

Frame the problem

Write solution

profit

Understanding Long-Term Poverty Trends in Belgium Through Integrated Data Analysis.

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KU LEUVEN

HIVA

Poverty Trap

Material Deprivation

Downward spiral - Poverty Trap

- ▶ Poverty reduces access to education, to the health systems, and promote a state of mind of stress and pressure.
- ▶ Poverty impedes individuals to invest time nor capital in themselves and develop agency.

Long Term and Intergenerational Poverty

Welfare State

Social Investments Perspective

The primary goal of social policies is to cultivate human capital across all life stages, stimulating:

- ▶ labor force engagement
- ▶ continuous training
- ▶ mitigating social risk

Purposes: enhance individual capabilities and fortify societal resilience

Social Protection Perspective

The primary goal of social protection is to protect vulnerable people through economic transfers, following principles such as justice and equality. These measures include:

- ▶ unemployment benefit
- ▶ sick and disability
- ▶ pension
- ▶ minimum wage

Research Question and Contribution

To what extent does "generous" social protection constitute an investment in households' resilience and poverty alleviation?

Contributions:

- ▶ shed light on the **long-term dynamics of poverty** in relation to anti-poverty initiatives (such as unemployment benefits, minimum income, sickness or disability benefits, and pensions).
- ▶ introduce the notion **generosity of social benefit** as a key mechanism to re-conciliate the social protection and the social investment perspectives.
- ▶ adopt a **micro-level perspective** to describe the intricate dynamics of long-term poverty and the determinants affecting the likelihood of individuals transitioning into and out of poverty over time.

Data Sources

	Description	Period
IPCAL	Information from the tax declaration of Belgian taxpayers, panel structure, 13 years	2005-2017
Prima	Record access to the Belgian guaranteed minimum income scheme, panel structure 11 years	2007-2017
Demobel	Structure of the population on the 1st January, from Statbel, the Belgian National Institute of Official Statistics, panel structure 18 years	2001-2018
Census	Official census to collect important socio-economic and demographic information	2001 - 2011

Data - Poverty and Generosity

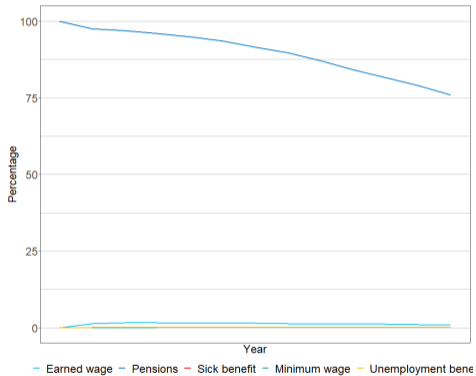
- ▶ The **poverty** threshold is equal to 60% of the national median disposable household income after social transfers (social security and social assistance benefits). The poverty thresholds is adjusted to the composition and size of the household. Earned Income and Social Benefits are retrieved from **IPCAL** and **Prima**.
- ▶ We define the **generosity** of benefit as High - if they exceed 60% of the median national disposable income, as Medium - if they fall between 30% and 60%, and as Low - if they are below 30%.

Data - Demographic characteristics

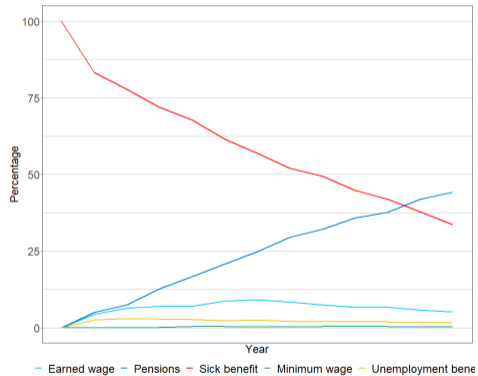
- ▶ **Family type** is a nominal variable that describes four categories of family type: single people and other kinds of families, monoparental families, couples (married or cohabiting) with children, and couples (married or cohabiting) with no children. This information is retrieved from **Demobel**.
- ▶ **Level of Education**. This variable is sourced from the **Census data**, available for the years 2001 and 2011.
- ▶ **Gender** is collected by **Demobel** and remain constant over time.
- ▶ **First Nationality** represents a nominal variable denoting the primary nationality of individuals. The macro-geographical areas include Africa, Europe, Belgium, and Rest, with the latter encompassing regions such as Asia, North and South America, Oceania, Stateless individuals, and Refugees. This information is retrieved from **Demobel**.

Transition Analysis from different main source of income

(a) From receiving pension

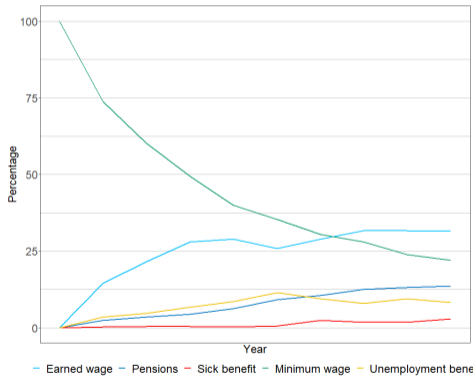


(b) From receiving sick or disability benefit

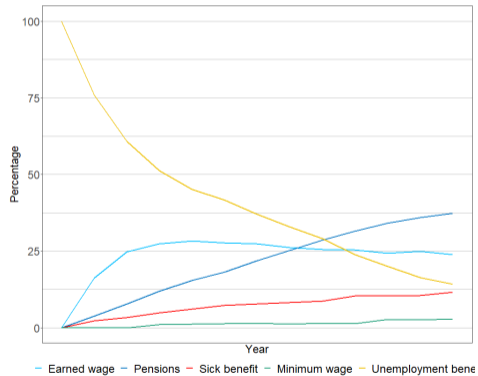


Transition Analysis

(a) From receiving the minimum income

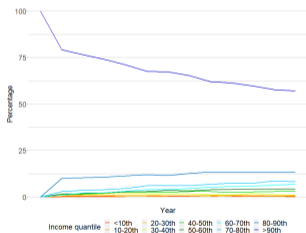


(b) From receiving unemployment benefit

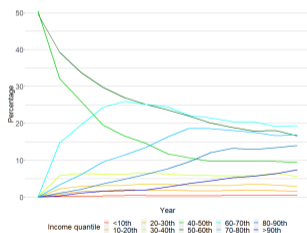


Transition Analysis from different income quantile

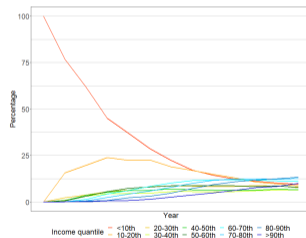
(a) Percentage of people from top income class to other income classes



(b) Percentage of people from 40-60 quantile income class to other income classes



(c) Percentage of people from lowest income class to other income classes



Kaplan-Meier and Cox Regression

The Kaplan-Meier survival analysis allows us to examine the survival function (time it takes for individuals to escape poverty - or become poor), stratified by

- ▶ **individual characteristics**: gender, education level in 2011, origin, and age;
- ▶ **family composition** in 2008: family type, number of children, total dependent people, and people with disability;
- ▶ **generosity of social benefit** received: unemployment, sickness, pension, and minimum wage.

The Cox proportional hazards model analyzes the effect of multiple covariates on the hazard rate. Advantages with respect to Kaplan-Meier plots are:

- ▶ It includes multiple covariates at the same time;
- ▶ It accounts for right censoring.

Survival Analysis - Basic Concepts

Survival Function: probability that a certain event has not occurred by a specific time t

$$S(t) = P(T > t) = 1 - F(t) = 1 - \int_0^t f(s) ds$$

Hazard Rate: probability of transitioning from one state to another at a given point in time, given that you survived until that point.

$$h(t) = \lim_{\Delta t \rightarrow 0} \frac{\text{Prob}(t, t + \Delta t)}{\Delta t} = \frac{f(t)}{S(t)}$$

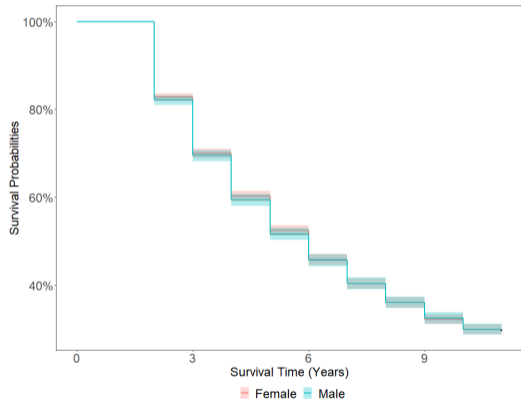
Cox proportional hazards model:

$$h(t|X) = h_0(t)e^{\beta_1 X_1 + \beta_2 X_2 + \dots + \beta_p X_p}$$

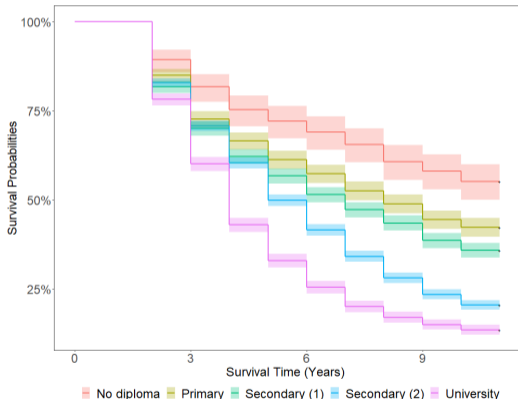
Assumptions: (1) Proportional Hazards Assumption (2) Linearity (3) Independence

Kaplan-Meier plots - Individual Characteristics (event: escape poverty)

(a) Stratification by Gender

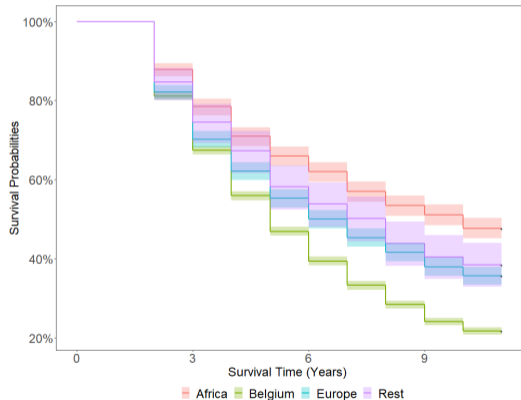


(b) Stratification by Education level

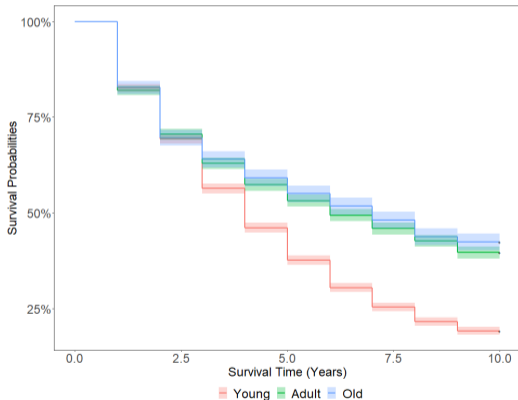


Kaplan-Meier plots - Individual Characteristics (event: escape poverty)

(a) Stratification by Origin

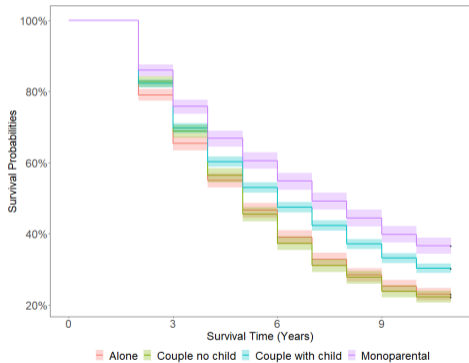


(b) Stratification by Age

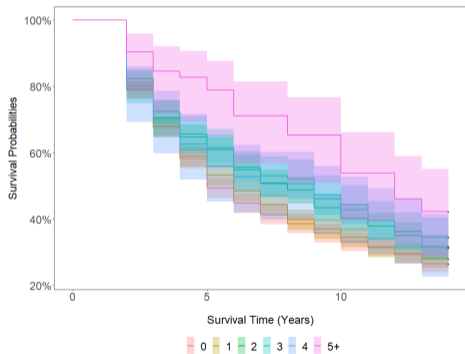


Kaplan-Meier plots - Family Characteristics (event: escape poverty)

(a) Stratification by Family type

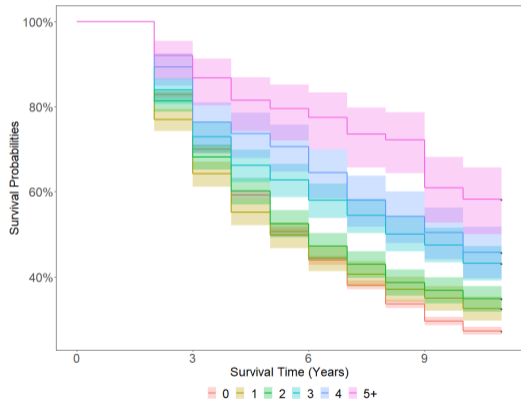


(b) Stratification by Number of children

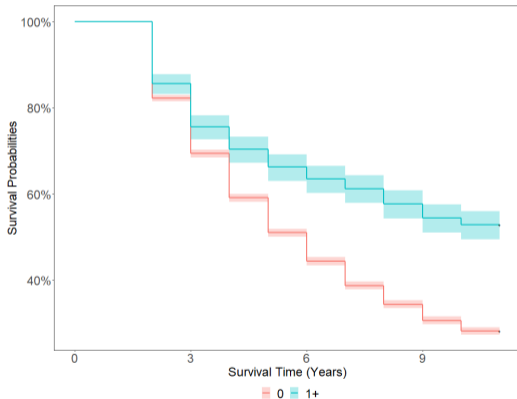


Kaplan-Meier plots - Family Characteristics (event: escape poverty)

(a) Stratification by Number of Dependents

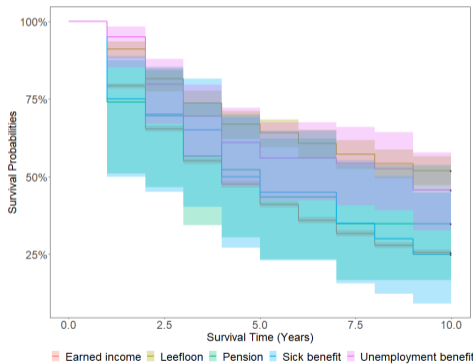


(b) Stratification by People with an Handicap

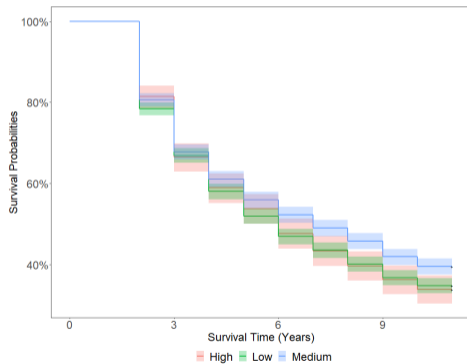


Kaplan-Meier plots - Generosity of Social Benefit (event: escape poverty)

(a) Stratification by main source of income



(b) Stratification by generosity of the total benefit.

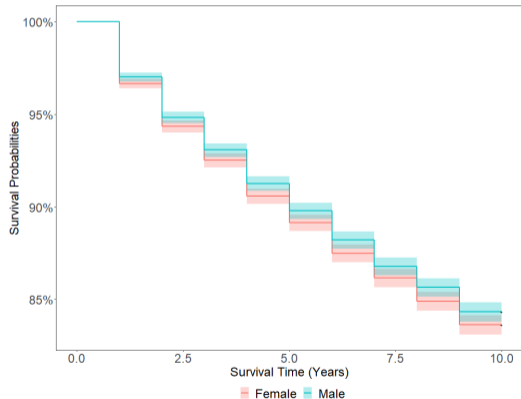


Cox Regression (event: escape poverty)

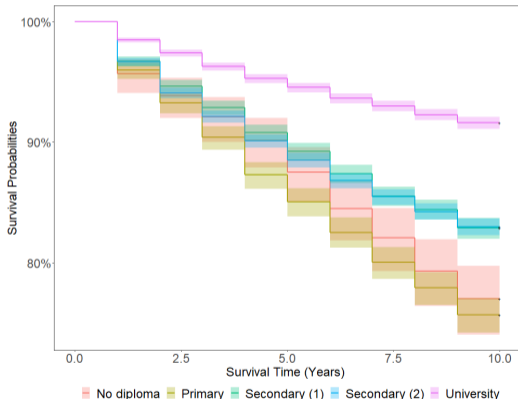
<i>Dependent variable</i>	Coef	Exp(coef)	Se(coef)	z	p	
Gender	-0.03	0.98	0.07	-0.35	0.73	*
Education	0.14	1.15	0.03	4.55	0.00	***
Age:Adult	0.06	1.07	0.07	0.87	0.39	
Age:Old	0.31	1.37	0.14	2.20	0.03	*
Origin:Africa	-0.30	0.74	0.15	-2.02	0.04	*
Origin:Africa(MENA)	-0.60	0.55	0.10	-6.03	0.00	***
Origin:America Latina	0.85	2.33	0.29	2.88	0.004	**
Origin:Asia	-0.74	0.48	0.28	-2.62	0.01	**
Origin:Eastern Europe	-0.36	0.70	0.27	-1.32	0.19	
Origin:Europe	-0.10	0.91	0.08	-1.26	0.21	
Origin:Nord America	-0.80	0.45	1.00	-0.80	0.43	
Family:Couple with no child	-0.00	1.00	0.15	-0.01	0.99	
Family:Couple with child	-0.58	0.56	0.10	-5.86	0.00	***
Family:Monoparental	-0.69	0.50	0.10	-6.63	0.00	***
Number Children	-0.23	0.80	0.16	-1.46	0.15	
Number Handicap	-0.16	0.85	0.08	-1.97	0.05	*
Number Dependent	0.09	1.09	0.15	0.56	0.57	
Low Benefit	0.03	1.03	0.08	0.44	0.66	
Medium Benefit	-0.15	0.86	0.08	-1.82	0.07	

Kaplan-Meier plots - Individual Characteristics (event: enter poverty)

(a) Stratification by Gender

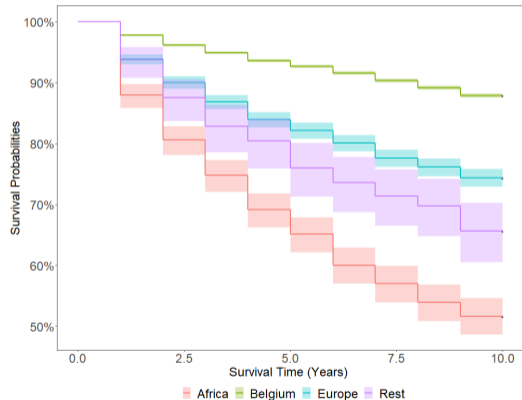


(b) Stratification by Education level

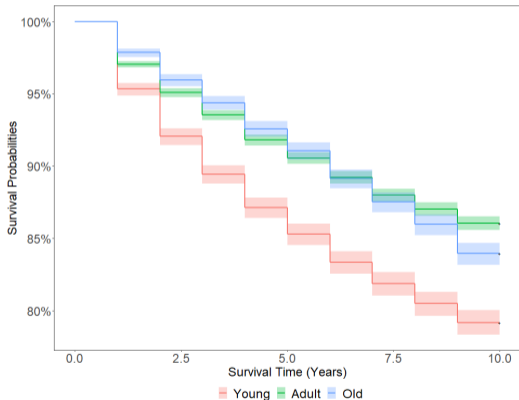


Kaplan-Meier plots - Individual Characteristics (event: enter poverty)

(a) Stratification by Origin

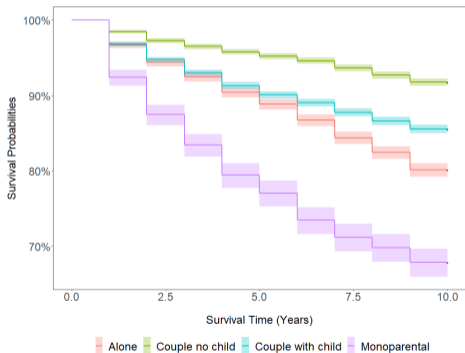


(b) Stratification by Age

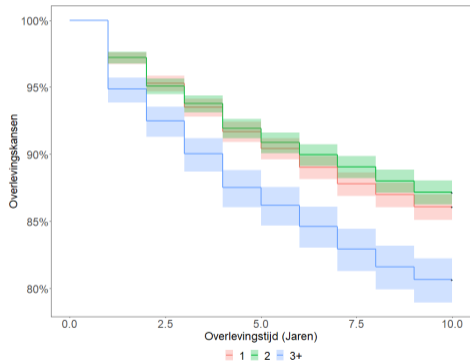


Kaplan-Meier plots - Family Characteristics (event: enter poverty)

(a) Stratification by Family type

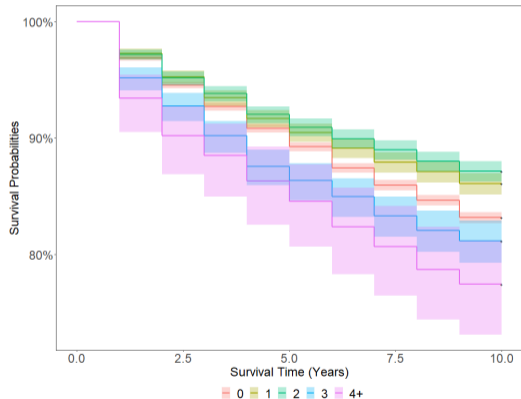


(b) Stratification by Number of children

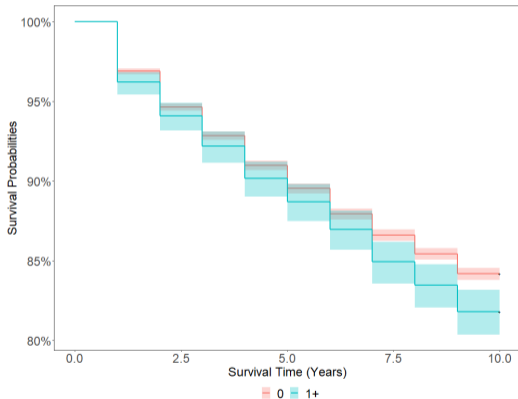


Kaplan-Meier plots - Family Characteristics (event: enter poverty)

(a) Stratification by Number of Dependents

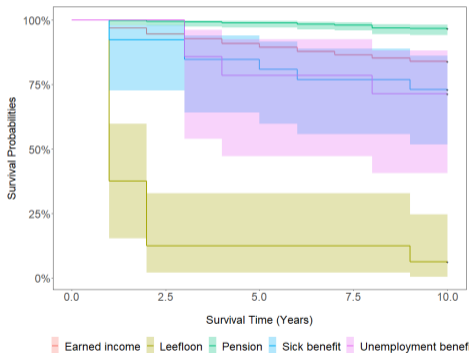


(b) Stratification by People with an Handicap

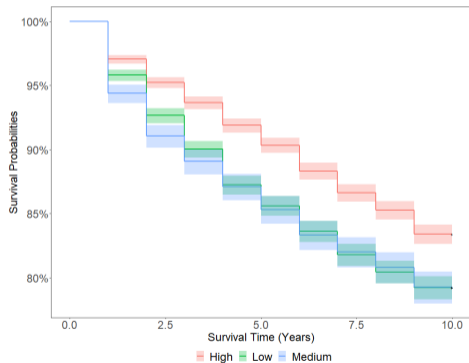


Kaplan-Meier plots - Generosity of Social Benefit (event: enter poverty)

(a) Stratification by income sources.



(b) Stratification by generosity of the total benefit.



Cox Regression (event: enter poverty)

<i>Dependent variable</i>	Coef	Exp(coef)	Se(coef)	z	p	
Gender	0.17	1.19	0.07	2.27	0.02	*
Education	-0.35	0.71	0.03	-10.15	0.00	***
Age:Adult	-0.41	0.67	0.07	-5.44	0.00	***
Age:Old	-0.51	0.60	0.25	-2.07	0.04	*
Origin:Africa	0.71	2.04	0.22	3.28	0.001	**
Origin:Arica (MENA)	1.14	3.13	0.12	9.87	0.00	***
Origin:America Latina	0.06	1.06	0.71	0.08	0.94	
Origin:Asia	1.41	4.08	0.23	6.16	0.00	***
Origin:Eastern Europe	0.44	1.56	0.36	1.24	0.22	
Origin:Europe	0.48	1.61	0.09	5.12	0.00	***
Origin:Nord America	-12.44	0.00	849.00	-0.02	0.99	
Family:Couple with no child	-1.23	0.29	0.20	-6.06	0.00	***
Family:Couple with child	-0.79	0.45	0.14	-5.79	0.00	***
Family:Monoparental	0.36	1.43	0.15	2.42	0.02	*
Number Children	0.10	1.11	0.22	0.47	0.64	
Number Handicap	0.06	1.06	0.10	0.63	0.53	
Number Dependent	0.16	1.18	0.22	0.74	0.46	
Low Benefit	-0.04	0.96	0.12	-0.31	0.76	
Medium Benefit	0.22	1.25	0.14	1.62	0.11	

Thank you for the attention!

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