

The Effect of Gender, Living Arrangements and Education on Health Transitions above Age 50 in Poland

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Abstract:

Poland will experience advanced population ageing driven by improvements in longevity, low fertility and approaching old age by baby boom cohorts. Given the higher morbidity prevalence observed at older ages, the demand for the elderly care is expected to increase considerably.

The study focuses on the dynamics of health of people aged 50 and over in Poland. We aim to verify how the risks of the health status change are shaped over age and what the impact of gender, education and living arrangements is.

The empirical analysis makes use of a non-parametric multi-state model for transitions in health. The age-specific health transition probabilities accounting for the individual level variables are estimated based on the European Union Statistics on Income and Living Conditions (EU-SILC) panel data for the years 2008–2011.

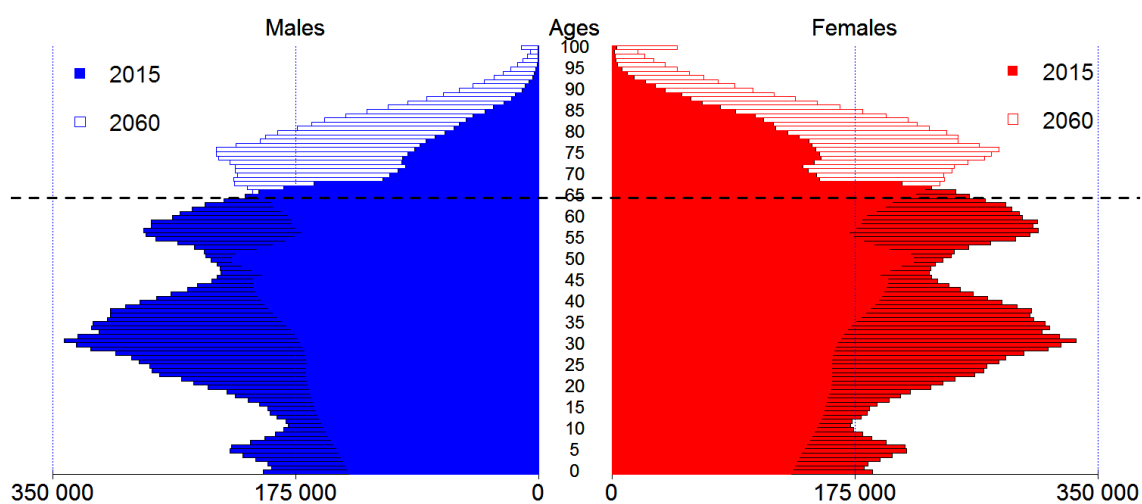
As a result, we assess age profiles for health transitions with respect to gender, education and living arrangements. The first results confirm the well-known regularities in research on health: the risk of being unhealthy is increasing with age, while the probability of recovery is decreasing. Women have a higher risk of the onset of disability than men, whereas recovery to health is similar for men and women. Potential effects of education and living arrangements on health are yet to be examined.

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1. Introduction

The demographic change in Europe is leading to population ageing. Population of Poland is not an exception and in the context of other European countries is actually experiencing the change at the fastest pace as the old-age dependency ratio is expected to triple in years 2014-2060 (Eurostat, 2014). Population projections show that the number of people aged 65 and over will increase from nearly 5.5 m in 2014 to 10.9 m in 2060 translating into an increase in share of total population from 14% to 33% respectively (compare Fig.1).

Figure 1. Population pyramid of Poland, years 2015 and 2060 by sex.



Source: EUROPOP2013, Eurostat.

From the perspective of individual health, it has been shown that physical abilities of men and women gradually diminish with advancing age, with women being more disabled than men (Andersen-Ranberg et al., 1999; Guralnik and Simonsick, 1993). A study by Bień (2003) for Poland shows that the percentage of people having problems with activities of daily living is increasing with age. As noted by Doblhammer and Ziegler (2006), by 2030, the baby boom cohorts will reach ages in which the likelihood of disability and need of care increases. However, education's beneficial influence on health is also recognized (Ross et al., 2012). It is especially important for Poland as the socio-economic transition after 1989 resulted in sharp increases in the level of education in society (Antonowicz, 2012; Jakubowski et al., 2010) leading Polish higher education system to the highest enrollment in tertiary education in Europe in 2010 (Kwiek, 2013). The increasing demand for the elderly care would be therefore mitigated to some extent by education and health improvements among the elderly, nevertheless the foreseen intensity of ageing will drive the increase.

While the supply of formal care in Poland is by far underdeveloped, the elderly in need rely strongly on the family care provision. However, family changes result in remarkable shifts in living arrangements, shrinking kinship networks and reducing potential of family care provision (Kotowska and Józwiak, 2012). As also noted by Iacovou (2000), the growth of the number of elderly across developed countries together with surging proportion of solitary living have considerable implications for social policy in these countries.

This study aim is to provide better description and help to better understand the interrelationships between individual's health transitions and age, gender, education and living arrangements.

2. Data and method

The analysis uses the European Union Statistics on Income and Living Conditions (EU-SILC) panel data for Poland for the years 2008-2011². Two health states {Healthy, Unhealthy} are distinguished based on question whether individual is suffering from any chronic (long-standing) illness or condition. In the sample we observe 10282 respondents with 2730 health transitions. We focus on respondents aged 50 and more. While gathering information about individuals of different ages, we obtain a synthetic life history that provides a picture of collective experience of individuals that could be treated as age profile (Willekens, 2014).

Transition rates and probabilities of health status are estimated with use of non-parametric multi-state methods (Nelson-Aalen estimator for transition rates and Aalen-Johansen estimator for transition probabilities) assuming the underlying process is Markovian and continuous (Willekens, 2014).

To measure the gender, education and living arrangements effects between two types of transition, Markov stratified hazards model is used (Putter et al., 2007). The hazard for transition $i \rightarrow j$ for a subject with covariate vector \mathbf{Z} is then given by

$$\lambda_{ij}(t|\mathbf{Z}) = \lambda_{ij,0}(t)\exp(\boldsymbol{\beta}_{ij}^T\mathbf{Z}),$$

where $\lambda_{ij,0}(t)$ is the baseline hazard of transition $i \rightarrow j$, and $\boldsymbol{\beta}_{ij}$ is the vector of regression coefficients that describe the effect of \mathbf{Z} on transition $i \rightarrow j$.

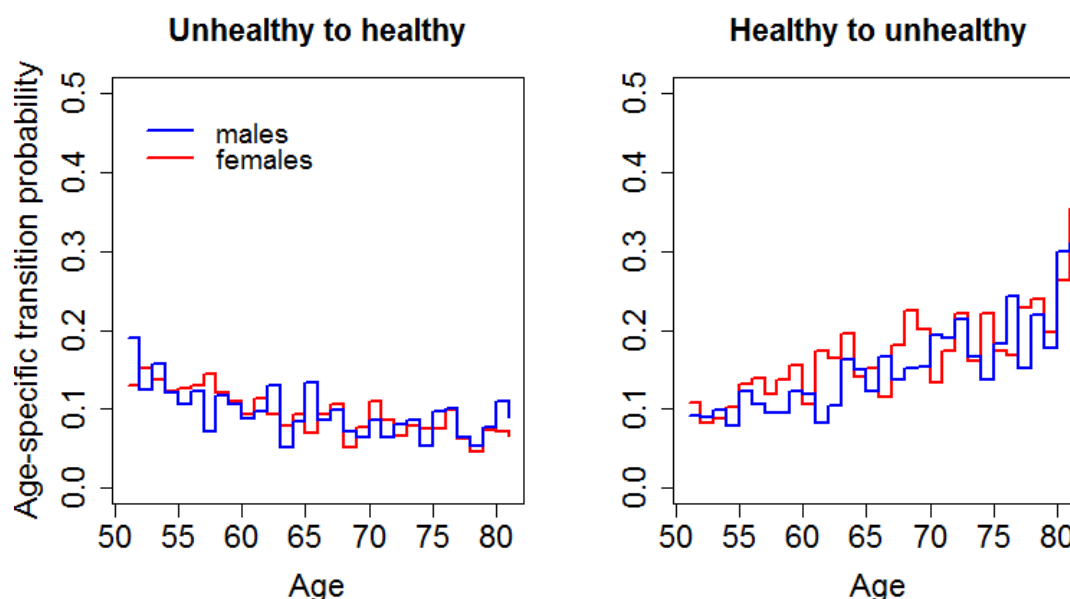
3. Results (partial and preliminary)

The first results refer to the overall relationship between health transitions and age and the effect of gender. In general, the profiles of health risks for both transitions vary over age (Figure 2). The Unhealthy to Healthy transition is characterized by a decreasing probability with age. For the transition from Healthy to Unhealthy, the older the individual, the higher the chances to become disabled.

When we account for gender not much difference between females and males in the Unhealthy to Healthy transition is observed. The other transition, however, shows some divergence between women and men, especially in ages 55-70. In the period, the risk of health deterioration is higher for women than men. The estimation results presented in Table 1 reinforce conclusions drawn from the analysis of the graphs. The effect of gender in the Unhealthy to Healthy transition is not identified (odds ratio equal to 1.01 and statistically not significant). Yet, women are characterized by 18% higher chances to become unhealthy then men.

² The years of analysis are planned to be extended with periods 2005-2007 and 2012-2013.

Figure 2. Transition probabilities between health statuses by age and gender accounting for the type of transition.



Source: own calculations based on EU-SILC data.

Table 1. Influence of sex on transition rates between states „in good health” and „in bad health”.

Transition (ref.=males)	Coefficient	Standard error	Odds ratio	p-value
Unhealthy to Healthy	0.0108	0.0594	1.01	0.860
Healthy to Unhealthy	0.1830	0.0555	1.20	<0.001 ***

Source: own calculations based on EU-SILC data. Significance level: *** < 0.01; ** < 0.05; * < 0.1

4. Preliminary conclusions

Results confirm the well-known regularities in research on health: 1) the risk of being unhealthy is increasing with age, while the probability of recovery is decreasing, 2) women have a higher risk of the onset of disability than men, whereas recovery to health is similar for men and women. These results for Poland are in line with similar studies looking at population of older Americans (Beckett et al., 1996; Crimmins et al., 1994; Wolf and Gill, 2009).

Our further work will concentrate on assessing the health transition profiles by education and by living arrangements as well as a combination of characteristics. Moreover, our intention is extend the period of the analysis to cover the whole 2005-2013 period available for Poland in the EU-SILC to improve the analytical capabilities of the sample.

The estimated transition probabilities provide additional insights into relationships between health and characteristics under considerations. Additionally, they can also serve as an input for further modelling purposes, for example to estimate the demand for care among people aged 50+. Such projections are also considered for the future work. The modelling approach

would be to integrate cohort-component population projections and estimates of health and living arrangements transition probabilities by multistate models. With multiple scenarios of health and living arrangements trajectories considered, we could offer what-if scenarios for future needs for care among the elderly.

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