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## **Age distribution of multidimensional quality of life for population with and without disabilities**

### **Aim of the study and research questions**

In our research we combine three concepts: age, disability and multidimensional life quality (QoL). We want to study multidimensional life quality with the prism both of age and of disability.

In this study we investigate differences in QoL by age between population with and without disabilities. The basic aim of this article is to identify the age profiles of the overall (multidimensional) life quality, as well as of its particular dimensions for two types of population: with and without disabilities. The final step of the analysis is to compare those age profiles between persons with and without disabilities. More detailed research questions are:

- *What are the age profiles of overall life quality and of its dimensions for population with and without disabilities? What are the differences in this respect between those two populations?*

First, we establish overall QoL variable, as well as domain QoL variables. The measurement of multidimensional life quality is based on the guidelines of the European Statistical System (Eurostat, 2011, 2016). Then we construct age profiles for all these variables, separately for population with and without disabilities. In the last step of the analysis we test the differences between persons with and without disabilities in QoL variables by age. The analysis is done for Poland, using data from the EU-SILC (The European Union Statistics on Income and Living Conditions) carried out in 2015.

### **Literature review**

#### **Quality of life quality as a concept**

QoL as a general concept has been studied in many fields: economy, political science, psychology, philosophy and medical science. The concept of QoL has appeared in public discourse in 1960's as an alternative for prevailing social development goal which was then defined as an increase in material living conditions (Phillips, 2006).

There is no single, commonly accepted definition of quality of life. For the purpose of this article we apply the individual-referenced definition outlined by Schalock, Keith, Verdugo and Gomez (2010), in which they underline that QoL is a multidimensional phenomenon composed of core domains influenced by personal characteristics and environmental factors. The authors claim that core domains are the same for all people, although they may vary individually in relative value and importance.

Alongside various definition, there are also different measurement tools for this phenomenon. (e.g. Cummins 2005; Felce 1997; Renwick, Brown, and Nagler 1996 and the WHO 1997, Panek, 2016). Generally, there are two approaches – first is to construct a measure for whole population and then using it for assessing QoL of different sub-groups, and the second approach dedicated only to persons with particular limitations or disabilities.

The most complex and precise concept of measurement following the first approach is provided by the final report of the Sponsorship Group 'Measuring Progress, Well-being and Sustainable Development' and Task Force on 'multidimensional measurement of quality of life' (Eurostat 2011), accepted by the European Statistical System Committee (Szukielojć-Bieńkuńska, Walczak, 2011). This proposal is an extension of QoL measurement concept of Berger-Schmitt and Noll (2000), operationalized in the framework of the European System of Social Indicators, which refers to recommendations Report on Measurement of Economic Performance and Social Progress (Stiglitz, Sen and Fitoussi, 2009). In those reports the multidimensional character of QoL was underlined, as well as the necessity to combine both subjective and objective measures. Moreover, it was clearly stated that QoL should be assessed both at individual and community level. The concept of quality of life provides also a useful conceptual and measurement framework to assess the personal outcomes guaranteed under UNCRPD for population with disabilities (Karr 2011).

In the second approach, the measurement of the quality of life of persons with particular disability has been mainly focused on medical and daily functioning issues (i.e. Socha, et al. 2011, Takada et al. 2012; Klein et al. 2012; Freemantle et al. 2013; Boulhosa et al. 2013; Gnacińska-Szymańska et al. 2012; Arnoldner et al. 2014).

The QoL has been studied for particular groups of persons with disabilities, distinguished by the type of disability or impairment. One of the reasons for growing interest in quality of life research of persons with disabilities is that for this group the need to improve the QoL is the most important target to be achieved as reaching full medical targets (understood as a state of full good health) is usually not possible (Kłak, et al. 2012).

Comparing those two approaches (QoL measured within the European Statistical System and in case of overall quality of life measured for total population) the scope of dimensions, which were considered, was broader, whereas in case of measuring QoL for persons with disability the emphasis was put on functioning connected with suffered affliction.

### **Quality of life and age**

The age profiles of quality of life depend on the method of measurement. Analysis of QoL by age is usually studied with regards to subjective aspect – namely life satisfaction, happiness or wellbeing. The relationship is studied both on cross-sectional, as well as panel data. Although panel data for analyzing changes in quality of life by age are most desired, but in many countries, are not available in longer perspective or very fragmented.

Many research deal with subjective measures of QoL and their distribution along the life course. The results are quite blurred. Commonly, it is believed that life satisfaction of persons over 50 years old deteriorates with age due to health problems, but scientific literature do not provide many empirical evidence. Recent studies show that the distribution of life satisfaction by age takes the U-shape, with the minimum values at 40-50 years age group (Blanchflower & Oswald, 2004, 2008; Böhnke & Kohler, 2010; Clark, 2007; Gerdtham & Johannesson, 2001; Helliwell, 2003). But there is no consensus in the literature about that – so far psychological literature have showed no relation between age and life satisfaction (Cantril, 1965; Frijters & Beatton, 2012; Palmore & Luikart, 1972). For example, in Australia recent analysis revealed even negative (but weak) relationship between age and life satisfaction (Dear et al., 2002). Recently Eurofound published report on relationships between age and quality of life

(Eurofound 2019).<sup>1</sup> The results are quite diversified across dimensions of QoL and groups of countries.

Summing up, the studies on relationship between quality of life (and especially of life satisfaction) and age provide unambiguous results. It was confirmed by López Ulloa, Møller, & Sousa-Poza (2013) who analyzed the relationship between age and life satisfaction by literature review, but no conclusive finding was made. Their recommendations was to analyze satisfaction with various aspects of life.

## **Research design and operationalization**

In our research we use multidimensional measurement model for individual QoL, based on the Eurostat guidelines (Eurostat, 2011 and 2016). So far, this measurement concept has not been commonly used to measuring quality of life for persons with disabilities. We apply this approach due to its comparability advantage which is crucial for the purpose of this study.

In its conceptual part, the model we are applying is based on capability approach, formulated by Sen (1985, 1992) for individuals. Our QoL measurement model is based on MIMIC model, formulated by Hauser and Goldberger (1971), and popularized by Jöreskog and Goldberger (1975). The operationalization of the QoL in the MIMIC model, according to Krishnakumar (2007). Starting point to establish the MIMIC model for measurement the QoL is assigning capabilities to dimensions of quality of life, presented within the European Statistical System (Eurostat 2011, 2016). The model includes 9 dimensions: material living conditions, productive or main activity, health, education, leisure and social interactions, economic and physical safety, governance and basic rights, natural and living environment, and overall experience of life.

The dimensions (group) quality of life indicators were computed for each person, using estimated parameters in the proposed version of the MIMIC model (Multiple Indicator Multiple Causes). To estimate the overall life quality indicator for each person we used formative approach (Edwards, Bagozzi 2000; Diamantopoulos, Siguaw 2006). Formative indicators in this approach are considered as determinants of multidimensional latent variable. In our study the overall life quality is described as latent variable influenced by dimension (group) quality of life indicators. The measurement model in this respect is based on principal component method, which is often used for formative indicators (Maggino, Zumbo 2012). In this method it is assumed that overall quality of life indicator is a linear combination of dimension (group) life quality indicators and there is no measurement error (Panek, 2016).

## **Results**

The values of overall quality of life and its dimensions were estimated for all individuals in the database, which allows to conduct a comparative analysis of QoL for population with and without disabilities. Before carrying out the comparison, the values of indicators were standardized by dividing the difference between individual value and the mean by standard deviation, and as a result, all indicators (overall quality of life and dimensions) took values of mean = 0, standard deviation = 1. This enabled direct comparison of quality of scores for population with and without disabilities.

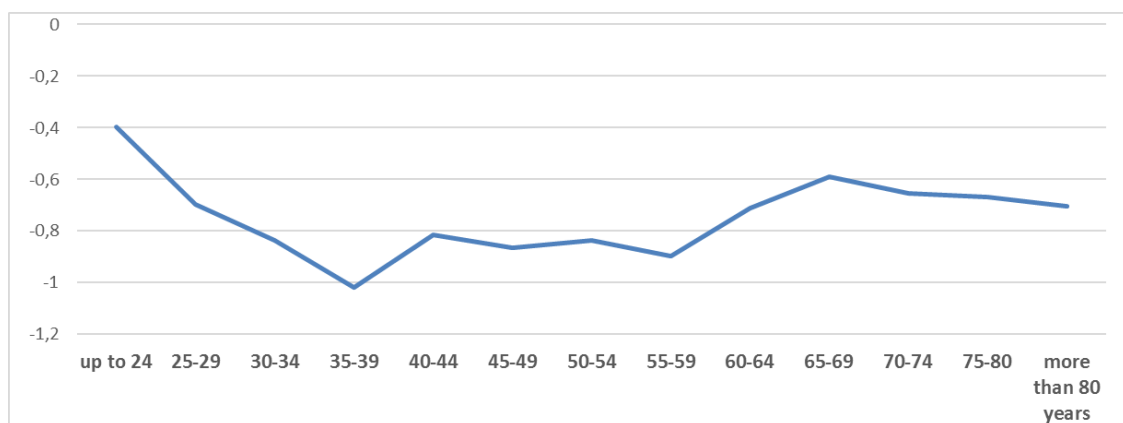
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<sup>1</sup> The authors of this report defines QoL through separate five dimensions: difficulty making ends meet, political participation in society, perceived social exclusion, mental well-being, life satisfaction, using data from European Quality of Life Survey (EQLS).

In general, persons with disabilities have lower estimated values of overall quality of life than persons without disabilities. This difference is statistically significant and great in magnitude. The mean value for persons with disabilities equals to -0,691 (Standard Deviation, SD = 0,986), whereas for population without disabilities mean value is 0,211 (SD = 0,904). Out of all nine dimensions of quality of life, in eight, the quality of life score of persons with disabilities is lower than non-disabled. Only in one dimension – education – persons with disabilities experience higher quality of life. All differences are statistically significant (T-test,  $p < 0.01$ ), though they vary in magnitude.

The analysis by age we started from 5-years groups. The overall quality of life in each age group was lower for persons with disabilities. The difference though varied and has flattened U-shape. The lowest difference was observed in the youngest group (below 25 years old), than started to growth to achieve the maximum value for the group 25-39 years old. Then it slightly increased and maintained the value up to 60 years old. After this threshold, the difference has narrowed, yet stabilizing. It means that the disadvantage of population with disabilities is especially built via factors connected to productivity, whereas in periods with low economic activity disability has much lower effect on quality of life.

Figure 1. The difference in overall quality of life between persons with and without disabilities.



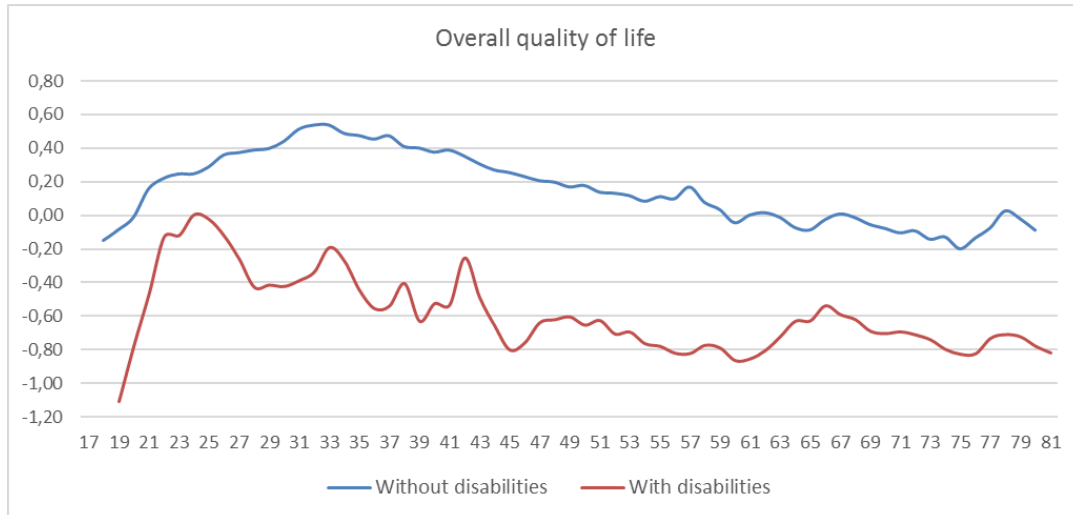
Source: own calculations.

Disadvantage of persons with disabilities (i.e. lower QoL score) was also visible in all specific dimensions of quality of life. In 7 dimensions - Material conditions, Productivity, Health, Leisure, Security and safety, Environment and Life experience - the lowest values for persons with disabilities was noted in all age groups. There were however, two dimensions, where total score was lower for persons with disabilities, yet with few interesting exceptions in selected age groups. In case of education among people aged 18-24, 30-34, and 80 years and over persons with disabilities had higher quality of life. In basic rights (consisting of trust in the legal and political system, active citizenship) the advantage of persons with disabilities was observed among persons aged 18-24, 25-29, and 40-44 years.

The analysis of single years of age allowed us to compare distribution of quality of life in both populations. In order to smooth the distribution, we used 3-year moving average. It revealed in general the same patterns for persons with disabilities and without disabilities in overall quality of life and all dimensions. Overall quality of life was the lowest among youngest age groups, then it grew up quickly up to 25 years of age among the population with disabilities and up to 32 years of age among population without disabilities. After those threshold, QoL started to decline slowly to the oldest age group (the cut off was 80 years). Additionally, the difference

between two populations was smaller for the youngest age groups. Then it was growing for the period between 30 and 60 years of age, and after that starting to decrease slowly at older ages.

Figure 2. The score of overall quality of life for persons with and without disabilities (3-years moving average)



Source: own calculations.

## Conclusions

In this research we applied MIMIC model to construct multidimensional, latent indicator of quality of life (overall and its dimensions). Then we use it to compare the distribution of quality of life score across age for two populations – with and without disabilities. The results confirmed lower quality of life of persons with disabilities as compared to population without disabilities. This difference is valid across the life course (i.e. comparing two populations in the same age groups). This difference has a flattened U-shape, which suggests, that the disadvantage of the population with disabilities is magnified by factors shaping life in productive period (30-60 years of age), whereas before entering economic activity age, the quality of life of persons with disabilities is closer to the quality of life of persons without disabilities. Dimension-specific analysis point out to those life domains, where the disadvantage of population with disabilities is the smallest or even took opposite direction – is education and basic rights young people with disabilities enjoy higher quality of life than persons without disabilities. These results have profound conclusions for policy makers. Firstly, the support for persons with disabilities in young age enables them to enjoy relatively good level of quality of life, but policies applied for this population during adulthood deepen the inequalities between those two populations Secondly, in some areas persons with disabilities are able to enjoy similar level of quality of life, yet it is again applicable to younger age cohorts. Further research should focus on discovering which factors influence growing disadvantage of persons with disabilities during their adulthood.

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