



4 Health and Health Care

Editor: Johan Mackenbach

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4.1 Changes in Physical Health Among Older Europeans

Mauricio Avendano, Johan Mackenbach

At the turn of the 21st century, life expectancy in western European countries ranked among the highest worldwide. In 2005, an average man in a European SHARE country could expect to live 76 to 79 years, and an average woman 80 to 84 years (World Health Organization, 2007). However, the number of years Europeans can expect to live in poor health remains substantial (World Health Organization, 2007). This largely reflects the fact that as individuals age, their health deteriorates. Describing the magnitude of this age-related deterioration in health for different health outcomes among Europeans is crucial for the development of prevention and healthcare policies.

Besides age, gender has also a major influence on health changes. It is well known that men experience a higher risk of dying than women. Paradoxically, data from the first Wave of SHARE and other studies indicate that women report more health complaints and experience more disability than men (Arber and Cooper, 1999; Börsch-Supan, et al., 2005). Longitudinal data from SHARE provide an opportunity to examine these gender variations in the European population, and to explore how they vary for different health outcomes. In the context of these gender and age differences, however, it is also important to bear in mind that health changes may occur differently across countries. Switzerland, Sweden and Italy have considerably higher life expectancy than countries such as Denmark and the Netherlands (World Health Organization, 2007). These differences may stem from variations in the prevalence of risk factors such as smoking and the delivery of healthcare, but may also be the consequence of differences in broader economic and political factors. Understanding these differences can contribute to the development of policies that can help us preventing disease, disability and death.

In an attempt to address these questions, we used longitudinal data from SHARE to examine variations in the incidence of chronic diseases, poor self-perceived health, disability and death according to age, gender and country, and explored the potential role of risk factors in explaining these differences.

Methods

Participants who took part in the 2004 Wave of SHARE were interviewed two years later to examine the occurrence of new health events. We measured a wide range of health outcomes, including: (1) Chronic diseases: Participants were asked whether they had had a heart attack, stroke, cancer or hip fracture since the last interview. In addition, respondents were asked whether they had ever been diagnosed by a doctor with other chronic diseases including hypertension, diabetes, lung disease, high cholesterol, arthritis and cataracts. Those who did not report these conditions in Wave 1 but reported having been diagnosed with these conditions by Wave 2 were classified as incident cases. (2) Self-perceived health: This was measured by a single item with 5 answer categories ranging from 'excellent' to 'poor'. (3) Disability: Participants were asked whether they experienced difficulties with one or more activities of daily living (ADL) e.g., dressing, getting in and out of bed; instrumental activities of daily living (IADL) e.g., using a map, preparing a hot meal; and mobility and motor function, e.g., walking 100 meters, climbing stairs. (4) Death: Vital status was ascertained based on reports from proxy respondents.

Data from SHARE comprise information on risk factors defined as: smoking (current, former or never), excessive alcohol drinking (>2 drinks 5 or more days a week), physical

activity (dichotomised based on one to three times a month or more vs. never or hardly ever engaging in vigorous or moderate physical activities), and body mass index, reclassified into underweight (BMI < 18.5), normal (BMI between 18.5 and 24.9), overweight (BMI between 25 and 29.9), and obese (BMI 30 or above).

Analysis on chronic diseases, self-perceived health and disability were restricted to participants who responded to the SHARE survey both in 2004 and 2006, and who had no missing values for outcomes measures (n=17,353). Analyses for each of these outcomes were restricted to sub-samples of participants who reported in the first Wave that they were free of the respective outcome. Analyses on mortality included individuals who responded to the survey in Wave 1 and for whom vital status was ascertained (n=18,344). We used Poisson regression to model the 2-year incidence rate of chronic diseases, poor self-perceived health, disability and death according to age, gender and country. In addition, we calculated Poisson-regression based rate ratios to examine the impact of gender and risk factors on the incidence of diseases, disability and death. When interpreting results, it is important to bear in mind that the present analysis is based on preliminary data, as records for all participants are not yet complete. Results should therefore be interpreted cautiously.

Results

Men Have Higher Incidence of Fatal Diseases and Death, But Women Experience More Disability

Many health changes occurred in SHARE participants who were healthy in 2004, see Table 1. Overall rates of stroke were higher than rates of heart attack. In a two-year period, the incidence of first heart attack was 1.4 in men and 0.6 in women, and the incidence of stroke was 1.9 for men and 1.0 for women per 100 individuals. After adjusting for age and country, rates of stroke, heart attack and lung disease in women were about half of those in men. About 14 per 100 participants reported a new diagnoses of hypertension, and about 3 per 100 a new diagnosis of diabetes.

Despite having a lower risk of dying, women were almost twice more likely to have a hip fracture, and had 77 percent (95 percent CI 1.60, 1.95) higher rates of arthritis than men. The rate of developing cataracts was about a third higher in women than in men. These three conditions are unlikely to result in death, but have a major impact on individual's ability to perform basic activities and in their quality of life. Consistently, women were about 20 percent (95 percent CI 1.10, 1.29) more likely to change from good to poor self-perceived health, and to develop disability as compared to men. Rates of developing new limitations with instrumental activities of daily living and mobility were about 50 percent higher in women than men.

Health outcome	Health	Population	Men		Women		Rate ratio (95%CI)
			Rate	95% CI	Rate	95% CI	
Heart attack	159	15,313	1.4	(0.9, 1.6)	0.6	(0.3, 0.7)	0.42 (0.31, 0.57)
Stroke	212	16,752	1.9	(1.7, 2.2)	1.0	(0.8, 1.2)	0.41 (0.32, 0.53)
Cancer	327	16,483	1.7	(1.5, 2.0)	1.4	(1.2, 1.7)	0.83 (0.66, 1.03)
Hip Fracture	118	17,033	0.9	(0.7, 1.0)	0.4	(0.3, 0.5)	1.89 (1.28, 2.83)
Hypertension	1,662	11,794	14.4	(13.5, 15.4)	14.2	(1.2, 1.7)	0.92 (0.85, 1.02)
Diabetes	519	15,759	3.6	(3.2, 4.0)	3.5	(3.1, 3.8)	0.90 (0.77, 1.05)
Lung disease	476	16,501	3.7	(3.3, 4.1)	2.3	(2.1, 2.6)	0.56 (0.48, 0.67)
High cholesterol	1,410	13,653	8.4	(7.7, 9.1)	9.0	(8.4, 9.6)	1.07 (0.96, 1.19)
Arthritis	1,556	13,882	7.6	(7.1, 8.3)	14.2	(13.4, 15.0)	1.77 (1.60, 1.95)
Cataracts	631	16,111	2.7	(2.4, 3.1)	4.2	(3.9, 4.6)	1.34 (1.14, 1.57)
Poor health	2,403	12,605	16.6	(15.7, 17.7)	21.1	(20.1, 22.2)	1.19 (1.10, 1.29)
1+ ADL	889	15,863	4.6	(4.1, 5.1)	6.3	(5.9, 6.8)	1.16 (1.02, 1.32)
1+ IADL	1,458	14,925	7.0	(6.5, 7.6)	11.7	(11.1, 12.4)	1.50 (1.35, 1.65)
1+ mobility	2,152	9,098	17.2	(16.1, 18.3)	28.2	(26.7, 29.8)	1.58 (1.45, 1.72)
Death	762	18,344	4.1	(3.8, 4.6)	3.0	(2.7, 3.3)	0.63 (0.55, 0.73)

Table 1 Two-year incidence of chronic diseases, poor-self-perceived health, disability and death per 100 individuals

Note: Rate ratios are adjusted for age and country and compare men (reference) vs. women

The Age-Related Increase in Incidence Differs for Men and Women and Across Different Health Outcomes

As expected, the incidence of most chronic diseases increases dramatically with age, but the magnitude of this increase differs for men and women, and across different chronic diseases, see Figure 1. Among men, a sharp increase with age was observed in the incidence of stroke, cancer and hip fractures. For instance, at ages 50-59, the two-year incidence of stroke was only 0.5 (95 percent Confidence interval 0.3, 0.7) per 100 men, but increased by a factor of 15 at ages 80+ (7; 5.2, 10.0). On the other hand, the incidence of heart attack among men did not increase after ages 60-69. This flattening in the incidence of heart attack is unexpected, as we would expect a sharper increase at older ages. Our results may be partly explained by underreporting of this condition at older ages, or by the fact that the SHARE sample interviewed in 2004 comprised only the non-institutionalised population, which may be a selection of healthy survivors. Among women, there was a marked age-related increase in the incidence of heart attack, stroke and hip fractures. To illustrate, the incidence of hip fractures was only 0.2 (0.1, 0.4) per 100 women at ages 50-59, but was about 15 times higher at ages 80+ (2.9; 2.0, 4.3).

In contrast to other chronic diseases, the incidence of cancer in women increased up to ages 60-69 and decreased sharply thereafter, whereas the incidence of cancer in men increased sharply with age, particularly among men aged 80+. These gender differences in the age patterning of cancer incidence are most likely attributable to cancer screening (Verkooijen, Koot, Fioretta, van der Heiden, Schipper, Rapiti et al., 2008). About half of cancers reported among women were breast tumours. In many European countries, women are screened for breast cancer after age 50 and up to about age 69, which may

explain the high incidence of cancer at these ages. Similarly, opportunistic screening for prostate and colorectal cancer in men is most marked at older ages, which may account for the large increase in incidence beyond age 80.

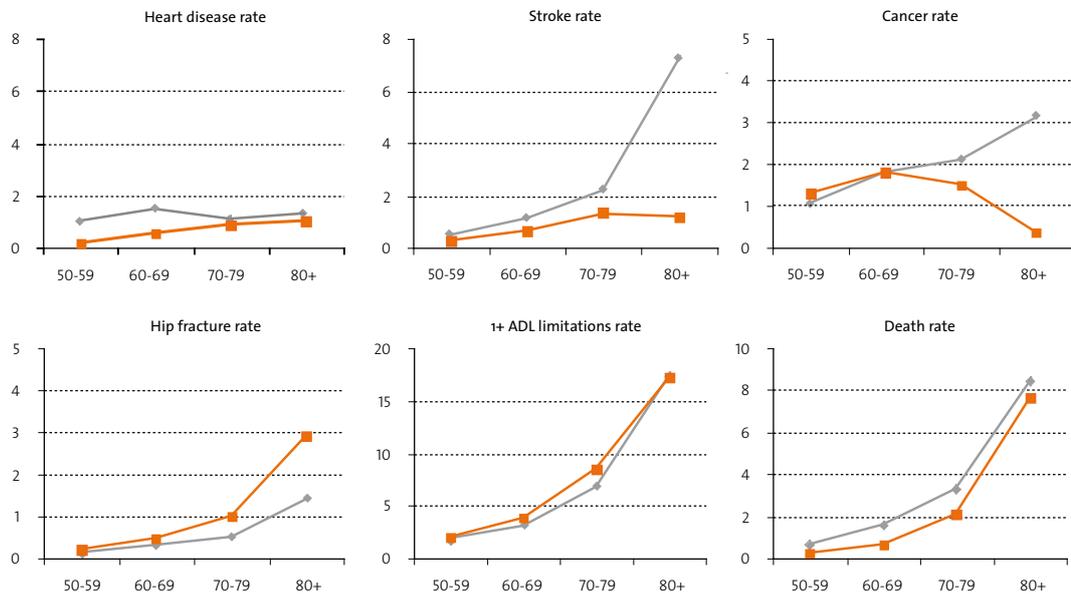


Figure 1 Two-year incidence of chronic diseases, disability and death per 100 individuals according to age and sex (adjusted for country) in the period 2004-2006

Rates of reporting 1+ limitation with ADLs increased sharply with age in both men and women. At ages 50-59, only about 2 per 100 individuals developed at least one new limitation in a two-year period, as compared to about 17 per 100 at ages 80+. As expected, death rates increased linearly with age. At ages 50-59, death rates were 0.7 (0.5, 0.9) in men and 0.3 (0.2, 0.4) in women, but at ages 80+ rates increased to 8.4 (7.1, 10.1) in men and 7.7 (6.6, 8.9) in women. At any age, men experienced a higher risk of dying than women.

Smoking and Low Physical Activity – Major Determinants of Health in Europeans

Figure 2 shows that participants who smoked in 2004 were more likely to develop a heart attack, poor self-perceived health, and disability, and had higher death rates, compared to those who did not smoke. For instance, the rate of heart attack was 2.5 (1.7, 3.6) times higher in smokers as compared to non-smokers. Low physical activity in 2004 was strongly associated with higher risk of reporting new health problems or dying two years later. Those who did not engage in vigorous or moderate physical activities were 3 (2.6, 3.5) times more likely to die than those who engaged in some level of physical activity. As compared to those having a normal weight, participants who were overweight were more likely to report poor health, but did not have an increased risk of death or other health problems. Obese participants had considerably higher rates of reporting poor health and disability than those with normal weight, but they had also a lower risk of dying. Participants who reported drinking 2 or more alcohol drinks 5/6 days per week had lower rates of health problems as compared to those who drank less.

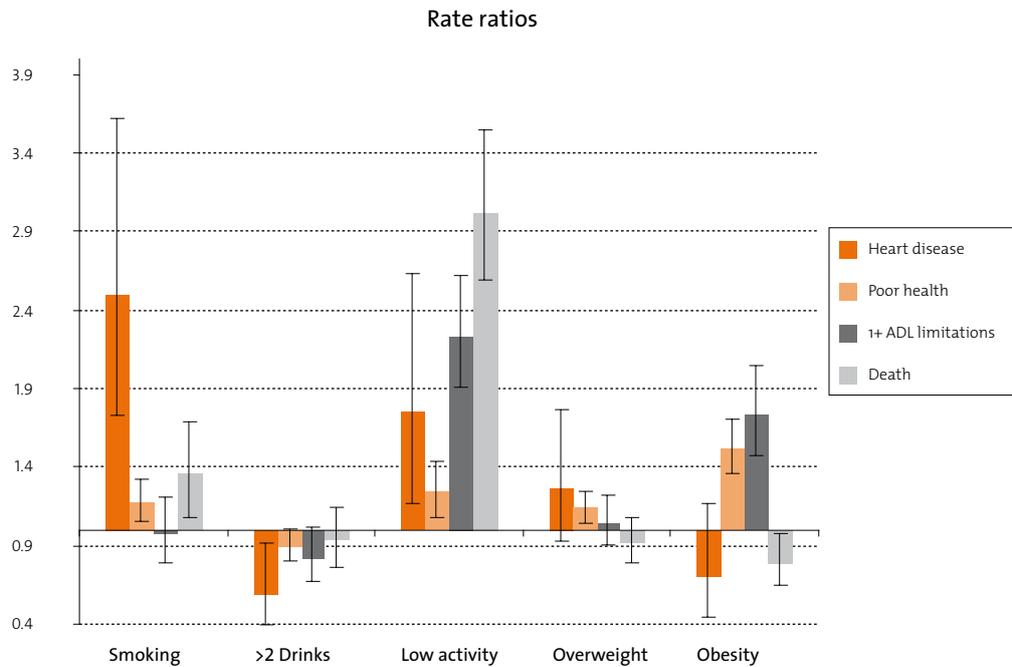


Figure 2 Rate ratios of the association between risk factors and the incidence of new health problems

Note: Rate ratios compare smoking vs. non-smokers; >2 alcoholic drinks vs. other; no physical activity vs. other; overweight vs. normal weight; and obesity vs. normal weight. All estimates are derived from a single model adjusted for age, sex, country, educational level, smoking, excessive drinking, physical activity, and body mass index

Differences in Health Among Countries Are Not Fully Explained by Cross-Country Differences in Known Risk Factors

Figure 3 shows that there are large variations across countries in health outcomes. Swiss and Greeks stand out as having the lowest mortality rates, as well as the lowest rates of incident poor self-perceived health. Belgium, Sweden and Italy have also relatively low mortality rates. France, Italy and Spain had the highest rates of incident poor self-perceived health, but death rates in these countries do not differ significantly from those in other populations. The incidence of reporting a new limitation with ADL is highest in Belgium, France and Spain, and lowest in the Netherlands and Greece. There is not a clear pattern of variation in the incidence of a new heart disease or stroke, with only Greece and France showing lower rates than other European countries.

The second bar for each country in Figure 3 shows what the two-year incidence of health problems would be if all countries had the same prevalence of smoking, excessive alcohol use, low physical activity, overweight and obesity. Strikingly, the pattern of variations in health across countries remained largely unchanged, which suggests that these factors do not fully explain why some countries are healthier than others.

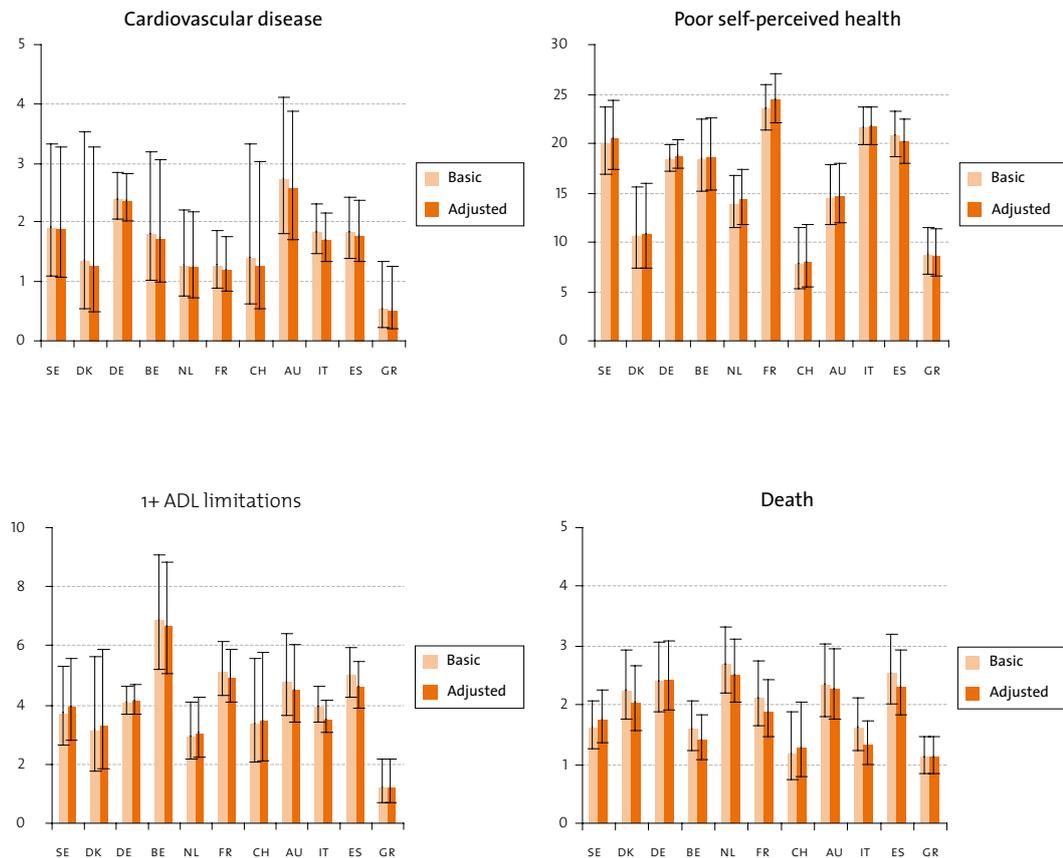


Figure 3 Two-year incidence of health problems in 11 European countries in the period 2004-2006, before and after adjusting for baseline prevalence of risk factors

Note: Basic model is adjusted for age and sex; adjusted model is adjusted for age, sex, smoking, excessive drinking, body mass index and physical activity

Conclusions

The SHARE study provides a unique opportunity to examine health and its determinants across Europe. Consistent with much previous research (Arber and Cooper, 1999), our data suggest that men are at higher risk of dying than women, but women experience more disability than men. Our data shed some light into this paradox: It would appear as if women are more likely than men to experience diseases that have a large impact on mobility, disability and quality of life, such as arthritis, cataracts, and hip fracture. On the contrary, men are at increased risk of developing fatal conditions such as heart disease and stroke. Two possible explanations are possible for this pattern: On the one hand, exposure to risk factors for fatal and non-fatal diseases may differ by gender. Whereas men are more likely to behave poorly, e.g., they smoke and drink more and have a less healthy diet, women may have a higher prevalence of risk factors for musculoskeletal disorders. On the other hand, this difference may be an artefact of selective survival. Because men are more likely to die than women across the age-span, men who survive into old age are a selection of the healthiest, and no longer comparable to women of the same age. Data from SHARE for later waves will provide an opportunity for testing these hypotheses.

Cross-country variations in the incidence of diseases, disability and death should be interpreted with much caution, as they may reflect variations across countries in reporting,

attrition and non-response rates. Future analyses should develop methods to account for these potential sources of bias. Despite these limitations, our data are consistent with estimates from the World Health Organization (World Health Organization, 2007) suggesting that health varies across European countries. Some countries such as Greece and Switzerland tend to be healthier than other countries regardless of the health outcome examined. This advantage might reflect the relatively healthy life style and diet among Greeks, and the relatively favourable social and economic conditions among the Swiss. On the other hand, a puzzling pattern emerges when examining variations in outcomes for other populations. To illustrate, although France had a lower incidence of cardiovascular disease, we did not observe a north-to south gradient as observed for ischaemic heart disease mortality in previous studies (Sans, Kesteloot, and Kromhout, 1997). Further inspection of the data is necessary to examine whether these differences are real or due to variations in response rates or diagnosis practices.

In conclusion, data from two waves of the SHARE study provide a unique source of information on the health of Europeans, along with extensive data on the economic and social context of health variations. A main challenge will be to examine how these contextual factors interact to explain why some populations are healthier than others, and thus develop policies to increase life expectancy in the European region.

Key Points

- Men have a higher risk of fatal diseases and death than women, whereas women are more likely to experience less fatal but more disabling diseases that result in a higher prevalence of disability as compared to men.
- The incidence of many chronic diseases increases dramatically with age, but the magnitude of this increase differs for men and women, and across different health outcomes.
- Smoking and low physical activity were most consistently associated with health deterioration among Europeans, whereas a mixed picture emerges for the impact of overweight, obesity and alcohol consumption on different health outcomes.
- There are large variations among European countries in the prevalence of smoking, alcohol consumption, overweight, obesity and physical activity, but these factors do not fully explain why some countries are healthier than others.

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4.2 The Association Between Socioeconomic Status and Changes in Health in Europe

Renske Kok, Mauricio Avendano, Johan Mackenbach

Numerous studies have found disparities in health between socioeconomic groups in modern societies (van Doorslaer, Wagstaff et al., 1997; Huisman, Kunst et al., 2004; Dalstra, Kunst et al., 2005). Many international studies targeted at measuring disparities in morbidity use self-perceived health as outcome, which is a broad, generic measure of health. Although many studies found that self-perceived health is a good predictor of mortality (Idler and Benyamini 1997), differences in reporting and expectations may influence this outcome. A more specific measure of morbidity is self-reported chronic diseases. Several country-specific longitudinal studies have examined socioeconomic disparities in chronic diseases such as heart disease and stroke (Mackenbach, Cavelaars et al., 2000; Avendano, Kunst et al., 2005). However, there are few European overviews of disparities in chronic disease incidence, as existing studies are based on cross-sectional data (Cavelaars, Kunst et al., 1998; Dalstra, Kunst et al., 2005) or mortality as an outcome (Mackenbach, Bos et al., 2003; Huisman, Kunst et al., 2004; Avendano, Kunst et al., 2005).

Based on data from two waves of the SHARE study, this paper examines disparities between socioeconomic groups in incident chronic diseases, death, poor self-perceived health and disability. It is generally known that risk factors are not spread evenly over socioeconomic groups (Cavelaars, Kunst et al., 1998). Therefore, we also examined the association between socioeconomic status and incident health outcomes adjusting for modifiable risk factors.

Methods

Data are restricted to respondents included in both waves of the SHARE survey; respondents with missing data on demographics or morbidity are omitted from the analysis. Two measures of socioeconomic status are used to assess disparities in health: level of education and wealth. Socioeconomic status is identified by the highest level of education reported, classified into three categories: levels 0-2 (pre-primary, primary and lower secondary education), 3 (upper secondary education) and 4-6 (post-secondary education) of the ISCED (international standard classification of education). Wealth is also used as it is an appropriate indicator of socioeconomic status of the elderly and retired. Wealth was defined as the sum of all financial and real assets. Wealth values were adjusted by purchasing power parity and subsequently reclassified into country-specific tertiles.

Two-year incidence rates and odds ratios are estimated using logit regression, and are adjusted for age, sex, country, and time-interval between waves. A variable indicating the number of months between waves is included into the estimation, since the time-interval between Wave 1 and Wave 2 is not identical to all respondents across countries. A healthy baseline population is used in all calculations. Odds ratios compare the incidence of health events between socioeconomic groups, taking the highest educational level or wealth as reference category.

Results

Health Disadvantages Among the Low Socioeconomic Groups in Europe

Table 1 presents the two-year incidence of chronic diseases, death, poor self-perceived health (defined as deterioration from good/moderate to poor/very poor health), and reports of new limitations with one or more activities of daily living (ADL). Europeans with a low educational level or wealth have higher incidence of heart attack and stroke than their higher educated and wealthy counterparts. For example, 1.45 percent of Europeans with low wealth reported a stroke compared to 0.85 percent of the wealthiest. These results are confirmed in Figures 1 and 2, which present odds ratios that compare incidence rates in the high education or wealth groups, with rates in the middle and low education and wealth categories. The figure shows that the odds of getting a heart disease is more than double for low educated as compared to high educated.

	Education			Wealth		
Heart attack	low	0.98	(0.43, 2.27)	low	0.86	(0.38, 1.97)
	middle	0.68	(0.27, 1.71)	middle	0.79	(0.33, 2.00)
	high	0.48	(0.17, 1.39)	high	0.70	(0.28, 1.79)
Stroke	low	1.42	(0.64, 3.15)	low	1.45	(0.64, 3.28)
	middle	0.94	(0.38, 2.27)	middle	1.18	(0.51, 2.72)
	high	0.85	(0.31, 2.30)	high	0.85	(0.35, 2.07)
Cancer	low	1.70	(0.97, 3.01)	low	1.85	(1.04, 3.32)
	middle	2.03	(1.15, 3.56)	middle	2.00	(1.16, 3.47)
	high	2.31	(1.31, 4.08)	high	1.92	(1.10, 3.35)
Poor/very poor health	low	35.26	(31.82, 38.86)	low	35.64	(32.02, 39.41)
	middle	22.68	(19.69, 25.95)	middle	24.80	(21.85, 27.99)
	high	15.25	(12.85, 17.98)	high	21.08	(18.40, 24.02)
1+ ADL	low	21.06	(18.24, 24.17)	low	20.94	(18.01, 24.18)
	middle	12.21	(10.03, 14.76)	middle	14.86	(12.53, 17.51)
	high	8.38	(6.58, 10.60)	high	11.60	(9.61, 13.91)
Death	low	5.09	(3.79, 6.77)	low	6.09	(4.55, 8.08)
	middle	3.16	(2.23, 4.45)	middle	3.52	(2.51, 4.90)
	high	2.78	(1.85, 4.13)	high	2.52	(1.76, 3.59)

Table 1 Estimation of two-year incidence of chronic diseases between both waves

Note: Incidence rates are adjusted for sex, age, and country, and the time-interval between the waves is set to 24 month.

Confidence intervals are displayed between brackets

The gradient is reverse for cancer when using education; the largest incidence rate is found for the high educated group, and the smallest incidence rate for the lowest educated group. No differences in cancer incidence among wealth tertiles were observed. As shown in Figure 1, no association was found between hip fractures and education. However, low wealth seems to be associated with higher incidence of hip fractures; those in the lowest wealth tertile have 1.5 larger odds of hip fracture than wealthy Europeans. Finally, education level is associated with the odds of getting arthritis.

The more generic measures of morbidity, self-perceived health (SPH) and limitations in activities of daily living (ADL) show also a marked socioeconomic gradient both for education and wealth. For example, from the low educated group 35.3 percent is estimated to rate their health as bad or very bad in Wave 2 while rating their health as moderate or better in Wave 1. This is relatively high compared to the high educated group, among whom only 15.3 percent reported a deterioration in their health.

Similarly, 20.9 percent of those in the low tertile of wealth who had no ADL limitations in 2004 reported at least one ADL limitation in 2006, as opposed to only 11.6 percent of those in the highest tertile of wealth.

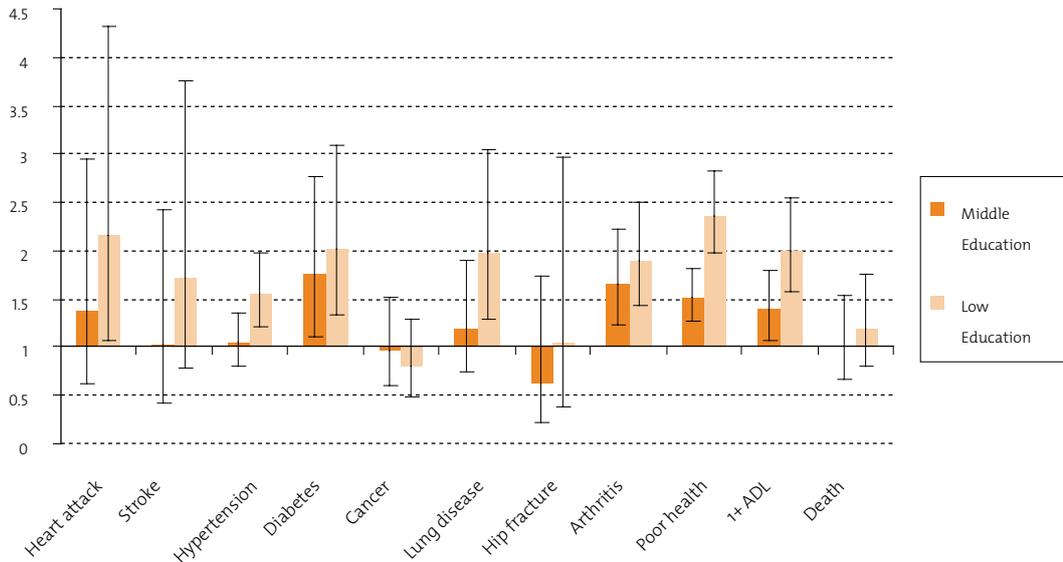


Figure 1 Odds ratios of having a chronic disease between 2004 and 2006 comparing low and middle with high education

Note: The odds are adjusted for age, gender, country, and the time-interval between waves

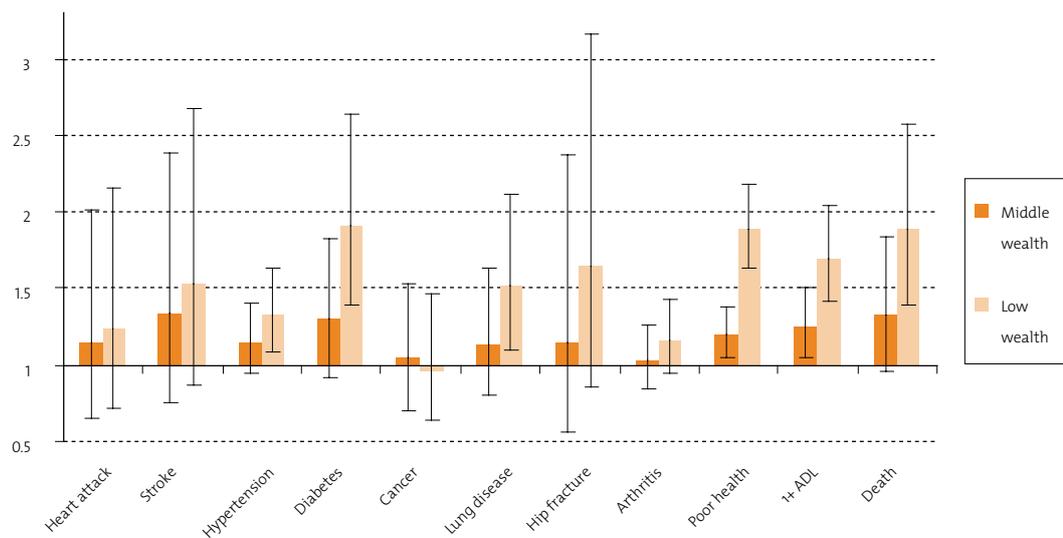


Figure 2 Odds ratios of having a chronic disease between 2004 and 2006 comparing low and middle with high wealth

Note: The odds are adjusted for age, gender, country, and the time-interval between waves

As shown in Figure 1, the odds of self-perceived health deterioration is more than twice higher in low educated Europeans as compared to their high educated counterparts. Consistently, those with a low educational level and low wealth have higher mortality rates than their higher education and wealthy counterparts, and the odds of dying is almost twice as large for Europeans with low wealth compared with the highest tertile of wealth. Differences between the middle and high socioeconomic status groups are less pronounced, both groups showing relatively similar incidence rates. In conclusion, Europeans with a low socioeconomic status experience a disadvantage in the incidence of most chronic diseases, self-perceived health and limitations with daily activities, as well and their risk of dying in a two-year period.

Behavioural Risk Factors Explain Only a Small Fraction of Health Disparities

Risk factors for chronic diseases are not evenly spread over socioeconomic groups, and could thereby explain the disparities we observe. Data from the first Wave of SHARE indicates that lower educated Europeans are generally more likely to smoke, to be physically inactive, and to be overweight. Furthermore, smoking, physical activity and obesity in 2004 were related to several health outcomes two years later. We calculated odds ratios that compare the highest and lowest educational levels, see Figure 3, and wealth tertiles, see Figure 4. Models are adjusted for baseline smoking (current and former), underweight, overweight, obesity, excessive alcohol consumption, hypertension, and diabetes. Both figures show that these risk factors have little influence on odd ratios, which suggest that they account for only a small fraction of health disparities. The adjustments have most influence on the odd ratios for self-perceived health and activity limitations, which are slightly attenuated after adjusting for risk factors. Overall, however, most of the effects of wealth and education on health remain unchanged in a model adjusted for all risk factors.

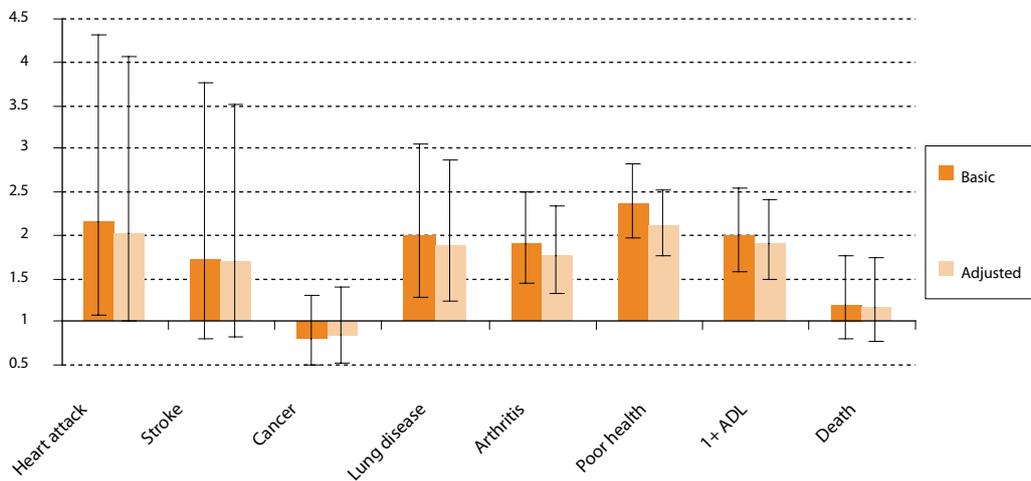


Figure 3 Odds ratios of having a chronic disease between 2004 and 2006 corrected for risk factors comparing low with high education

Note: Basic model is corrected for: age, gender, country, and time-interval between waves. The adjusted model is corrected for: age, gender, country, time-interval, hypertension, diabetes, smoking (current and former), underweight, overweight, obesity, and alcohol consumption in Wave 1

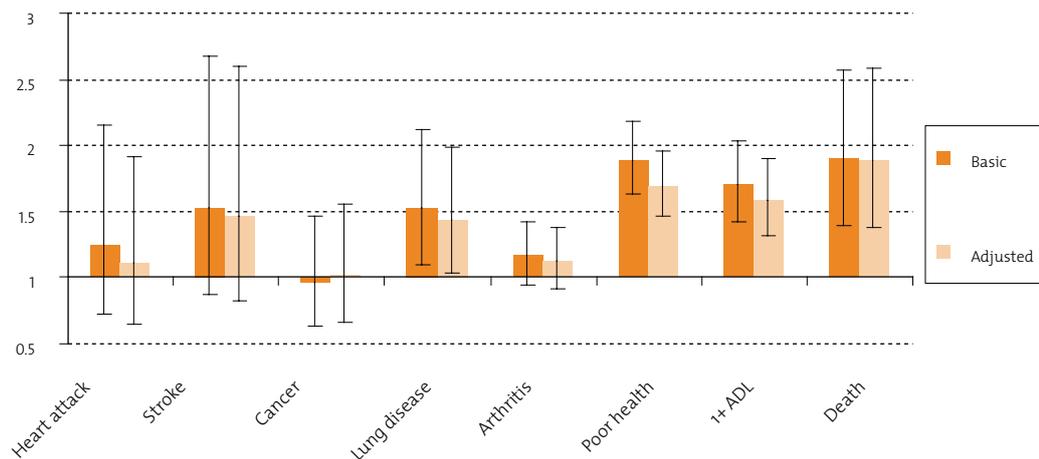


Figure 4 Odds ratios of having a chronic disease between 2004 and 2006 corrected for health behaviour comparing low with high education.

Note: Basic model is corrected for: age, gender, country, and time-interval between waves. The adjusted model is corrected for: age, gender, country, time-interval, hypertension, diabetes, smoking (current and former), underweight, overweight, obesity, and alcohol consumption in Wave 1

Conclusions

The results illustrate the persistence of socioeconomic disparities in health in European countries. The burden of both mortality and morbidity is generally larger for the low socioeconomic groups than for the rest of the population. These findings are consistent with earlier European studies, where similar socioeconomic gradient in prevalence of chronic diseases (Dalstra, Kunst et al., 2005), self-perceived health, limitations in daily activities (Huisman, Kunst et al., 2003), and mortality (Huisman, Kunst et al., 2004) were found.

The effect of education on health tended to be stronger than that for wealth. However, this is due to the fact that the high educated group is a smaller group of respondents and is therefore a more extreme category than their low educated counterparts, whereas wealth tertiles were all of equal size. Furthermore, confidence intervals are wide, and mostly suggest that both education and wealth are equally important determinants of health. The small number of new cases of chronic diseases led to lack of statistical power.

Adjusting for risk factors did not attenuate odds ratios substantially. Risk factors measures in our study were very generic and may not fully capture the complexity of health behaviour. For instance, alcohol consumption patterns are complex and vary dramatically across countries, and our instrument may not fully capture this complexity. It should be noted that risk factors in our study cannot be expected to completely explain the disparities in health, which is consistent with findings from cohort studies in localized populations; the British Whitehall study found that risk factors explained a small part of disparities in self-reported morbidity (Breeze, Fletcher et al., 2001) and the Dutch GLOBE study found similar results in disparities in mortality (van Oort, van Lenthe et al., 2005). Other determinants including psychosocial and nutritional risk factors, as well as exposures across the life course, may account for part of the unexplained effect of socioeconomic status on health. Data from SHARE will provide opportunities to further examining these hypotheses. Information about pathways in the explanation of socioeconomic differences

in health is essential for public health policy. Diminishing the disparities can potentially increase (healthy) life expectancy in Europe substantively, since the burden of morbidity and mortality is the largest for low socioeconomic groups.

Key Points

- Low socioeconomic status is associated with worsening health: Europeans with a low educational level and wealth experience more cardiovascular disease, lung disease, arthritis, deterioration in health and disability, and higher mortality rates than their high socioeconomic status counterparts.
- Smoking, alcohol consumption, underweight, overweight, obesity, hypertension and diabetes are associated with socioeconomic status, but explain only a small fraction of socioeconomic disparities in health.

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4.3 Changes in Health-Behaviour Related Determinants

Farizah Mohd Hairi, Mauricio Avendano, Johan Mackenbach

Smoking, a sedentary lifestyle and obesity are major determinants of cardiovascular disease, cancer and death (Murray, 1997). Positive changes in these determinants can improve the physical health of the elderly, and many of these improvements can be achieved by changes in behaviour (Ngaire M Kerse, 1999). Many theories and models have been developed on why people adopt, maintain and change their behaviour (Norman, 2000). Furthermore, governments have introduced policies such as smoke-free environments, ‘move for health’ campaign and encouraging physical activity.

The likelihood of adopting change in behaviour is likely to be influenced by demographic characteristics, factors in the social environment and national level-policies (Norman 2000). For instance, as people age the prevalence of health problems increases, which can motivate changes in health behaviour. Consequently, we would expect older age to be associated with changes in factors such as smoking. Similarly, the extent of changes in behaviour may differ between countries with different policies. For example, in Spain where a smoking ban was recently introduced, we would expect more smokers to stop smoking. Studies have also shown that Europeans with lower socioeconomic status are less aware of the risks of unhealthy behaviour and have less control over their unhealthy habits (Bobak 2000). Therefore, we would expect lower education or wealth to be associated with fewer changes towards a healthier lifestyle. Understanding these health-behaviour related determinants is essential to develop effective policies targeted towards high-risk populations.

The aim of this chapter is to examine the impact of demographic characteristics, socioeconomic status and country of residence on the likelihood of changes in health-behaviour related determinants. To address this question, we examine how these factors influence the likelihood of quitting smoking, becoming physically inactive and developing overweight and obesity among the elderly population.

Methods and Measurements

Respondents without missing values on all variables who participated in both waves of SHARE were included in our sample (n=17,607). Four outcomes were analysed in four separate sub-samples:

1. Quitting smoking: Smokers in Wave 1, i.e. those ‘having ever smoked (cigarettes, cigars, cigarillos, or pipe) at least for a year were asked whether they had stopped smoking since last interview (i.e. stop smoking in Wave 2). In France, reports of current smoking in both waves were used to determine changes in smoking.
2. Physical inactivity: Physically active respondents in Wave 1 (who were able to do ‘moderate physical activity’ (such as gardening, cleaning the car, or walking) and ‘vigorous physical activity’ (such as sports, heavy housework, or job that involves physical labour) but became sedentary in Wave 2, i.e. who hardly ever, or never engage in ‘vigorous physical activity’; and also hardly ever, or never engage in ‘activities that require a moderate level of energy’.
3. Overweight: Normal weight respondents in Wave 1 (with BMI between 18.5-24.9) who exceeded their BMI beyond 25 in Wave 2 were classified as having become overweight.

4. Obesity: Overweight respondents in Wave 1 (with BMI between 25-29.9) who had a BMI of 30+ in Wave 2 were classified as having become obese.

We used two indicators of socioeconomic status: education and wealth. Education was classified into three levels i.e., 0-2 (low), 3 (middle) and 4-6 (high) of the ISCED (International standard classification of education). Wealth was defined as the sum of all household financial and housing wealth (total net worth). To account for differences in household size, wealth was divided by the square root of the number of household members. Data on wealth was adjusted for purchasing power parity and transformed into euro in all countries. Wealth values were subsequently reclassified into tertiles.

Analysis

We used logistic regression to model two-year changes in health-behaviour related determinants as a function of age, gender and country. Figures present changes in determinants as predicted by the model. Subsequently, we incorporated both educational level and wealth into the models, and calculated odds ratios that compare the odds of changes in determinants in the highest against the middle and low education and wealth groups.

Results

Variations in Health Determinants: Changes by Gender, Age and Country

Major changes in health-behaviour related determinants were observed within this two-year period in the SHARE population. 3,188 SHARE respondents smoked in 2004. Among these, 413 (13.1 percent [95 percent CI, 11.8 percent - 14.2 percent]) had stopped smoking 2 years later. 16104 participants were physically active in 2004. Among these 993 (6.2 percent [95 percent CI, 5.8 percent - 6.6 percent]) became less active. 6,701 SHARE respondents had normal body weight in 2004. Out of these, 1046 (15.8 percent [95 percent CI, 14.9 percent - 16.7 percent]) became overweight or obese.

Men and Older Smokers Are More Likely to Stop Smoking

In 2004, 22.2 percent of men and 14.7 percent of women aged 50+ in Europe smoked daily. Figure 1 shows that female smokers at baseline were significantly less likely to stop smoking two years later when compared to male smokers at baseline (OR=0.80, 95 percent CI 0.64, 0.99), and this pattern was consistent across the entire age span. A possible explanation of this gender difference is that female smokers are heavier smokers than their male counterparts. Furthermore, as male's health deteriorates as a consequence of smoking, they may become more determined to stop smoking than their female counterparts, who may be less likely to perceive an immediate health threat and thus be less likely to quit smoking.

The probability of giving up smoking increased significantly with age. For instance, men and women at ages 75+ had twice the odds of stopping smoking as compared to those aged 50-64 (95 percent CI 1.45, 2.88). It is postulated that as individuals get older and the prevalence of multiple health problems increases, their determination to stop smoking might become higher, which may explain why older age is associated with more changes in smoking behaviour.

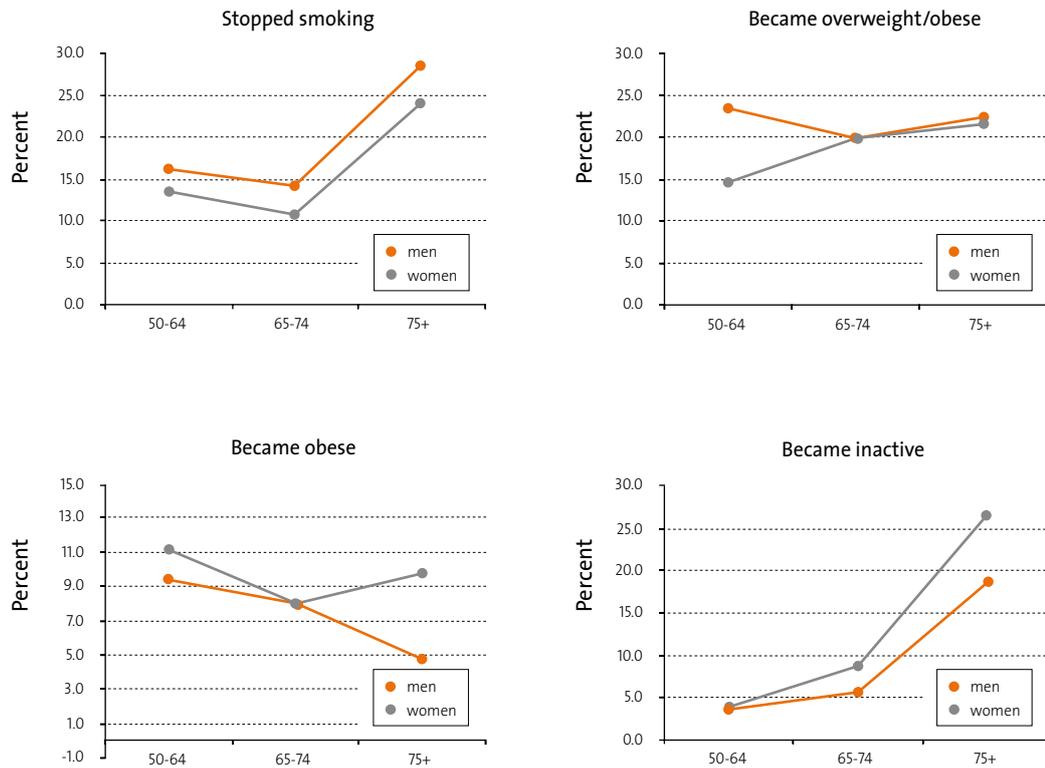


Figure 1 Changes in behavioural risk factors by gender and age group

Overweight Women Are More Likely to Become Obese

Figure 1 illustrates that among those with normal weight, women were less likely to become overweight or obese than men (OR=0.72, 95 percent CI 0.64, 0.82). However, this advantage among women was only present up to ages 50-64; beyond this age, the chance of becoming overweight was similar in men and women. This was due to a significant age-related increase in the probability of becoming overweight or obese in women, whereas among men the chance of becoming overweight or obese did not change with age. On the other hand, overweight women are more likely to become obese than overweight men (OR=1.26, 95 percent CI 1.07, 1.48), particularly at very old ages, at which point a significant decline in the risk of becoming obese was observed for men, but not for women.

Women and Older Europeans Are More Likely to Become Inactive

As shown in Figure 1, the probability of becoming physically inactive increased dramatically with age. For instance, Europeans at ages 75+ had eight times higher odds (95 percent CI 7.04, 9.47) of becoming inactive than those aged 50-64. Women were overall more likely to become physically inactive than men (OR=1.43, 95 percent CI 1.26, 1.62). This disadvantage among women was not present at age 50-64, but was already evident at ages 65-74 and increased significantly beyond age 75. This was due to the fact that women had a sharper age-related increase in the transition to inactivity than men ($p < 0.05$).

Cross-Country Differences in Changes of the Health-Behaviour Related Determinants Over Time

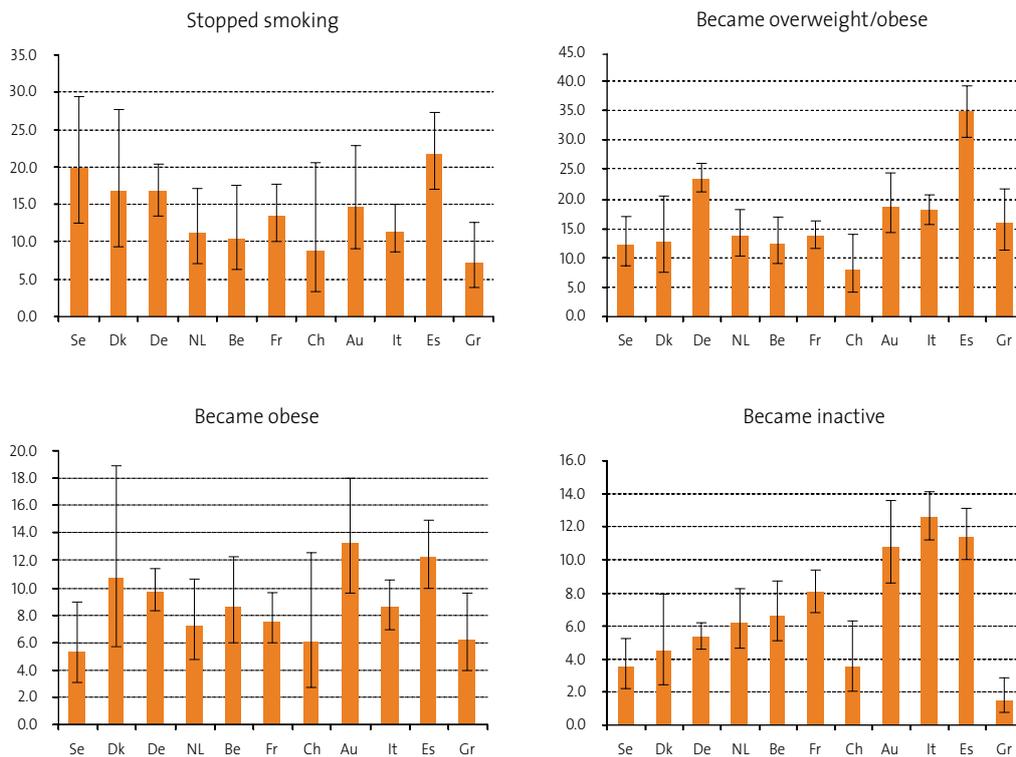


Figure 2 Changes in behavioural risk factors by country

Figure 2 shows that there was no clear pattern in the probability of giving up smoking across countries, i.e. no significant differences. Only Spain had slightly (but not significantly) higher rates of quitting smoking. This could reflect the impact of a recently implemented policy to ban smoking in public places, introduced in Spain in 2005. If a higher quit smoking rate in Spain is due to this policy, then this would indicate that smoking-ban policies are effective.

We observed a North to South gradient in the probability of becoming physically inactive, see Figure 2. Southern Europeans (except Greeks) were more likely to become physically inactive than their counterparts in the Scandinavian countries or most other European populations. There are many reasons why southern Europeans may be more likely to become inactive, including more deterioration in their health status, as well as less availability of spaces and opportunities to be active as opposed to other countries. Overall, however, these differences across countries in physical activity did not translate in cross-country variations in the risk of becoming overweight or obese, see Figure 2.

Higher Education and Wealth Are Associated with More Changes Towards a Healthier Lifestyle

In Wave 1, we saw a clear social disparity in the determinants of health. In particular, Europeans with higher educational level and income were less likely to smoke, more likely to be physically active, and less likely to be overweight or obese (Börsch-Supan et al., 2005). Two waves of the SHARE data allowed us now to examine whether socioeconomic status

is associated with changes in health-behaviour related determinants. As expected, Figure 3 indicates that the odds of stopping smoking decreases as education and wealth decreases. For instance, those with lower education or wealth had lower odds of stopping smoking than those with high education or wealth, although this effect was only significant for wealth (OR=0.72, 95 percent CI 0.56, 0.94). Similarly, low education and wealth were both independently associated with higher odds of becoming overweight or obese, and higher odds of becoming physically inactive.

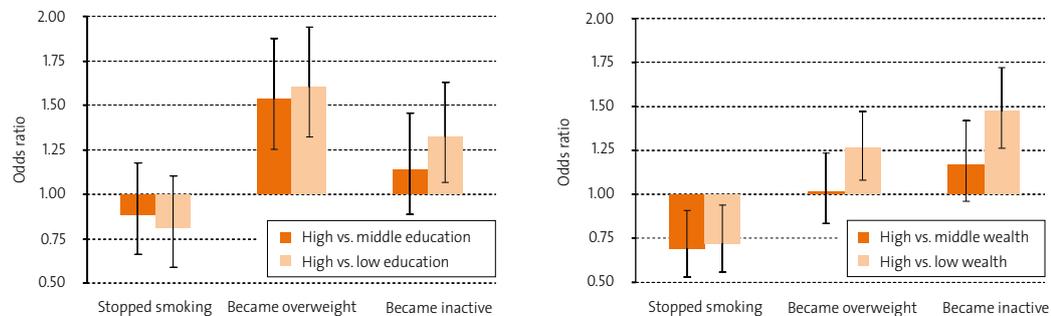


Figure 3 Odds ratio of the health-behaviour related determinants comparing high vs. low and middle educational levels (3a) and wealth tertiles (3b) in men and women aged 50+ in 11 European countries

Note: All models were adjusted for age, sex, country, education and wealth

Conclusions

Our results suggest that the likelihood of changes in health behaviour are strongly dependant on age and gender, and vary considerably across different European countries.

An interesting finding of our study is that higher rates of quitting smoking were observed in Spain, where a smoking ban policy was recently implemented. This result coincides with a reduction of smoking observed in other countries that have introduced a ban on smoking, such as Ireland and Norway (Braverman et al. 2007). Although smoking ban targets primarily second-hand smokers, our results suggest that it may also contribute to reduce smoking prevalence. However, such policies should be accompanied by additional interventions facilitating access towards effective therapies to stop smoking, such as evidence-based counselling and support (Siahpush et. al. 2006).

We found that women were more likely than men to become physically inactive. In terms of health status, women are more likely to develop physically limiting health and disability problems whereas men tend to develop other types of diseases such as cardiovascular problems (Börsch-Supan, 2005). The lower average exit age from the labour force among women could also explain their transition to lower physical activity. Slingerland found that retirement introduces a reduction in physical activity from work-related transportation that is not compensated for by an increase in sports participation or an increase in non-sports leisure-time physical activity (Slingerland et al., 2007). Another possible explanation is the different life-course trajectories of physical activity between men and women. Men experience greater declines in physical activity levels during adolescence, whereas women experience more declines in activity throughout adulthood (Weiss et al., 2007).

We also found that southern Europeans are generally more likely to become physically inactive than Northern or central Europeans. The North-South gradient in poor physical health could be one of the explanations of this phenomena (Börsch-Supan et al., 2005).

Other studies found that there is lack of good opportunities for physical activity within the residential environment in Southern Europe (Zunft et al., 1999; Rutten et al., 2001).

Our results provide input for the development of preventive measures targeting specific determinants and sub-populations. For example, more efforts will be needed to target the 50-64 age group and women to stop smoking. Physical activity should be promoted in both men and women, but particular efforts need to be implemented to encourage women in Southern European countries to be physically active. Although only indirectly, our results suggest that implementing a ban on smoking in public places may encourage smokers to quit, and thus reduce the burden of this risk factor in the population.

Key Points

- Men are more likely to stop smoking, while women are more likely to become physically inactive and obese.
- Older Europeans are more likely to stop smoking, but they are also more likely to become physically inactive than their younger counterparts.
- Higher education and wealth are both independently associated with more changes towards a healthier lifestyle. Whereas wealth is a stronger predictor of quitting smoking, education is a stronger predictor of becoming overweight/obese.
- Southern Europeans are generally more likely to become physically inactive than Northern or central Europeans.

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4.4 The Effects of Ill Health on Displacement from the Labour Market and Potential Impact of Prevention

Alex Burdorf, Tilja van den Berg, Mauricio Avendano, Anton Kunst, Johan Mackenbach

In many industrialised countries the population is ageing, due to increasing life expectancy and falling birth rates. A rather paradoxical development is that, despite the increased life expectancy, the average time people spend in paid work has decreased in most European countries. Young people enter the labour market at later age due to prolonged education and most older workers exit the labor market before the statutory retirement age. Thus, many countries are developing policies to increase the duration of working life, especially among older workers. Clearly, the success of these policies will depend on a better understanding of aging in the work force and the particular role of health in continuing work or withdrawal from the labour market.

There is ample evidence on the relation between unemployment and ill-health, showing that unemployment may affect people's health but also that health may determine the selection into and out of the workforce (Bartley, 1994). There is an increasing awareness that among older workers ill-health does not only affect unemployment, but may also drive selection out of the workforce into other forms of non-employment, such as early retirement and staying home to take care of the family. A cross-sectional analysis of the baseline data from the Survey on Health and Ageing in Europe (SHARE study) showed a large variation across European countries in the proportion of persons 50-65 years with paid employment. Furthermore, a perceived poor health was strongly associated with non-participation in the labour force in most countries. Long-term illnesses such as depression, stroke, diabetes, chronic lung disease, and musculoskeletal disease were significantly more common among those persons not having paid employment (Alavinia, M., Burdorf, 2008). A longitudinal study among European countries showed that ill health was a risk factor for transitions between paid employment and various forms of non-employment, including retirement, unemployment, and taking care of a household (Schuring, Burdorf, Kunst, and Mackenbach, 2007).

Against this background, the aims of this study were (i) to assess the strength of the association between ill health and becoming unemployed, retired, homemaker, or disabled in Europe, and (ii) to investigate the potential impact on withdrawal from paid employment or health prevention policies that would completely eliminate the adverse effects of ill health on labour market participation.

Methods

Study Population

The study population consisted of participants of the Survey on Health and Ageing in Europe (SHARE). The first Wave of data was collected by interviews between April and October 2004 and the available dataset (SHARE Release 2.0) contains 27,617 participants, with 14,833 subjects (54percent) aged between 50 and 65 years. For 269 persons employment status was unknown and for another 45 persons not clearly defined, resulting in a study population of 14,564 subjects. Individuals aged 65 years and older were excluded for the current study, since it was assumed that workers normally retired when they became 65 years old. Of those 9,682 subjects participated again in the second Wave of SHARE. Complete information on employment status in 2006 was available for 9,485 subjects. For

the longitudinal analysis of the influence of ill health on displacement of the labour market, a cohort of 4,746 subjects with paid employment at baseline in 2004 was available.

Labour Force Participation

The outcome of this study is work status, which was based on self-reported current economic status with five mutually exclusive categories: paid work, retired, unemployed, disabled, or homemaker. The definition of being employed in SHARE encompasses all individuals with paid employment, including self-employed work for a family business. Unemployed were those who were laid off from their last job before being able to benefit from normal pension benefits, and therefore were forced to spend some time in unemployment before effectively being retired. The category of disabled participants predominantly includes persons whose health problems at work were an eligibility criterion for receiving a disability pension.

Health Measurements

Four different measures of health were defined in order to present different aspects of health. The first measure was the European version of self-perceived health, with a single 5-point scale ranging from 'very bad' to 'very good', whereby the answers 'very bad', 'bad' and 'fair' were collated into the category less than good health. The second health measure was the occurrence of at least one chronic disease, defined as a chronic disease diagnosed by a doctor during lifetime and an affirmative answer on a limitative list of 14 chronic diseases. The third measure of health was the presence of clinically relevant symptoms indicating depression, based on at least 4 affirmative answers on the EURO-D 12 items scale of depression. The fourth measure of health was the presence of mobility problems based on the presence of at least one physical limitation with mobility, arm function, of fine motor function lasting longer than 3 months, derived from a limitative list of 10 items, such as walking 100 meters, climbing stairs without resting, and reaching with arms above shoulder level.

Individual Characteristics

Education was coded according to the 1997 International Standard Classification of Education (ISCED-97) and categorized as low (pre-primary, primary and lower secondary education), intermediate (upper secondary education) and high (post secondary education). Body mass index (BMI) was calculated by dividing body weight in kilogram by the square of body height in meters. According to the BMI, persons were defined as normal (BMI below 25), overweight (BMI from 25 to 30), or obese (BMI above 30). Marital status was used to categorize individuals into those who were living with a spouse or a partner in the same household (reference category) and those living as a single. Smokers were subjects who were currently smoking; all others were categorized as non-smokers. Problematic alcohol use was defined as drinking more than two glasses of alcohol at least 5 days a week in the last six months. Physical activity was dichotomised, and defined individuals without any physical activity in leisure time.

Statistical Analysis

The statistical analysis was restricted to the study population with paid employment at baseline (first Wave). In logistic regression analyses odds ratios were calculated for the risk of ill health at baseline on becoming unemployed, retired, disabled, or homemaker during

the 2 year follow-up. The associations between ill health and employment status were adjusted for socio-demographic variables, lifestyle factors, working conditions, and country. Since the number of male subjects was too small in the category homemakers (i.e. taking care of a household), the analysis on the association between ill health and homemaker was performed only in women. All statistical models were based on the (varying) number of persons available for the four different measures of non-participation in the workforce without weighing the regression coefficients according to attrition rate in the country sample or population size in each country. Since the health measures of interest were strongly interrelated, different measures of health were never included simultaneously in the same multivariate model. The statistical analyses were carried out with SAS Release 8.02 for Windows.

The potential effects on withdrawal from paid employment of policies which would eliminate the adverse effects of ill health on labour market participation were estimated with a multistate life table, describing for each age the distribution over the 5 possible states: employment, retirement, unemployment, homemaking, and disabled. In order to investigate the theoretical benefits of elimination of the influence of ill health on paid employment two populations were compared: a reference population reflecting the labour participation in the study population of the first Wave of data collection (n=9,485), and an intervention population for which the contribution of ill health to withdrawal from the labour market was eliminated. The multi-state life table of the reference population started at age 50 with all subjects in paid employment and presented the proportion of workers with paid employment for each following year and the relative contribution of unemployment, retirement, disability, and homemaker to the annual proportion of workers that had quit paid employment. In the intervention population the relative contribution of unemployment, retirement, disability, and homemaker in this annual proportion was adjusted for the population attributable fraction of ill health. This analysis was conducted for one definition of ill health (less than good health), without taking into account possible additional effects of other measures of ill health.

Results

Large Variation in Labour Force Participation Across Europe

Figure 1 shows a large variation across European countries for the proportion of persons aged below 65 years with paid employment, varying from 43 percent in Austria to 80 percent in Switzerland among men, and from 22 percent in Italy to 71 percent in Sweden among women. In some countries there was little difference in labour force participation between men and women, such as Sweden, France and Denmark, whereas in other countries the relative labour force participation among women was much lower, most notably in Italy, Greece, and Spain. The proportion of homemakers among men was extremely small in all countries. Among men, the proportion of employed was inversely associated with the proportion retired (Pearson coefficient $r = -0.94$) and unemployed ($r = -0.28$). Retirement and disability were inversely associated among men ($r = -0.27$) and women ($r = -0.57$).

During the two year follow-up period 20 percent of employed workers quitted the workforce, primarily due to retirement, see Table 1. A large proportion of disabled and unemployed subjects retired during the follow-up period. Entering paid employment (again) was generally rare, varying from 21 percent among unemployed persons at baseline to 2 percent among retirees.

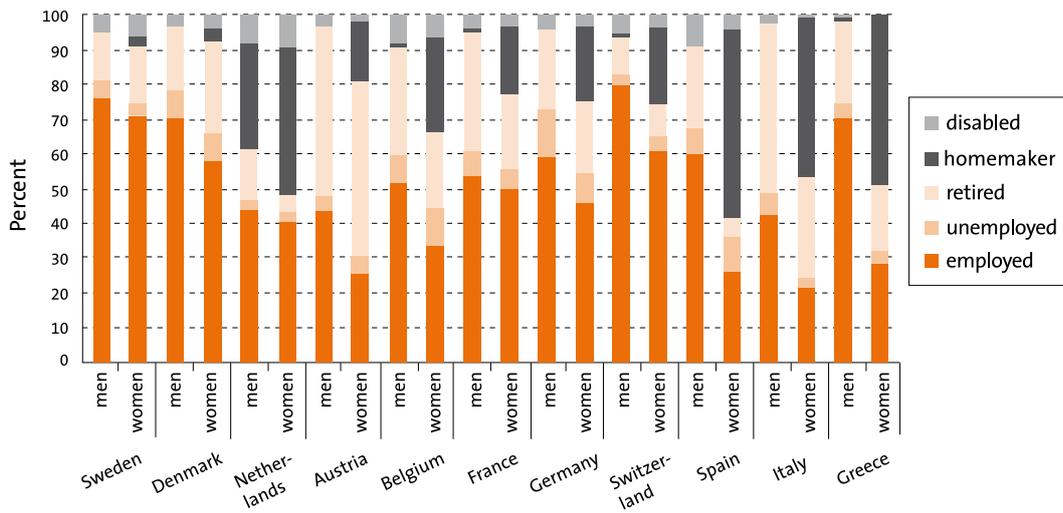


Figure 1 Distribution of persons aged 50-64 years, stratified by sex and country, over employment, unemployment, retirement, homemaker, and disability among 11 European countries in the study population of the SHARE-study, 2004

	2006	Employed (n=4054)	Retired (n=3130)	Unemployed (n=386)	Disabled (n=482)	Homemaker (n=1433)
2004						
Employed (n=4,746)		80.2%	13.3%	2.7%	1.8%	2.0%
Retired (n=2,288)		1.5%	90.7%	0.5%	4.1%	3.2%
Unemployed (n=542)		20.5%	26.0%	39.1%	5.0%	9.4%
Disabled (n=415)		7.0%	30.8%	1.4%	57.1%	3.6%
Homemaker (n=1494)		5.1%	10.3%	1.8%	2.6%	80.2%

Table 1 Changes in labour status between 2004 and 2006 among persons in the SHARE-study (n=9,485)

Ill Health Predicts Displacement from the Labour Market

Figure 2 shows the associations of ill health with transitions into different states of non-participation in the labour market. Ill health was strongly associated with becoming disabled (ORs from 3.30 to 4.56) and with becoming unemployed (ORs from 1.09 to 2.09). The decision to retire was not influenced by depressive symptoms and mobility problems. None of the measures of ill health was associated with becoming a homemaker among women who had had paid employment at the start of the study.

A less-than-good self-perceived health had the strongest effect on becoming disabled (OR=4.56, 95 percent CI 2.88-7.22), unemployed (OR=2.09, 95 percent CI 1.39-3.13), or retired (OR=1.31, 95 percent CI 1.02-1.67). The corresponding population attributable fractions of ill health for these transitions were 32.3 percent, 16.1 percent, and 5.1 percent, respectively. Displacement from the labour market was also higher, apart from ill health, among lower educated persons, persons not living together, persons with overweight or obesity, and workers with lack of control at work.

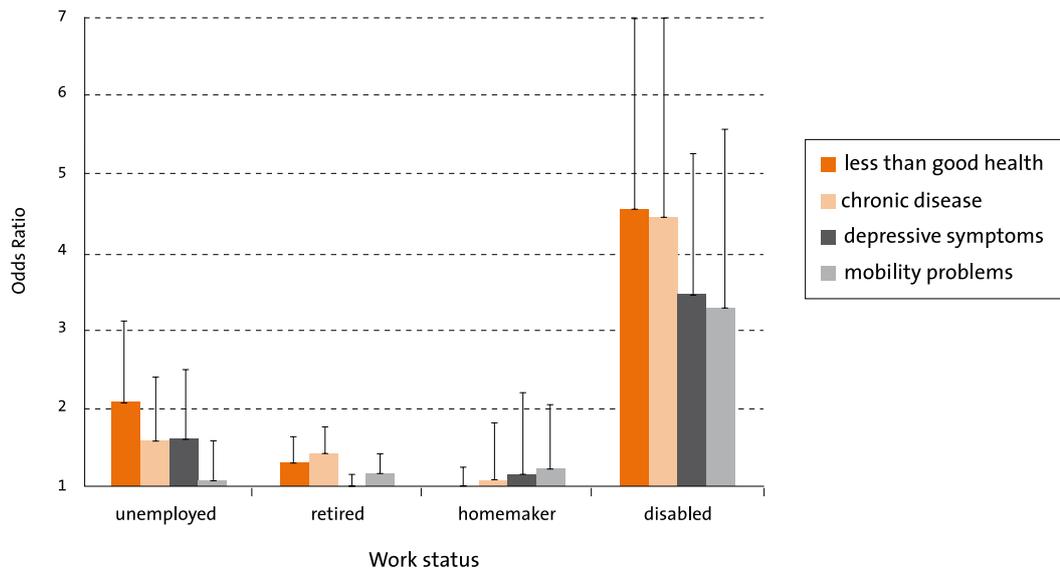


Figure 2 The effects of different measures of ill health in 2004 on early retirement, unemployment, disability, homemaker, and disability in 2006 in 11 European countries, expressed by adjusted Odds Ratios

Potential Impact of Prevention of Ill Health

The hypothetical effect of a complete elimination of the effects of ill health on labour market displacement among men with paid employment at the age of 50 years is shown in Figure 3. For women a very similar pattern was observed. The potential impact of prevention of ill health on labour force participation could increase the average age of quitting paid employment from 60.4 to 61.5 years (13.2 months) among men and from 59.2 to 60.5 years (16.2 months) among women.

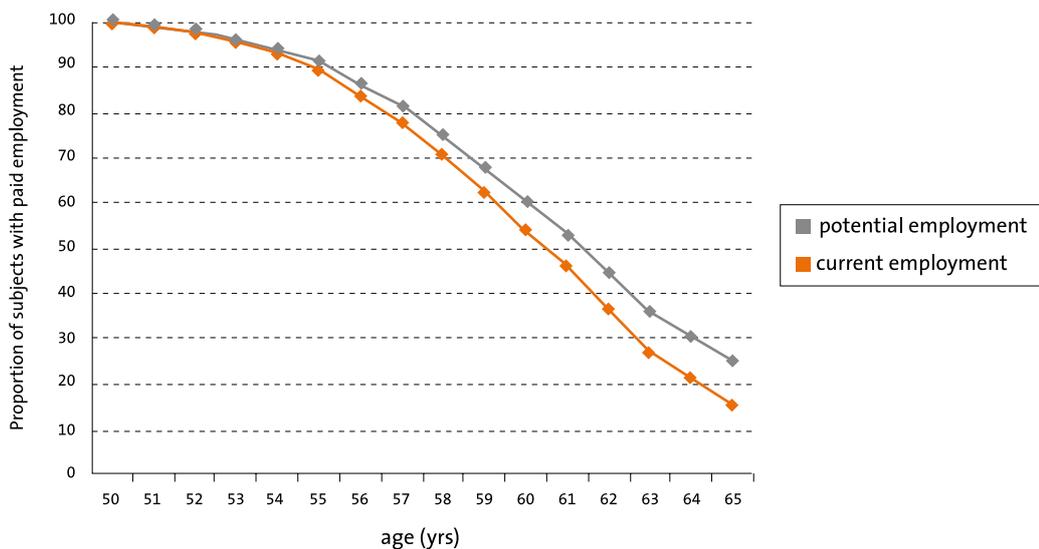


Figure 3 Theoretical effect of elimination of health problems through preventive efforts aimed at important health determinants on the labour force participation among men who have paid employment at the age of 50 years

Key Points

- There are large variations between European countries in patterns of withdrawal from paid employment among persons aged 50-64 years. This variation does not only lead to very different proportions of persons aged 50-64 years who are in paid employment, but also to large variations in exit routes (unemployment, early retirement, homemaking, or disability benefit). Differences between European countries in institutional arrangements are likely to play an important role in explaining these variations, which clearly show that high rates of non-participation in the labour force among 50-64 year olds are not inevitable.
- Ill health is an important predictor of withdrawal from paid employment among 50-64 year olds. This was most evident for those who become dependent on a disability benefit, but ill health also increased the likelihood of becoming unemployed or retiring early. The multi-state life table approach showed that there is a large potential for increasing the labour force participation by health interventions. If (the effect of) ill-health (on withdrawal from the labour market) among 50-64 year olds could be eliminated, the average duration of working life would increase by 13-16 months.
- Given well-established determinants of ill health, important entry-points for health-related policies could be lifestyle interventions, improvements in working conditions, and social policies to encourage employment among older persons with health problems. Further study of the determinants of withdrawal from paid employment, and the role of ill-health, is necessary to develop effective policies which will increase labour force participation among 50-64 year olds. The SHARE study provides excellent opportunities to contribute to this endeavor, particularly when more longitudinal data will be collected.

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4.5 Do New Countries Joining SHARE Experience a Different Level of Health Services Utilization?

Jacques Spagnoli, Sarah Cornaz, Brigitte Santos-Eggimann

The association between health services utilization and countries was briefly commented on in the first results book, which was based on release 0 data from the SHARE main test performed in 2004 within 10 countries. Analyses showed that all indicators of health services utilization (i.e. ambulatory medical care, medication, hospital stays and surgeries) differed significantly between the 10 countries included in the SHARE study. The number of ambulatory medical consultations was rather low in Sweden, Denmark and Switzerland, and higher in Germany, France, Italy and Spain. Variations also characterized the distribution of the number of drugs categories taken at least once a week, with large proportions of individuals reporting no medication in Sweden, Denmark, the Netherlands and Switzerland, while numerous categories were frequently reported in France, in Spain and, to a lesser extent, in Greece. Proportions of persons reporting one or more overnight hospitalizations were higher in Austria and in Germany. This last country was also characterized by the highest proportion of individuals who mentioned at least one inpatient or outpatient surgery in the past twelve months.

This chapter has the objective to compare the crude level of health services utilization in the three new countries added in SHARE in 2005-2006 (Poland and Czech Republic in 2006 and Israel in 2005) and to examine to what extent differences are explained by populations' gender and age distributions or by their level of overall subjective health.

Measures and Analysis

Analyses were performed on 50+ years old community-dwelling populations participating in the SHARE Wave 2, except Israel for which 2005 data were used. Crude proportions of health services utilization were first estimated in the 14 participating countries. Subsequently, the country effect on each indicator of health services utilization (i.e. proportions with any medical contact, a high number of medical contacts, any current medication, any hospital stay and any surgery) was analyzed in multivariate models, adjusting first for gender and age, and then for gender, age and subjective health. For each outcome, the country which crude level of use was the closest to the overall use estimated across the 14 participating countries was selected as the reference. Analyses were all conducted using weighted data. For the logistic regressions relative weights were used instead of absolute weights to obtain unbiased results.

As indicated in the first results from the Survey of Health, Ageing and Retirement in Europe all data collected in the health care section of the SHARE survey were self-reported. Medical contacts were dichotomized using two different strategies: the first distinguished between respondents with at least one medical contact and respondents with no medical contacts during the last twelve months; the second separated respondents with 12 medical contacts at most and respondents with 13+. Participants were also asked about the drugs currently taken at least once a week, from a list of 14 drugs classes, and categorized in 0 vs 1 medication or more. Furthermore, we distinguished between respondents with at least one overnight stay in hospital and those with none during the last twelve months, as well as respondents with any in- or outpatient surgery and those with none within the same time frame.

Age was expressed with 5-year categories, except the last one (85+), based on the year of birth (age achieved by the end of 2006 and 2005 for Israel). Subjective health was evaluated by a single question “Would you say your health is... excellent, very good, good, fair or poor?” and answers were categorized into excellent-very good / good /fair-poor.

Analyses were performed on release 0 of the SHARE Wave 2. The level of health services utilization was estimated overall in the 14 participating countries, and in each of them separately.

Results

Sample Characteristics

Our working sample – derived from release 0 of the SHARE Wave 2 database – counted 25,814 participants (incl. 5,731 respondents from the three new countries Czechia, Poland, and Israel). It was characterized by one half aged 50-65 years and by a higher proportion of women (54.3 percent).

Ambulatory Medical Care

At Least One Medical Contact in the Past Twelve Months

Figure 1 shows that proportions with at least one medical contact ranged from 78.2 percent to 93.8 percent, with an overall proportion of 88.7 percent. It was lower in PL (81.8 percent) as in several other countries included in the first Wave (SE, DK, NL, CH, GR), whereas CZ (92.1 percent) and IL (92.6 percent) were characterized by higher proportions as were DE, BE and FR. AT, IT and ES were close to the average.

Multivariate analyses (see Appendix), here with IT as the reference, pointed to some significant differences, with higher proportions reporting at least one medical contact in DE, BE, FR and one new country, CZ, while lower proportions were observed in SE, DK, NL, CH, GR and PL. IL, however, did not differ significantly from the reference. The observed differences persisted with adjustment for subjective health.

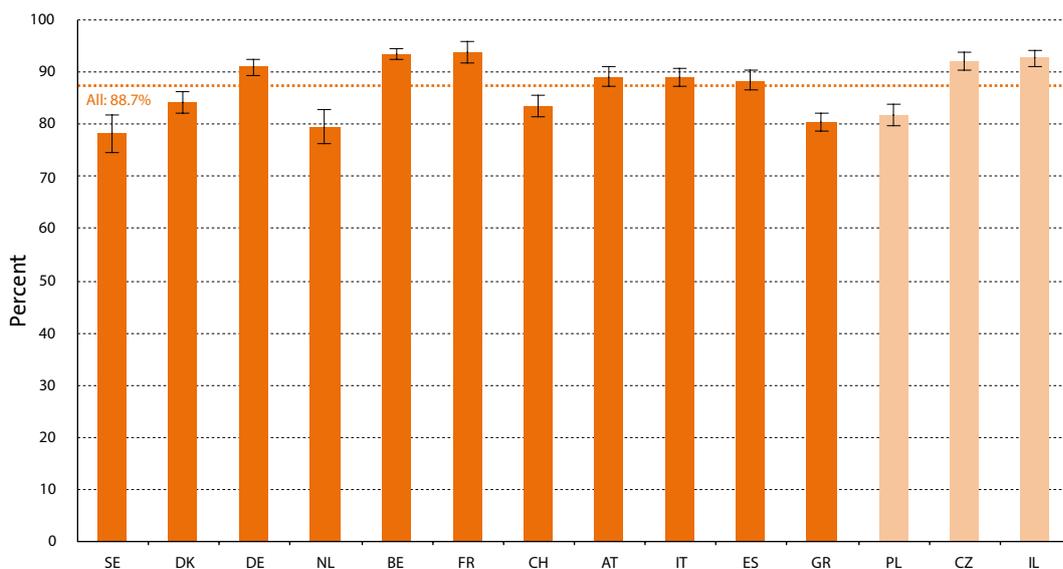


Figure 1 Proportion with at least one medical contact during the past twelve months, by country

High Number of Medical Contacts in the Past Twelve Months

The proportion reporting 13+ medical contacts in the past year varied significantly, ranging from 1.7 percent in Sweden to 21.6 percent in IL, see Figure 2. It was under the average in PL (13 percent) as in SE, DK, NL, FR, CH and GR, while CZ (18.1 percent) and IL (24.6 percent) were over the average like BE, AT, IT and ES.

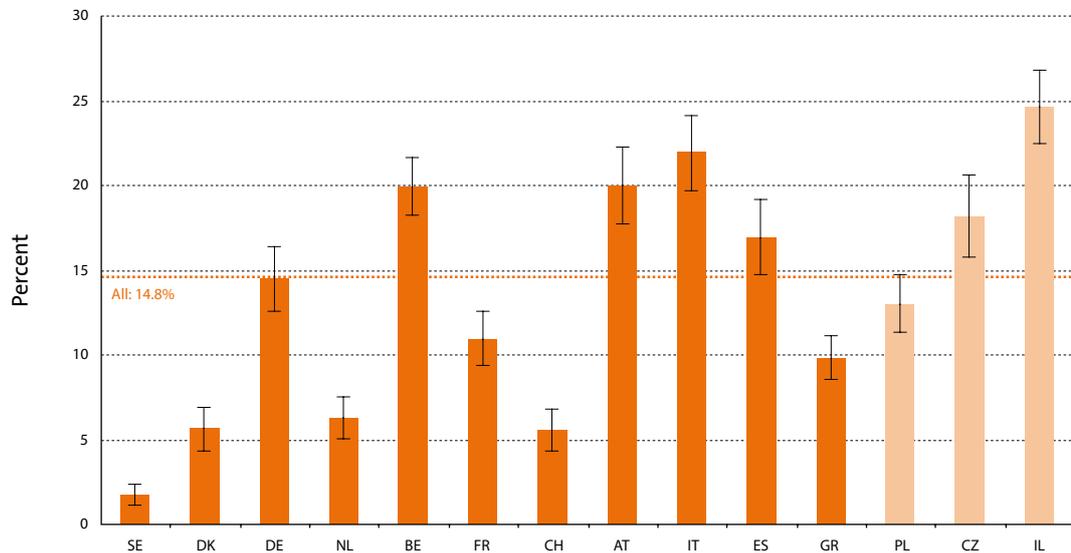


Figure 2 Proportion with 13+ medical contacts during the past twelve months, by country

Demographic characteristics did not explain the significantly higher proportions reporting 13+ medical contacts in BE, AT, IT, ES and in two new countries, CZ and IL, or lower proportions in SE, DK, NL, FR, CH and GR. With further adjustment for subjective health, PL joined the group of countries with a significantly lower probability to report 13+ medical contacts.

At Least One Current Medication

Proportions of the population taking at least one drug varied from 53.7 percent to 72.9 percent in BE, with an average of 66 percent, see Figure 3. Lower proportions observed in Northern countries and in CH were already noted in Wave 1. The three new countries had quite similar proportions as initial countries, all were slightly over the average, with 68 percent for PL and 70 percent for CZ and IL.

Taking into account age and gender characteristics of the populations, a higher proportion reporting some medication was observed only in BE, while lower proportions were found in DE and CH. When subjective health was also considered in multivariate analyses, lower proportions were also noted in IT, in ES and in PL.

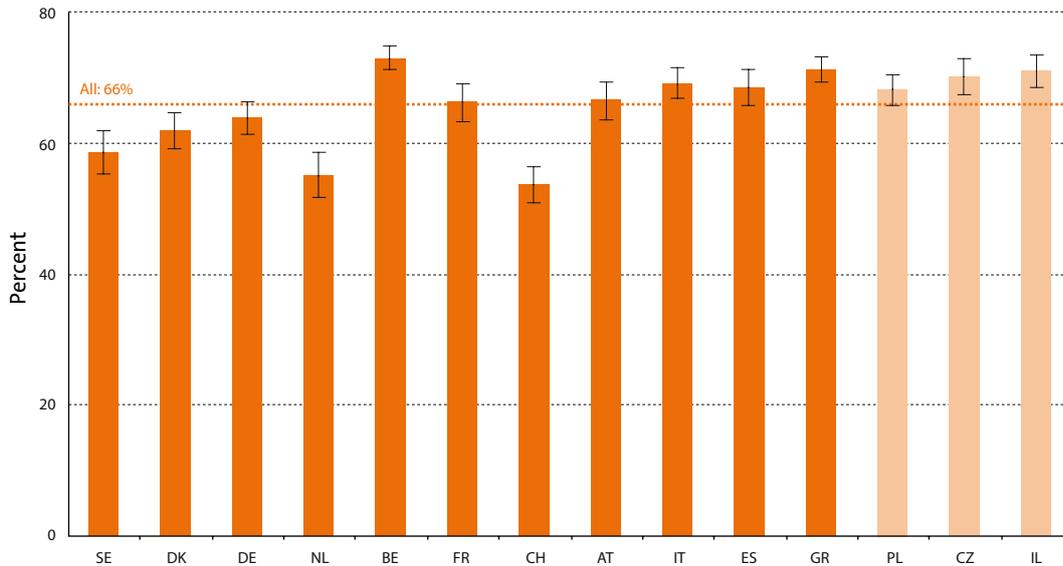


Figure 3 Proportion with at least one current medication, by country

At Least one Overnight Hospital Stay in the Past Twelve Months

The proportion with at least one hospital stay differed significantly, ranging from 7.6 percent in GR to 22.2 percent in AT, with an average of 15.7 percent, see Figure 4. The highest proportions were observed in two countries that already ranked at the top in Wave 1: AT and DE. Among the three new countries, CZ was close to the average with 16 percent, while hospital admission was slightly more frequent in PL and IL with respectively 17.9 percent and 17.6 percent.

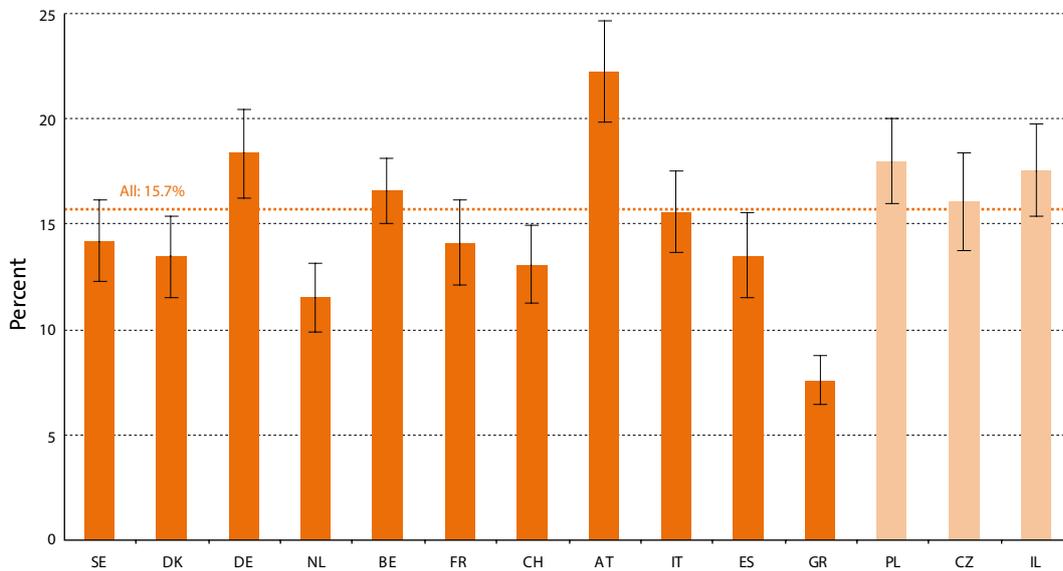


Figure 4 Proportion hospitalized at least once during the last twelve months, by country

Multivariate models confirmed significantly higher proportions of the population admitted at least once in hospitals in DE and AT that were not explained by an unfavorable age and gender structure, while lower proportions were observed in ES and GR. After controlling for subjective health as an additional factor, BE also had a higher frequency of hospitalization than the reference country (IT).

At Least One In- or Outpatient Surgery in the Past Twelve Months

The proportion with at least one surgery ranged from 2.3% in GR to 12.5% in NL, with an average of 6.7 percent, see Figure 5. All countries already included in the first Wave had lower proportions than in 2004, except NL which saw its proportion reporting at least one surgery increase slightly (from 11.6 percent in 2004 to 12.5 percent in 2006) and ranked first in Wave 2, followed by BE, DE and CH. Among the new SHARE countries, CZ was close to the average, while PL and IL were lower.

Multivariate analyses adjusting for age and gender confirmed the significantly lower proportions with at least one surgery in IT, GR and PL, and the higher ones observed for NL. With additional adjustment for subjective health, BE was also characterized by a higher frequency of surgery.

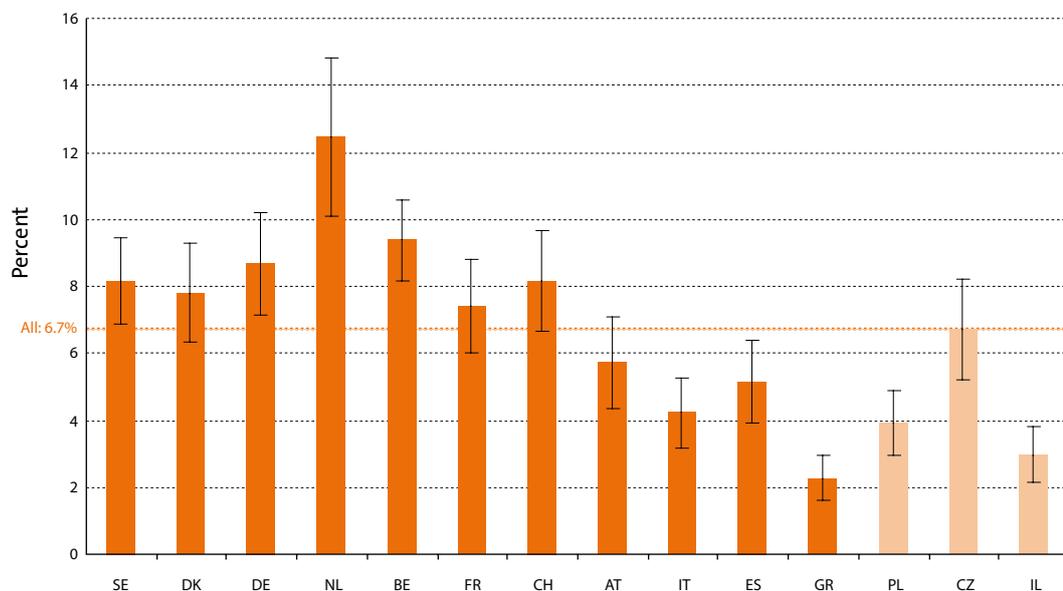


Figure 5 Proportion reporting at least one in- or outpatient surgery during the last twelve months, by country

Conclusions

- Data from the second wave of SHARE showed variations between initial and new countries, but also between initial countries themselves, for several indicators of health services utilization. Most of them were not explained by demographics. CZ and IL had higher proportions with a large number of medical contacts and, in CZ, more respondents reported at least one medical contact in the past year. By contrast, larger proportions of the population in PL indicated no medical contact and experienced at least one hospital stay within a year. Taking into account subjective health differences between countries, PL also had a lower proportion reporting any surgery, any medication, or a large number of medical contacts.

- Data from Wave 2 also confirmed results already found in Wave 1, such as a lower level of medical contacts and medication in Northern countries and in CH, or a higher level of hospital admission in AT and DE, that were not explained by demographic characteristics.
- Subjective health was considered as a global, integrative indicator of health that includes both mental and physical health dimensions and predicts unfavorable evolutions such as the mortality. It was used essentially as a control variable in the preliminary analyses presented in this chapter. However, subjective health is also known to have different meanings in different countries. For this reason, further research should integrate other indicators of health status in order to explain variations in the level of health services utilization in SHARE countries.
- Interpretations of variations observed between initial countries and between initial and new countries require an extensive knowledge of health systems in each participating country; the SHARELIFE module will produce contextual variables necessary for a careful discussion of the more definitive results.

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4.6 Life Events and Change in Economic Resources as Predictors of Change in Health Services Utilization

Sarah Cornaz, Jacques Spagnoli, Brigitte Santos-Eggimann

Many factors may influence health services utilization. In the first results book, we explored its cross-sectional relationships with age, gender, subjective health or education in Europe, based on release 0 data from the SHARE main test performed in 2004 in 10 countries (Santos-Eggimann, Junod, Cornaz, 2005). First data confirmed the high level of health services utilization in the old age. Subjective health was associated with all measures of health services utilization, except for dental care. Women reported significantly more medical consultations and medications than men, whereas hospital use was not significantly associated with gender. There was a strong relationship between the level of education and several, but not all, indicators of health services utilization in Europe: the better educated consumed a significantly lower number of medications while participants in the lowest educational category reported significantly less hospital admissions and surgeries.

Previous reports from other sources also suggest that unfavorable social and economic circumstances may affect the level of health, the consequences of chronic diseases and the use of healthcare (Montgomery, Cook, Bartley, and Wadsworth, 1999; Bazin, Parizot, Chauvin, 2005). For example, children leaving home and bereavement induce a reduction of the household size, and the consequent decrease in social ties may result in a higher consumption of health care. The loss of employment, due to retirement or other causes, may also be related to an increase in health services utilization. Variations in economic resources, such as income and health insurance coverage, are other possible causes for changes in the level of health care consumption. In this chapter, we explore the hypothesis that such life events and changes in economic situation between SHARE waves 1 and 2, which are likely to occur with some frequency in middle-aged and older populations, predict a change in health services utilization when demographics and initial characteristics (subjective health, socio-economic) are taken into account.

Measures and Analyses

Analyses were conducted on the whole sample of community-dwelling individuals aged 50+ who participated in the two waves (2004 and 2006) of the SHARE project, using unweighted data.

The effects of four major life events or changes in economic resources were investigated. Reduction in household size was computed for individuals living in a household of at least 2 persons in Wave 1. Cessation of work was defined, within the group of subjects who were professionally active in Wave 1, by inactivity in Wave 2, irrespective of the cause and the perspective of finding a new job in the future. An increase or a reduction in income was defined by the transition from one country-specific income quartile (household income adjusted for the household size) to another between waves 1 and 2. Finally, a change in health insurance was defined by the self-report of improved or worsened coverage by all private or social insurances for specific elements of care (i.e. ambulatory medical care, medication, hospitalization).

We selected five dichotomous outcomes regarding the evolution of health services utilization between waves 1 and 2, based on self-report. Two of them related to changes in the number of medical contacts in past twelve months: transitioning from none in Wave 1 to at least one in Wave 2, and from less than 13 to 13 or more contacts, respectively. The

next two outcomes referred to changes in the number of current medication reported, out of a list of 14 drug categories: transitioning from none in Wave 1 to at least one in Wave 2, and from less than 3 to 3 or more medications, respectively. The last outcome concerned overnight hospital stays in the past twelve months; it was defined by transitioning from no stay in Wave 1 to at least one stay in Wave 2.

Relationships between each life event and each of these five outcomes were tested in multivariate models of logistic regressions, adjusting for gender, age, income, education, subjective health, and the number of months separating the two waves. Age was calculated based on the year of birth (age achieved by the end of 2006). Income was categorized in quartiles taking into account the household size and education was defined by the number of years. Subjective health was evaluated by a single question “Would you say your health is...very good, good, fair, bad or very bad?” and answers were dichotomized into very good or good versus the three last answer categories. An indication of the number of months separating the two interviews (2004 and 2006) was also added in the analyses. In each analysis, only individuals at risk for experiencing both the life event and the outcome were included (e.g. in analysis of the effect of work cessation on the probability to evolve from no medical contact to at least one, only individuals working and having reported no medical contact in Wave 1 were included). Analyses were performed on release 0 of the SHARE Wave 2006 associated with release 2 of Wave 1, taking into account the 11 countries included in both waves.

Results

Sample Characteristics and Distribution of Life Events

The overall working sample counted 17,544 individuals, 7,986 male (45.5 percent) and 9,558 female (54.5 percent), with more than half aged 50-64 years (55.2 percent), one third aged 65-79 years (36.8 percent) and a low proportion aged 80+ years (8 percent). Two thirds of respondents rated their health as very good or good in 2004 and one third reported a fair (27.5 percent), bad (6.6 percent) or very bad (1.4 percent) health. The frequency of life events and changes in economic resources recorded between waves 1 and 2 is summarized in Table 1.

Table 1 shows that out of 17,544 individuals in our sample, 13,805 were living in a household of size 2 or more in Wave 1; 15.7 percent (n=2'173) of them experienced a reduction in household size between the two waves of the SHARE project. This reduction was attributed to widowhood in 12 percent and to divorce in only 1.2 percent. Like all other changes presented in this table, it was significantly related to age. Work cessation concerned essentially the 50-64 years category, which was expected on the basis of usual retirement age in most countries. Changes in income quartile were more frequently to the better than to the worst. By contrast, changes in health insurance coverage were more frequently in a negative direction; however, only a small proportion of respondents (at most 5 percent for each type of insurance) reported a change in whatever direction.

	Evolution		Age			
	Wave 1 → 2	n (%)	50-64	65-74	75+	p
Household size (living with others, N=13,805)						
	Reduction	2,173 (15.7%)	1.556	397	220	0.000
			71.6%	18.3%	10.1%	
Work (employed, N=4,955)						
	Cessation	1,083 (21.9%)	992	80	11	0.000
			91.6%	7.4%	1.0%	
Income (N=17,544)						
	Improvement	5,690 (31.9%)	2.960	1.695	1.035	0.000
			52.0%	29.8%	18.2%	
	Deterioration	4,625 (25.9%)	2.800	1.176	649	
			60.5%	25.4%	14.0%	
Insurance, medical ambulatory care (N=17,544)						
	Improvement	314 (1.8%)	200	84	30	0.000
			63.7%	26.8%	9.6%	
	Deterioration	565 (3.2%)	341	156	68	
			60.4%	27.6%	12.0%	
Insurance, drugs (N=17,544)						
	Improvement	145 (0.8%)	116	44	15	0.004
			66.3%	25.1%	8.6%	
	Deterioration	578 (3.2%)	340	145	93	
			58.8%	25.1%	16.1%	
Insurance, hospitalization (N=17,544)						
	Improvement	165 (0.9%)	111	38	16	0.000
			67.3%	23.0%	9.7%	
	Deterioration	236 (1.3%)	159	51	26	
			67.4%	21.6%	11.0%	

Table 1 Frequency and distribution by age category of selected life events and changes in economic resources between Waves 1 and 2

Effects on Ambulatory Medical Contacts in Past Twelve Months

Transitioning from No Medical Contact to 1+

In Wave 1, 2,438 individuals (13.9 percent) reported no medical consultation in the past 12 months. Of these, 58.7 percent had one or more medical consultations in Wave 2. The proportion increased across age categories, from 53.3 percent at age 50-54 to 68.4 percent at age 75+.

Multivariate models suggested that both a reduction in household size and a change in health insurance for ambulatory medical care (either to a better or a worse coverage) significantly increased the probability of transitioning from no medical contact to at least

one, after controlling for demographic and baseline subjective health and socio-economic factors, see Figure 1. By contrast, changes in income and work cessation did not contribute to this evolution.

Transitioning from <13 Medical Contacts to 13+

The probability to evolve towards a high level of medical contacts (percentile 90 and over in the distribution of the number of contacts) within the subset of individuals who reported at most 12 consultations at baseline also increased with age. It ranged between 5.3 percent at age 50-54 and 12.8 percent at age 75+.

Once age, gender and baseline socio-economic characteristics were taken into account in multivariate models, significant, positive effects of household reduction and work cessation were detected, see Figure 1. Reported positive and negative changes in insurance coverage for ambulatory medical care also influenced this outcome by increasing the probability of a transition to a high level of medical contacts in Wave 2. Changes in income category, either to an increase or to a reduction, did not influence the probability of a transition to the highest level of use of ambulatory medical care.

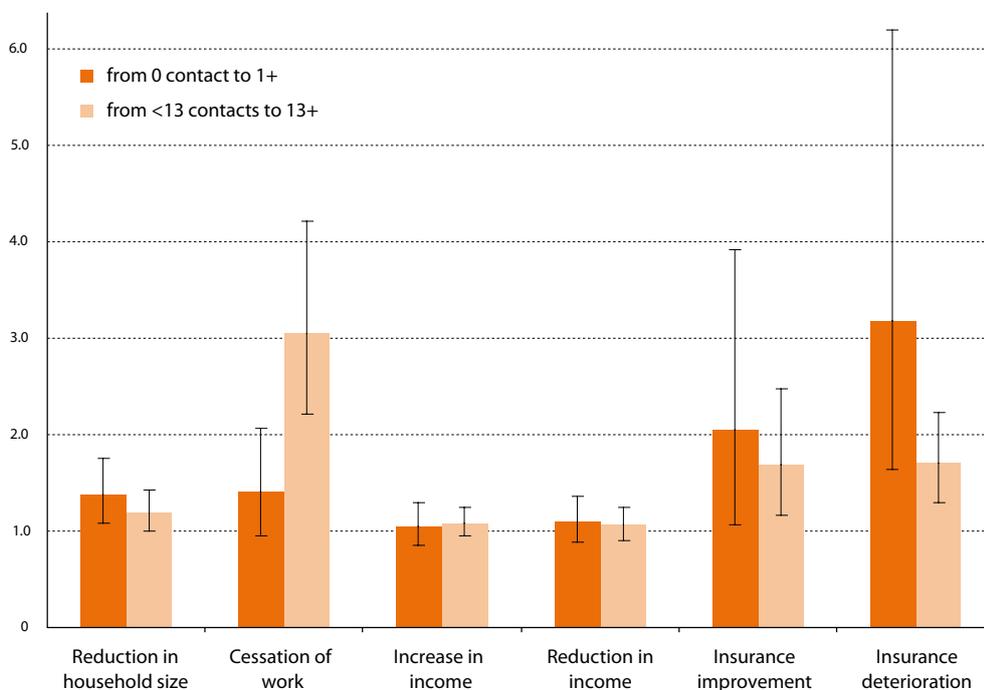


Figure 1 Odds ratio, for transitioning from 0 medical contact in past twelve months to 1+, and from <13 medical contacts to 13+ between waves 1 and 2, related to life events and changes in economics resources (adjusted for age, gender and baseline socio-economics characteristics)

Effects on Current Medications

Transitioning from No to Some Medication

Overall, 6,475 subjects (36.9 percent) did not report any medication in Wave 1 and were eligible for the analysis of transition to new medication in Wave 2. Of these, six out of ten still reported no medication in Wave 2 while one or more medications were recorded in 40.6 percent of them. The proportion transitioning to medication was 32.0 percent in the

first age class while it amounted to 58.3 percent at the age of 75+.

Multivariate analyses showed a positive effect of work cessation and of changes in the reported coverage of drugs by health insurances on the probability to evolve from no medication to at least one between waves 1 and 2, see Figure 2. A reduction in household size or changes in income quartile were not significantly related to this outcome.

Transitioning from Less Than to Three or More Medications

The proportion of individuals reporting less than 3 medications in Wave 1 (i.e. under the percentile 90 of the number of current drugs) who became high consumers in Wave 2 increased regularly across age categories, from 7.8 percent at age 50-54 to 26.3 percent at age 75+.

Controlling for age, gender as well as for subjective health and socio-economic characteristics recorded in Wave 1, work cessation and reported changes in specific health insurance coverage between the two waves were both positively associated with an evolution towards a high level of medication, see Figure 2. A smaller household size or a change in income of whatever direction were not related to this outcome.

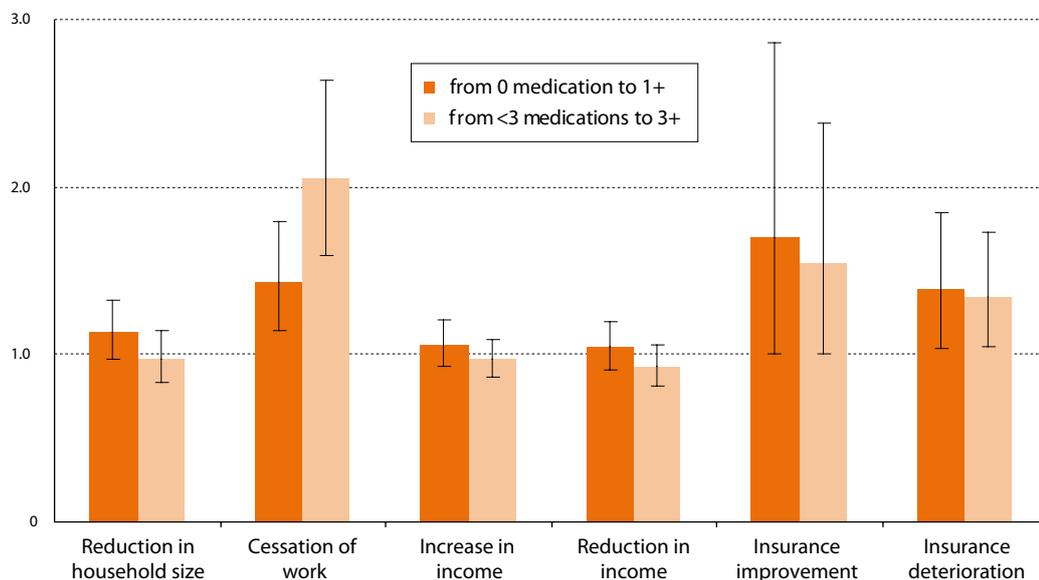


Figure 2 Odds ratio, for transitioning from 0 medication in past twelve months to 1+, and from <3 medication to 3+ between waves 1 and 2, related to life events and changes in economics resources (adjusted for age, gender and baseline socio-economics characteristics)

Effects on Hospital Stays in the Past Twelve Months

In 2004, 15,333 subjects (87.4 percent) did not report any overnight hospital stay within the past twelve months. Of these, 12.5 percent declared at least one hospitalization in Wave 2. Like other outcomes, this evolution was positively related to the age category. It ranged from 7.4 percent in the 50-54 age class to 19.6 percent at age 75+.

In multivariate models, transitioning from no hospital stay in Wave 1 to at least one stay in Wave 2 was positively associated with work cessation, with income reduction and with reported worsening of the coverage of hospitalization by health insurances, see Figure 3. Changes in household size or an increase in income were unrelated to this outcome.

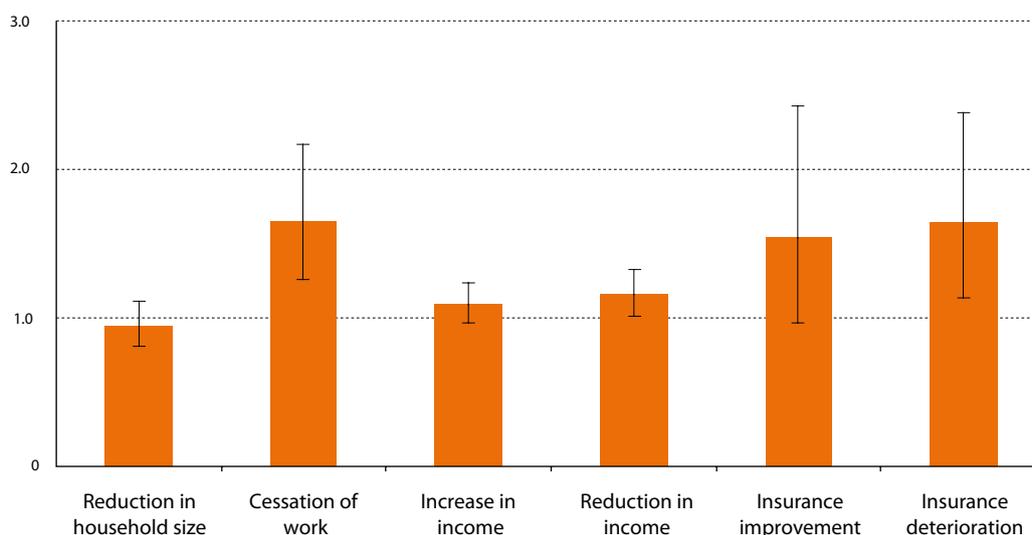


Figure 3 Odds ratio, for transitioning from 0 hospital stay in past twelve months to 1 between waves 1 and 2, related to life events and changes in economic resources (adjusted for age, gender and baseline socio-economics characteristics)

Conclusions

- The occurrence of life events such as household reduction or work cessation and changes in economic resources such as income or health insurance coverage were found related to age. This variable also positively influences the probability of transitions to higher levels of health services utilization such as ambulatory medical care, medication and hospitalizations.
- A reduction in household size predicted essentially a higher use of ambulatory medical care but it had no effect on medication or hospital admission. A higher level of medical contacts might result from less social support available in front of health problems, or from health perturbations (e.g. depression) related to the loss of close relatives.
- Work cessation increased the probability of transitioning to a high level of medical contacts, to medicament consumption, and to hospitalization. Reasons for this association, however, deserves further research. Although initial subjective health was taken into account, new health problems occurring between waves 1 and 2 might have resulted both in work cessation and in a higher level of healthcare use. An alternative hypothesis could be that of a lower level of health resulting from involuntary retirement or unemployment.
- Changes in income category did not seem to influence the use of new health services (except for transition to hospitalization in case of income reduction) or the probability to evolve towards a high level of use. By contrast, reported changes in health insurance coverage, in either direction, were found related to all types of transition towards more healthcare use. Relationships with health insurance should, however, be interpreted with caution since information regarding changes in coverage was self-reported. The need for more health care may influence the perception, and consciousness, of insurance coverage while an increasing volume of co-payment may induce some resentment and the feeling of a decreased coverage. Further investigation of these associations would request objective data on health insurance contracts.

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4.7 Changes in Health Out-of-Pocket Payments and Health Care Utilization in the Early Post-Retirement Period

Alberto Holly, Karine Lamiraud, Karine Moschetti, Tarik Yalcin

This chapter analyzes to what extent retirement may affect health care use expressed in either monetary or level units. More precisely, our analysis looks at how out-of-pocket (OOP) payments and health care utilization have been changing in the early post-retirement period among the elderly in Europe. Most individuals identify themselves as “retired” when they retired from full-time work in their primary occupation. These people may still be working, on a part-time or project basis. However, most individuals are likely to experience changes during this phase. Retirement may be associated with a change in insurance coverage, a change in income or/and a change in health status. The Share longitudinal data offer a unique opportunity to study the impact of such factors on OOP expenditures and health care utilization around retirement. Our analysis focuses on the following questions. How do OOP and health care utilization evolve around retirement? What are the equity impacts of health care use around retirement?

Before addressing these specific questions, we briefly present the methodology of analysis as well as some descriptive statistics concerning possible changes that might have occurred around retirement.

Methods

We used a longitudinal sample of the SHARE data including all the respondents who were interviewed in Wave 1 and Wave 2 (N=18,285). 832 individuals retired between Wave 1 and Wave 2. Among them, 691 had an economic activity in 2004, the others (141) were on sickness leaves in 2004.

Health care use was captured through both OOP and level variables. OOP payments included non-refunded expenses for inpatient care, outpatient care, prescribed drugs and nursing homes. Monetary values were expressed in Euros adjusted by the purchasing power parity. Level variables referred to the number of contacts with a general practitioner during the past 12 months, the number of contacts with a specialist physician during the past 12 months, whether the individual was hospitalized during the previous year and the length of hospital stays.

For comparative purposes, descriptive statistics (means, standard deviations, statistic tests) were computed for three groups of people: people who retired between Wave 1 and Wave 2 (N=832), people who stayed in the workforce between Wave 1 and Wave 2 (N=4,204), people who were retired in both waves (N=7,935). The remaining groups (people who returned to working status between both waves and people who were neither workers nor retired at Wave 1 or Wave 2) were not considered here due to the scope of our analysis.

In order to estimate the impact of retirement on health care use, we performed a difference in differences (DiD) analysis (Meyer, 1995). The idea of such an analysis is the following. If we simply performed a “before and after” analysis on the subgroup of people who retired between both waves, we could not identify whether the change in OOP payments (if any) was attributable to a time change or to a job situation change. One way to identify the impact of retirement is to identify a group of people who did not experience a job change during the period of analysis (control group) in order to compare the changes in health care use between this group and the group of new retirees between the two waves.

The control group was composed of the individuals who were in the work force at both Wave 1 and Wave 2 (N=4,204). The treatment group was composed of the individuals who retired between Wave 1 and Wave 2 (N=832).¹

Changes in Possible Determinants of Health Care Use

This section investigates changes related to health insurance coverage, health status and income in the early post retirement period.

Very few people experienced a change in health insurance coverage after a change in labor market status. 8.2 percent of new retirees were affected by a drop in insurance coverage whereas 3.7 percent could rely on a more generous insurance coverage after they retired.

A majority of individuals (62 percent) who left the workforce declared to experience no change in their health conditions whereas for 20 percent of them retirement was associated with a decline in their perceived health status. Note however that the relationship between retirement and health status may be complex and bi-directional. On the one hand, poor health may affect retirement decisions (Miah and Wilcox-Gök, 2007; Bound et al., 1999; Hagan et al., 2006). On the other hand, poor retirement conditions (e.g. lower income) may have a negative impact on health status. Moreover, for some people, leaving the workforce generate anxiety or depression. These psychological changes due to retirement may lead to a decline in self reported health.

Looking at the income, we observed that about half of the people (47 percent) moved down to a lower income quintile after they retired. About one fifth of the European retirees moved up into a higher income quintile and 32 percent remained in a same income quintile. Moreover, people who retired between waves experienced on average a significant ($p < 0.001$) decline in their total income. This mean reduction of income was higher than one third between Wave 1 and Wave 2.

The health-related findings are in line with the analysis of Hyde et al. (2004) who showed that retirement, per se, is not associated with a significant change in health status. However, in contrast with Hyde et al. (2004), our data suggest that retirement may be associated with a change in financial situation.

We may wonder whether such changes may have impacted health care use in the early post retirement status. We could expect health care use to decline because of a decline in income or insurance coverage. However, the decline in health status could lead to an increase in health care use. Furthermore, subsidies targeted at retired people could well be imagined to mitigate the impacts of changes in insurance, health or income.

How Does Health Care Use Evolve Around Retirement?

In this section we investigate changes in OOP payments and health care utilization around retirement. We address the two following questions. Do OOP payments and health care utilization increase or decrease in the early retirement period? Does the distribution of OOP evolve in the early retirement period?

¹The following DiD equation was estimated on the subpopulation composed of the control and treatment groups.

$$OOP_{it} = \beta W_2 + \lambda T_i + \gamma W_2 \times T_i + \alpha X_{it} + \varepsilon_{it}$$

W_2 is a time dummy for W2, T is a dummy for the treatment group, $W_2 * T$ is the interaction of the time dummy and the treatment group dummy. X_{it} is a vector of covariates including age, gender, health status, income and health care utilization. γ represents the difference in the changes over time (i.e. the DiD estimator).

Do OOP Payments and Health Care Utilization Increase or Decrease in the Early Retirement Period?

The proportion of people with positive OOP payments remained stable between both waves in the group of new retirees (71 percent). However, Table 1 suggests that there has been a substantial decrease in mean OOP (if OOP > 0) for people who retired between both W1 and W2 (p = 0.08). Furthermore, it is worth mentioning that the decrease in mean OOP resulted from the decrease in all types of OOP expenditures (inpatient, outpatient, drugs, nursing home). Note that a similar pattern was observed in the other two groups of people: those who remained in the workforce and those who were retired at both waves also exhibited a stability in the proportion of people with positive OOP together with a decline in mean OOP (p = 0.02; p<0.01, respectively).

	People who retired between W1 and W2		Working people at W1 and W2		Retired people at W1 and W2	
N	832		4204		7935	
Proportion of women	40%		48%		45%	
	W1	W2	W1	W2	W1	W2
% with positive OOPs	71	71	68	68	73	74
% with positive OOPs at W1 and W2	59		56		64	
Mean of OOP if OOP>0	553	410	404	317	611	511
Std Dev.	1,225	1,370	1,038	935	1,803	2,000

Table 1 OOP payments at Wave 1 and Wave 2 for the three groups

In terms of health care utilization, Figure 1 suggests that the mean number of contacts with a general practitioner and a specialist physician remained stable between both waves for people who retired between Wave 1 and Wave 2. For both GP and specialist types of care, the average number of visits recorded at Wave 1 and Wave 2 was equal to 5. The percentage of hospitalization also remained stable. About 13 percent of the individuals who left the labor force between Wave 1 and Wave 2 had an inpatient stay. However, the length of stay declined. The total number of night stayed in hospital declined from fourteen days to ten days on average. Though this drop was not significant, it might partly explain the drop in health OOP payments previously observed. Note that health care utilization was similar at both waves for the other two groups of people for outpatient and inpatient care.

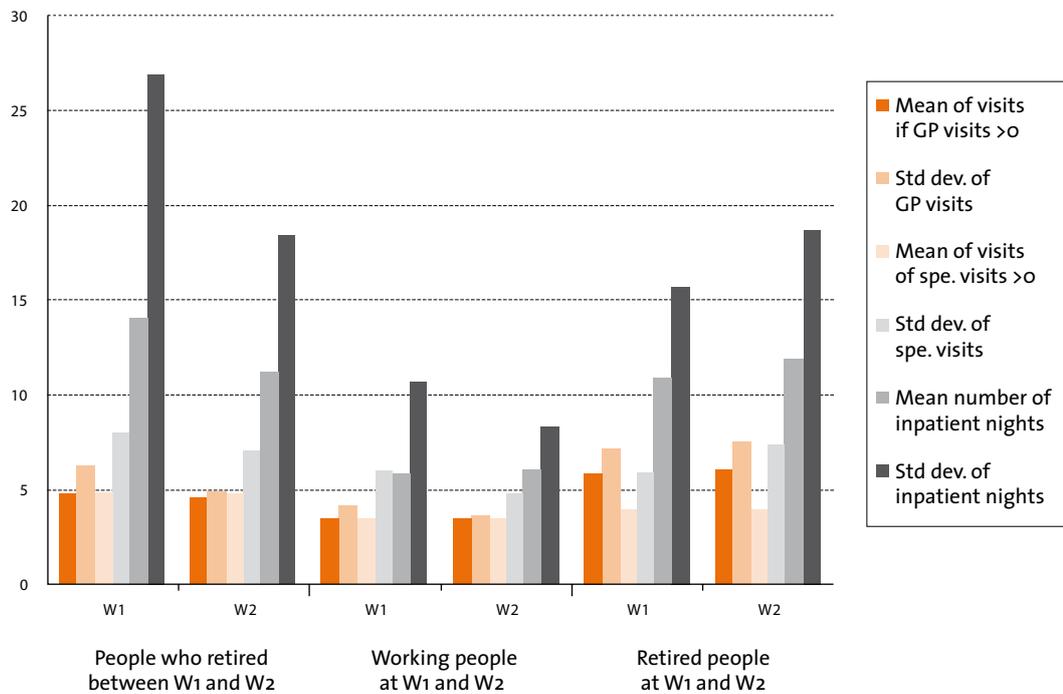


Figure 1 Health care utilization for the three groups

To What Extent is Retirement Responsible for the Observed Changes?

Concerning the decline in mean OOP payments, the results of the DiD equation indicated a reduction of Euros 43 in the mean of OOP payments between 2004 and 2006 (coefficient gamma). Note however, that this difference was not significant, meaning that there was no significant impact of retirement on OOP payments even after controlling for age, gender, subjective health status, income and health care use. The DiD analysis excluding OOP payments with a null value provided similar results. The results of the regression also showed that lower income levels were significantly associated with lower OOP payments. Moreover, higher health care utilization was significantly associated with higher OOP payments. Finally, the time dummy for Wave 2 was associated with significant lower OOPs after controlling for covariates. The understanding of the decline in OOP payments between both waves is out of the scope of the present analysis and would deserve further investigation.

Does the Distribution of OOP Evolve in the Early Retirement Period?

Another question of interest is whether the new retirees spend differently at Wave 1 and Wave 2. In order to give some insight into this question we looked at the structure of the OOP payments at Wave 1 and Wave 2 for people who retired between Waves. As shown in Figure 2, OOP payments at Wave 1 and Wave 2 for outpatient and medicines contributed to a very large part (more than 88 percent) of the medical expenditures borne by people who retired between Wave 1 and Wave 2. The part of outpatient OOP, representing more than half of the total expenditure, remained quite stable between the two waves. However, the part of inpatient OOP decreased between both waves from 9 percent to 3 percent while the share of drug OOP increased from 33 percent to 38 percent. However, none of these differences were significant. The share of day care with a low level slightly increased from 2 percent to 4 percent. These results are consistent with the previous re-

sults on health care indicating a stable number of contacts with practitioners (generalists and specialists) and a decline in the length of stay for inpatient care.

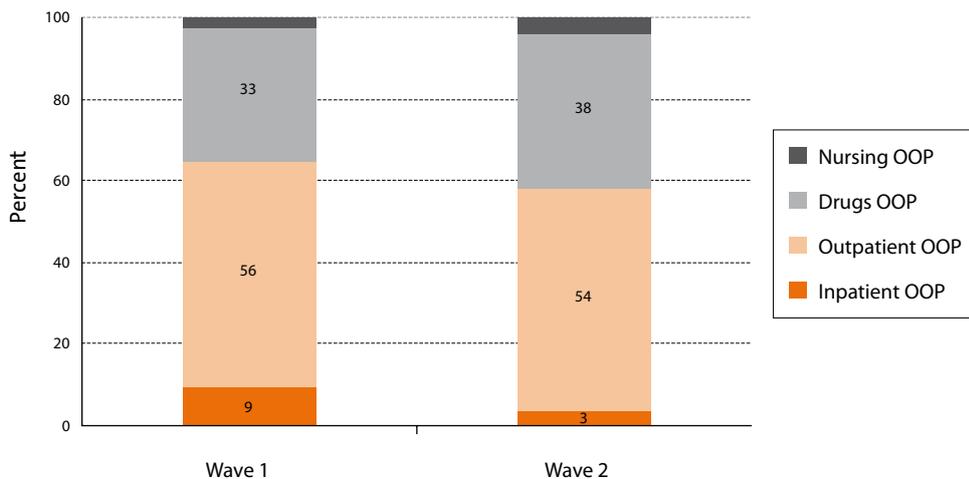


Figure 2 Structure of the OOP payments for people who retired between waves

What Are the Equity Impacts of Health Care Use in the Early Post-Retirement Period?

From an equity perspective, it is interesting to analyze to what extent health OOP are related to individual ability to pay, especially around the retirement which is generally associated with a reduction in income. This is the case of the group of people under study who experienced on average a substantial decline in their total income close to 33 percent.

Figure 3 displays, for people who retired between waves, total OOP payments for health as a percentage of income before and after retirement. At both waves, the shares of OOP payments as percentages of income decrease with total income. For instance, the share of OOP payments at Wave 2 varies from a minimum of 1 percent for the richest respondents (fifth quintile) to a maximum of 8 percent for the poorest (first quintile). A similar pattern is observed at Wave 1. As previously mentioned (Holly et al., 2005), this indicates a regressive financing system for OOP expenditure.

When comparing OOP as shares of total income between waves, Figure 3 shows two opposite trends. For the first and the second quintiles of income we observed a substantial decrease in the shares of OOP payments between waves. There is a decline of around 8 percent and 3 percent in the OOP share between Wave 1 and Wave 2 for the poorest and the second poorest respondents respectively. The decline is very small for the third quintile. The other quintiles are characterized by a slight increase of the shares of OOP. This result may have different interpretations.

First, this might suggest that due to the decline in their income, the poorest forgo certain types of care paid OOP thus decreasing the share of their income allocated to health care expenditure. Second, retired people may have access to certain types of health care that become free or partially paid by a social coverage. For instance, influenza vaccination is free for people over 65 years old in France. Finally, although we could have expected a more regressive system one may see in this Figure that the system becomes less regressive as the individual retired. One explanation is that retirement reduces the financial differences (heterogeneity) between individuals.

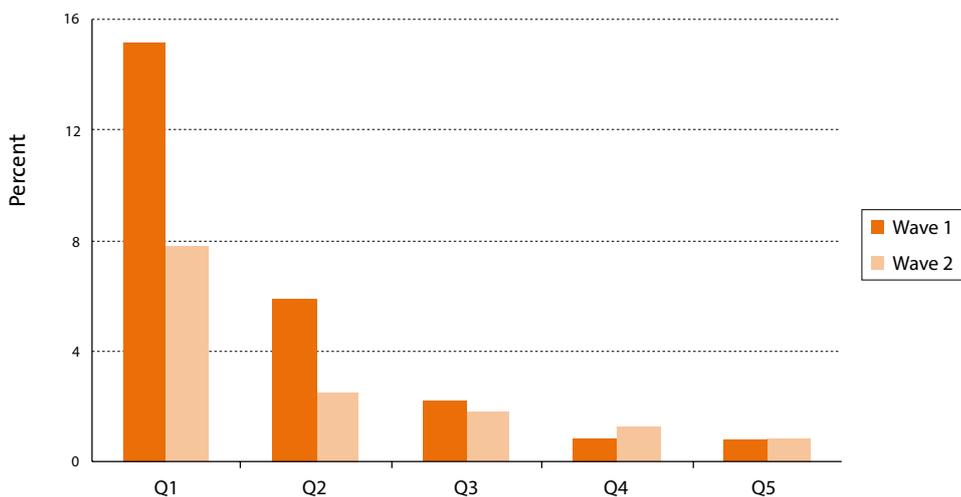


Figure 3 Distribution of OOP (as shares of total income) by income quintile for people who retired between waves

Further results suggest that health care expenditures may represent a higher burden for those who underwent a decline in income around retirement. Indeed, in the group of people who retired between waves and moved down to a lower income quintile ($\Delta Q < 0$), we observed that the share of income attributed to OOP expenditure increased between both waves from 1.5 percent to almost 4 percent see Figure 4. Note however that the increase is not very important. Conversely, we observed declines in the shares of OOP expenditure for the rest of people who retired between Wave 1 and Wave 2. Substantial reduction in the shares of income attributed to OOP payments was observed for people who retired and moved up (35 percent) to an upper income quintile ($\Delta Q > 0$) whereas a lower decline were found for retirees that remained in the same income quintile ($\Delta Q = 0$). These results suggest that those who underwent a decline in income may be impoverished around retirement due to health care expenditures. This result is of interest for policy makers.

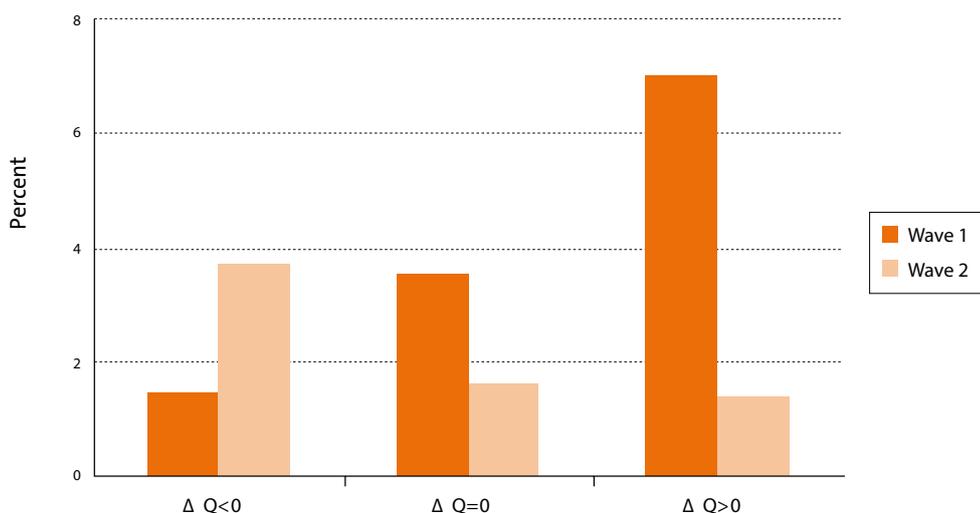


Figure 4 OOP as shares of income by changes in income quintile for people who retired between waves

Conclusion

- Generally, this analysis contributes to a better understanding of the impact of retirement on OOP payments and health care utilization.
- Although health OOPs were not affected by retirement, our results suggest that some new retirees were impoverished even slightly by health care expenditures paid out of pocket. This result may be worth considering from a policy point of view.

Two caveats are in place: First, the size of the studied sample is small. Attrition between both waves may also be a limitation. Second, the duration of analysis may be too short to observe the impacts associated with retirement. The availability of additional data for the panel on the 50-years-old and more would be very helpful to perform further investigations.

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