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Trends in disability in Europe using various indicators and SHARE data

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Introduction

Disability affects quality of life; this has been widely recognised and, over the past two decades, apart from estimating life expectancy at birth, a lot of emphasis has been put on deriving estimates of healthy life years (Robine *et al*. 2013). Additionally, severe disability poses a significant financial burden on health care services since it often results in loss of independence requiring provision of long-term care and use of technological aids (Geerts *et al*. 2012).

Detailed analysis of current trends concerning Europe is rather scarce though there is some fragmentary evidence (Lutz *et al.* 2001). A study by Egidi (2003) shows that, in specific countries, disability rates among older adults appear to be on the decline over the 1980s and the 1990s. Similarly, there is some evidence showing a declining trend in severe disability in the 1990s among persons aged 65+ in Finland and in mild disability in Norway over the period 1987-2008 (Sulander *et al.* 2006; Moe and Hagen 2011). By contrast, analyses of survey data from France provide conflicting evidence for the period 1980-2008; while for persons aged 65 or higher it seems that increasing disability is coupled with a reduction in its severity, for those in mid-adulthood there seems to be an overall increase (Cambois *et al.* 2008; Cambois *et al.* 2012). Similarly, conflicting trends have been found regarding the Swedish population aged 65-84, where there was an improvement in the period 1980 to the mid-1990s but a worsening or no change thereafter (Parker *et al.* 2008).

Aims

Evidence from Europe is rather inconsistent and there is no consensus on current and future trends. Further exploration and data analysis is needed to observe tendencies in disability in order to obtain a clearer picture of likely changes in European context. This is where the present study aims at making a contribution, using data from waves one, two, four and five of the Survey of Health, Ageing and Retirement in Europe (SHARE) which were carried out between 2004 and 2013; wave 3 has not been used in the analysis as it includes exclusively retrospective information. The main aim of the study is to assess trends in disability by sex in this 9-year period for the ten European countries that participated in all waves, covering Northern, Central, Western and Southern Europe. Further, it is intended to examine the role of chronic conditions in shaping these trends.

Data and Methods

In order to obtain a more complete picture of trends over time four different measures of disability are used, three of which reflect restriction in activities (ADLs, IADLs and GALI) while the fourth (mobility difficulties) is an indicator of functional limitations. The dependent variables used in the logistic regression models are binary; respondents reporting at least one ADL limitation, one IADL limitation, one mobility difficulty and moderate/severe limitation problems (=1) are compared to those not limited at all (=0). These cutoff points are provided by SHARE and a binary version of the corresponding variables is included in the SHARE dataset. In this paper the abovementioned dichotomous variables are referred to as ADL1+, IADL1+, MOB1+ and GALI, respectively, throughout the text. All models control for age; further, weights have been used to adjust for non-response. Since observations for persons present at more than one wave are correlated, the estimates have been adjusted for within cluster correlation. The abovementioned models were run separately by country for all respondents and by sex. Additionally, the models were considered separately for males/females aged 50-64 and 65+ to assess whether changes differentiate between younger and older persons. The significance of the estimated parameters is evaluated on the basis of the Wald test and the overall goodness of fit of the models is assessed on the basis of Loglikelihood; Nagelkerke R-squared coefficients are also presented. The statistical analysis was carried out using STATA 13.

Results

Descriptive findings

The overall unweighted sample includes 129,796 observations; the highest proportion of respondents comes from Belgium (17.5%) whereas the lowest comes from Switzerland (9.0%). Regarding the different waves, 18.9% of respondents correspond to wave one, 18.5% to wave two, 27% to wave four and 35.6% to wave five. Of these individuals 54.6 per cent are women. Among men, 40.2 per cent reported themselves as limited in activities (GALI), 38.7 per cent as having at least a mobility difficulty (MOB1+), 12.1 per cent as having at least one IADL limitation and 9.5 per cent as having at least one ADL limitation. The corresponding proportions for women are

higher in all instances, ranging from 11.8 per cent (ADL1+) to 53.6 per cent (MOB1+).

Trends in disability based on logistic regression models

Table 1 shows odds ratios (ORs) and 95% Confidence Intervals regarding trends in the period 2004-2013 based on logistic regression models for both sexes, by indicator and country. The models are adjusted for age of the respondent at each wave and gender. Persons who have reported at least one limitation are contrasted to those who have reported none. The corresponding results for broad age-groups (50-64 and 65 or higher) are also presented in Tables 1a and 1b. The ORs indicate that trends differentiate between countries. Whereas an increasing trend in disability is apparent in Belgium (for most indicators) as well as Germany and France (for GALI), there is a declining trend in most other countries, and especially Austria, Sweden, Denmark, Italy and Spain. Considering the different indicators, the decline seems greatest regarding mobility difficulties and least important regarding ADLs. The findings for broad age-groups indicate that improvements are more substantial among persons aged 65 or higher. In particular, in Germany there seems to be a worsening in disability among younger persons for all indicators whereas there seems to be an improvement among persons aged 65+. Considering these findings by sex (results not shown here) the overall patterns persist but it seems that improvement is more substantial among women. Further, when chronic conditions are also controlled for (models not shown here), improvement becomes more significant in some instances highlighting thus the important role of chronic conditions in the disablement process.

Conclusion

It is a fact that disability prevalence is greatest among the oldest old segment of the population, especially those aged 85 or higher. Given the continuing decline in mortality and the fact that the baby boom generations in Europe are nearing retirement age, a substantial increase in the numbers of disabled elderly in the future seems inevitable (Grundy *et al.* 2006). Most research indicate improvements in activity restrictions and functional limitations among the older old though some studies show an increasing trend in activity restrictions in mid-life. The present study indicates that though trends may differentiate by country the overall picture is of an improvement, especially among women aged 65 or higher.

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Table 1: Trends in disability between waves 1 and 5 of SHARE among persons aged 50 or higher: Odds Ratios and 95% Confidence Intervals (in parentheses) by country and indicator, controlling for age and gender

Country	Gali	ADL	IADL	Mobility	N
Austria	.959(.928,.990)	.978(.928,1.030)	.978(.939,1.019)	.917(.887,.948)	11923
Germany	1.035(1.010,1.060)	1.041(.998,1.085)	1.015(.979,1.053)	.996(.972,1.0214)	12452
Sweden	.934(.910,.958)	.927(.887,.969)	.898(.863,.934)	.927(.902,.952)	12075
Netherlands	1.026(1.000,1.051)	.967(.921,1.016)	.971(.936,1.007)	.961(.936,.987)	12193
Spain	.955(.922,.989)	1.021(.971,1.073)	.958(.919,.999)	.965(.931,.999)	14243
Italy	.964(.931,.999)	1.031(.973,1.091)	.955(.909,1.003)	.945(.913,.977)	13503
France	1.041(1.013,1.070	.989(.950,1.029)	.946(.912,.981)	.986(.958,1.014)	15583
Denmark	.911(.886,.936)	.940(.896,.987)	.911(.875,.949)	.940(.914,.967)	10348
Switzerland	.948(.914,.983)	.959(.895,1.027)	1.001(.944,1.062)	.951(.916,.987)	8903
Belgium	1.087(1.060,1.115)	1.068(1.030,1.107)	1.020(.987,1.053)	1.033(1.007,1.060)	17196

Table 1a: Trends in disability between waves 1 and 5 of SHARE among persons aged 50-64: Odds Ratios and 95% Confidence Intervals (in parentheses) by country and indicator, controlling for age and gender

Country	Gali	ADL	IADL	Mobility	N
Austria	.966(.920,1.013)	.925(.841,1.017)	.988(.920,1.062)	.881(.840,.924)	5461
Germany	1.128(1.090,1.167)	1.170(1.086,1.262)	1.123(1.055,1.195)	1.070(1.034,1.109)	6239
Sweden	.941(.901,.983)	.935(.854,1.024)	.955(.879,1.039)	.944(.903,.988)	5038
Netherlands	1.026(.990,1.064)	1.048(.966,1.137)	.997(.941,1.057)	.987(.950,1.025)	6319
Spain	.935(.885,.989)	.922(.830,1.024)	.889(.821,.964)	.952(.902,1.003)	6023
Italy	.954(.908,1.002)	.996(.884,1.123)	.861(.792,.935)	.912(.870,.956)	6113
France	1.044(1.001,1.089)	1.022(.944,1.107)	1.011(.941,1.086)	1.018(.975,1.063)	7702

Denmark	.931(.895,.968)	.959(.881,1.045)	.942(.878.1.010)	.967(.928,1.007)	5504
Switzerland	.935(.885,.988)	.955(.849,1.074)	.971(.876,1.077)	.955(.902,1.010)	4355
Belgium	1.093(1.055,1.132)	1.081(1.015,1.151)	1.024(.971,1.080)	1.025(.990,1.061)	8894

Table 1b: Trends in disability between waves 1 and 5 of SHARE among persons aged 65 or higher: Odds Ratios and 95% Confidence Intervals (in parentheses) by country and indicator, controlling for age and gender

Country	Gali	ADL	IADL	Mobility	N
Austria	.950(.910,.991)	1.000(.939,1.065)	.968(.919,1.019)	.959(.917,1.003)	6462
Germany	.932(.899,.966)	.977(.929,1.028)	.961(.917,1.006)	.910(.877,.944)	6213
Sweden	.936(.906,.967)	.929(.883,.978)	.884(.845,.924)	.916(.887,.947)	7034
Netherlands	1.024(.988,1.062)	.923(.866,.983)	.957(.911,1.005)	.937(.902,.973)	5874
Spain	.968(.926,1.011)	1.048(.988,1.111)	.982(.9335,1.033)	.976(932,1.022)	8220
Italy	.970(.923,1.020)	1.036(.970,1.107)	.980(.923,1.041)	.978(.931,1.027)	7390
France	1.050(1.010,1.092)	.972(.922,1.024)	.918(.875,.963)	.956(.918,.995)	7881
Denmark	.898(.864,.934)	.940(.885,.999)	.904(.859,.951)	.921(.885,.958)	4844
Switzerland	.962(.916,1.012)	.964(.885,1.051)	1.025(.951,1.104)	.951(.904,1.001)	4548
Belgium	1.079(1.041,1.118)	1.054(1.008,1.102)	1.005(.963,1.048)	1.040(1.002,1.080)	8302