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Abstract

This study examines the effects of survivor benefits on widowed women's' health status and wealth using the Income and Living Conditions Survey (ILCS) in Turkey during the period 2006-2012. A structural Equation Modelling (SEM) is applied, where the causal assumptions from survivor benefits on health and wealth are tested. The results show that those who claim the survivor benefits report a higher health status level by 0.11 units the scale from 1 to 5 than widowed mothers that do not receive the benefits. Examining the sample of those who receive the survivor benefits, a 1 per cent increase in the survivor benefits results to a 2 per cent reduction in poverty.

Keywords: Health Status; Poverty; Structural Equation Modelling; Survivor Benefits; Widowed mothers

1. Introduction

Survivors' benefits are cash payments made by government to family members when a worker dies. His or her spouse and unmarried children are entitled to receive these cash benefits. The payments are intended to help ease the financial strain caused by the loss of the worker's income. Survivors can receive benefits if the dead partner was employed and contributed to Social Security long enough to be considered insured. Although these benefits aim to help single-head households who are in financial difficulties due to the loss of an additional household income, the partner, and especially the woman, has generally serious challenges to face, such as work both at labour market and home, including childrearing and house chores. Widows across the world therefore share two common experiences: a loss of social status and reduced economic circumstances. Prior research suggests that widowhood is much more common experience among women than men. Moreover, it is more likely to cause financial difficulties for women than for men, and financial strain reduces well-being of women. Single-mother households are poorer than two-parent households due to the challenges of balancing paid work and family obligations alone. Although there are publicly provided survivors' benefits to the single-mother households, only a single source of income categorize these households under low-income families and those cash benefits would not be enough to promote better health and socio-economic status to family members of those households.

In Turkey, the first law for survivor benefits is passed in 1957 with old-aged and disability benefits. The qualifying conditions for survivor benefits is not the same for everybody in Turkey, regarding whether the dead parent or spouse was public, private of self-employed. The partners whose the deceased spouses met the contribution requirements for a disability pension or an old-aged pension or was insured for at least 5 years and had paid contributions for a total of 900 days is eligible for survivor benefits. For civil servants and self-employed people, the total number of these required days is 1,800 instead of 900. The spouse's survivor pension ceases on remarriage. Survivors are eligible to receive only one survivor pension, but if they are wage earners they can keep their salaries while taking the pension of their deceased spouse as well. Moreover starting from 2014, a new law for the uninsured widows is passed to cover them under social security system as well. A fixed amount of 250 Turkish Liras are paid to widows who do not receive survivor benefits.

Using the Cross-Sectional Income and Living Conditions Survey of Turkey (2006-2012), this is the first study that empirically analyses the effect of survivors' benefits on health status of widowed women and the poverty indicators of single-mother households. In order to do that, a structural equation modelling (SEM) that relates the components of heath measures and household financial capacity and properties is formulated. The impossibility or difficulty to measure abstract variables, such as the health status and wealth is recognised. Thus, the strategy is to treat them as latent variables, controlling for confounding effects as measurement errors. A significant effect from survivor benefits to health and wealth of the household is found. Those who receive the survivor benefits report higher health status level by 0.11 units measured in a scale from 1 to 5, than widowed mothers that do not receive the benefits. Regarding the sample of the survivors the amount of benefits improves the health status by 0.12 units and it reduces poverty by 0.5 units in a scale ranging between -7 and 4, resulting to a poverty reduction at 2 per cent.

The structure of the paper has as follows: In the next section a brief literature review on the previous empirical researches on the poverty and health effects of survivor benefits is discussed. In section 3 the data and variables are presented and in section 4 the methodology followed is described. In section 5 the empirical results are reported and finally in the last section the concluding remarks are discussed.

2. Literature Review

The literature on Survivor Benefits and Poverty outcomes is mainly based on US case studies. For being the first study on the effect of survivor benefits in Turkey, we believe that this study will make a significant contribution with a Turkish case study to the existing literature. Myers et al. (1987) is one of the novel studies on the survivor benefits and poverty outcomes and they found that, on average women have higher levels of poverty as widows than when they were married. However the simulations that the authors employed reveals the advantages of joint benefits option for the widowed. Once they assume all married men chose the joint-and-survivor option even though they actually chose the single life annuity, the mean income and poverty rates of widows are improved. However, more recent studies show that survivor benefits in US apparently is not as effective in preventing poverty among elderly women after the death of a spouse or divorce (Burkhauser et al., 1994). To reduce poverty among widows, some scholars proposed that survivor benefits should be increased by lowering the spouse benefits of married women during the time of high poverty risk for widowed women (Iams and Sandell 1998).

Regarding the health status, relevant literature suggests that the widows and their children are generally in poorer health, have less opportunity to use physician services and spend more on health care compared with the general population (Springer, 1984). Moreover the loss of the spouse, and especially for the women, is one of the most intensive, negative and dramatic events that a person can live, next to the loss of a child (Bennett et al*.,* 2005).

As a financial contribution and a part of personal income, it is expected that survivor benefits will be effective on health outcomes. Among studies on the determinants of health, several studies found a strong relationship between income and health status. On average, individuals, who are in most advantaged social groups in terms of high-income level, are healthier. In other words, financial strain and vulnerability to the life events may affect health (Kessler et al., 1988). However, some types of social security benefits delivered to the people can buffer the adverse effects on health (Kessler et al., 1988; Rodriguez 2001). This is actually the main concern of our study; however, none of the previous literature analysed the effect of survivor benefits which will be one of the significant contributions of this study.

3. Data description and variables

The main data used in this study have been derived from the Income and Living Conditions Survey (ILCS) cross-sectional survey which took place during the period 2006-2012. The annual sampling size is around 13,000 households. Considering our dataset based on variety of variables the number of women who are the beneficiary of Survivor Benefits are 6,721 out of 11, 390 women. Namely, 59.01 per cent of the whole sample receives survivor benefits.

Table 1 presents a number of descriptive statistics of the widowed women. The principal health outcome is the self-assessed health (SAH) defined by a response to the question "What is your general health status; very good/good/fair/bad/very bad?" In order to give meaningful interpretations in the coefficients the health status variable is re-ordered from 1 (very bad health status) to 5 (very good health status). Figure 1 presents the percentage of each health status levels for widowed women who are receipting and not receipting survivor benefits respectively. The number of survivor benefits beneficiaries who report very good health status is higher than the respective widowed women who also report very good health status but they do not receive any benefit. Contrarious applies for women who report very bad health status as well.

(Insert figure 1)
(Insert table 1)

Based on the data, this study examines the poverty using deprivation indicators. Deprivation indicators that measure relative poverty have been introduced by Townsend (1979), as poverty cannot be measured only by the income. However, other possible poverty indices can include expenditures of food, clothing, health and other categories as a share of the income. Nevertheless, the dataset does not allows us to explore these alternative indices. Moreover, Income and household expenditures can be problematic as there might be measurement error, because the respondents do not always reveal the true information or they do not remember the exact amount for the expenditures. Townsend (1979) made a list of items and activities that every household should have them. He counted as poor those lacking three or more items, without considering which item. His work has been criticised because he did not distinguish whether respondents could not afford to have these items or simply they did not want them. In addition, another important point of criticism is the selection of the specific threshold, which is three or more items, as well as, the qualitative basket of items. More specifically, let us consider a household which has the following three items, according to Townsend (1979): telephone, coloured TV and washing machine, while the second household has the following items: car, coloured TV and washing machine. Thus, someone could argue that the second household is wealthier as both households have exactly the same items; the coloured TV and washing machine, while the second household has a car instead of a telephone, which the former is definitely more expensive. Therefore, there is no weight on the items in the methodology proposed by Townsend (1979). Guio proposed more indicators (see for more details Guio, 2009), which are set in three categories. The first category includes situations that a household cannot afford, such as to face unexpected expenses, one week annual holiday away from home, to pay for arrears on mortgage, loan or rent, to pay for arrears on utility bills, to pay for arrears on hire purchase instalments or credit cards a meal with meat, chicken or fish every second day and to keep home adequately warm. The second set is consisted of durable items and the households could not afford -if they wanted to have, washing machine, a coloured TV, a telephone and a personal car.

However, in this study a poverty-deprivation index is constructed using factor analysis and considering more items as the old indices may be outdated. More specifically, the new items proposed are: mobile phone, piped water and hot water in the dwelling, computer, internet, refrigerator, dishwater and air conditioner. Thus, nowadays, it may be more important to possess mobile phone, computer and internet, instead of coloured TV and landline telephone as it was in the past. Then the third and the last set consists of five housing indicators which are: leaking roof, dark rooms, shortage of space, no bath or shower, no indoor flushing toilet for sole use of the household and spending more than 40 per cent of income net on housing costs (Guio, 2009). The wealth index can take negative values, indicating low wealth levels and positive values, where higher values are equivalent to higher level of wealth. Figure 2 depicts a positive relationship between wealth index and the survivor benefits. However these explanations are not particularly enough to make predictions for a positive relationship without controlling for the possible determinants of wealth.

(Insert figure 2)

4. Methodology

4.1 Heckman Selection Model

In this section the Heckman selection model (Heckman 1979) is described. The main reason of using the Heckman selection model is to test whether there is a selection bias in our sample, where the treatment variable is a dummy indicating whether the household receives survivor benefits or not. The source of selection bias is coming from the selective way that the distribution of the respondents over the categories of the independent variables takes place. For instance, if we are interested to examine the effects of whether someone has migrated in the past or not on income we might get biased estimates if the distribution of respondents over the categories of migrants and non-migrants is not random. Thus, if there are characteristics that affect peoples' decision to migrate and these are related to income then the coefficient of the migration dummy may be biased. Similarly, for the individuals who decide whether or not to have health insurance and claim the survivor benefit. However, the eligibility of taking claiming these survivor benefits cannot be always endogenous as the choice and eligibility depends mainly on the total hours or years worked.

Heckman model consists of two processes which can be described by two equations, the "selection" equation and the "observation" equation. Initially, the Heckman model as it has been employed is the original study by Heckman is estimated (see Heckman 1979 for more details). Then in the second step an ordered Probit model takes place. It should be noted that in the original study by Heckman (1979) the second stage equation includes a continuous variable (wages). However, in the case examined, health status is a self-reported ordered variable, thus the ordered Probit model is more appropriate

4.2 Structural Equation Modelling (SEM)

4.2.1 General Model of SEM

Structural equation models (SEMs) with latent variables provide a very general framework for modelling of relationships in multivariate data (Bollen 1989). SEM is most commonly applied in studies involving latent variables, such as life satisfaction, happiness and health status and they provide a parsimonious framework for covariance structure modelling. SEM

includes both endogenous and exogenous variables. The endogenous variables are dependent variables in at least one of the SEM equations. These variables are called endogenous because they may act also as independent variables in other equations within the SEM framework. On the other hand, the exogenous variables are treated always as independent variables in the SEM equations.

There are various advantages and benefits of using SEM approach. Firstly, it is possible to study the complex patterns of relationships in a conceptual or theoretical model. Secondly, the measurement of the unobserved or latent variables by observed indicators can be modelled taking into account the effect of the measurement error on the structural relationships. Thirdly, the causal assumptions underlying the theoretical model and the statistical analysis are clear and testable. Fourthly, the graphical representation allows for further understanding of the analysis, while the simultaneous comparison between means, variances and regression coefficients is feasible. Furthermore, SEM provides overall tests of model fit and individual parameter estimate tests simultaneously. One of the first studies by Baron and Kenny (1986) addressed the mediation analysis, which is one of the main characteristics of the SEM, and which mediation assumes both the ordering of the three variables –intervention, mediation and response- and causality. Single regression analysis is unsuitable for such a causal relationship, since variables can be both causes and effects. Thus, SEM provides a more appropriate and flexible framework for examining these causal relationships (Kraemer 2001; MacKinnon and Fairchild 2009).

4.2.2 SEM for Survivor's Benefits and Health Status

In figure 3 the SEM theoretical model is presented. The items chosen for the construction of the poverty-deprivation or wealth index are based on the factor analysis, which is presented in the empirical results section. More specifically, in figure 3 the household belongings *bath, toilet, pipe_water* and *hot_water,* indicate whether there is bath, indoor toilet, piped water system and hot water system in the dwelling or not. The next belongings are *phone* and *wash_m* indicating whether there is telephone and washing machine in the dwelling or not. Variables, *fridge* and *car* indicates whether there is refrigerator and car in the household or not. The variable *leak_prob* indicates whether there are leaking and roof problems in the dwelling, *holiday* and *meat* show respectively if the household can afford to go for holiday and whether they can afford to have a meal in the second day with meat or fish. Variable *warm_home* shows whether the household is able to keep the house warm and *fin_hardship* indicates whether the household has the capacity to face unexpected financial expenses. Variables *diffc_house*, *diffc_bills* and *install* indicate respectively arrears on mortgage, utility bills and hiring purchase instalments. The variables *dark_room* and *no_space* indicate respectively if there is darkness in the rooms and shortage in the space of the dwelling. The variable *fuel_heat* indicates the fuel type for the main heating of the dwelling, while *ratio_hou* indicates whether the household spends more than 40 per cent of the net income on housing. The wealth index can take negative values, indicating low wealth levels and positive values, where higher values are equivalent to higher levels of wealth or equivalently lower levels of poverty.

(Insert figure 3)

Variables *age* and *edu* denote respectively the age and education level. Variables *tenure_st*, *emp* and *num_member* denote respectively the house tenure status, the employment status and the number of family members in the household. *unmet_doctor* is a dummy variable indicating whether the individuals cannot the needs for medical examination or treatment, while *dw_size*

and *expense* denote respectively the dwelling-house size and the average monthly expenses. Variables *heat_prob* and *air_p* are dummies indicating whether there are heating problems because of the insulation in the dwelling and whether there are air pollution and other environmental problems in the neighborhood. Finally, *log_inc* is the natural logarithm of the household income and *urban* is a dummy indicating whether the location of the household is an urban area or not.

Health status is a measurement equation of two factors, *illness* and *limit_act*. The former indicates whether the individual suffers from chronic or long-standing illnesses i.e. diabetes, hypertension, asthma, renal failure, rheumatic diseases and others. The latter variable indicates whether the individual suffers from limitation in daily activities of any physical or psychological-mental health problems for at least the last 6 months. This is important because health status is a latent variable with measurement error; thus using these two variables both physical and mental health problems can be captured at some point. However, it would be even more precise if there were in the survey, questions about activities of daily living (ADL) and instrumental activities of daily living (IADL) including walking, bathing, dressing, toileting, eating, cooking, driving, using the phone, managing medication, shopping and managing finances. Also questions on specific health problems mental and physical would be very useful. In the case examined the observed variables and unobserved constructs are linked by one of two factor equations for observations i=1,…..,N as:

$$x_i = u_x + \Lambda_x \xi_i + \delta_i^x \quad (1)$$

$$y_i = u_y + \Lambda_y \eta_i + \delta_i^y \quad (2)$$

Model (1) relates xs or $x_i=(x_{i1},\ldots\ldots, x_{iq})'$ to an n-vector of latent variables $\xi_i=(\xi_{i1},\ldots\ldots, \xi_{in})'$, $n \leq q$, through the $q \times n$ factor loadings matrix Λ_x. Similarly, model (2) relates the vector of indicators $y_i=(y_{i1},\ldots\ldots, y_{ip})'$ to an m-vector of latent variables $\eta_i=(\eta_{i1},\ldots\ldots, \eta_{im})'$, $m \leq p$, through the $p \times m$ factor loadings matrix Λ_y. The vectors δ_i^x and δ_i^y are the measurement error terms, with dimensions q × 1 and $p \times 1$ respectively, while vectors u_x and u_y are the intercept terms of the measurement models with dimensions q × 1 and $p \times 1$ respectively.

Overall the theoretical model in figure 3 makes various assumptions. Firstly, it includes the possible reciprocal effects among the latent variables examined in this study. More specifically, while wealth can affect health status, there is a possible degree of reverse causality as healthier people can earn more or invest more. However, this reverse causality is not very obvious and it depends on the ordering of the events taking place. The causal and effects linkages in figure 3 cannot be examined and captured by the single econometric modelling, such as OLS and ordered Logit and Probit models. In addition, the traditional econometric modelling does not account for the measurement error, which can be especially important for the health status and wealth-poverty indices that are examined in this study.

The SEM framework when the level of survivor benefits is further considered. The figure is not presented but is very similar with figure 3. The variables remain the same, where the reciprocal effects between health status and wealth (or poverty) are examined. In addition, in this case the reciprocal effects between survivor benefits and health, as well as, between survivor benefits and wealth are not explored, but only the one way causal effects from benefits to wealth and health are investigated. The reason is that in this case only the sample of the households which are eligible for the benefits and they have claimed them, is considered, because the death of the spouse is an exogenous event. In the previous case whether the

household is eligible for the survivor benefits or not was a reason for reverse causality, where for example the richer households may be more likely to be eligible for the benefits.

The last step is to examine and determine the fit of the model and this is based on three goodness-of-fit indices; comparative fit index (CFI) developed by Bentler (1990), the Tucker-Lewis index (TLI) proposed by Tucker and Lewis (1973) and the root mean square error of approximation (RMSEA). The CFI and TLI indices ranges between 0 and 1 and the large they are the better the fit is. According to Bentler (1990) and Hu and Bentler (1999), a CFI and TLI value of greater than 0.90 can be expected for a very good fit to the data. As a rule of thumb, if the value of RMSEA is lower than 0.05 indicates a good fit, values between 0.05-0.08 suggest acceptable fit, while values higher than 0.10 imply poor model fit (Hancock and Mueller 2006). The last index is the root mean square residual (RMSR), which is a measure of the mean absolute value of the covariance residuals. Generally, values less than 0.1 indicate favourable estimates.

5. Empirical Results

5.1 Heckman selection model

The results of Heckman Ordered Probit selection model in table 2 are reported. This model is estimated to test whether the distribution of the independent variables for the treatment (survivor benefits claimants) and the non-treated (non-survivor benefits claimants) is randomly chosen or distributed. In column (1) the observation-health status equation estimates are reported, where the dependent variable is the ordered health status. In the second column (2) the selection equation estimates are presented and in this case the dependent variable is the dummy variable indicating whether the household receives survivor benefits or not.

(Enter table 2)

The Wald test and its p-value indicate a good model fit. Based on the likelihood-ratio test, which is equal at 0.071 and its p-value is equal at 0.5345, the null hypothesis that the errors for outcome and selection are uncorrelated is accepted. In other words, the test suggests that there is no selection bias. The ρ is positive and equal at 0.032, but it is statistically insignificant, and therefore zero, indicating that there are not unobservables that co-occur with the improvement of the health status and the claiming of the specific social benefit. This is confirmed by the fact that the treatment and control groups examined in this study are well chosen. More specifically, both groups share very similar socio-economic and household characteristics, but in the control group widow women are uninsured and not eligible for the survivor benefits. In addition, the endogeneity is not really an issue as the death of the spouse is an exogenous event.

5.2 Structural Equation Modelling (SEM) Estimates

In this section the SEM estimates are reported. More precisely, the indirect, direct and total effects of the SEM are presented respectively in columns (1)-(3) in table 3. The main coefficient of interest which is the treatment of the group receiving survivor benefits and which is represented by the dummy of survivor benefits is positive and significant in all cases. More specifically, the direct effect of survivor benefit is 0.027, while the indirect effects, through wealth index, on health status is 0.0836. This, indicates that the survivor benefits have low and

positive direct effects on health status, such as covering the needs for medical examination and treatment among others. However, the indirect effects are significantly higher, through the wealth index. This is explained by the fact that these households that they receive the survivor benefits, might improve the wealth index, such as the ability to afford unexpected expenses, appears on utility bills, to afford a meal with meat or fish, resulting on improvement of the health status. The the total effect of the survivor benefits dummy on health status is 0.11 while the total effect on wealth is 0.165.

Regarding the direct effects, the coefficients present the expected signs in all structural equations in panels A-C. Age has a negative effect on health, while those who belong in any other category, expect working full time, present lower levels of health status. Similarly, individuals with higher education level, households that meet the need for medical treatment, that are not exposed to air pollution, that have not heating problems, are more likely to classified in higher health status levels. Also, another point of interest is the exploration of the indirect effects. More precisely, while the direct effect of age on health status is negative, the indirect effect becomes positive. The explanation is while age affects negatively health, has a positive impact on health through survivor benefits, indicating that those who are old and receive survivor benefits are more likely to improve their health status, either physical or mental than the widowed women that do not receive the benefits. The total effect of age is negative as the direct effect is larger than the indirect; however SEM is very useful to examine the effects of age on health status, through survivor benefits claimants. Similarly, for those who are tenants or belong to any category other than house owners, are likely to report lower health status levels as it can be seen in column (1) and the direct effects.

On the other hand, those who are not house owners report higher health status levels, through the channel of survivor benefits. More specifically, this shows that those who are not house owners and receive survivor benefits, are more likely to improve their health status. This may be explained by the fact that the households which do not own the house might be in extra financial needs, and survivor benefits can ease their financial burden. A similar interpretation can be given for those who belong into any employment category, except the full-time workers, and the larger households and families, as it can be seen by the coefficient of the household size. The situation for the remained factors, and specifically the education level, the need met for medical treatment, no expose to air pollution, the size of the dwelling, the average monthly expenses, no heating problems and the households which are located in urban areas are positively related with health status, regarding both the direct and indirect effects.

Concerning the structural equation of claiming the survivor benefits, all the effects present the expected signs. Thus, health status, wealth index, education level are positively associated with the probability of claiming the survivor benefits, while those who are not full-time employed are less likely to be eligible for the benefits.

Regarding the structural equation for wealth index or poverty, both the treatment group of the survivor benefit claimants and health status have positive and significant effects on wealth. The indirect effect of survivor benefits on wealth are explained from the channel through health status. In other words, those who receive the current benefits improve their health status and then increase their wealth, either by meeting the unexpected financial needs or arrears in utility bills and others. The widowed mothers who are not house owners are less wealthy, while those who do not face problems with environment, heating, located in large houses in urban area and they can meet the needs for medical treatment are in less risk of being in poverty as it can be observed by the indirect effects. The total effects are the same with the indirect, as there is no

direct path from those factors on wealth. Thus, these indirect effects are coming through the health status channel, indicating that for instance those who can meet the need for medical examination and treatment can improve their health status and then increase their wealth either by being for instance more productive. Therefore, the causal path here can be drawn as *medical need met health status wealth*. Another example can be that healthier people may have less risk of being in poverty if they have less need for medical treatments, and thus less financial burden in relation to less healthy people, especially the severely and permanently disabled. Based on the CFI and TLI criteria the model fits the data well, while RMSEA is lower than the proposed 0.05 value and SRMR is lower than the proposed threshold of 0.1. Thus, overall the diagnostic tests suggest that the SEM fits the data well. Similarly, in table 4 the SEM estimates considering the level of the survivor benefits, are reported. Regarding the structural equation for the health status, the concluding remarks are the same with those derived by the SEM in table 3. More specifically, survivor benefits have a positive and significant effect on health status, while the remained effects are the same.

(Insert tables 3-4)

Regarding the structural equation of the survivor benefits the age and education level have a direct positive effect. This can be explained by the fact that the more educated people usually are married with educated people as well; thus, since the amount of the survivor benefits depends on the spouse's salary education level, the salary has a positive effect on the level of the current benefits. Similarly, age can be associated with the fact that working experience and age are positively correlated, as well as, the salary is increased with age, because older women are more likely of being married with older men. Thus, age affects positively the survivor benefits level. On the other hand, the widows who are not full time employed might be more likely to have been married with less educated husband, earning a lower income and leading to lower level of benefits. Regarding the wealth structural equation, the survivor benefits have a positive impact on reducing poverty, where the indirect effects, through the improvement on health status, are higher. More specifically, the total effects of the survivor benefits on wealth are 0.47. In this case for a 1 per cent increase in the survivor benefits the poverty is reduced by 2 per cent. The rest of the factors present the similar effects found in the previous SEM estimates in table 3. Finally, based on the diagnostic tests CFI, TLI, RMSEA and SRMR it is suggested that the SEM model fits the data well.

Conclusions

This study examined and tried to answer the following questions: Whether the widowed mothers who are eligible for survivor benefits present better health status and are less likely to be at risk of poverty than the respective widowed mothers who do not claim the benefits. The results show that the widows who receive the survivor benefits are more likely to improve their general health status and to reduce poverty than the widows who do not receive the current benefits. Concluding the study initially examined and compared the health status between single-mothers (widows) who claim the survivor benefits and those who do not. The Heckman selection model showed that the treated group (survivor benefits claimants) share very similar characteristics with the untreated –control group (those who do not claim the benefits). The findings of this study are important in order to understand the effects of the survivor benefits on the relative well-being, such as the health status and poverty examined in this study, of the sensitive group; the widows. Especially those who are in old age, low educated and not

employed full time are in higher risk of poverty and health. Moreover, it could be claimed that the widows who are not eligible for these benefits are forced to get employed in order to face the financial burden and thus it could be possible to improve their wealth and health status. However, the results do not confirm this and it can be explained by the fact that usually the widowed are old which makes it very likely to remain unemployed or to be employed in a low wage job.

To summarise various policy measures can be taken in order to protect the widows and their households that are uninsured and not eligible for survivor benefits. One policy option can be the coverage of the uninsured by providing free services for them or by covering their financial contributions to some extension and especially for the poor households. The extension of the tax-based system and the tax collection improvement may result to additional funds that can be efficiently distributed to the non-eligible poor widowed mothers.

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Figure 1: Health Status Levels for Widowed Beneficiaries and Non-Beneficiaries of Survivor Benefits

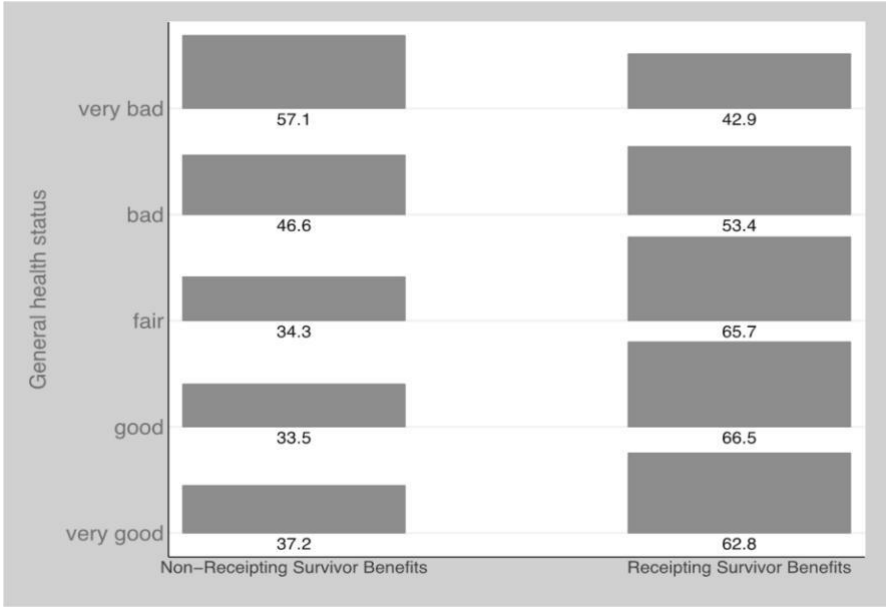

Figure 2: Relationship Between Survivor Benefits and Wealth

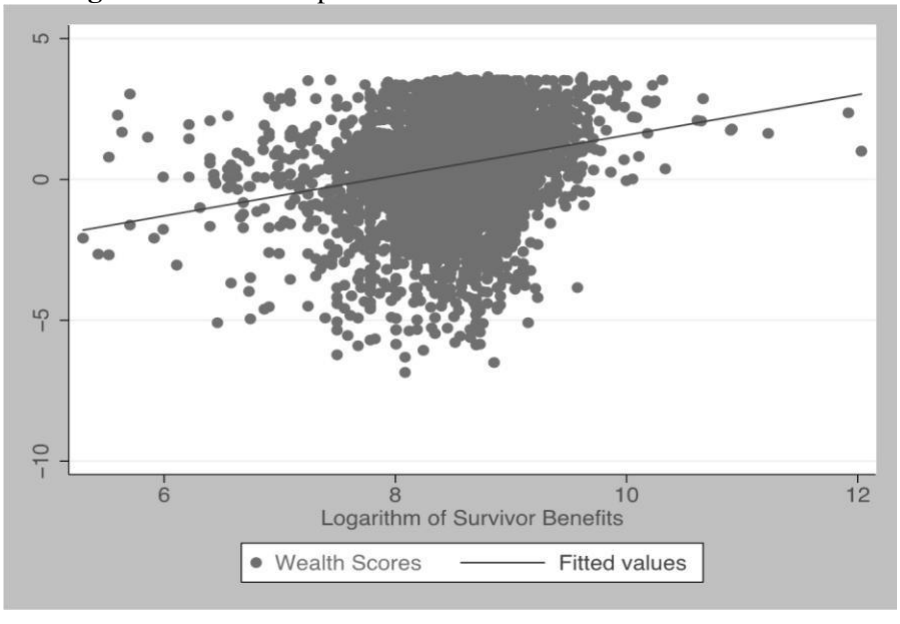

Figure 3. SEM Theoretical Model for Health Status, Survivor Benefits Treatment Group and Wealth-Poverty

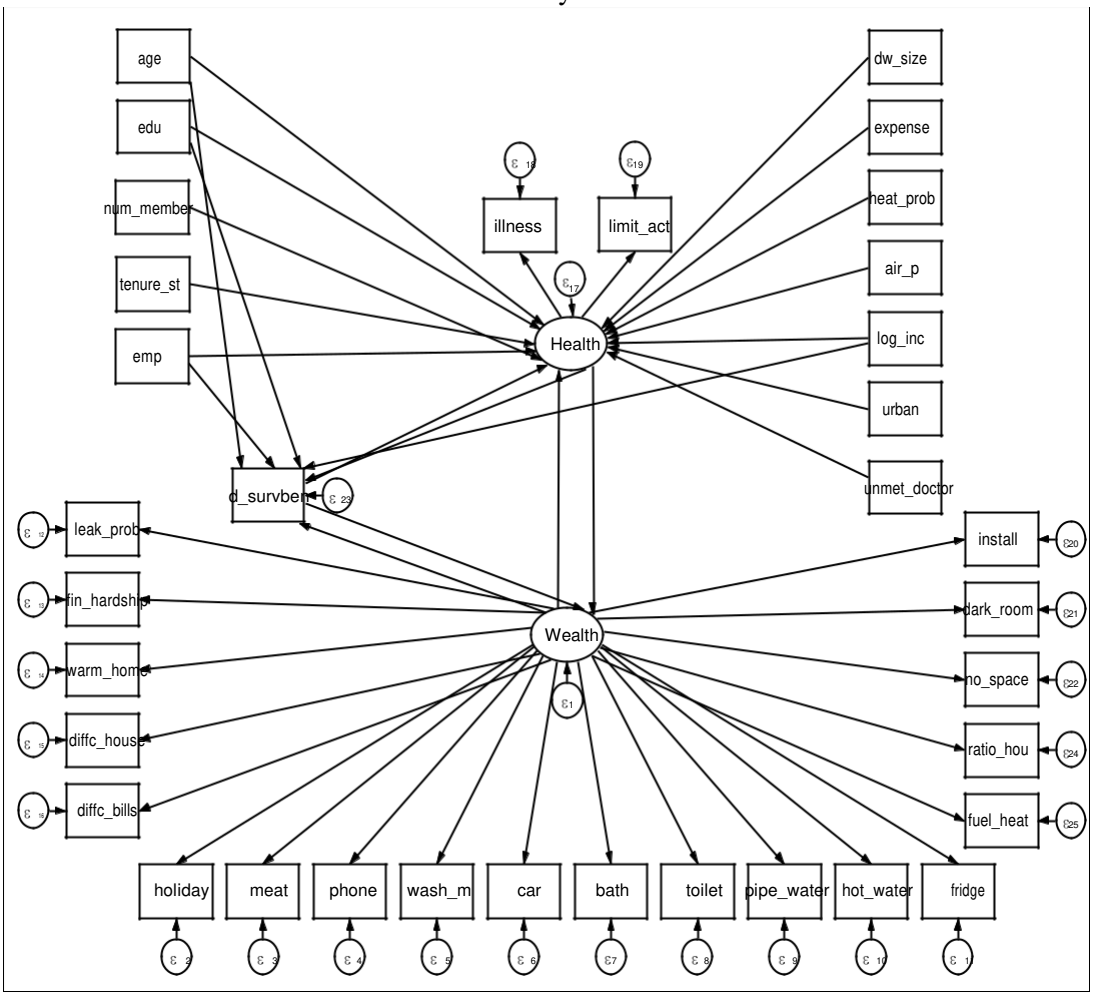

Table 1. Summary Statistics of the Dataset for Widowed Women

Continuous	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Variables	**N**	**mean**	**sd**	**min**	**max**
Monthly expenses	11,389	164.7	152.0	0	2,208
Dwelling Size	11,389	96.02	32.02	25	400
Number of members in Household	11,389	2.696	1.559	1	16
Log (Income)	11,389	9.492	0.729	5.938	13.20
Log (Survivor Benefits)	6,721	8.582	0.475	5.298	12.03
Log (Other Income)	6,621	9.041	1.062	2.463	13.19
Categorical Var.	**Percentage**	**Categorical var.**	**Percentage**	**Categorical Var.**	**Percentage**
Health (very bad)	8.60	Fuel type (wood)	20.75	Tenure status (owner)	75.26
Health (bad)	39.04	Fuel type (coal)	50.18	Tenure status (tenant)	11.03
Health (fair)	35.48	Fuel type (natural gas)	17.65	Tenure status (lodging)	0.30
Health (good)	16.05	Fuel type (fuel-oil)	0.60	Tenure status (rent-free)	13.42
Health (very good)	0.83	Fuel type (diesel oil-gasoil)	0.25	Employment St. (Full-Time)	6.57
Gender (Female)	100.0	Fuel type (electricity)	4.43	Emp.St.(Part-Time)	10.51
Age (20-24)	0.09	Fuel type (dried cow dung)	5.53	Emp.St.(Looking for a job)	10.70
Age (25-29)	0.40	Fuel type	0.61	Emp.St.(Student or unpaid	10.72
Age (30-34)	0.81	(other)		work experience)	
Age (35-39)	1.67	Education (Illiterate)	57.05	Emp.St.(Retirement/giving up business)	5.66
Age (40-44)	2.90	Education (Literate but not a graduate)	12.86	Emp.St.(Seasonal)	0.11
Age (45-49)	4.98	Education (Primary Sch.)	24.56	Emp.St.(old, permanently disabled)	42.22
Age (50-54)	7.84	Education (Secondary Sch.)	2.20	Emp.St.(Fulfilling domestic tasks)	40.29
Age (55-59)	9.60	Education (High Sch.)	1.39	Emp. St.(Other inactive person)	1.00
Age (60-64)	11.45	Education (Vocational high Sch.)	1.10	Unmet need for medical examination or treatment (No)	75.31
Age (65 +)	60.28	Education	0.85	Pollution, grime or other	78.40
Urban Area	56.71	(Higher edu)		environmental problems (No)	
Leaking roof, damp walls or rot in window frames problems (No)	51.72	Heating problems because of insulation (no)	53.46	Capacity to afford a meal with meat, fish or vegetarian equivalent (No)	65.43
Receipting Survivor Benefits	59.01				

Table 2. Heckman Selection Model Estimates.

	Panel A: Observation (Health Status) Equation	**Panel B: Selection (Survivor Benefits) Equation**
	DV: Health Status	**DV: Dummy Survivor Benefits**
Age group (reference category= age group 20-24)		
Age group 25-29	-0.1865***	0.6742
	(0.0405)	(0.4562)
Age group 30-34	-0.2784***	0.9794 **
	(0.0428)	(0.4375)
Age group 35-39	-0.4167***	1.087**
	(0.0466)	(0.4227)
Age group 40-44	-0.5940***	1.4819***
	(0.0548)	(0.4190)
Age group 45-49	-0.7278***	1.401***
	(0.0705)	(0.4159)
Age group 50-54	-1.045***	1.4250***
	(0.1079)	(0.4144)
Age group 55-59	-0.8821***	1.4469***
	(0.1494)	(0.4140)
Age group 60-64	-1.269***	1.4910***
	(0.2208)	(0.4137)
Age group 65+	-1.598***	1.2309***
	(0.5025)	(0.4126)
Education Level (Reference category= Illiterate)		
Literate but not a graduate	0.0113	0.3367***
	(0.430)	(0.0362)
Primary School	0.1262***	0.2916***
	(0.0374)	(0.0304)
Secondary school	0.1240*	0.1936***
	(0.0727)	(0.0677)
High school	0.2620***	0.0905**
	(0.0848)	(0.0423)
Vocational/Technical school	0.4968***	0.3387***
	(0.1039)	(0.0842)
Higher Education	0.3139**	1.007***
	(0.1340)	(0.0782)
Leaking roof, damp walls or rot in window frames problems (No)	0.1066***	0.0326
	(0.0294)	(0.1052)
Type of the fuel for heating (Reference category=wood)		
Type of the fuel for heating (Coal)	0.0517	0.0687**
	(0.0381)	(0.0377)
Type of the fuel for heating (Natural Gas)	-0.0495	0.0595
	(0.0552)	(0.0641)
Type of the fuel for heating (Fuel-Oil)	0.1529	-0.3348
	(0.1540)	(0.2571)
Type of the fuel for heating (Electricity)	-0.2130	0.1566
	(0.2139)	(0.2771)
Type of the fuel for heating (Diesel oil-gasoil)	0.0778	0.1816**
	(0.0651)	(0.0817)
Type of the fuel for heating (Dried cow dung)	0.1211**	-0.2387***
	(0.0552)	(0.0733)

Table 2 (cont.) Heckman Selection Model Estimates.

	DV: Health Status	DV: Dummy Survivor Benefits
Type of the fuel for heating (Other)	-0.1604	-0.0083
	(0.1508)	(0.0173)
Tenure Status (reference category=Owner)		
Tenure Status (Tenant)	0.0060	-0.0235
	(0.0537)	(0.0624)
Tenure Status (Lodging)	-0.0490	-0.9143***
	(0.2677)	(0.2501)
Tenure Status (Other free-rent accommodation)	0.0111	-0.1237
	(0.0372)	(0.0394)
Employment Status (reference category=Full-Time)		
Employment Status (Part-Time)	-0.2045**	0.2425
	(0.0813)	(0.8431)
Employment Status (Unemployed)	0.0959	0.2572
	(0.1767)	(0.2180)
Employment Status (Student or unpaid work experience	-1.2349**	-0.7103***
	(0.4771)	(0.0805)
Employment Status (Retired)	0.1557**	-0.3495***
	(0.0746)	(0.0561)
Employment Status (Seasonal)	0.4035	0.4077
	(0.4504)	(0.3885)
Employment Status (Old, permanently disabled)	-0.6950***	-0.2680***
	(0.0602)	(0.0453)
Employment Status (Fulfilling domestic tasks)	0.1070	0.7119***
	(0.0712)	(0.0393)
Employment Status (Other inactive)	-0.2379*	0.6316***
	(0.1339)	(0.1156)
Capacity to afford a meal with meat, fish or vegetarian equivalent (No)	-0.1630***	-0.0448
	(0.0274)	(0.0318)
Household size	0.0234	-0.3145***
	(0.0247)	(0.0091)
Unmet need for medical examination or treatment (No)	0.2978***	0.2643***
	(0.0317)	(0.0323)
Size of dwelling in square meters (m^2)	0.0003	0.0002
	(0.0004)	(0.0005)
Average monthly expenses	1.15e-0.4	0.00007
	(1.12e-0.4)	(0.00015)
Heating problems because of insulation	0.1274***	-0.0608**
	(0.0298)	(0.0329)
Pollution, grime or other environmental problems (No)	0.0922***	0.8331***
	(0.0297)	(0.0310)
Household Income	0.0984*	0.7666***
	(0.0588)	(0.0196)
Urban Area	(0.0746**	0.1813***
	(0.0326)	(0.0257)
No. Observations	16,319	
Wald chi-square statistic	1,416.37	
	[0.000]	
Rho	0.0316	
	(0.1244)	
LR test of independent equations. (rho = 0)	0.071	
	[0.5345]	

Robust standard errors within brackets, p-values within square brackets, ***, ** and * indicate significance at 1%, 5% and 10% level.

Table 3. SEM Estimates for the Survivor benefits Dummy

	Direct Effects (1)	**Indirect Effects (2)**	**Total Effects (3)**
Panel A: Health <-			
Dummy of Survivor Benefits	0.0272**	0.0836***	0.1108***
	(0.01283)	(0.0159)	(0.0202)
Logarithm of Household Income	0.1031***	0.0109***	0.1141***
	(0.0133)	(0.0087)	(0.0056)
Age	-0.0876***	0.0624***	-0.0251***
	(0.0105)	(0.0051)	(0.0048)
Education Level	0.0704***	0.0542***	0.1247***
	(0.0063)	(0.0051)	(0.0043)
Tenure Status	-0.1261**	0.0411***	-0.0177***
	(0.0538)	(0.0047)	(0.0027)
Employment Status	-0.0129***	0.0042*	-0.0087***
	(0.0029)	(0.0023)	(0.0022)
Household Size	-0.0547***	0.0382***	-0.0165***
	(0.0059)	(0.0037)	(0.0023)
Unmet need for medical examination or treatment (No)	0.1801***	0.1257***	0.3058***
	(0.0151)	(0.0100)	(0.0163)
Pollution, grime or other environmental problems (No)	0.1445***	0.1009***	0.2454***
	(0.0202)	(0.0133)	(0.0172)
Heating problems because of insulation	0.2719***	0.1913***	0.4632***
	(0.0142)	(0.0094)	(0.0113)
Size of dwelling in square meters (m^2)	0.0038***	0.0026***	0.0064***
	(0.0003)	(0.0002)	(0.0001)
Average monthly expenses	0.0006***	0.0004***	0.0008***
	(0.0001)	(0.0001)	(0.0001)
Wealth Index	0.3996***	0.6999	1.0665
	(0.1055)	(constrained)	(constrained)
Urban	0.1038***	0.0864***	0.1902***
	(0.0121)	(0.0085)	(0.0043)
Panel B: Dummy of Survivor <-			
Logarithm of Household Income	0.1255***	0.0117**	0.1138***
	(0.0090)	(0.0047)	(0.0184)
Wealth Index	0.5643***	0.6587	1.2235
	(0.1042)	(constrained)	(constrained)
Heath Status	1	0.7968***	0.2031***
	(constrained)	(0.0595)	(0.0595)
Age	0.0055	0.0163***	0.0219***
	(0.0050)	(0.0041)	(0.0028)
Education Level	0.0561***	0.0087***	0.0648***
	(0.0059)	(0.0033)	(0.0047)
Employment Status	-0.0324***	-0.0080***	-0.0244***
	(0.0031)	(0.0020)	(0.0025)
Tenure Status	No Path	0.0021	0.0021
		(0.0042)	(0.0042)
Household Size	No Path	-0.0111***	-0.0111***
		(0.0018)	(0.0018)
Unmet need for medical examination or treatment (No)	No Path	0.0366***	0.0366***
		(0.0052)	(0.0052)
Pollution, grime or other environmental problems (No)	No Path	-0.0293	-0.0293
		(0.0255)	(0.0255)
Heating problems because of insulation	No Path	0.0556***	0.0556***
		(0.0058)	(0.0058)
Size of dwelling in square meters (m^2)	No Path	0.0007***	0.0007***
		(0.0001)	(0.0001)
Urban	No Path	0.02517***	0.02517***
		(0.0033)	(0.0033)

Table 3 (cont.) SEM Estimates for the Survivor benefits Dummy

	Panel A: Direct Effects (1)	**Panel B: Indirect Effects (2)**	**Panel C: Total Effects (3)**
Panel C: Wealth Index <-			
Dummy of Survivor Benefits	0.1087***	0.0556***	0.1643***
	(0.0189)	(0.0129)	(0.0079)
Logarithm of Household Income	No Path	0.0246***	0.0246***
		(0.0024)	(0.0024)
Heath Status	0.2381***	0.1035***	0.3416***
	(0.0486)	(0.0251)	(0.0134)
Age	No Path	-0.0156***	-0.0156***
		(0.0013)	(0.0013)
Education Level	0.0074***	0.0205***	0.0279***
	(0.0022)	(0.0021)	(0.0011)
Employment Status	-0.0024**	0.0012	-0.0012**
	(0.0011)	(0.0094)	(0.0006)
Tenure Status	No Path	-0.0102***	-0.0102***
		(0.0011)	(0.0011)
Household Size	No Path	-0.0095***	-0.0095***
		(0.0009)	(0.0009)
Unmet need for medical examination or treatment (No)	No Path	0.0314***	0.0314***
		(0.0024)	(0.0024)
Pollution, grime or other environmental problems (No)	No Path	0.0252***	0.0252***
		(0.0032)	(0.0032)
Heating problems because of insulation	No Path	0.0478***	0.0478***
		(0.0023)	(0.0023)
Size of dwelling in square meters (m^2)	No Path	0.0007***	0.0007***
		(0.00004)	(0.00004)
Urban	No Path	0.0216***	0.0216***
		(0.0021)	(0.0021)
No. Observations		8,882	
CFI		0.912	
TLI		0.895	
RMSEA		0.038	
SRMR		0.074	

Standard errors within brackets, ***, ** and * indicate significance at 1%, 5% and 10% level.

Table 4. SEM Estimates for the Survivor benefits levels

	Panel A: Direct Effects	**Panel B: Indirect Effects**	**Panel C: Total Effects**
Health <-			
Logarithm of Survivor Benefits	0.1387**	0.0080	0.1307***
	(0.0121)	(0.0081)	(0.0083)
Logarithm of the Rest of Household Income	0.0080*	0.0320***	0.0400***
	(0.0042)	(0.0047)	(0.0044)
Age	-0.0502***	0.0260***	-0.0242***
	(0.0033)	(0.0018)	(0.0098)
Education Level	0.0661***	0.0369***	0.1030***
	(0.0047)	(0.0062)	(0.0032)
Tenure Status	-0.0438***	0.0236***	-0.0202***
	(0.0050)	(0.0029)	(0.0022)
Employment Status	-0.0052**	0.0015	-0.0050***
	(0.0025)	(0.0018)	(0.0018)
Household Size	-0.0147***	0.0079***	-0.0068***
	(0.0046)	(0.0025)	(0.0021)
Unmet need for medical examination or treatment (No)	0.1196***	0.0644***	0.1840***
	(0.0127)	(0.0070)	(0.0063)
Pollution, grime or other environmental problems (No)	0.0447***	0.0241***	0.0688***
	(0.0124)	(0.0069)	(0.0056)
Heating problems because of insulation	0.2318***	0.1249***	0.3567***
	(0.0113)	(0.0080)	(0.0057)
Size of dwelling in square meters (m^2)	0.0035***	0.0013***	0.0048***
	(0.0002)	(0.0001)	(0.00008)
Average monthly expenses	0.0003***	0.0002***	0.0005***
	(0.00004)	(0.00001)	(0.00002)
Wealth Index	0.5168***	0.2172	0.7340
	(0.1321)	(constrained)	(constrained)
Urban	0.0519***	-0.0280***	0.0239***
	(0.0119)	(0.0044)	(0.0056)
Logarithm of Survivor <-			
Logarithm of the Rest of Household Income	0.0028	No Path	0.0028
	(0.0055)		(0.0055)
Wealth Index	No Path	No Path	No Path
Heath Status	No Path	No Path	No Path
Age	0.0339***	No Path	0.0339***
	(0.0036)		(0.0036)
Education Level	0.0716***	No Path	0.0716***
	(0.0048)		(0.0048)
Employment Status	-0.0144***	No Path	-0.0144***
	(0.0029)		(0.0029)

Table 4 (cont.) SEM Estimates for the Survivor benefits levels

	Panel A: Direct Effects	**Panel B: Indirect Effects**	**Panel C: Total Effects**
Wealth Index <-			
Logarithm of Survivor Benefits	0.2234***	0.2466***	0.4700***
	(0.0079)	(0.0036)	(0.0039)
Logarithm of Household Income	0.0395***	0.0184***	0.0579***
	(0.0037)	(0.0032)	(0.0024)
Heath Status	0.3701***	0.2149***	0.5850***
	(0.0517)	(0.0278)	(0.0238)
Age	No Path	-0.0180***	-0.0180***
		(0.0012)	(0.0012)
Education Level	-0.0013	0.0238***	0.0225***
	(0.0036)	(0.0032)	(0.0020)
Employment Status	-0.0031*	-0.0036**	-0.0067***
	(0.0018)	(0.0014)	(0.0019)
Tenure Status	No Path	-0.0155***	-0.0155***
		(0.0019)	(0.0019)
Household Size	No Path	-0.0052***	-0.0052***
		(0.0017)	(0.0017)
Unmet need for medical examination or treatment (No)	No Path	0.0425***	0.0425***
		(0.0047)	(0.0047)
Pollution, grime or other environmental problems (No)	No Path	0.0159***	0.0159***
		(0.0045)	(0.0045)
Heating problems because of insulation	No Path	0.0823***	0.0823***
		(0.0053)	(0.0053)
Size of dwelling in square meters (m^2)	No Path	0.0009***	0.0009***
		(0.00007)	(0.00007)
Urban	No Path	0.0184***	0.0184***
		(0.0042)	(0.0042)
No. Observations		6,607	
CFI		0.903	
TLI		0.883	
RMSEA		0.0041	
SRMR		0.077	

Standard errors within brackets, ***, ** and * indicate significance at 1%, 5% and 10% level.