Disability levels and trends among older adults in Europe based on the 3-category GALI and SHARE data

Background

Disability prevalence is greater among older persons; it affects quality of life while, at the same time, it poses a significant financial burden on health care services (Geerts et al. 2012). Over the past decade a lot of emphasis has been put on estimating healthy years of life expectancy, a measure which takes into account disability in conjunction with mortality. In this context, a general measure of disability, the Global Activity Limitation Indicator (GALI) has been developed and validated, and has been used extensively since to derive such estimates (Robine and Jagger 2003; van Oyen et al. 2006).

GALI stems from a question on whether the respondent considers himself as 'strongly limited in activities people usually do', 'limited but not strongly', or 'not limited', for at least the six months preceding the survey due to a health problem. Other well established self-reported measures of disability are based on the ability of an individual to perform specific tasks; such are limitations in Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs). Whereas ADLs and IADLs reflect mostly severe disability among older persons, GALI can identify limitations occurring before age 65 while it also has the potential to distinguish between moderately and severely limited persons (Cambois et al. 2012).

ADLs and IADLs have been used extensively in analyses of disability in the past. Literature on GALI, on the other hand, has been increasing over the past decade, but the measure has been considered almost exclusively in its binary form (i.e. no limitations vs at least some) instead of the 3-category version of it. Distinguishing between 'mild' and 'severe' level of disability/activity limitations is important, since these represent a different burden on health care systems. The present analysis contributes towards filling in this gap. The study uses data from two waves of the Survey of Health, Ageing and Retirement in Europe (SHARE), carried out in 2004 and 2006/7, covering 11 European countries, and aims at (a) exploring age-specific patterns of disability by sex among persons aged 50 or higher putting emphasis on the 3-category version of GALI; (b) examining over time changes calculating age standardised disability rates by sex, and (c) assessing effects of established socioeconomic indicators (educational attainment and net wealth) and of behavioural

risk factors (obesity and physical activity) on GALI using multinomial regression models.

Data and methods

The data used in this analysis derive from release 2-5-0 (May 2011) of waves 1 and 2 of the Survey of Health Ageing and Retirement in Europe (SHARE). The study population is males and females aged 50 or higher. The analysis focuses on the eleven countries participating in both waves (Austria, Germany, Sweden, The Netherlands, Spain, Italy, France, Denmark, Greece, Switzerland and Belgium). The sample sizes of waves 1 and 2 are 27,527 and 27,523 persons, respectively, with non-missing information on demographic variables.

Usual descriptive and exploratory data procedures are applied to the variables used in the analysis. The detailed age and sex distribution of the respondents reporting disability difficulties is depicted graphically in single-year pyramids. The age patterns of disability are examined in terms of age and sex specific rates. To evaluate overall differences in the health outcome between sexes and across categories of GALI as well as changes over time (waves 1 and 2) age-sex standardised prevalence rates are calculated using the direct standardisation technique.

Relying on cross-sectional data of waves 1 and 2, the relative effects of the demographic characteristics (age, sex), socioeconomic variables (education, net-wealth) and selected risk factors (physical inactivity, obese, presence of chronic diseases) on the disability outcomes are assessed employing multinomial regression models. Mildly and severely limited states are compared to the 'no limitation' category (reference category). Educational attainment is considered in three intervals: 0–6 years (none or primary education), 7–12 years (lower and upper secondary education) and 13 years or more (tertiary education). Net wealth distinguishes individuals in four groups based on the quartiles of net-wealth values; these quartiles have been calculated separately by country, as levels and patterns of economic characteristics (net-wealth, income) differ considerably between them. In statistical modelling low educational attainment (0-6 years) and low level of net wealth (first quartile) are considered as reference categories. The results are adjusted for country differences. The statistical analysis has been carried out using SPSS 19.0.

Results

The patterns of cross-sectional age specific disability rates (Figure 1) are quite similar for both waves and sexes, though levels are lower for males, especially regarding mild disability. The rates increase with age; the increase is rather regular for persons reporting mild disability while the rates tend to level off above age 75, especially for females. By contrast, severe disability rates are fairly constant between ages 50 and 65 and exhibit a sharp increasing trend thereafter. Levels of severe disability are lower compared to mild disability at all ages.

Table 1 presents age standardised rates of limitations by sex and wave based on the 3-category GALI. For both waves and sexes, prevalence of mild limitations is nearly double the prevalence of severe limitations. The rates also indicate that there is a sex differential; for both waves, prevalence is greater for women while the difference is more pronounced among the mildly limited. Between the waves, there is a clear declining trend both among the mildly and the severely limited, observed for males and for females. The magnitude of the decrease is greater among mildly limited females.

Table 2 shows the cross-sectional associations of socio-economic indicators and behavioural risk factors with mild and severe disability based on the use of multinomial regression models. The results are fairly similar for both waves. Increasing age is significantly related to higher chances of disability. Regarding mild disability, the relative risk ratios (RRR) indicate for females significantly higher chances of reporting limitations compared to males. The results also show that there is a strong socio-economic gradient. Behavioural risk factors (obesity and physical inactivity) are very important. Having reported at least one chronic condition significantly increases chances of mild disability fivefold. Regarding severe disability, sex does not play any part. Socio-economic factors are very significant in this instance, as well, while they exhibit a stronger effect compared to mild disability. The relative importance of physical inactivity and of the presence of chronic diseases is much more marked in this case, increasing chances of disability tenfold.

Conclusions

A decline in disability prevalence among older adults in Europe has been found though in order to establish inadvertently that this represents a long term trend further research is needed, covering a longer period of time and using additional waves of SHARE data. The 3-category version of GALI seems a consistent indicator of disability which,

though based on a general question, has the advantage of identifying cases of mild as well as of severe disability.

References

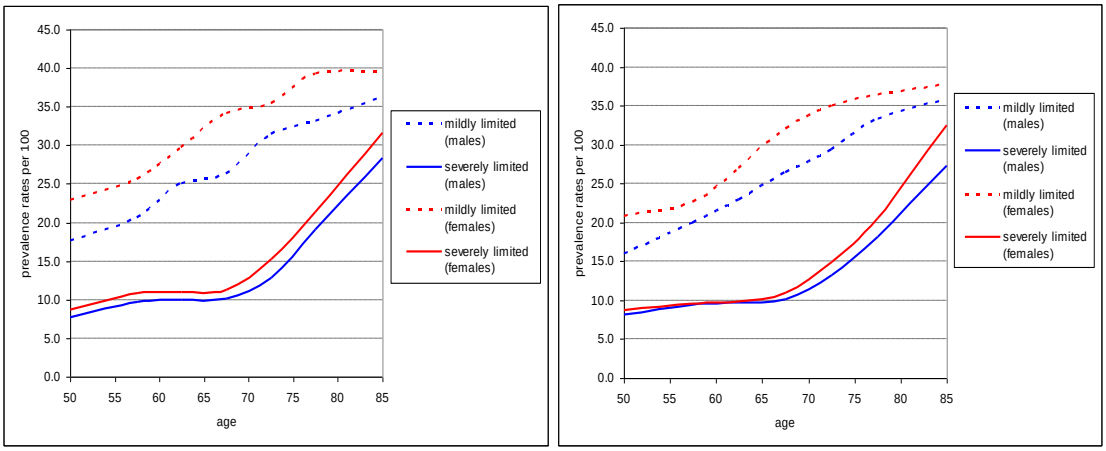
Cambois, E., Blachier, A., & Robine, J-M. (2012). Aging and health in France: an unexpected expansion of disability in mid-adulthood over recent years. *European Journal of Public Health*, Doi: 10.1093/eurpub/cks136.

Geerts, J., Willemé, P., Pickard, L., King, D., Comas-Herrera, A., Wittwer, J., Goltz, A., Mot, E., Schultz, E., Sowa, A., & Vegas, R. (2012). Projections of use and supply of long-term care in Europe: Policy implications. European Network of Economic Policy Research Institutes, ENEPRI Policy Brief No. 12. http://aei.pitt.edu/34585/

Robine, J-M., & Jagger, C. (2003). Creating a coherent set of indicators to monitor health across Europe. The Euro-REVES2 project. *European Journal of Public Health*, *13(3 supplement)*, 6-14.

Van Oyen, H., van der Heyden, J., Perenboom, R., & Jagger, C. (2006). Monitoring population disability: evaluation of a new Global Activity Limitation Indicator (GALI). *Soz Praventiv Med*, *51*, 153-161.

Figure 1 Age-specific disability rates per 100 based on the GALI indicator



(a) Wave 1 (b) Wave 2

Table 1 Age standardiased rates of functional limitations per 100 based on the GALI indicator by sex and wave

	Wave 1	Wave 2	Difference (%)
	Males		
mildly limited	26.2	25.2	-3.8
severely limited	13.1	12.6	-3.3
	Females		
mildly limited	31.6	29.3	-7.1
severely limited	14.5	13.9	-3.6

Table 2 Multinomial regression results (dependent variable is 3-category GALI): relative risk ratios (RRR) and 95% confidence intervals (wave 1 and wave 2)

		Wave 1 (N=26669)			Wave 2 (N=25931)		
Reference: Not limited	**Variables**	**RRR**	**Lower**	**Upper**	**RRR**	**Lower**	**Upper**
Mildly limited	female	1.253**	1.180	1.330	1.176**	1.106	1.251
	age	1.024**	1.021	1.027	1.025**	1.022	1.029
	educ7to12	0.771**	.710	.838	0.785**	.715	.861
	educ13plus	0.643**	.582	.710	0.710**	.638	.790
	hhnetworth_Q2	0.858**	.789	.934	0.897*	.824	.977
	hhnetworth_Q3	0.806**	.741	.878	0.788**	.721	.861
	hhnetworth_Q4	0.738**	.676	.807	0.758**	.695	.827
	phactiv	2.153**	1.911	2.425	2.273**	2.008	2.573
	obese	1.346**	1.246	1.455	1.228**	1.135	1.329
	chronic 1+	5.263**	4.831	5.735	5.148**	4.714	5.622
Severely limited	female	1.062	.977	1.155	1.004	.921	1.094
	age	1.028**	1.023	1.032	1.029**	1.024	1.033
	educ7to12	0.654**	.582	.734	0.780**	.683	.891
	educ13plus	0.487**	.423	.560	0.570**	.487	.666
	hhnetworth_Q2	0.767**	.685	.858	0.688**	.614	.771
	hhnetworth_Q3	0.705**	.628	.791	0.610**	.542	.686
	hhnetworth_Q4	0.549**	.484	.622	0.589**	.520	.667
	phactiv	10.157**	8.976	11.494	11.529**	10.155	13.088
	obese	1.441**	1.298	1.600	1.401**	1.261	1.557
	chronic 1+	10.064**	8.551	11.845	10.017**	8.479	11.835
-2Log Likelihood		31428**			30440**		

* $p < 0.05$ ** $p < 0.01$