

15 Life Expectancy with Chronic Morbidity

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1 Introduction

This chapter is not about one specific chronic disease but rather brings together all chronic diseases through assessment of life expectancy with and without chronic morbidity in Europe. The generic term for such indicators is health expectancies and they are summary measures of population health combining information on survival with the prevalence of a health measure (Robine 2006). The most common health measure used is disability, producing disability-free life expectancy. Within Europe the Healthy Life Years (HLY) indicator based on a global activity limitation question has been developed by the European Commission in the framework of the European Union Lisbon Strategy* to monitor whether the steady increase in life expectancy observed in Europe is accompanied by an equivalent increase in the expected number of years to be lived in good health and whether the individual lengthening of life can be accompanied by increase in the labour force participation of the older workers. Comparison of HLY across Europe based on data from the Statistics of Income and Living Conditions (SILC) survey 2005 will be available in the EUROGLOREH (Global Health Status Report of the European Union) under preparation.

Background to health expectancies

Research on health expectancies dates back to the 1960s. Being independent of the size of populations and of their age structure, health expectancies allow direct comparison of the different groups that make up populations: e.g. sexes, socio-professional categories, regions. The first method of calculation was proposed by Sullivan in 1971 (Sullivan 1971). Since that time health expectancies have been increasingly used in developed countries to assess the evolution of a population's health status, in particular that of older people (Robine et al. 1999). From 1989, an international research network, REVES (Réseau Espérance de Vie en Santé/Network on Health Expectancy), has coordinated research on summary measures. However comparison between countries remained almost impossible due to national differences in the morbidity data collected, particularly in the study design, the health concepts used and the wording of questions.

The Euro-REVES project

The Euro-REVES project began in 1995 as a concerted action of BIOMED 2 (1995-1997), aiming to identify the reasons for the incomparability of health expectancy calculations in Europe. After three years, Euro-REVES provided recommendations to improve the comparability of health expectancies in Europe and harmonization of health data collections. Today, these recommendations still summarize the spirit of the Euro-REVES approach.

This first concerted action was followed by a second step aiming to propose a coherent set of health indicators for the EU Health Monitoring Program (Euro-REVES 2, 1997-2002), covering the various dimensions of health at the population level. In total 10 instruments were proposed with their exact wording in English (Box 1). The set allows in theory the computation of many health expectancies covering the totality of the conceptual framework of the measurement of population health. This number appeared to be a good compromise between too little and too many, making it possible at the same time to measure the extent of the differences in health between the European Union Member States (MS), to appreciate the causes, to specify the profile of each country and the differences between the various concepts of health: chronic disease, functional limitations, activity restrictions, mental health and health perceptions (Robine et al. 2004). Moreover the instruments aimed to address a major drawback with the then current European study, the European Community Household Panel (ECHP) which was that the questions did not fully distinguish the different facets of

* http://www.consilium.europa.eu/ueDocs/cms_Data/docs/pressData/en/ec/00100-r1.en0.htm

health according to current views on the disablement process and health measurement (Verbrugge and Jette 1994; Robine, Jagger and Euro-REVES 2003a).

Box 1 Health indicators for the EU Health Monitoring Program, proposed by Euro-REVES, 2002

- (1) a general question about chronic morbidity,
- (2) a set of specific questions on chronic morbidity,
- (3) a set of specific questions on physical and sensory functional limitations,
- (4) a set of specific questions on cognitive functional limitations,
- (5) a general question about activity restrictions,
- (6) a set of specific questions on personal care activities,
- (7) a set of specific questions on household activities,
- (8) a set of specific questions on other activities of daily living,
- (9) a general question about perceived health,
- (10) a set of specific questions on mental health.

Similar methodology was used in the development of the 10 health indicators: a systematic review of the literature on the concept and wording of questions and their previous use in surveys. In addition Euro-REVES harnessed the expertise of other European groups who were working on specific indicators and utilised their recommendations rather than producing contradictory ones. To this end the global and specific questions on chronic morbidity were developed by the EuroHIS Chronic Physical Conditions Network .

The three global instruments (chronic morbidity, activity limitation and perceived health) included in the list of 10 indicators were later defined as the Minimum European Health Module (MEHM) (Box 2). The MEHM has been included in a number of national surveys, in the Eurobarometer since 2002 and in the SILC since its inception in 2003. Most of the indicators proposed by Euro-REVES including the three indicators based on the MEHM and their related health expectancies were selected for the European Community Health Indicators (ECHI) short list, (Sicard and Montserrat, 2004 ; ECHIM, 2007).

Box 2 The Minimum European Health Module (Version 2002)

1. How is your health in general? Very good / good / fair/ bad / very bad.
2. Do you suffer from (have) any chronic (long-standing) illness or condition (health problem)? Yes/ No.
3. For the past 6 months or more have you been limited in activities people usually do because of a health problem? Yes, strongly limited / Yes, limited / No, not limited.

In 2002-2003 Euro-REVES developed the draft of the European Health Status Module (EHSM) for Eurostat that would be one of the core modules of the European Core Health Interview Survey (ECHIS). This module was mainly built from the 10 instruments selected during the second stage of Euro-REVES. Ultimately 9 indicators were chosen: chronic morbidity (global and detailed); activity limitation (global); perceived health (global); physical and sensory functional limitations; personal care activities; household care activities; other activities; and mental health. The major importance of this development was the formation of a strict protocol for the translation process, hitherto the few European surveys that had taken place, for instance the European Community Household Panel (ECHP) had paid less attention to this key aspect for true harmonisation. Indeed it is crucial that even if existing

items are taken from current European Surveys, existing translations are not automatically taken but that new translations following a standard scientific protocol are undertaken. Initially the translation process involved 6 countries but after a series of validation pilots, translations in the remaining languages of the EU27 were undertaken by Eurostat. The systematic, protocol-driven approach taken in the development and translation of the EHSM provided a template for the remaining three core modules of the ECHIS (health determinants, health care and background variables) and has been utilised for the MEHM in the EU-SILC.

The Statistics on Income and Living Conditions (EU-SILC)

Following the decision of the Board of directors, In 2003 Eurostat began to develop the wider European Health Survey System (EHSS) of which the new annual survey called Statistics on Income and Living Condition (SILC) was an integral part. It had already been decided that the EU-SILC would contain the Minimum European Health Module (MEHM). This was the fourth step in the development of common health interview surveys in the European Statistical System (ESS). The first was the introduction of a small module on health in the ECHP (1994-2001) as a first trial of harmonized data collection on an annual periodicity. The second step was the systematic data collection at the National Statistical Institutes (NSI) of 12, then 18, health or health-related items, such as perceived health. The third step was the introduction in 2002 of a disability module in the European Community Labor Force survey (LFS) (Bonte et al, 2003).

The EU-SILC (Community Statistics on Income and Living Conditions) was first launched in 2003 as a replacement to the ECHP which had ended in 2001. However 2003-2004 was a transitional period, during which data were provided by national sources with post-harmonisation giving a break in series. EU-SILC was launched under a gentleman's agreement with six EU15 countries plus Norway in 2003 and re-launched under a Regulation with twelve EU15 countries plus Iceland in 2004 and the remaining three EU15 countries in 2005. In Estonia it was launched in 2004 and in the remaining EU10 new member states in 2005. Bulgaria, Romania, Turkey and Switzerland launched SILC in 2006 (SILC, 2007).

This chapter is written by the European Health Expectancy Monitoring Unit (EHEMU) which provides scientific support to the European Commission for the Healthy Life Years (HLY) indicator through successive projects of the Community action programmes for public health (DG Health and Consumer Protection). With its first grant (EHEMU, 2004-2007), EHEMU developed a comprehensive website (www.ehemu.eu) including an Information System, several scientific reports on health expectancy in Europe, training material including a step-by-step calculation guide with accompanying software (Jagger et al 2006), a glossary of key definitions and an Interpreting guide aimed at non-technical audiences as well as bibliographic tools. Moreover, EHEMU performed the feasibility study for the adoption of HLY as a Structural Indicator. With its second grant (EHLEIS, 2007-2010), EHEMU will develop further the European Health and Life Expectancy Information System (EHLEIS), provide new insights into gender gaps in health expectancies (HE) and trade-offs between health dimensions through scientific reports, organize a training workshop in HE and a European Health Expectancy conference and provide scientific resources to the European Union Task Force on Health Expectancies (TF-HE).^{*} Calculations provided by EHEMU are made on line through the EHEMU Information System and are available on the EHEMU website.[†] Members of EHEMU were also major contributors to the earlier Euro-REVES projects which developed the MEHM.

In this chapter we report comparisons across Europe of life expectancy with chronic morbidity (LEwCM) at age 65 based on the global chronic morbidity question of the MEHM in

^{*} http://ec.europa.eu/health/ph_information/implementation/wp/indicators/taskforce_expectancies_en.htm

[†] www.ehemu.eu

SILC 2005. Data is therefore available for 25 countries (Austria, Belgium, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom). Although comparable trend data on global chronic morbidity is unavailable, we report trends in life expectancy at age 65 since these form an integral part of LEwCM.

2 Health determinants/risk factors

Other than age and gender, these are not available for global chronic morbidity in the same way as other chapters since life expectancy (and therefore the life table) is generally only available by these subgroups.

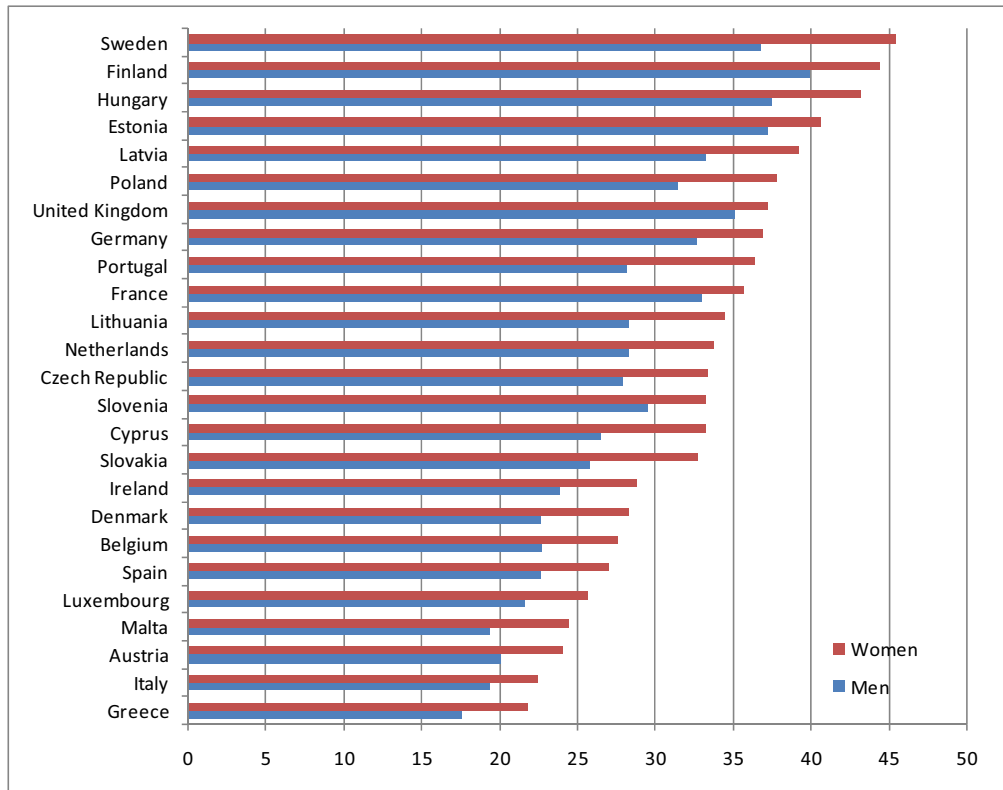
3 Prevalence of global chronic morbidity

Global chronic morbidity is measured by the MEHM question “Do you suffer from (have) any chronic (long-standing) illness or condition (health problem)? Yes/ No”.

The data were collected from SILC to ensure maximum harmonization for all Member States and are available for EU25 for 2005 and EU27 from 2006. For this chapter only 2005 data are available.

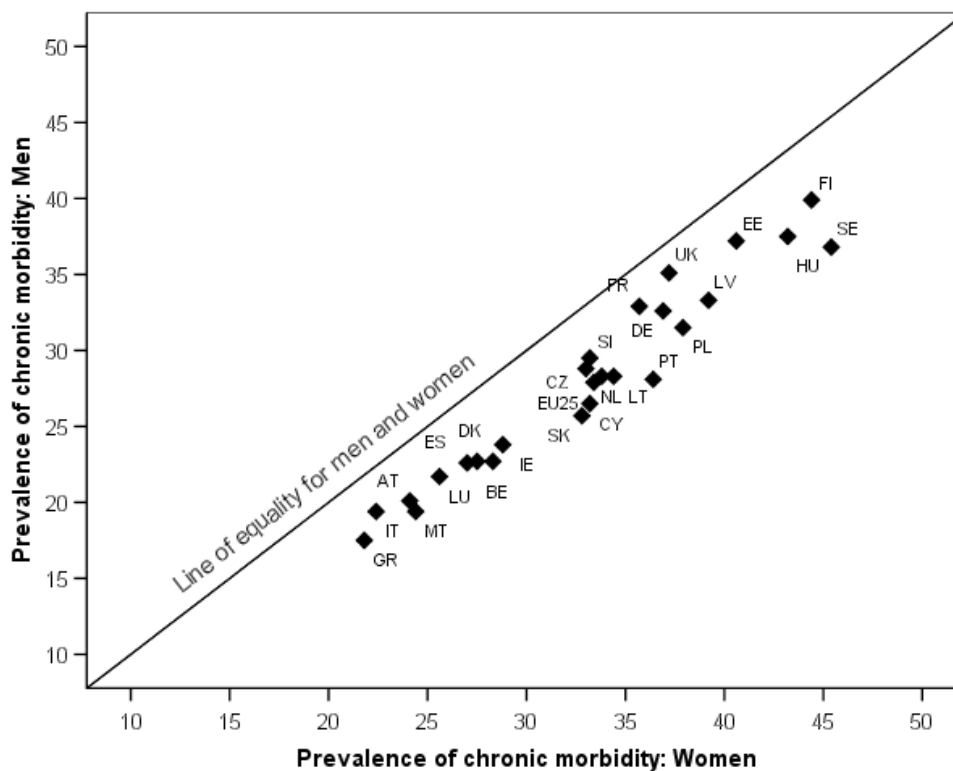
Figure 1 summarizes for the 25 Member States the prevalence of chronic morbidity in 2005, standardised to the age structure of the EU25 in 2005. Considerable disparities are evident between the European Member States in the level of chronic morbidity reported by the population. For men the prevalence ranges from 17.5% (Greece) to 39.9% (Finland) and for women from 21.8% (Greece) to 45.4% (Sweden). The reported prevalence in women is higher than that for men within every Member State though the gender gap varies from 2.1% in the United Kingdom to 8.4% in Sweden (Figure 2). However men and women give the same picture of the diversity of chronic health problems reported in Europe.

Figure 1 Prevalence of chronic morbidity at age 16 and over* for the EU25, by Member State and gender, ranked by female prevalence (Source: EU-SILC 2005)



*Proportion standardized by age with the EU25 2005 age structure

Figure 2 Standardised prevalence of chronic morbidity in EU25 for men and women (Source: EU-SILC 2005)



4 Life expectancy with chronic morbidity (LEwCM)

Life expectancy with chronic morbidity (LEwCM) is calculated by the Sullivan method (Sullivan, 1971) and using an algorithm developed by Eurostat in collaboration with EHEMU.* Briefly this entails applying the age and gender specific prevalence of chronic morbidity, presented in the previous section, to the life table for the corresponding years of the survey from which the prevalence data were obtained. Further methodological reports on health expectancies can be found on the EHEMU and Europa websites. As it forms the basis of LEwCM we first report life expectancy at age 65 by gender and trends over the period 1995-2005. Life expectancy estimates since 1995 are computed using the current Eurostat algorithm, and MS death counts and population estimates from the Eurostat database.† EHEMU may have more recent data directly collected at National Institutes of Statistics (NSI). Calculations made from such data are flagged as provisional.

Life expectancy at age 65

Life expectancy at age 65 is one measure of the ageing of the population and for the EU25 in 2005 was 16.7 years for men and 20.3 years for women.

Table 1 Life expectancy and life expectancy with chronic morbidity at age 65 in 2005 in EU25 (Source: EU SILC 2005 and EHEMU Information System)

Country	Life expectancy (years)		Life expectancy with chronic morbidity (years)	
	Men	Women	Men	Women
Austria	17.0	20.4	7.0	9.5
Belgium	16.6	20.2	7.1	10.1
Cyprus	16.8	19.1	10.3	13.6
Czech Republic	14.4	17.7	8.5	11.6
Denmark	16.1	19.1	5.6	7.7
Estonia	13.1	18.0	9.3	14.5
Finland	16.8	21.0	13.0	16.7
France	17.7	22.0	11.3	14.3
Germany	16.9	20.1	10.6	13.2
Greece	17.1	19.2	8.5	10.5
Hungary	13.3	17.2	9.4	13.3
Ireland	16.8	20.0	8.4	10.5
Italy	17.7	21.7	8.5	11.1
Latvia	12.5	17.2	7.7	12.0
Lithuania	13.0	17.6	7.1	11.8
Luxembourg	16.7	20.4	6.7	9.5
Malta	16.2	19.4	7.9	10.9
Netherlands	16.4	20.1	7.8	10.8
Poland	14.3	18.5	9.4	13.8
Portugal	16.1	19.4	9.3	13.8
Slovakia	13.3	17.1	7.1	10.5
Slovenia	15.2	19.3	8.4	11.5
Spain	17.3	21.3	8.6	11.7
Sweden	17.4	20.7	11.1	14.8
United Kingdom	17.0	19.5	10.3	12.2
EU25	16.7	20.3	9.6	12.4

* http://ec.europa.eu/health/ph_information/indicators/lifeyears_en.htm

† <http://epp.eurostat.ec.europa.eu>

These average values hide considerable differences between the Member States with a gap between the highest and lowest values in men of 5.2 years from 12.5 years (Latvia) to 17.7 years (France); in women a slightly smaller gap of 4.9 years from 17.1 years (Slovak Republic) to 22.0 years (France) (Table 1) though correlation between male and female life expectancies at age 65 were high ($\rho=0.84$, $p<0.001$). The gender gap in life expectancy at age 65 within Member States in 2005 was only 2.1 years for Greece compared to 4.9 years for Estonia.

Over the period 1995 to 2005, life expectancy at age 65 increased in the EU25 from 15 years to 16.7 years for men and from 19.1 years to 20.3 years for women. The average increase in life expectancy at age 65 across all Member States was 1.5 years for men and 1.4 years for women however patterns varied between Member States over this time period. For both men and women Ireland showed the largest increase with a gain of 3.3 years over the decade. Lithuania had the smallest increase for men (0.1 years) and Cyprus for women (0.6 years). There appeared to be little relationship between the increase over the period 1995 -2005 and life expectancy at age 65 in 1995 for either men or women. Thus there was no evidence that Member States with the highest life expectancies at the beginning of the period were showing signs of reaching a maximum value.

When increases over the decade were separated into early (1995-2000) and later (2000-2005) changes (Figure 3) further diversity between Members States is apparent. On average increases in the later period were marginally greater than those in the early period. Increases in the two periods remained constant in Austria, Portugal, Sweden and United Kingdom in men and Austria in women. Increases in the first period were greater than those in the second period, suggesting a slowing down of the life expectancy increase at age 65 for the Czech Republic, Denmark, Estonia, Hungary, Latvia, Lithuania, Poland in men and Czech Republic, Germany, Hungary, Latvia, Lithuania, Luxembourg, Poland, Portugal, Slovak Republic, Slovenia, Spain, United Kingdom in women. In Lithuania for both men and women life expectancy at age 65 declined in the period 2000-2005.

Years with chronic morbidity at age 65

Applying the prevalence of chronic morbidity within age groups to the life tables gives the expected years spent with chronic morbidity. Table 1 shows these life expectancies with chronic morbidity at age 65 by Member State and gender with values for the EU25 of 9.6 years for men and 12.4 years for women. The gap in LEwCM between Member States is greater than those for life expectancy being 7.3 years for men (from 5.6 years with chronic morbidity in Denmark to 13.0 years in Finland) and 8.9 years for women (from 7.7 years in Denmark to 16.7 years in Finland). When taken together with the total life expectancies in Table 1, we can see the proportion of remaining life at age 65 spent with chronic morbidity (Figure 4). As with most health measures women spend a greater number of years but also a greater proportion of their remaining longer life with chronic morbidity. At age 65 this ranges for men from 34.8% of remaining life spent with chronic morbidity in Denmark to 77.0% in Finland and for women from 40.5% in Denmark to 79.6% in Finland.

The evidence from Europe does not appear to support that Member States with longer life expectancy have longer healthier life expectancy or rather that they have less life expectancy with chronic morbidity. In Figure 5 for men particularly there appears to be two distinct clusters: the eastern European countries of Estonia, Poland, Latvia, Lithuania, Slovak Republic, Hungary, the Czech Republic and the remaining Member States. However there appears little evidence that Member States with the lowest proportion of unhealthy life (spent with chronic morbidity) are also those with the longest overall life expectancy at age 65.

Figure 3 Changes in life expectancy at age 65 in period 1995-2000 and 2000-2005 by Member State and gender (Source: Eurostat and EHEMU Information System)

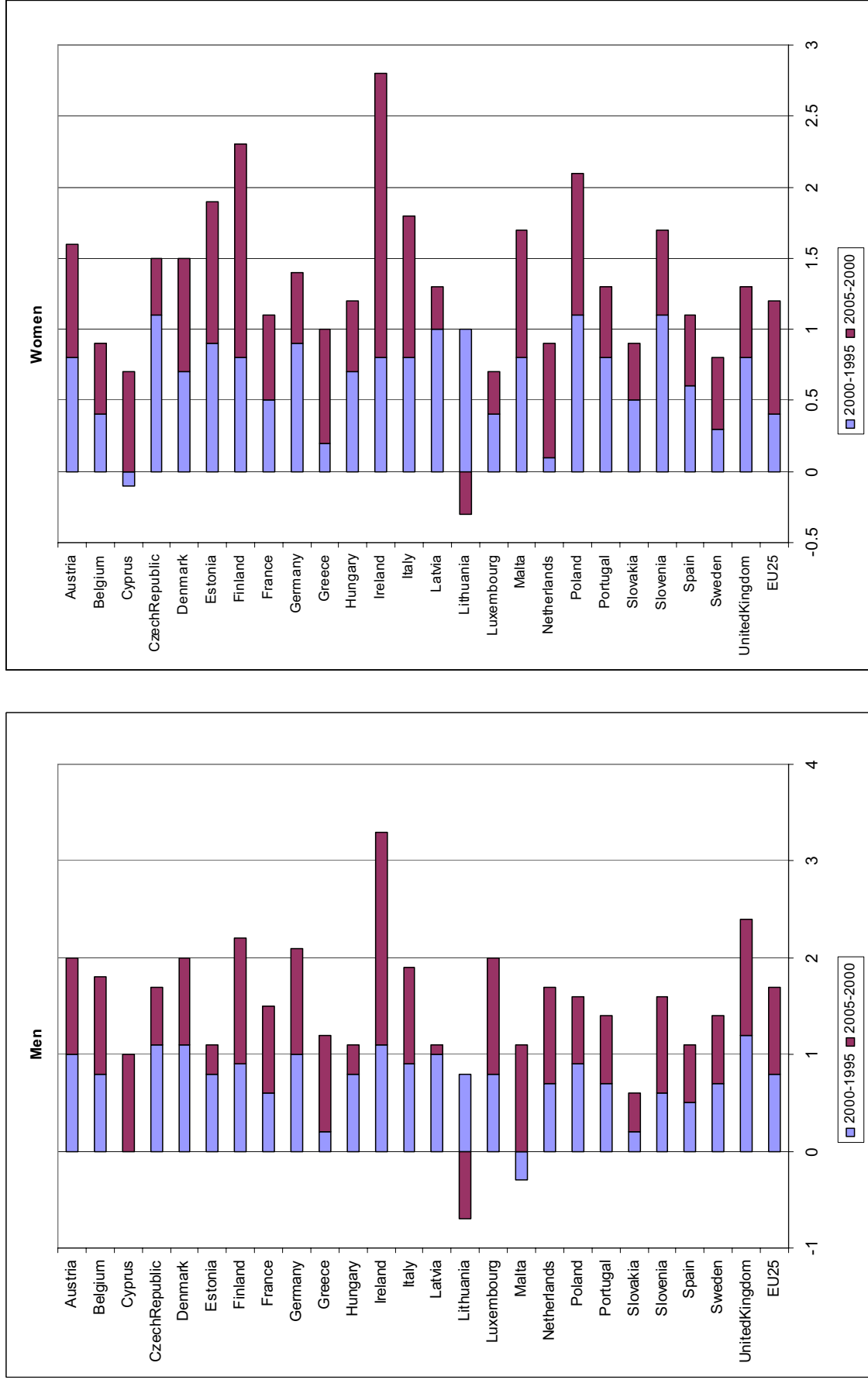


Figure 4 Proportion of remaining life at age 65 spent with and without chronic morbidity, by Member State and gender (Source: EU-SILC 2005 and EHEMU Information System)

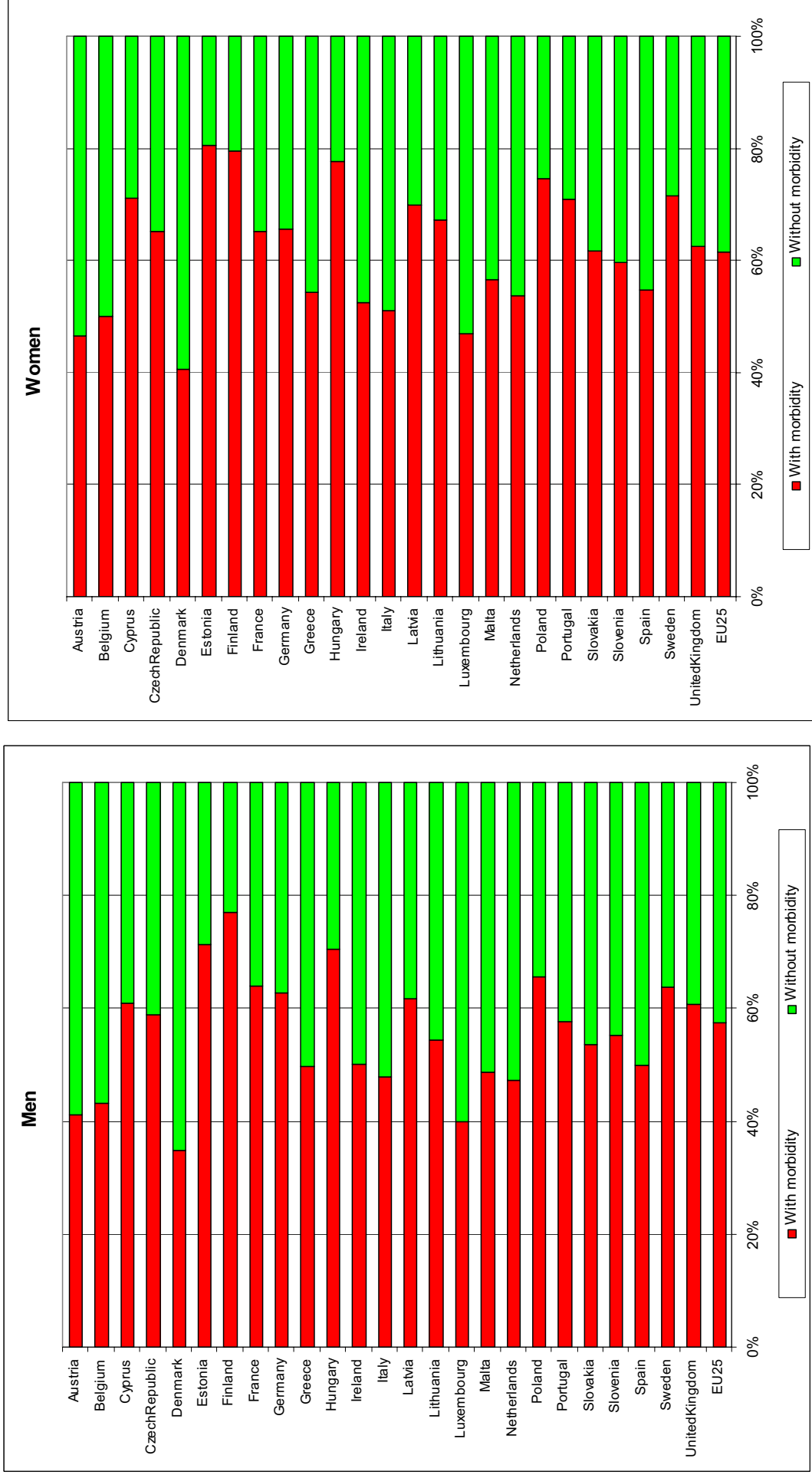
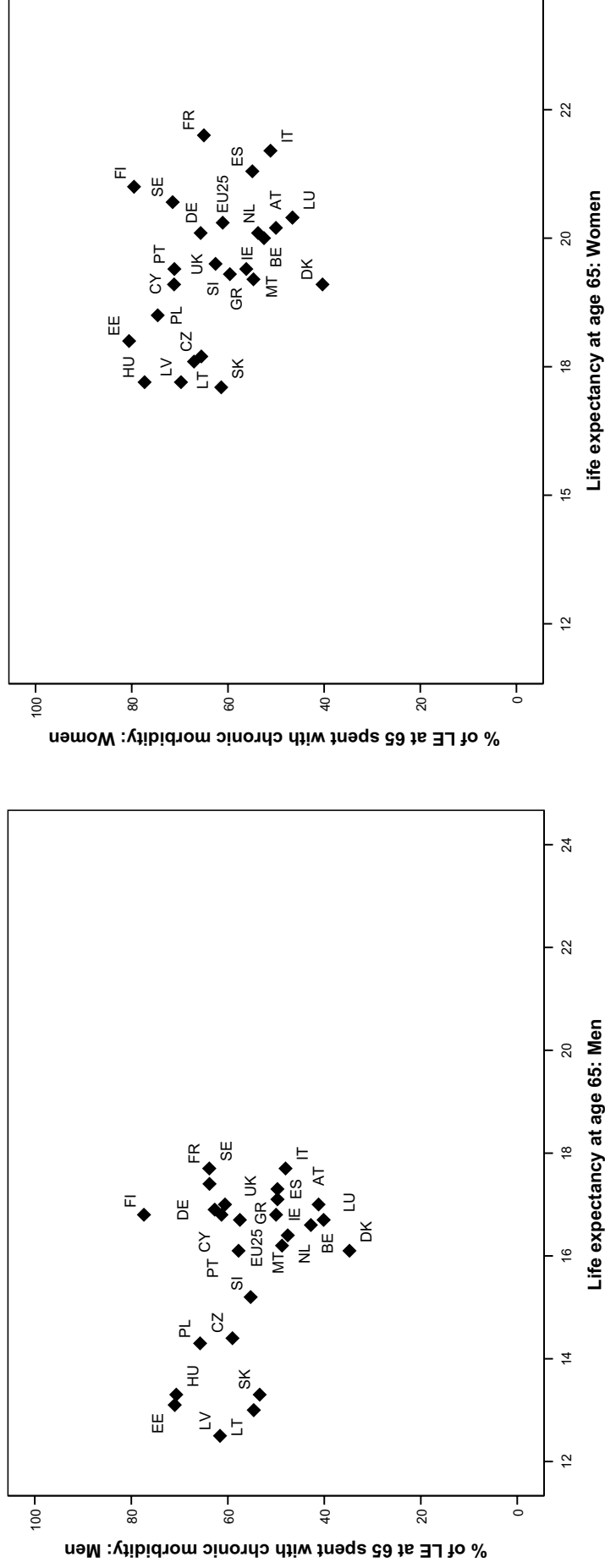


Figure 5 Proportion of remaining life at age 65 spent with chronic morbidity and life expectancy at age 65, by Member State and gender
 (Source: EU-SILC 2005 and EHEMU Information System)



5 Conclusion

A decade ago, the World Health Organization (WHO) underlined that increased longevity has no value per se if it is not accompanied by a healthy and active life, allowing a true economic and social participation of the older citizens (World Health Organization, 1997). Health expectancies such as life expectancy with chronic morbidity offer the means to monitor that reducing the longevity gaps in Europe and increasing life expectancy will be accompanied by better health and quality of life. Our findings from SILC 2005 suggest that longevity gaps are still evident in Europe with gaps of around 5 years for both men and women between countries with the highest and lowest life expectancies at age 65. Given that the average life expectancy at age 65 in the EU25 is 16.7 years for men and 20.3 years for women, this gap of 5 years is substantial. Gaps in life expectancy with chronic morbidity at age 65 are even greater than for life expectancy – over 7 years for men and almost 9 years for women.

Significant progress has been made during the last few years in developing sustainable summary measures of population health to meet the EU political agenda alongside similar efforts in North America. Indeed after almost 20 years of research on health expectancies (Robine et al 2003b), on both sides of the North Atlantic governmental authorities request these simple and robust indicators to monitor the quality of life and support active ageing and employment in the context of lengthening of life. International comparability needs further improvement as the US and the EU are still not using the same survey design or instruments and comparability with Japan has still to be developed. However the development of the Minimum European Health Module (MEHM) included in the SILC has vastly improved comparability within Europe. The MEHM includes measures of chronic morbidity, perceived health and disability, the latter by means of the Global Activity Limitation Indicator (GALI) (Van Oyen et al 2006), addressing previous inadequacies in distinguishing different health facets. In addition greater care has been taken to ensure optimal translation to the underlying health concepts.

Future initiatives

In 2002 Euro-REVES proposed a plan for the development of health statistics in Europe paralleling the first European Public Health Programme (2003-2008). This plan, which was accepted by the Board of European Directors of Social Statistics, comprised three main points: (i) the implementation of an European Core Health Interview Survey (ECHIS) initially scheduled for 2006 (now scheduled for 2008/2009), and made of standardized modules and instruments, available from (ii) a repository of European survey instruments, this whole forming part of a broader (iii) European Health Survey System (EHSS). ECHIS was to be run every five years from 2008 onwards and would include four core modules on: health status, health care, health determinants and background variables. All the survey instruments were to be validated for European use and available in a repository of common instruments. Eventually EHSS was defined as a combination of existing international or national survey instruments with appropriately designed common modules. The ECHIS managed by the Community Statistical Programme (Eurostat) remains at its heart but it could be joined by a set of Special Health Interview Survey modules and by a European Health Examination Survey, managed by the Health Programme 2008-2013 (DG Health and Consumer Protection). In addition there will be an annual component with the EU-SILC and the Mini European Health Module (MEHM), providing the data needed annually for the European Structural Indicators in the field of health, such as the Healthy Life Years (HLY). The first round of the ECHIS will take place in 2008/2009 in all the EU Members States and thereafter will be repeated every five years. The survey might take various forms in the different countries, but in all Member States the common elements could be the core modules such as the European Module on Health Status (EMHS) which includes the MEHM together with the European Health Determinants Module (EHDM), the European Health Care Module

(EHCM) and the European Background Module (ECHIS, 2007). This design with the ECHIS including the MEHM will allow calibration every five years of the HLY series computed annually with the SILC as well as more in-depth analyses with the wealth of data collected by ECHIS and addressing the shortcoming on data availability across all Member States (Robine and Jagger 2007a).

Further political demands about the quality of life of populations will come in the near future and policy makers will have more experience and higher expectations of such indicators. To be ready to meet these, the scientific community should work on second generation summary measures: true period indicators (using incidence in place of prevalence), less subjective (using measured in place of self-reported morbidity and disability and covering the whole population (rather than excluding those living in institutions such as long-term care establishments).

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