0.002 (0.126)	−0.034 (0.124)	−0.035 (0.124)	−0.005 (0.176)	−0.005 (0.176)
Time	0.035*** (0.013)	0.035*** (0.013)	0.012 (0.013)	0.013 (0.013)	0.114*** (0.031)	0.114*** (0.031)
HH head—age (interaction)	0.0001 (0.003)	−0.0001 (0.002)	−0.001 (0.003)	0.0005 (0.002)	−0.004 (0.008)	−0.002 (0.004)
HH head—female (interaction)	−0.005 (0.069)	−0.011 (0.067)	0.007 (0.068)	0.006 (0.066)	−0.152 (0.176)	−0.142 (0.177)
HH head—worked (interaction)	0.069 (0.080)	0.059 (0.062)	0.038 (0.083)	0.054 (0.061)	−0.015 (0.214)	0.025 (0.165)
HH head education— secondary (interaction)	0.026 (0.082)	0.020 (0.083)	−0.007 (0.076)	0.0002 (0.078)	0.103 (0.160)	0.147 (0.179)
HH head education— university (interaction)	0.159 (0.142)	0.155 (0.140)	0.104 (0.127)	0.104 (0.126)	0.234 (0.219)	0.264 (0.234)
Assets	0.015*** (0.005)	0.015*** (0.005)	0.010** (0.005)	0.010** (0.005)	0.036** (0.015)	0.036** (0.015)

Table C.8 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Indigenous (interaction)	-0.042 (0.072)	-0.043 (0.071)	-0.021 (0.072)	-0.023 (0.070)	-0.018 (0.208)	-0.010 (0.212)
Children	-0.031*** (0.010)	-0.031*** (0.010)	-0.034*** (0.009)	-0.034*** (0.009)	-0.017 (0.020)	-0.018 (0.020)
Adults	-0.030*** (0.009)	-0.030*** (0.009)	-0.029*** (0.009)	-0.029*** (0.009)	-0.011 (0.022)	-0.011 (0.022)
Seniors	-0.078*** (0.027)	-0.080*** (0.027)	-0.076*** (0.027)	-0.078*** (0.027)	-0.091* (0.048)	-0.093* (0.049)
Observations	2866	2866	2866	2866	2866	2866
$R^2$	0.370	0.370	0.388	0.388	0.231	0.232

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

### 8.3.9 Robustness check—below-median income households

Table C.9

Table C.9 Households with below median income

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	-0.034 (0.248)		-0.011 (0.253)		0.012 (0.576)	
Death child		-0.144 (0.229)		-0.056 (0.152)		-0.462 (0.485)
Death adult		0.022 (0.087)		-0.027 (0.083)		0.134 (0.185)
Death senior		-0.059 (0.133)		-0.081 (0.153)		-0.135 (0.193)
Disease	0.042 (0.038)	0.044 (0.038)	0.031 (0.040)	0.033 (0.041)	0.097 (0.086)	0.101 (0.087)
Unemployment	-0.061 (0.056)	-0.061 (0.056)	-0.056 (0.052)	-0.057 (0.052)	-0.014 (0.119)	-0.014 (0.119)
Natural disaster	-0.054 (0.124)	-0.046 (0.118)	-0.051 (0.151)	-0.044 (0.144)	0.025 (0.176)	0.046 (0.184)

Table C.9 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Crop loss	-0.109 (0.091)	-0.114 (0.092)	-0.122 (0.104)	-0.124 (0.104)	-0.068 (0.128)	-0.082 (0.135)
Production animals	-0.075 (0.075)	-0.078 (0.076)	-0.048 (0.114)	-0.050 (0.114)	-0.267 (0.169)	-0.277 (0.172)
Time	0.030 (0.019)	0.030 (0.019)	0.012 (0.019)	0.013 (0.019)	0.116*** (0.045)	0.116** (0.045)
HH head—age (interaction)	0.001 (0.003)	0.001 (0.002)	0.001 (0.004)	0.002 (0.002)	0.002 (0.009)	0.003 (0.005)
HH head—female (interaction)	-0.060 (0.088)	-0.079 (0.087)	-0.047 (0.101)	-0.061 (0.097)	-0.413 (0.260)	-0.465* (0.270)
HH head—worked (interaction)	0.112 (0.106)	0.107 (0.080)	0.065 (0.111)	0.076 (0.081)	0.200 (0.276)	0.198 (0.238)
HH head education— secondary (interaction)	0.044 (0.133)	0.017 (0.133)	0.060 (0.132)	0.047 (0.129)	0.106 (0.324)	0.041 (0.332)
HH head education— university (interaction)	-0.037 (0.161)	-0.073 (0.165)	-0.112 (0.126)	-0.150 (0.119)	-0.061 (0.306)	-0.130 (0.350)
Assets	0.019*** (0.007)	0.019*** (0.007)	0.015* (0.008)	0.015* (0.008)	0.041** (0.021)	0.041** (0.021)
Indigenous (interaction)	-0.118 (0.090)	-0.119 (0.088)	-0.076 (0.092)	-0.076 (0.090)	-0.240 (0.273)	-0.244 (0.269)
Children	-0.032** (0.013)	-0.032** (0.013)	-0.034*** (0.012)	-0.034*** (0.012)	-0.025 (0.026)	-0.026 (0.025)
Adults	-0.020 (0.012)	-0.020 (0.012)	-0.024** (0.011)	-0.024** (0.011)	0.019 (0.032)	0.020 (0.032)
Seniors	-0.102*** (0.032)	-0.104*** (0.032)	-0.092*** (0.033)	-0.095*** (0.034)	-0.136** (0.067)	-0.143** (0.068)
Observations	1434	1434	1434	1434	1434	1434
$R^2$	0.406	0.408	0.404	0.405	0.258	0.263

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

### 8.3.10 Robustness check—above-median income households

Table C.10

Table C.10 Households with above median income

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	−0.043 (0.285)		0.056 (0.281)		0.379 (0.759)	
Death child		0.247 (0.413)		0.190 (0.390)		0.264 (0.609)
Death adult		−0.045 (0.128)		−0.086 (0.105)		0.039 (0.228)
Death senior		−0.013 (0.151)		−0.106 (0.118)		0.144 (0.262)
Disease	0.088** (0.039)	0.089** (0.039)	0.070* (0.037)	0.072* (0.037)	0.140* (0.075)	0.139* (0.076)
Unemployment	−0.050 (0.051)	−0.049 (0.051)	−0.052 (0.050)	−0.051 (0.050)	−0.043 (0.085)	−0.040 (0.086)
Natural disaster	−0.059 (0.162)	−0.060 (0.162)	−0.026 (0.164)	−0.030 (0.164)	−0.141 (0.307)	−0.144 (0.307)
Crop loss	0.296*** (0.094)	0.296*** (0.094)	0.215* (0.114)	0.219* (0.115)	0.456*** (0.152)	0.458*** (0.155)
Production animals	−0.021 (0.196)	−0.021 (0.196)	−0.082 (0.166)	−0.083 (0.166)	0.070 (0.287)	0.069 (0.288)
Time	0.040** (0.018)	0.040** (0.018)	0.012 (0.017)	0.014 (0.017)	0.112*** (0.041)	0.110*** (0.042)
HH head—age (interaction)	0.0002 (0.004)	0.00004 (0.002)	−0.001 (0.004)	0.001 (0.002)	−0.006 (0.012)	−0.003 (0.005)
HH head—female (interaction)	0.035 (0.112)	0.042 (0.105)	0.044 (0.095)	0.059 (0.092)	0.075 (0.209)	0.143 (0.204)
HH head—worked (interaction)	0.038 (0.124)	0.044 (0.105)	0.020 (0.125)	0.054 (0.097)	−0.175 (0.305)	−0.070 (0.222)
HH head education— secondary (interaction)	0.022 (0.110)	0.001 (0.101)	−0.046 (0.092)	−0.032 (0.089)	0.090 (0.189)	0.119 (0.202)
HH head education—university (interaction)	0.297 (0.208)	0.293 (0.211)	0.253 (0.170)	0.273 (0.173)	0.460 (0.344)	0.462 (0.365)
Assets	0.011 (0.007)	0.011 (0.007)	0.004 (0.005)	0.004 (0.005)	0.031 (0.021)	0.031 (0.021)

**Table C.10** continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Indigenous	0.071	0.058	0.059	0.048	0.302	0.308
(interaction)	(0.110)	(0.095)	(0.102)	(0.087)	(0.288)	(0.301)
Children	-0.030**	-0.029**	-0.033**	-0.033**	-0.006	-0.005
	(0.014)	(0.014)	(0.013)	(0.013)	(0.032)	(0.032)
Adults	-0.044***	-0.044***	-0.034**	-0.034**	-0.048*	-0.049*
	(0.013)	(0.013)	(0.013)	(0.013)	(0.026)	(0.026)
Seniors	-0.048	-0.046	-0.054	-0.053	-0.031	-0.023
	(0.041)	(0.042)	(0.040)	(0.040)	(0.066)	(0.066)
Observations	1432	1432	1432	1432	1432	1432
$R^2$	0.364	0.365	0.398	0.400	0.237	0.237

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

### 8.3.11 Robustness check—detailed consumption aggregates

**Table C.11****Table C.11** Robustness check—detailed consumption aggregates

	Dependent variable					
	Clothes		Durables		Non-durables	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	0.161		-0.433		0.195	
	(1.003)		(1.013)		(0.558)	
Death spouse		0.546		0.546		0.088
		(0.669)		(0.669)		(0.329)
Death children		-0.185		-0.185		0.344
		(0.738)		(0.738)		(0.335)
Death parents		0.141		0.141		0.033
		(0.631)		(0.631)		(0.253)
Death other		0.588		0.588		0.026
		(0.593)		(0.593)		(0.284)
Death parents i.l.		0.260		0.260		0.096
		(0.651)		(0.651)		(0.259)
Death sibling		0.435		0.435		-0.247
		(0.731)		(0.731)		(0.257)
Death sibling i.l.		-0.475		-0.475		0.121
		(0.794)		(0.794)		(0.402)

Table C.11 continued

	Dependent variable					
	Clothes		Durables		Non-durables	
	(1)	(2)	(3)	(4)	(5)	(6)
Death head		0.480 (0.844)		0.480 (0.844)		0.075 (0.341)
Disease	0.093 (0.161)	0.082 (0.163)	0.064 (0.146)	0.082 (0.163)	0.121 (0.075)	0.125* (0.076)
Unemployment	-0.075 (0.200)	-0.070 (0.199)	0.329* (0.190)	-0.070 (0.199)	-0.017 (0.094)	-0.026 (0.095)
Natural disaster	-0.331 (0.648)	-0.320 (0.646)	0.072 (0.624)	-0.320 (0.646)	0.040 (0.271)	0.035 (0.274)
Crop loss	0.535 (0.329)	0.520 (0.329)	0.235 (0.411)	0.520 (0.329)	-0.111 (0.255)	-0.107 (0.256)
Production animals	-0.225 (0.481)	-0.216 (0.482)	-0.342 (0.462)	-0.216 (0.482)	-0.260 (0.397)	-0.260 (0.399)
Time	0.030 (0.071)	0.029 (0.072)	0.040 (0.069)	0.029 (0.072)	0.055 (0.035)	0.057 (0.035)
HH head—age	-0.00004 (0.014)	-0.003 (0.010)	0.001 (0.014)	-0.003 (0.010)	-0.002 (0.009)	-0.0001 (0.005)
HH head—female	-0.019 (0.366)	-0.081 (0.354)	-0.018 (0.326)	-0.081 (0.354)	-0.088 (0.195)	-0.070 (0.211)
HH head—worked	-0.193 (0.450)	-0.183 (0.388)	0.307 (0.429)	-0.183 (0.388)	-0.119 (0.248)	-0.079 (0.204)
HH head education—secondary	0.162 (0.433)	0.150 (0.373)	0.470 (0.559)	0.150 (0.373)	0.212 (0.194)	0.250 (0.204)
HH head education—university	-0.313 (0.554)	-0.206 (0.554)	-0.185 (0.802)	-0.206 (0.554)	0.146 (0.269)	0.160 (0.280)
Assets	0.050** (0.020)	0.050** (0.020)	0.059*** (0.018)	0.050** (0.020)	0.023 (0.016)	0.023 (0.016)
Indigenous	0.239 (0.449)	0.253 (0.459)	0.068 (0.364)	0.253 (0.459)	-0.097 (0.190)	-0.125 (0.198)
Children	0.032 (0.052)	0.030 (0.052)	0.008 (0.047)	0.030 (0.052)	-0.028 (0.022)	-0.027 (0.022)
Adults	-0.047 (0.044)	-0.046 (0.044)	0.013 (0.041)	-0.046 (0.044)	-0.011 (0.026)	-0.011 (0.027)
Seniors	-0.254* (0.139)	-0.245* (0.142)	-0.111 (0.130)	-0.245* (0.142)	-0.028 (0.072)	-0.032 (0.073)
Observations	2862	2862	2862	2862	2862	2862
R <sup>2</sup>	0.282	0.285	0.282	0.285	0.234	0.236

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

### 8.3.12 Robustness check—controlling for the evolution of income and inheritance

Tables C.12–C.15

**Table C.12** Robustness check—income (broad)

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	0.030 (0.214)		0.022 (0.212)		0.733 (0.628)	
Death spouse		0.044 (0.128)		−0.045 (0.135)		0.172 (0.411)
Death children		0.038 (0.136)		−0.044 (0.113)		0.315 (0.358)
Death parents		−0.028 (0.114)		−0.127 (0.108)		0.169 (0.319)
Death other		0.028 (0.137)		−0.042 (0.124)		0.227 (0.345)
Death parents i.l.		−0.054 (0.124)		−0.114 (0.120)		0.165 (0.356)
Death sibling		0.017 (0.126)		−0.099 (0.112)		0.229 (0.324)
Death sibling i.l.		0.045 (0.178)		0.076 (0.147)		−0.049 (0.608)
Death head		0.059 (0.153)		−0.029 (0.130)		0.426 (0.395)
Disease	0.083** (0.032)	0.083** (0.033)	0.074** (0.033)	0.075** (0.033)	0.144** (0.068)	0.144** (0.068)
Unemployment	−0.051 (0.050)	−0.053 (0.050)	−0.056 (0.049)	−0.058 (0.049)	−0.025 (0.083)	−0.027 (0.084)
Natural disaster	0.021 (0.097)	0.019 (0.098)	0.053 (0.096)	0.049 (0.096)	0.004 (0.167)	−0.013 (0.169)
Crop loss	0.040 (0.085)	0.039 (0.085)	0.002 (0.090)	0.002 (0.090)	0.095 (0.122)	0.101 (0.122)
Production animals	0.014 (0.145)	0.014 (0.146)	−0.024 (0.138)	−0.024 (0.139)	0.023 (0.229)	0.023 (0.230)
Time	0.037** (0.015)	0.038** (0.015)	0.012 (0.015)	0.014 (0.015)	0.101*** (0.034)	0.103*** (0.034)
HH head—age (interaction)	0.0003 (0.003)	0.0002 (0.002)	0.0001 (0.003)	0.001 (0.002)	−0.008 (0.009)	−0.001 (0.005)
HH head—female	−0.056	−0.055	−0.026	−0.012	−0.281	−0.230

Table C.12 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
(interaction)	(0.085)	(0.081)	(0.085)	(0.083)	(0.223)	(0.219)
HH head—worked	0.028	0.046	0.015	0.060	-0.119	0.020
(interaction)	(0.092)	(0.080)	(0.094)	(0.083)	(0.262)	(0.235)
HH head education—secondary	0.060	0.071	0.032	0.057	0.095	0.203
(interaction)	(0.089)	(0.096)	(0.082)	(0.088)	(0.180)	(0.216)
HH head education—university	0.184	0.205	0.122	0.157	0.241	0.303
(interaction)	(0.156)	(0.161)	(0.139)	(0.140)	(0.232)	(0.240)
Assets	0.017***	0.017***	0.010*	0.010*	0.043**	0.043**
	(0.005)	(0.005)	(0.006)	(0.006)	(0.017)	(0.017)
Income	0.002	0.002	0.002	0.002	0.009	0.009
(broad)	(0.002)	(0.002)	(0.002)	(0.002)	(0.006)	(0.006)
Indigenous	-0.0003	-0.005	0.027	0.024	-0.011	-0.007
(interaction)	(0.079)	(0.078)	(0.073)	(0.072)	(0.259)	(0.263)
Relatives USA	-0.017	-0.021	-0.016	-0.016	-0.232	-0.232
(interaction)	(0.074)	(0.073)	(0.072)	(0.071)	(0.222)	(0.219)
Children	-0.026**	-0.026**	-0.033***	-0.032***	-0.016	-0.016
	(0.011)	(0.011)	(0.011)	(0.011)	(0.020)	(0.020)
Adults	-0.034***	-0.033***	-0.029***	-0.029***	-0.028	-0.028
	(0.010)	(0.011)	(0.010)	(0.010)	(0.022)	(0.022)
Seniors	-0.072**	-0.074**	-0.068**	-0.069**	-0.087	-0.089
	(0.030)	(0.030)	(0.030)	(0.031)	(0.054)	(0.054)
Observations	2120	2120	2120	2120	2120	2120
R <sup>2</sup>	0.379	0.380	0.392	0.395	0.270	0.269

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$



**Table C.13** Robustness check—income (narrow)

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	0.027 (0.215)		0.023 (0.212)		0.729 (0.630)	
Death spouse		0.039 (0.129)		−0.043 (0.135)		0.163 (0.413)
Death children		0.037 (0.136)		−0.044 (0.113)		0.313 (0.358)
Death parents		−0.029 (0.115)		−0.126 (0.108)		0.166 (0.319)
Death other		0.027 (0.138)		−0.041 (0.124)		0.225 (0.345)
Death parents i.l.		−0.055 (0.124)		−0.113 (0.120)		0.163 (0.356)
Death sibling		0.016 (0.126)		−0.099 (0.112)		0.228 (0.325)
Death sibling i.l.		0.050 (0.179)		0.073 (0.146)		−0.040 (0.609)
Death head		0.057 (0.154)		−0.028 (0.130)		0.422 (0.396)
Disease	0.081** (0.033)	0.082** (0.033)	0.075** (0.033)	0.076** (0.033)	0.142** (0.068)	0.142** (0.069)
Unemployment	−0.052 (0.050)	−0.054 (0.050)	−0.055 (0.049)	−0.058 (0.049)	−0.027 (0.082)	−0.029 (0.083)
Natural disaster	0.021 (0.098)	0.019 (0.098)	0.053 (0.096)	0.049 (0.096)	0.004 (0.168)	−0.012 (0.169)
Crop loss	0.038 (0.085)	0.037 (0.085)	0.003 (0.090)	0.003 (0.090)	0.093 (0.122)	0.099 (0.122)
Production animals	0.026 (0.138)	0.026 (0.138)	−0.030 (0.140)	−0.030 (0.140)	0.041 (0.234)	0.043 (0.234)
Time	0.036** (0.015)	0.037** (0.015)	0.013 (0.015)	0.014 (0.015)	0.100*** (0.034)	0.101*** (0.035)
HH head—age (interaction)	0.0003 (0.003)	0.0003 (0.002)	0.0001 (0.003)	0.001 (0.002)	−0.008 (0.009)	−0.001 (0.005)
HH head—female (interaction)	−0.054 (0.086)	−0.052 (0.081)	−0.027 (0.085)	−0.014 (0.083)	−0.277 (0.224)	−0.225 (0.220)
HH head—worked (interaction)	0.030 (0.092)	0.047 (0.080)	0.015 (0.094)	0.059 (0.082)	−0.116 (0.262)	0.022 (0.235)
HH head education— secondary	0.059	0.069	0.032	0.058	0.093	0.199

Table C.13 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
(interaction)	(0.090)	(0.097)	(0.081)	(0.088)	(0.181)	(0.218)
HH head education— university	0.184	0.204	0.122	0.157	0.241	0.302
(interaction)	(0.156)	(0.161)	(0.139)	(0.141)	(0.232)	(0.240)
Assets	0.017***	0.017***	0.010*	0.010*	0.044***	0.044***
	(0.005)	(0.005)	(0.006)	(0.006)	(0.017)	(0.017)
Inheritance	0.004	0.004	−0.002	−0.002	0.006	0.007
	(0.004)	(0.004)	(0.004)	(0.004)	(0.008)	(0.008)
Income	0.002	0.002	0.002	0.002	0.009	0.008
(narrow)	(0.002)	(0.002)	(0.002)	(0.002)	(0.006)	(0.006)
Indigenous	−0.003	−0.007	0.028	0.026	−0.015	−0.011
(interaction)	(0.080)	(0.079)	(0.072)	(0.072)	(0.260)	(0.264)
Relatives USA	−0.020	−0.024	−0.015	−0.014	−0.236	−0.237
(interaction)	(0.074)	(0.073)	(0.072)	(0.071)	(0.221)	(0.219)
Children	−0.026**	−0.026**	−0.033***	−0.032***	−0.016	−0.016
	(0.011)	(0.011)	(0.011)	(0.011)	(0.020)	(0.020)
Adults	−0.034***	−0.033***	−0.029***	−0.029***	−0.028	−0.028
	(0.010)	(0.010)	(0.010)	(0.010)	(0.022)	(0.022)
Seniors	−0.072**	−0.074**	−0.068**	−0.069**	−0.087	−0.088
	(0.030)	(0.030)	(0.030)	(0.031)	(0.054)	(0.054)
Observations	2120	2120	2120	2120	2120	2120
$R^2$	0.380	0.381	0.393	0.395	0.270	0.269

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

**Table C.14** Robustness check—real income (broad)

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	0.023 (0.214)		0.014 (0.212)		0.718 (0.620)	
Death spouse		0.043 (0.128)		-0.046 (0.135)		0.171 (0.405)
Death children		0.040 (0.134)		-0.043 (0.113)		0.314 (0.353)
Death parents		-0.033 (0.114)		-0.132 (0.108)		0.163 (0.315)
Death other		0.021 (0.137)		-0.050 (0.124)		0.216 (0.341)
Death parents i.l.		-0.057 (0.125)		-0.117 (0.121)		0.161 (0.354)
Death sibling		0.016 (0.124)		-0.100 (0.113)		0.229 (0.320)
Death sibling i.l.		0.041 (0.179)		0.072 (0.147)		-0.051 (0.608)
Death head		0.062 (0.154)		-0.026 (0.130)		0.421 (0.390)
Disease	0.080** (0.032)	0.081** (0.033)	0.071** (0.033)	0.072** (0.033)	0.141** (0.068)	0.141** (0.068)
Unemployment	-0.051 (0.050)	-0.053 (0.050)	-0.056 (0.048)	-0.058 (0.049)	-0.025 (0.083)	-0.027 (0.083)
Datural disaster	0.024 (0.101)	0.022 (0.102)	0.056 (0.101)	0.052 (0.100)	0.006 (0.169)	-0.011 (0.171)
Crop loss	0.039 (0.086)	0.039 (0.087)	0.001 (0.091)	0.002 (0.091)	0.095 (0.122)	0.101 (0.122)
Production animals	0.016 (0.145)	0.016 (0.146)	-0.023 (0.138)	-0.023 (0.139)	0.025 (0.229)	0.025 (0.230)
Time	0.037** (0.015)	0.038** (0.015)	0.013 (0.015)	0.014 (0.015)	0.102*** (0.034)	0.103*** (0.034)
HH head—age (interaction)	0.0003 (0.003)	0.0002 (0.002)	0.0002 (0.003)	0.001 (0.002)	-0.007 (0.009)	-0.001 (0.005)
HH head—female (interaction)	-0.058 (0.085)	-0.057 (0.080)	-0.028 (0.085)	-0.015 (0.083)	-0.280 (0.220)	-0.230 (0.216)
HH head—worked (interaction)	0.030 (0.092)	0.049 (0.080)	0.017 (0.094)	0.062 (0.082)	-0.113 (0.259)	0.023 (0.232)
HH head education— secondary	0.061	0.072	0.032	0.058	0.094	0.201

Table C.14 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
(interaction)	(0.088)	(0.096)	(0.081)	(0.088)	(0.179)	(0.214)
HH head education— university	0.190	0.211	0.128	0.163	0.246	0.306
(interaction)	(0.156)	(0.161)	(0.140)	(0.142)	(0.231)	(0.239)
Assets	0.017***	0.017***	0.011*	0.010*	0.044***	0.043***
(real)	(0.005)	(0.005)	(0.006)	(0.006)	(0.017)	(0.017)
Income	0.002	0.002	0.002	0.002	0.009	0.009
(real—broad)	(0.002)	(0.002)	(0.002)	(0.002)	(0.006)	(0.006)
Indigenous	0.002	−0.004	0.029	0.025	−0.009	−0.006
(interaction)	(0.079)	(0.079)	(0.073)	(0.073)	(0.256)	(0.260)
Relatives USA	−0.013	−0.018	−0.012	−0.013	−0.227	−0.227
(interaction)	(0.074)	(0.072)	(0.072)	(0.072)	(0.218)	(0.215)
Children	−0.027**	−0.026**	−0.033***	−0.033***	−0.016	−0.016
	(0.011)	(0.011)	(0.011)	(0.011)	(0.020)	(0.020)
Adults	−0.034***	−0.034***	−0.030***	−0.030***	−0.029	−0.029
	(0.011)	(0.011)	(0.010)	(0.010)	(0.021)	(0.022)
Seniors	−0.072**	−0.074**	−0.067**	−0.069**	−0.086	−0.088
	(0.030)	(0.031)	(0.030)	(0.031)	(0.054)	(0.054)
Observations	2120	2120	2120	2120	2120	2120
$R^2$	0.345	0.346	0.340	0.342	0.272	0.271

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

**Table C.15** Robustness check—real income (narrow)

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	0.016 (0.215)		0.013 (0.212)		0.701 (0.623)	
Death spouse		0.040 (0.129)		−0.042 (0.135)		0.171 (0.404)
Death children		0.037 (0.133)		−0.043 (0.113)		0.306 (0.351)
Death parents		−0.033 (0.114)		−0.131 (0.109)		0.165 (0.312)
Death other		0.019 (0.138)		−0.050 (0.124)		0.209 (0.340)
Death parents i.l.		−0.060 (0.124)		−0.118 (0.121)		0.157 (0.355)
Death sibling		0.016 (0.123)		−0.099 (0.112)		0.232 (0.313)
Death sibling i.l.		0.050 (0.184)		0.073 (0.150)		−0.033 (0.613)
Death head		0.065 (0.155)		−0.022 (0.131)		0.431 (0.387)
Disease	0.079** (0.033)	0.080** (0.033)	0.072** (0.033)	0.074** (0.033)	0.141** (0.068)	0.140** (0.069)
Unemployment	−0.053 (0.050)	−0.055 (0.050)	−0.056 (0.048)	−0.059 (0.049)	−0.031 (0.082)	−0.032 (0.083)
Natural disaster	0.025 (0.101)	0.023 (0.101)	0.057 (0.100)	0.053 (0.100)	0.010 (0.167)	−0.005 (0.169)
Crop loss	0.038 (0.086)	0.037 (0.086)	0.003 (0.091)	0.003 (0.092)	0.097 (0.122)	0.103 (0.122)
Production animals	0.028 (0.138)	0.028 (0.138)	−0.028 (0.140)	−0.029 (0.140)	0.043 (0.234)	0.044 (0.235)
Time	0.046* (0.026)	0.047* (0.026)	0.022 (0.024)	0.023 (0.024)	0.159** (0.076)	0.159** (0.076)
HH head—age (interaction)	0.0004 (0.003)	0.0002 (0.002)	0.0002 (0.003)	0.001 (0.002)	−0.007 (0.009)	−0.001 (0.005)
HH head—female (interaction)	−0.055 (0.086)	−0.055 (0.081)	−0.028 (0.085)	−0.017 (0.083)	−0.273 (0.220)	−0.226 (0.217)
HH head—worked (interaction)	0.034 (0.092)	0.051 (0.080)	0.019 (0.094)	0.063 (0.082)	−0.103 (0.258)	0.030 (0.232)
HH head education— secondary	0.060	0.070	0.034	0.059	0.094	0.197

Table C.15 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
(interaction)	(0.090)	(0.097)	(0.081)	(0.088)	(0.181)	(0.215)
HH head education— university	0.193	0.213	0.130	0.165	0.257	0.316
(interaction)	(0.158)	(0.162)	(0.143)	(0.144)	(0.236)	(0.241)
Assets	0.017***	0.017***	0.011*	0.010*	0.044***	0.043***
(real)	(0.005)	(0.006)	(0.006)	(0.006)	(0.017)	(0.017)
Income	0.001	0.001	0.001	0.001	0.007	0.007
(real—narrow)	(0.002)	(0.002)	(0.002)	(0.002)	(0.007)	(0.007)
Inheritance	0.004	0.004	−0.001	−0.002	0.007	0.007
(real)	(0.004)	(0.004)	(0.004)	(0.004)	(0.008)	(0.008)
Indigenous	−0.003	−0.009	0.028	0.024	−0.021	−0.019
(indigenous)	(0.080)	(0.080)	(0.073)	(0.073)	(0.254)	(0.258)
Relatives USA	−0.017	−0.022	−0.011	−0.012	−0.232	−0.234
(interaction)	(0.074)	(0.073)	(0.072)	(0.072)	(0.218)	(0.215)
Children	−0.026**	−0.026**	−0.033***	−0.032***	−0.016	−0.016
	(0.011)	(0.011)	(0.011)	(0.011)	(0.020)	(0.020)
Adults	−0.033***	−0.033***	−0.029***	−0.029***	−0.027	−0.027
	(0.010)	(0.011)	(0.010)	(0.010)	(0.021)	(0.021)
Seniors	−0.071**	−0.073**	−0.067**	−0.068**	−0.081	−0.084
	(0.030)	(0.031)	(0.030)	(0.031)	(0.054)	(0.054)
Observations	2120	2120	2120	2120	2120	2120
$R^2$	0.345	0.346	0.339	0.342	0.270	0.270

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

### 8.3.13 Robustness check—imputation

Tables C.16–C.23

**Table C.16** Robustness check—imputation, baseline model

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	0.003 (0.13)		−0.018 (0.12)		0.078 (0.312)	
Death spouse		−0.043 (0.092)		−0.075 (0.086)		−0.133 (0.227)
Death children		−0.011 (0.099)		−0.043 (0.097)		−0.092 (0.217)
Death parents		−0.01 (0.092)		−0.041 (0.086)		−0.081 (0.186)
Death other		−0.029 (0.09)		−0.076 (0.08)		0.017 (0.216)
Death parents i.l.		−0.064 (0.095)		−0.119 (0.094)		0.086 (0.223)
Death sibling		−0.014 (0.12)		−0.103 (0.122)		0.046 (0.193)
Death sibling i.l.		0.039 (0.107)		0.013 (0.091)		0.036 (0.23)
Death head		0.005 (0.122)		−0.062 (0.105)		0.105 (0.266)
Disease	0.041** (0.019)	0.041** (0.019)	0.029 (0.018)	0.03 (0.018)	0.075** (0.038)	0.073** (0.038)
Unemployment	−0.027 (0.023)	−0.027 (0.023)	−0.041* (0.022)	−0.04* (0.022)	0.005 (0.047)	0.003 (0.047)
Natural disaster	0.042 (0.075)	0.038 (0.075)	0.08 (0.076)	0.079 (0.076)	−0.07 (0.114)	−0.072 (0.116)
Crop loss	−0.027 (0.055)	−0.026 (0.055)	−0.061 (0.055)	−0.059 (0.055)	0.002 (0.096)	−0.001 (0.096)
Production animals	0.019 (0.072)	0.018 (0.072)	−0.024 (0.064)	−0.026 (0.064)	0.009 (0.117)	0.016 (0.116)
Time	0.037*** (0.008)	0.037*** (0.008)	0.012 (0.008)	0.012 (0.008)	0.115*** (0.019)	0.115*** (0.019)
HH head—age (interaction)	0.00007 (0.002)	0.0004 (0.001)	0.0003 (0.002)	0.001 (0.001)	−0.0002 (0.004)	0.001 (0.003)
HH head—female	−0.005	−0.004	0.004	0.006	−0.112	−0.087

Table C.16 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
(interaction)	(0.045)	(0.046)	(0.043)	(0.044)	(0.11)	(0.111)
HH head—worked	0.035	0.042	0.024	0.039	−0.022	−0.002
(interaction)	(0.054)	(0.048)	(0.051)	(0.045)	(0.149)	(0.129)
HH head education—secondary	0.022	0.025	0.027	0.031	0.019	0.039
(interaction)	(0.054)	(0.054)	(0.051)	(0.052)	(0.104)	(0.102)
HH head education—university	0.03	0.027	0.1	0.096	−0.122	−0.095
(interaction)	(0.085)	(0.085)	(0.091)	(0.09)	(0.195)	(0.2)
Assets	0.019***	0.019***	0.013***	0.013***	0.047***	0.047***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.009)	(0.009)
Indigenous	−0.003	−0.004	−0.003	−0.005	0.055	0.07
(interaction)	(0.059)	(0.06)	(0.058)	(0.059)	(0.123)	(0.123)
Children	−0.032***	−0.032***	−0.033***	−0.033***	−0.019	−0.019
	(0.005)	(0.005)	(0.005)	(0.005)	(0.012)	(0.012)
Adults	−0.036***	−0.036***	−0.036***	−0.036***	−0.027**	−0.028**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.012)	(0.012)
Seniors	−0.059***	−0.059***	−0.059***	−0.059***	−0.035	−0.037
	(0.017)	(0.017)	(0.016)	(0.016)	(0.039)	(0.039)
Observations	6880	6880	6880	6880	6880	6880

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$



**Table C.17** Robustness check—imputation, persistence

	Dependent variable		
	Total consumption (1)	Food consumption (2)	Non-food consumption (3)
Death 1 year	−0.027 (0.08)	−0.1 (0.081)	0.039 (0.168)
Death 2 years	0.017 (0.064)	−0.027 (0.062)	0.045 (0.151)
Death 3 years	−0.027 (0.068)	−0.034 (0.065)	−0.035 (0.171)
Death 4 years	0.06 (0.075)	0.058 (0.072)	0.042 (0.18)
Death 5 years	−0.071 (0.077)	−0.106 (0.081)	−0.007 (0.167)
Death 6 years	−0.104 (0.19)	−0.064 (0.19)	−0.232 (0.195)
Death 7 years	0.158** (0.074)	0.144** (0.072)	0.049 (0.169)
Disease	0.041** (0.019)	0.028 (0.018)	0.076** (0.038)
Unemployment	−0.027 (0.023)	−0.042* (0.022)	0.005 (0.047)
Natural disaster	0.043 (0.073)	0.083 (0.073)	−0.073 (0.113)
Crop loss	−0.026 (0.055)	−0.06 (0.054)	0.003 (0.095)
Production animals	0.024 (0.072)	−0.021 (0.064)	0.016 (0.119)
Time	0.038*** (0.008)	0.013* (0.008)	0.116*** (0.019)
HH head—age (interaction)	0.0001 (0.001)	0.001 (0.001)	0.0004 (0.002)
HH head—female (interaction)	−0.002 (0.041)	0.007 (0.04)	−0.105 (0.103)
HH head— worked (interaction)	0.035 (0.046)	0.029 (0.044)	−0.005 (0.121)
HH head education— secondary (interaction)	0.03 (0.05)	0.03 (0.048)	0.045 (0.101)
	0.031	0.103	−0.113

Table C.17 continued

	Dependent variable		
	Total consumption (1)	Food consumption (2)	Non-food consumption (3)
HH head education— university (interaction)	(0.084)	(0.091)	(0.198)
Assets	0.019*** (0.004)	0.013*** (0.003)	0.048*** (0.009)
Indigenous (interaction)	0.004 (0.06)	−0.001 (0.058)	0.063 (0.124)
Children	−0.031*** (0.006)	−0.033*** (0.005)	−0.018 (0.012)
Adults	−0.035*** (0.005)	−0.035*** (0.005)	−0.026** (0.012)
Seniors	−0.058*** (0.017)	−0.059*** (0.016)	−0.036 (0.038)
Observations	6880	6880	6880

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

**Table C.18** Robustness check—imputation, below-median income households

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	0.065 (0.183)		0.046 (0.17)		-0.124 (0.407)	
Death spouse		-0.051 (0.124)		-0.072 (0.119)		-0.172 (0.339)
Death children		0.026 (0.141)		0.031 (0.123)		-0.179 (0.358)
Death parents		0.016 (0.129)		-0.026 (0.123)		-0.122 (0.275)
Death other		-0.063 (0.122)		-0.119 (0.108)		-0.111 (0.322)
Death parents i.l.		-0.097 (0.125)		-0.145 (0.135)		-0.096 (0.277)
Death sibling		-0.099 (0.16)		-0.136 (0.19)		-0.147 (0.269)
Death sibling i.l.		0.116 (0.108)		0.123 (0.101)		-0.027 (0.36)
Death head		0.052 (0.153)		-0.028 (0.147)		0.212 (0.337)
Disease	0.039 (0.028)	0.039 (0.028)	0.021 (0.027)	0.022 (0.027)	0.082 (0.059)	0.08 (0.06)
Unemployment	-0.027 (0.036)	-0.024 (0.037)	-0.05 (0.034)	-0.047 (0.034)	0.023 (0.08)	0.024 (0.081)
Natural disaster	0.092 (0.103)	0.09 (0.101)	0.121 (0.11)	0.117 (0.107)	0.009 (0.157)	0.014 (0.157)
Crop loss	-0.118* (0.066)	-0.114* (0.066)	-0.13* (0.069)	-0.125* (0.069)	-0.159 (0.124)	-0.16 (0.124)
Production animals	0.019 (0.095)	0.018 (0.096)	-0.047 (0.083)	-0.048 (0.083)	0.021 (0.161)	0.022 (0.161)
Time	0.035*** (0.012)	0.035*** (0.012)	0.013 (0.012)	0.013 (0.012)	0.123*** (0.029)	0.123*** (0.029)
HH head—age (interaction)	-0.001 (0.002)	0.0003 (0.002)	-0.001 (0.002)	0.0005 (0.002)	0.002 (0.006)	0.002 (0.004)
HH head—female (interaction)	-0.004 (0.067)	0.0003 (0.066)	-0.017 (0.068)	-0.003 (0.068)	-0.064 (0.161)	-0.105 (0.156)
HH head—worked (interaction)	0.079 (0.077)	0.115* (0.07)	0.078 (0.074)	0.123* (0.066)	0.161 (0.187)	0.176 (0.175)
HH head education— secondary	-0.014	-0.013	0.016	0.021	-0.014	-0.024

Table C.18 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
(interaction)	(0.076)	(0.077)	(0.069)	(0.07)	(0.15)	(0.161)
HH head education— university	−0.168	−0.173	−0.149	−0.152	−0.444	−0.457
(interaction)	(0.146)	(0.138)	(0.118)	(0.109)	(0.422)	(0.428)
Assets	0.021***	0.021***	0.015***	0.015***	0.052***	0.052***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.012)	(0.012)
Indigenous	−0.034	−0.048	−0.03	−0.048	−0.059	−0.058
(interaction)	(0.079)	(0.081)	(0.079)	(0.081)	(0.166)	(0.165)
Children	−0.029***	−0.029***	−0.031***	−0.031***	−0.025	−0.025
	(0.008)	(0.008)	(0.007)	(0.007)	(0.017)	(0.017)
Adults	−0.032***	−0.032***	−0.035***	−0.035***	−0.014	−0.015
	(0.007)	(0.007)	(0.007)	(0.007)	(0.018)	(0.018)
Seniors	−0.057**	−0.056**	−0.054**	−0.054**	−0.038	−0.035
	(0.023)	(0.023)	(0.023)	(0.023)	(0.057)	(0.057)
Observations	3440	3440	3440	3440	3440	3440

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

**Table C.19** Robustness check—imputation, above-median income households

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	−0.056 (0.18)		−0.062 (0.164)		0.355 (0.457)	
Death spouse		−0.031 (0.133)		−0.067 (0.112)		−0.092 (0.298)
Death children		−0.053 (0.135)		−0.12 (0.131)		−0.023 (0.258)
Death parents		−0.032 (0.123)		−0.04 (0.108)		−0.028 (0.248)
Death other		0.012 (0.127)		−0.015 (0.106)		0.162 (0.289)
Death parents i.l.		−0.014 (0.13)		−0.067 (0.111)		0.303 (0.353)
Death sibling		0.054 (0.162)		−0.087 (0.113)		0.192 (0.269)
Death sibling i.l.		0.015 (0.179)		−0.014 (0.134)		0.201 (0.365)
Death head		−0.044 (0.195)		−0.073 (0.144)		−0.015 (0.438)
Disease	0.044* (0.026)	0.043* (0.026)	0.037 (0.025)	0.036 (0.025)	0.067 (0.051)	0.067 (0.051)
Unemployment	−0.025 (0.031)	−0.025 (0.031)	−0.032 (0.03)	−0.031 (0.03)	−0.001 (0.056)	−0.006 (0.057)
Natural disaster	−0.045 (0.105)	−0.046 (0.106)	0.004 (0.093)	0.007 (0.096)	−0.205 (0.169)	−0.201 (0.171)
Crop loss	0.121 (0.088)	0.12 (0.088)	0.052 (0.083)	0.05 (0.083)	0.265** (0.133)	0.264** (0.131)
Production animals	0.004 (0.106)	0.005 (0.105)	−0.008 (0.096)	−0.008 (0.096)	−0.028 (0.167)	−0.011 (0.165)
Time	0.037*** (0.012)	0.037*** (0.012)	0.01 (0.011)	0.01 (0.011)	0.104*** (0.025)	0.105*** (0.025)
HH head—age (interaction)	0.001 (0.003)	0.001 (0.002)	0.001 (0.002)	0.002 (0.002)	−0.004 (0.006)	0.0003 (0.004)
HH head—female (interaction)	−0.007 (0.061)	−0.002 (0.063)	0.028 (0.053)	0.03 (0.055)	−0.16 (0.146)	−0.059 (0.166)
HH head—worked (interaction)	−0.021 (0.074)	−0.032 (0.065)	−0.049 (0.07)	−0.057 (0.061)	−0.226 (0.225)	−0.171 (0.183)
HH head education— secondary (interaction)	0.067 (0.075)	0.059 (0.074)	0.045 (0.071)	0.038 (0.072)	0.061 (0.146)	0.094 (0.136)

Table C.19 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
HH head education— university	0.156	0.153	0.257**	0.256**	0.107	0.155
(interaction)	(0.101)	(0.099)	(0.112)	(0.11)	(0.169)	(0.175)
Assets	0.016***	0.016***	0.01***	0.01***	0.042***	0.042***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.013)	(0.013)
Indigenous	0.027	0.031	0.025	0.035	0.166	0.208
(interaction)	(0.08)	(0.079)	(0.073)	(0.074)	(0.161)	(0.164)
Children	−0.035***	−0.035***	−0.035***	−0.035***	−0.011	−0.012
	(0.008)	(0.008)	(0.007)	(0.007)	(0.018)	(0.018)
Adults	−0.04***	−0.04***	−0.036***	−0.036***	−0.042***	−0.043***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.016)	(0.016)
Seniors	−0.061***	−0.062***	−0.066***	−0.065***	−0.031	−0.034
	(0.024)	(0.024)	(0.023)	(0.023)	(0.052)	(0.052)
Observations	3440	3440	3440	3440	3440	3440

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

**Table C.20** Robustness check—imputation, households in the first quartile

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	0.143 (0.244)		0.027 (0.219)		0.104 (0.575)	
Death spouse		0.147 (0.186)		0.118 (0.176)		-0.079 (0.534)
Death children		0.323 (0.216)		0.275 (0.185)		0.146 (0.584)
Death parents		0.149 (0.167)		0.104 (0.164)		-0.043 (0.447)
Death other		0.037 (0.179)		-0.074 (0.148)		-0.139 (0.532)
Death parents i.l.		0.037 (0.161)		-0.022 (0.177)		-0.051 (0.448)
Death sibling		0.134 (0.153)		0.129 (0.178)		-0.101 (0.433)
Death sibling i.l.		0.066 (0.137)		-0.087 (0.122)		0.224 (0.452)
Death head		0.275 (0.208)		0.135 (0.192)		0.554 (0.513)
Disease	0.04 (0.036)	0.039 (0.037)	0.027 (0.035)	0.028 (0.035)	0.048 (0.09)	0.036 (0.092)
Unemployment	-0.002 (0.049)	0.002 (0.05)	-0.031 (0.047)	-0.024 (0.048)	0.095 (0.126)	0.098 (0.127)
Natural disaster	0.214 (0.133)	0.217 (0.135)	0.271* (0.141)	0.281* (0.145)	0.025 (0.201)	0.02 (0.204)
Crop loss	-0.152 (0.101)	-0.149 (0.102)	-0.191* (0.109)	-0.185* (0.11)	-0.096 (0.144)	-0.099 (0.147)
Production animals	-0.1 (0.114)	-0.1 (0.114)	-0.112 (0.113)	-0.111 (0.114)	-0.191 (0.193)	-0.186 (0.195)
Time	0.022 (0.017)	0.023 (0.017)	-0.002 (0.016)	-0.0004 (0.016)	0.099** (0.042)	0.103** (0.042)
HH head—age (interaction)	-0.002 (0.003)	-0.002 (0.002)	-0.0003 (0.003)	-0.001 (0.002)	0.002 (0.009)	0.003 (0.008)
HH head—female (interaction)	-0.007 (0.09)	-0.01 (0.079)	0.023 (0.094)	0.017 (0.088)	-0.16 (0.246)	-0.198 (0.223)
HH head—worked (interaction)	0.002 (0.113)	0.011 (0.1)	0.022 (0.11)	0.013 (0.092)	-0.022 (0.27)	0.04 (0.256)
HH head education— secondary	0.069	0.086	0.049	0.06	0.183	0.208

Table C.20 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
(interaction)	(0.097)	(0.092)	(0.086)	(0.083)	(0.192)	(0.193)
HH head education— university	−0.021	−0.021	−0.03	−0.053	−0.058	−0.045
(interaction)	(0.183)	(0.156)	(0.156)	(0.147)	(0.267)	(0.254)
Assets	0.022***	0.022***	0.016**	0.016**	0.059***	0.059***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.017)	(0.017)
Indigenous	−0.064	−0.097	−0.069	−0.097	−0.163	−0.232
(interaction)	(0.093)	(0.098)	(0.092)	(0.097)	(0.243)	(0.242)
Children	−0.023**	−0.023**	−0.024***	−0.023**	−0.029	−0.03
	(0.01)	(0.01)	(0.009)	(0.009)	(0.024)	(0.024)
Adults	−0.027***	−0.027***	−0.033***	−0.033***	−0.011	−0.011
	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)	(0.03)
Seniors	−0.055*	−0.057*	−0.059*	−0.063*	−0.001	−0.003
	(0.032)	(0.033)	(0.034)	(0.034)	(0.081)	(0.084)
Observations	1720	1720	1720	1720	1720	1720

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

Table C.21 Robustness check—imputation, households in the second quartile

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	0.056		0.088		−0.147	
	(0.265)		(0.26)		(0.519)	
Death spouse		−0.163		−0.191		−0.117
		(0.15)		(0.146)		(0.381)
Death children		−0.135		−0.105		−0.28
		(0.158)		(0.138)		(0.374)
Death parents		−0.05		−0.098		−0.13
		(0.202)		(0.188)		(0.34)
Death other		−0.102		−0.121		0.055
		(0.157)		(0.141)		(0.38)
Death parents i.l.		−0.191		−0.227		−0.114
		(0.162)		(0.172)		(0.333)
Death sibling		−0.296		−0.366		−0.252
		(0.218)		(0.272)		(0.329)



Table C.21 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death sibling i.l.		0.103 (0.192)		0.135 (0.142)		-0.068 (0.507)
Death head		-0.071 (0.22)		-0.097 (0.242)		0.073 (0.374)
Disease	0.027 (0.043)	0.028 (0.043)	0.011 (0.041)	0.012 (0.041)	0.09 (0.076)	0.092 (0.076)
Unemployment	-0.048 (0.053)	-0.046 (0.054)	-0.06 (0.05)	-0.059 (0.05)	-0.053 (0.094)	-0.053 (0.096)
Natural disaster	-0.125 (0.159)	-0.094 (0.135)	-0.158 (0.179)	-0.124 (0.138)	-0.02 (0.257)	0.017 (0.263)
Crop loss	-0.052 (0.085)	-0.049 (0.085)	-0.035 (0.081)	-0.028 (0.081)	-0.179 (0.211)	-0.189 (0.213)
Production animals	0.216 (0.146)	0.207 (0.151)	0.057 (0.11)	0.051 (0.115)	0.365 (0.239)	0.365 (0.241)
Time	0.048*** (0.017)	0.047*** (0.017)	0.027 (0.017)	0.026 (0.017)	0.147*** (0.039)	0.144*** (0.039)
HH head—age (interaction)	-0.001 (0.004)	0.001 (0.002)	-0.002 (0.004)	0.001 (0.002)	-0.0005 (0.007)	-0.001 (0.004)
HH head—female (interaction)	0.017 (0.091)	0.026 (0.104)	-0.033 (0.086)	-0.009 (0.097)	0.087 (0.201)	0.049 (0.22)
HH head—worked (interaction)	0.139 (0.1)	0.204** (0.098)	0.13 (0.098)	0.218** (0.095)	0.314 (0.234)	0.326 (0.218)
HH head education—secondary (interaction)	-0.121 (0.116)	-0.121 (0.124)	-0.028 (0.108)	-0.013 (0.113)	-0.284 (0.23)	-0.299 (0.264)
HH head education—university (interaction)	-0.328 (0.208)	-0.363* (0.187)	-0.279* (0.164)	-0.3** (0.139)	-0.879 (0.796)	-0.941 (0.828)
Assets	0.019** (0.007)	0.019** (0.007)	0.013* (0.007)	0.013* (0.007)	0.043** (0.018)	0.043** (0.018)
Indigenous (interaction)	0.003 (0.138)	-0.002 (0.137)	0.024 (0.134)	0.015 (0.133)	0.08 (0.223)	0.134 (0.23)
Children	-0.034*** (0.012)	-0.035*** (0.012)	-0.037*** (0.011)	-0.038*** (0.012)	-0.022 (0.024)	-0.021 (0.024)
Adults	-0.035*** (0.01)	-0.036*** (0.01)	-0.036*** (0.009)	-0.036*** (0.009)	-0.012 (0.021)	-0.014 (0.021)
Seniors	-0.054 (0.034)	-0.055* (0.033)	-0.043 (0.032)	-0.046 (0.032)	-0.065 (0.078)	-0.059 (0.079)
Observations	1720	1720	1720	1720	1720	1720

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

**Table C.22** Robustness check—imputation, households in the third quartile

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	−0.228 (0.224)		−0.224 (0.209)		−0.176 (0.468)	
Death spouse		−0.087 (0.191)		−0.114 (0.182)		−0.19 (0.406)
Death children		−0.187 (0.22)		−0.289 (0.221)		−0.25 (0.389)
Death parents		−0.129 (0.179)		−0.104 (0.172)		−0.248 (0.332)
Death other		−0.0002 (0.185)		−0.056 (0.183)		0.209 (0.428)
Death parents i.l.		−0.022 (0.194)		−0.064 (0.179)		−0.016 (0.349)
Death sibling		−0.1 (0.209)		−0.2 (0.171)		−0.075 (0.368)
Death sibling i.l.		0.071 (0.351)		−0.086 (0.235)		0.291 (0.636)
Death head		−0.226 (0.266)		−0.243 (0.245)		−0.416 (0.552)
Disease	0.049 (0.035)	0.048 (0.035)	0.054 (0.033)	0.055* (0.033)	0.07 (0.077)	0.067 (0.078)
Unemployment	−0.004 (0.043)	−0.002 (0.042)	0.001 (0.04)	0.004 (0.04)	−0.015 (0.071)	−0.011 (0.07)
Natural disaster	−0.1 (0.144)	−0.097 (0.147)	−0.034 (0.135)	−0.022 (0.137)	−0.297 (0.199)	−0.312 (0.208)
Crop loss	0.131 (0.113)	0.117 (0.11)	0.067 (0.109)	0.054 (0.109)	0.237* (0.137)	0.218 (0.134)
Production animals	−0.09 (0.146)	−0.082 (0.141)	−0.034 (0.135)	−0.031 (0.132)	−0.193 (0.22)	−0.172 (0.219)
Time	0.016 (0.016)	0.015 (0.016)	−0.005 (0.015)	−0.005 (0.015)	0.084** (0.036)	0.083** (0.037)
HH head—age (interaction)	0.005 (0.003)	0.003 (0.003)	0.005 (0.003)	0.003 (0.002)	0.005 (0.007)	0.004 (0.005)
HH head—female (interaction)	0.009 (0.082)	0.03 (0.082)	0.005 (0.079)	0.016 (0.076)	−0.039 (0.176)	0.069 (0.225)
HH head—worked (interaction)	−0.037 (0.093)	−0.072 (0.093)	−0.066 (0.099)	−0.096 (0.098)	−0.1 (0.193)	−0.122 (0.188)
HH head education— secondary	0.081	0.029	0.056	0.011	0.074	0.003

**Table C.22** continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
(interaction)	(0.114)	(0.106)	(0.116)	(0.111)	(0.185)	(0.174)
HH head education—university	0.261	0.234	0.511	0.465	0.195	0.17
(interaction)	(0.203)	(0.242)	(0.36)	(0.325)	(0.307)	(0.388)
Assets	0.012**	0.012**	0.007	0.007	0.034**	0.035**
	(0.005)	(0.005)	(0.004)	(0.004)	(0.015)	(0.015)
Indigenous	−0.027	0.006	−0.051	−0.004	0.027	0.099
(interaction)	(0.096)	(0.094)	(0.088)	(0.094)	(0.193)	(0.175)
Children	−0.034***	−0.035***	−0.035***	−0.035***	−0.008	−0.008
	(0.01)	(0.011)	(0.01)	(0.01)	(0.023)	(0.023)
Adults	−0.036***	−0.037***	−0.033***	−0.034***	−0.032	−0.032
	(0.01)	(0.01)	(0.01)	(0.01)	(0.021)	(0.021)
Seniors	−0.054	−0.056	−0.06*	−0.058*	−0.026	−0.034
	(0.034)	(0.035)	(0.032)	(0.033)	(0.064)	(0.066)
Observations	1720	1720	1720	1720	1720	1720

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

**Table C.23** Robustness check—imputation, households in the fourth quartile

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death	0.181		0.191		1.014	
	(0.324)		(0.285)		(0.903)	
Death spouse		0.002		−0.013		−0.233
		(0.206)		(0.179)		(0.498)
Death children		0.06		0.07		0.035
		(0.189)		(0.177)		(0.364)
Death parents		0.031		0.021		−0.018
		(0.189)		(0.161)		(0.389)
Death other		0.002		0.018		−0.038
		(0.186)		(0.151)		(0.369)
Death parents i.l.		−0.035		−0.077		0.454
		(0.183)		(0.156)		(0.52)
Death sibling		0.329		0.163		0.411
		(0.293)		(0.189)		(0.438)

Table C.23 continued

	Dependent variable					
	Total consumption		Food consumption		Non-food consumption	
	(1)	(2)	(3)	(4)	(5)	(6)
Death sibling i.l.		0.058 (0.244)		0.09 (0.221)		0.228 (0.523)
Death head		0.092 (0.301)		0.054 (0.195)		0.144 (0.704)
Disease	0.032 (0.038)	0.035 (0.038)	0.013 (0.039)	0.016 (0.04)	0.054 (0.067)	0.065 (0.068)
Unemployment	-0.04 (0.046)	-0.041 (0.046)	-0.068 (0.046)	-0.071 (0.047)	0.031 (0.092)	0.032 (0.094)
Natural disaster	0.054 (0.123)	0.057 (0.125)	0.071 (0.116)	0.072 (0.117)	-0.009 (0.221)	0.028 (0.225)
Crop loss	0.117 (0.134)	0.119 (0.136)	0.038 (0.128)	0.038 (0.129)	0.344 (0.225)	0.36 (0.231)
Production animals	0.098 (0.148)	0.096 (0.149)	0.016 (0.14)	0.014 (0.141)	0.128 (0.239)	0.122 (0.243)
Time	0.06*** (0.017)	0.06*** (0.017)	0.025 (0.016)	0.026 (0.016)	0.127*** (0.035)	0.129*** (0.036)
HH head—age (interaction)	-0.003 (0.004)	-0.001 (0.003)	-0.003 (0.004)	-0.001 (0.002)	-0.015 (0.012)	-0.002 (0.006)
HH head—female (interaction)	-0.029 (0.087)	-0.006 (0.096)	0.053 (0.071)	0.075 (0.084)	-0.268 (0.218)	-0.098 (0.267)
HH head—worked (interaction)	-0.021 (0.125)	0.028 (0.099)	-0.057 (0.112)	-0.009 (0.089)	-0.407 (0.445)	-0.198 (0.324)
HH head education—secondary (interaction)	0.039 (0.106)	0.058 (0.105)	-0.003 (0.086)	0.028 (0.083)	0.068 (0.232)	0.2 (0.24)
HH head education—university (interaction)	0.113 (0.117)	0.104 (0.122)	0.15 (0.101)	0.145 (0.11)	0.171 (0.231)	0.292 (0.272)
Assets	0.022*** (0.007)	0.022*** (0.007)	0.014** (0.006)	0.014** (0.006)	0.054*** (0.02)	0.052** (0.02)
Indigenous (interaction)	0.076 (0.136)	0.102 (0.141)	0.141 (0.121)	0.16 (0.119)	0.242 (0.3)	0.356 (0.319)
Children	-0.036*** (0.011)	-0.035*** (0.011)	-0.035*** (0.011)	-0.034*** (0.011)	-0.014 (0.028)	-0.015 (0.028)
Adults	-0.043*** (0.012)	-0.043*** (0.013)	-0.038*** (0.012)	-0.038*** (0.012)	-0.05*** (0.025)	-0.055** (0.023)
Seniors	-0.069** (0.033)	-0.071** (0.033)	-0.065* (0.034)	-0.067* (0.035)	-0.029 (0.084)	-0.046 (0.079)
Observations	1720	1720	1720	1720	1720	1720

\* $p < 0.1$ ; \*\* $p < 0.05$ ; \*\*\* $p < 0.01$

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