

# questions

## d'économie de la santé

Issues in health economics

method

### Background

In 2003-04 the International Longevity Centre (ILC) launched a project called Indicators of Active Ageing. Its main objective is to develop new measures of ageing and of economic activity for purposes of comparing countries in space and time (in Europe, the United States and Canada). This research, begun by Pr Françoise Forette and Dr Marie-Anne Brieu for ILC-France, forms part of this work. Its intermediate objective is to assess the comparability of twenty four surveys which include measures of health and economic activity in ten European countries: Germany, Spain, France, Greece, Italy, the United Kingdom, Sweden, Poland, the Czech Republic and the Russian Federation.

### Are measures of health and economic activity comparable in european surveys?

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The employment of older workers is now a key social issue, and varies widely in Europe. Its development is closely related to health status, which is not uniform across Europe either. To understand these differences we need comparable data. Do the surveys we currently have in Europe enable us to carry out these analyses? Which measures of health and of economic activity are actually comparable in the national surveys carried out recently in ten European countries?

Five measures of health status meet the criteria of adequate comparability and are available in at least eight of the ten countries studied: self-perceived health, certain self-reported illnesses, anthropometric measures, certain restrictions in activities of daily living, and daily cigarette consumption. Furthermore, three measures of economic activity are comparable: employment status in all of the surveys (active, inactive and retired), occupational status (salaried or independent) and hours worked daily. The comparative analysis of self-perceived health, Body Mass Index and cigarette consumption shows that international variations in health status are closely related to the indicator selected.

Map 1: Self-perceived health, « good » or « very good » in 45 to 64 year olds



Source : Eco-Santé® OECD (IRDES-OECD)

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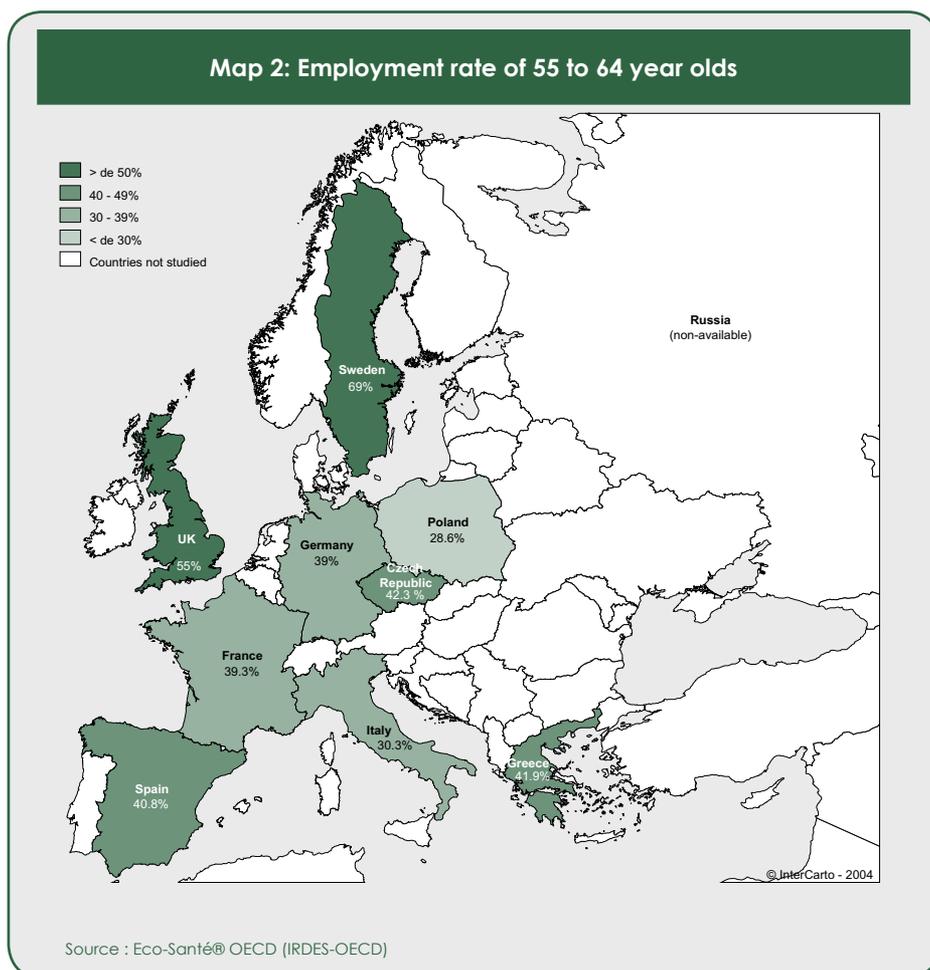
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The employment of older workers is a major issue in Europe today. Thus, in March 2001, the Stockholm Council of Europe reaffirmed the objective of the Lisbon summit to attain an average rate of employment of 70%<sup>1</sup> in Europe by 2010, with an employment rate of 50% for persons between 55 and 64. These are ambitious objectives for the European Union overall because the average rate of employment for 15 to 64 year olds was only 64,8% in 2003, and for those aged 55 to 64 only 42,3% for the then fifteen member states (see Map 2). They are particularly ambitious for some Member States with employment rates well below these levels. In fact only Norway, Denmark, Sweden and the UK had an employment rate for 15 to 64 year olds above 70%, and for 55 to 64 year olds greater than 50%. In France only 39,3% of older workers are in employment, and in Italy this rate barely reaches 30% (OECD, 2004).



2 At the same time there are big differences in health status across the European Union (European Commission, 2003). Even if life expectancy in Europe has increased from 62 years in 1950 to 73 today (Vallin et al, 2001), it ranges from 60,9 in the Russian Federation to 78,9 in France and as high as 79,6 in Sweden (WHO, 2002).

These differences in health and economic activity can undoubtedly be explained by specific national factors such as the health system on one hand, and the state of the labour market and regulations which control departure from this market on the other. However, the complex relationship between employment and health means that these factors should be analysed together. To begin with, employment seems to have an ambiguous effect on health. In fact, although onerous working conditions may result in poorer health (Volkoff and Thébaud-Mony, 2000), health status may also affect employment, with poor health resulting in

early departure from the labour market, or even permanent inactivity (Barnay, 2005; Coutrot and Waltisperger, 2005). Furthermore, exclusion from the labour market appears to have a detrimental effect on health (Sermet and Khlata, 2004), increasing health problems.

In order to understand these European differences in health and employment, we need comparable data. Hence this study aims to assess the methodological quality and content of surveys which include measures of health and employment carried out in ten European countries.

**Measuring health and employment in Europe**

Several projects to monitor health status are currently being carried out

by Eurostat, WHO Europe and the programme of Community action, with a view to establishing a harmonised health information system in Europe (McKee, 2003). The common objective of these projects is to develop recommendations for survey methodologies and for health indicators which should be included in health surveys for making European comparisons (ECHI, EUROHIS, EURO-REVES, HIS/HES<sup>2</sup>). The HIS/HES project has made an inventory of and evaluated those surveys carried out by interview and health examinations in eighteen countries in Europe, in order to specify these recommendations (Aromaa *et al*, 2003).

<sup>1</sup> Proportion of persons employed in the population studied  
<sup>2</sup> ECHI : European Community Health Indicators, EUROHIS : European Health Interview Surveys, EURO-REVES : Réseau Espérance de Vie en Santé, HIS : Health Interview Survey, HES : Health Examination Survey.

Given that our project compares European health surveys, it is fairly similar to the HIS/HES project. Nevertheless it differs in terms of its objectives and the countries studied. This study aims to document and compare the sources of information available. The latter enable analysis, using individual data, of the relationship between health status and employment status of persons aged 50 or more, and, in the population younger than 50, of those factors which affect health status and productivity. It therefore differs somewhat from most projects assessing health status in Europe underway at present, which do not have a specific focus on employment. Moreover, the goal of our study is to identify those European surveys of sufficient quality and data comparability to support comparative analyses now, and not to make recommendations for the development of new instruments.

The SHARE survey (Survey on Health, Ageing and Retirement in Europe), recently launched in eleven European countries (Blanchet and Dourgnon, 2004), does however correspond fairly well to our overall aim, given that it covers health, employment and retirement. However it only addresses persons aged 50 or more. As in other European projects, it includes the countries of Western Europe, members of the EU and of EFTA (European Free Trade Association), while our project, in addition to France, Germany, Italy, Spain, Greece, the UK and Sweden, includes three countries from Eastern Europe, the Czech Republic, Poland and the Russian Federation.

At the same time the European Community Household Panel, ECHP, run by Eurostat from 1994 to 2001 and the SILC Survey which followed it in 2003, also enable the collection of information on health status and employment. Like SHARE, ECHP was

Table 1: List of twenty four surveys analysed

Pays	Intitulés des enquêtes	Producteurs, maîtres d'œuvre ou contact et sites web
FR	Enquête Santé et Protection sociale (ESPS)	IRDES www.irdes.fr
FR	Enquête Santé et soins médicaux	INSEE www.insee.fr
FR	Baromètre Santé	INPES www.inpes.sante.fr
FR	Enquête permanente sur les conditions de vie	INSEE www.insee.fr
UK	General Household Survey (GHS)	Office for National Statistics www.statistics.gov.uk
UK	Health Survey of England (HSE)	National Centre for Social Research qb.soc.surrey.ac.uk
UK	Scottish Health Survey (SHS)	National Centre for Social Research qb.soc.surrey.ac.uk
UK	Welsh Health Survey (WHS)	National Assembly for Wales www.wales.gov.uk
UK	British Household Panel Survey (BHPS)	United Kingdom Longitudinal Studies Centre www.iser.essex.ac.uk
UK	English Longitudinal Study of Ageing (ELSA)	National Centre for Social Research www.ifs.org.uk/elsa
RU	Russian Longitudinal Monitoring Survey (RLMS)	Carolina Population Center www.cpc.unc.edu/projects/rlms/home.html
PO	Polish Health Survey	Central Statistical Office www.iph.fgov.be/hishes/surveys(site His-Hes)
CZ	Czech Health Survey	Institute of Health Information and Statistics of the Czech Republic www.uzis.cz
CZ	Labour Force Sample Survey	Institute of Health Information and Statistics of the Czech Republic www.uzis.cz
GE	German National Health Examination and Interview Survey	Robert Koch Institut www.rki.de
GE	Questions on Health Microcensus Supplementary Survey	Statistisches Bundesamt -Dienstort Bonn www.destatis.de
GE	Survey on living conditions, health and environment	Bundesinstitut für Bevölkerungsforschung www.iph.fgov.be/hishes/surveys (site His-Hes)
GR	National Greek Survey	University Mental Health Research Institute ektepn@ektepn.gr
IT	Health Conditions of the Population and the Use of health Services	Istituto Nazionale de Statistica www.istat.it
IT	Aspects of daily living	Istituto Nazionale de Statistica www.istat.it
SP	National Health Survey	Instituto Nacional de Estadística www.ine.es
SP	Impairments, Disabilities and Health Status Survey	Instituto Nacional de Estadística www.ine.es
SP	Labour Force Survey ad hoc module on disability	Instituto Nacional de Estadística www.ine.es
SW	Living Conditions Survey (ULF)	Statistics Sweden www.scb.se

implemented first in western Europe, but nevertheless was not able to ensure a good level of comparability between the different national surveys. It is only since the implementation of SILC that the harmonisation of survey methods and measures of health status have really been addressed.

In the first phase of this work, sixty-seven surveys including information on health and employment have been identified in ten countries for the period 1995-2004, using the HIS-HES database<sup>3</sup>, the International Health Data Reference Guide<sup>4</sup> of the Centre for Disease Control and expert consultation in each country. We then refined this list on the basis of four criteria, selecting national surveys, of the general population, carried out by national statistical offices and including a health module. This left twenty-four surveys all of which are interview surveys.

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Hence we have compared twenty-four surveys (see Table 1). To do this we carried out a detailed examination of the methodology and terminology of the questionnaires in order to compile a comparative table of the different approaches of each survey and of the measures of health status and employment used. This enables us to evaluate the methodological quality of the surveys and to identify comparable questions on health and employment.

### Analysis of the statistical quality of the surveys

Initially this study has focussed on the methodology of each survey. We have assessed this on the basis of five criteria:

- the type of survey (individual or household surveys, longitudinal or cross-sectional, periodicity);

- the national representativeness of the sample (quality of the base population and the sampling plan);
- the rate of non-response and methods used to correct non-response;
- and finally, the method for conducting the survey (face-to-face or telephone interviews, competence of interviewers etc.).

The first point is that information on survey methodology is not always available in English, and often lacks detail. In particular information on sampling plans is often rather brief, and the strategies for correcting non-responses are rarely detailed. Hence it has been difficult to evaluate the statistical quality of some of the surveys.

Choosing a sampling frame made up of households or individuals does not affect the quality of surveys, provided that the sampling method is designed to obtain a representative sample of the population at the level of individuals. Whether or not surveys are longitudinal or cross-sectional was not a criterion for inclusion in our study. In fact, longitudinal surveys are as representative as cross-sectional surveys for a cross-sectional analysis, if the attrition rate<sup>5</sup> is low and the sample is adjusted in each period to compensate for any attrition. Even if the main objective of the study is not to monitor indicators of health status and employment, surveys carried out at frequent intervals are interesting because they facilitate comparisons for the same years. Finally, the season of the year during which the survey is carried out may result in seasonality bias. This affects numerous surveys, such as the French Health and Social Protection Survey.

The criterion of national representativeness is more discriminating,

insofar as most British surveys cover only one region (e.g. Scotland, Wales or England). Nevertheless, by pooling them, nationally representative data can be obtained. Most surveys also involve multi-stage sampling (the British surveys, the French ten-year health survey, the RLMS in Russia), in which certain areas of the country are excluded. This does not affect the national representativeness of surveys provided that the non-surveyed areas are not atypical. Surveys based on samples constructed from telephone directories or random number generation also suffer from lack of representativeness of the sample surveyed. This is the case for example with the French 2000 Health Barometer Survey.

To aim for national representativeness and enable sufficiently precise estimations, surveys must be based on sufficiently large initial sample sizes. Hence, the Greek, Czech and Swedish surveys, based on small samples, do not appear suitable for detailed analysis.

In the sample surveyed, a high non-response rate may also reduce the representativeness of the sample. This is true for the Czech surveys with a non-response rate of about 30%, the General Household Survey (33%), and the Welsh Health Survey where this rate is approximately 40%. This criterion is even more significant where the initial sample size is small (the Czech surveys) or where no information is provided on the strategy for dealing with non-response.

<sup>3</sup> <https://www.iph.fgov.be/hishes>

<sup>4</sup> <http://www.cdc.gov/nchs/data/misc/ihdr2001.pdf>

<sup>5</sup> The attrition rate is the decrease in the number of survey respondents from one wave to the next.

Finally, the method for conducting the survey (face-to-face or by telephone), and interviewer training affect in particular the quality of health information collected.

## Comparable measurement instruments

Several instruments for measuring health status are available in the surveys. As Blaxter (1989) has suggested, these instruments can be divided into three categories. The first deals with subjective health and includes measures of perceived health and quality of life scales. The second group refers to a medical or biological model: poor health is a function of some variance from a physiological or psychological norm which manifests as disease. In this analysis we consider only chronic diseases and disease-specific quality of life scales. The third category is based on a social and functional model and assesses health status using indicators of incapacity (functional limitations or activity restrictions). Thus a poor health state is defined as the inability to assume a social role and carry out normal tasks. Finally, we may consider risk factors such as alcohol and tobacco consumption and anthropometric measurements, as a fourth group of measures, providing information on current or future health status.

Furthermore, several instruments for measuring activity are available in the surveys. The concept of activity is interpreted here in the widest sense, including remunerated and non-remunerated activity. Economic activity relates above all to employment status (employed active, unemployed, retired, other inactive), to occupational status (self-employed, salaried, civil servants) and to employment characteristics (hours worked, type of employment contract). Social status, measured by level of income, profession and social class, or education level

**Table 2: Instruments for measuring health status and economic activity which are comparable in the countries and surveys included in the study\***

	Number of countries	Number of studies
<b>Comparables and available instruments</b>		
Employment status <sup>6</sup>	10/10	24/24
Daily cigarette consumption	10/10	22/24
Body Mass Index	9/10	18/24
Working hours (per week)	9/10	14/24
Occupational status (independent, salaried)	8/10	21/24
List of self-reported disease with semi-closed questions	8/10	18/24
Self-perceived health (WHO-Europe)	8/10	13/24
ADL - « get out of bed unaided »	8/10	9/24
<b>Other instruments</b>		
Household income**	9/10	18/24
Type of activity: full- or part time	7/10	13/24
ADL - « dressing oneself »	7/10	7/24
Visual impairment	6/10	9/24
ADL - « washing oneself »	6/10	8/24
IADL - « going shopping oneself »	6/10	6/24
Hearing difficulties	5/10	9/24
SF-36 (quality of life scale)	4/10	6/24
Functional limitations - « going up or down stairs »	4/10	5/24
GHQ-12 (quality of life scale)	3/10	6/24
CAGE (alcohol)	3/10	5/24

\* Instruments ranked by decreasing order of frequency of use in the countries and surveys analysed.

\*\* Because the dates of the surveys vary, conversion to a common currency is difficult and does not enable reliable inter-country comparisons.

as well, is taken into account as a determinant of economic activity. Finally, we look at non-remunerated activity, such as voluntary work or caring for family members.

Questionnaire analysis was carried out in four phases: identification of the dimensions of health status and activity, comparison of questionnaire terminology, analysis of the form of questions, open or closed, and where closed, of the number and terms used in the items of reply. In the light of this analysis, in our view questions for which the termino-

logy is identical and present in at least 8 of the 10 countries are comparable (see Table 2).

### Several measures of health and economic activity are comparable in most countries <sup>7</sup>

The health status measurement instrument most frequently included in these

<sup>6</sup> Provided that these statutes are defined in the same way in each country.

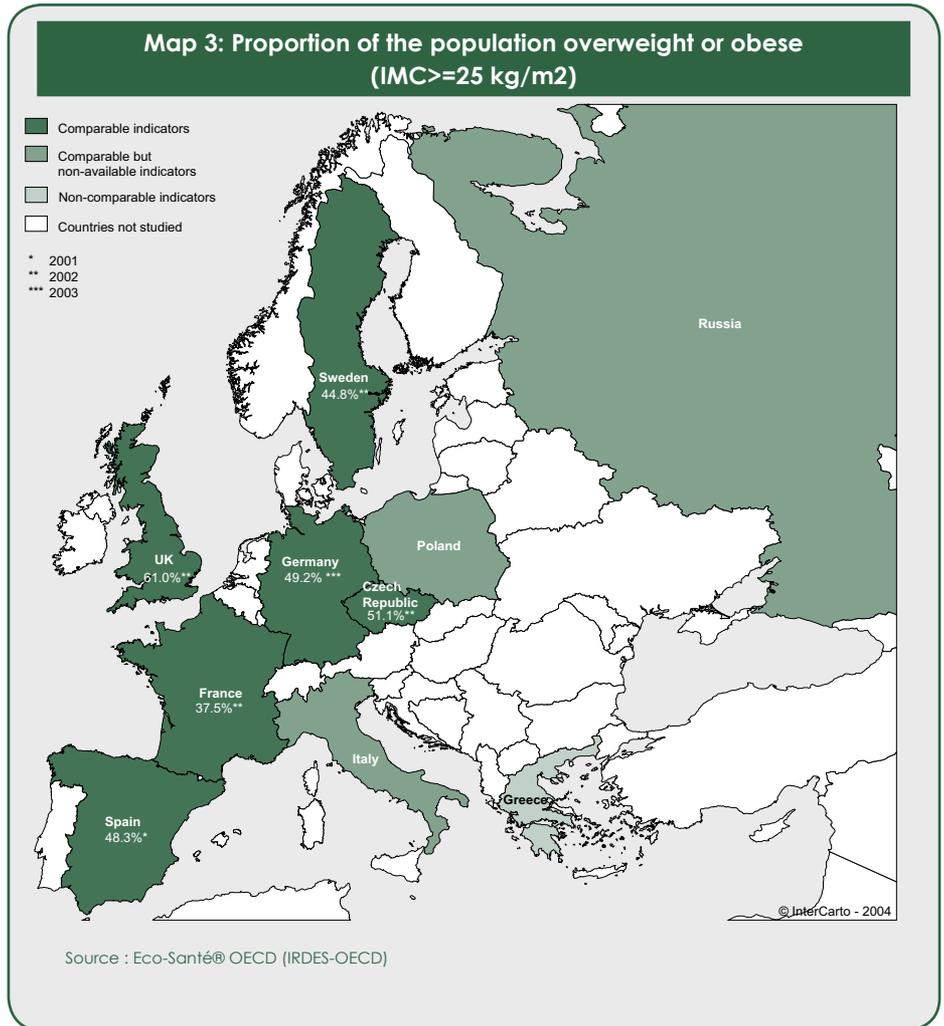
<sup>7</sup> Detailed information on health and economic activity indicators by survey are available in the report and its annexes on the IRDES website.

surveys is that of self-perceived health. It is used in many surveys (21/24), although terminology varies. Self-perceived health using the standard form recommended by the European Office of WHO: «How do you judge your state of health: very good, good, average, poor, very poor?» is used in 8 countries and 13 surveys.

The approach to chronic diseases varies greatly between surveys – lists of diseases are often used. In interview surveys, information on diseases is self-reported by survey subjects, rather than from a diagnosis by a medical professional following examination. The question is sometimes more precise, it may address the diseases perceived by the interviewee («Do you suffer from...?»), diseases diagnosed by a doctor, or illnesses for which the interviewee is being treated. The questions may be open, closed (« Do you suffer from hypertension?

6 Yes or No») or semi-closed i.e. allowing the interviewee to add conditions which do not appear in the list. Information collected concerning perceived illness is usually obtained using semi-closed questions (18 surveys). We can compare groups of declared diseases by analysing the survey questionnaires, in particular cardio-vascular disease (arterial hypertension and ischaemic cardiopathies), diseases of the musculo-skeletal system, diseases of the nervous system, allergies, cancers, diabetes and hypercholesterol.

Many surveys include questions on what we term in general «incapacity». This category includes functional limitations (difficulties with walking, climbing stairs, understanding a conversation, short or long sightedness) and limitations in personal care activities (ADL<sup>8</sup>: washing, dressing) or domestic tasks (IADL<sup>9</sup>: housework, shopping, phoning). How to standardise these ques-



tions has been of concern to European researchers for many years, and the issue resolved only recently, which explains the limited number of strictly comparable questions identified. Hence, only the question which address ability to get up unaided is comparable in 8 countries.

Daily tobacco consumption («Do you smoke every day?») is present in all of the surveys, except for the Czech «Labour Force Survey» and the Spanish «Labour Force Survey ad hoc module on disability». Former smokers and persons who have never smoked are also identifiable in most surveys (except for the Permanent Quality of Life Survey in France, the British Household Panel Survey, the Czech «Labour Force Survey», the Spanish «Labour Force Survey ad hoc module on disability» and the Swedish «Living Conditions Survey»).

Data on weight and height, enabling the calculation of Body Mass Index, is collected in 18 of the 24 surveys. BMI comparisons can therefore be compared for 9 of the 10 countries included in this study.

Finally, three economic activity measures are comparable. Employment status is available in all of the surveys and enables international comparisons of activity rates, but also of rates of inactivity, retirement or unemployment. Information on occupational status – salaried or self-employed – is also

<sup>8</sup> Activity of Daily Living (ADL) ou activités de la vie quotidienne.

<sup>9</sup> Instrumental Activity of Daily Living (IADL) ou activités instrumentales de la vie quotidienne.

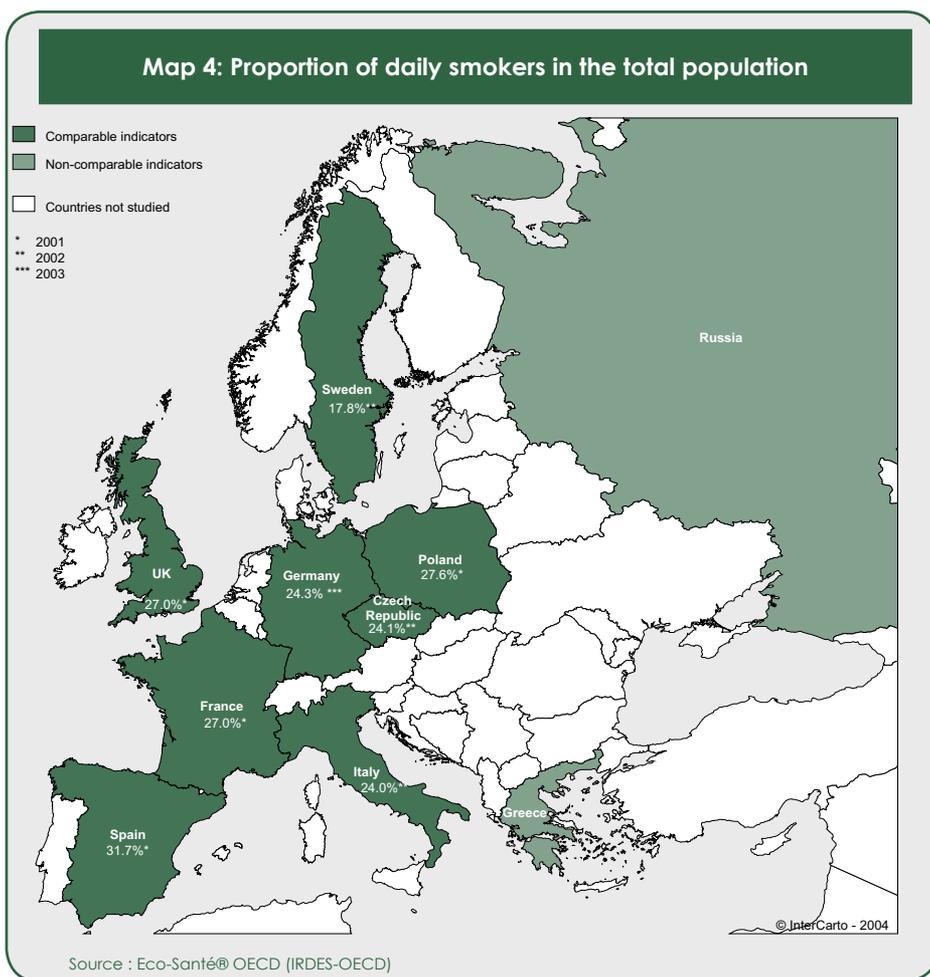
available in most surveys (21/24). For 8 of the 10 countries we have information on weekly working hours.

**Comparable measurement instruments present in a limited number of surveys**

Other measurement instruments are available but are present in a limited number of surveys. Two health-related quality of life scales are present in the surveys we have analysed: the SF-36 and the GHQ-12. They appear in 6 of the 24 surveys analysed. Similarly, depression-specific scales (CASP-19, CES-D and MINI) have been used very rarely. The surveys contain many questions concerning alcohol consumption but their varied terminology prevents valid comparisons. International comparisons are possible using the CAGE indicator which measures levels of alcohol dependence, but this is only available in 5 surveys in 3 countries.

**Indicators of limited comparability**

All of the surveys include variables on economic activity: non-remunerated activity, type of contract (full-time, part-time), social class, level of household income. Nevertheless the structure of the scales used to measure class or income is often country-specific. Furthermore even though the question on household income is the same for 9 of the 10 countries (18) surveys), conversion to a common currency is complicated by the different dates of the surveys. Overall, the activity indicators need to be harmonised in order to compare results. The scale of the International Standard Classification of Occupations (Classification Internationale Type des Professions CIP-88) proposed by the International Labour Organisation to facilitate comparisons of social class, is only used in the Swedish survey and the Spanish «Labour Force Survey».



**Eight measurement instruments are suitable for comparisons**

The number of instruments which can be used to make valid comparisons is relatively limited. Based on a systematic analysis of the terminology used, it appears that five health status measurement tools and three activity variables are comparable in at least 8 countries. (see Table 2).

Hence it is possible to make comparative analyses of self-perceived health, certain diseases, Body Mass Index, daily cigarette consumption, ability to get out of bed unaided, employment status, occupational status and weekly working hours.

**Important differences between countries**

To date, the surveys examined here have not been used to make inter-

national comparisons in recent years. The results published in the literature or in survey reports are usually difficult to compare, because the selection criteria used to select the study populations are different (specific to a particular issue, analysis of specific age or gender groups etc). However, the Eco-Santé® OECD (IRDES-OECD) database does enable us to compare three health indicators from the surveys assessed here: the percentage of persons declaring themselves to be in good or very good health, the proportion of the population which is overweight or obese and the proportion of daily smokers. However this database does not include any of the activity indicators included in these surveys.

Information on self-perceived health shows big differences between countries. Of the population aged 45 to 64, only 28,1% of Poles and 48,3% of

Czechs consider themselves in good or very good health, whereas in France, the UK and Sweden, this proportion rises to around 70%.

At first glance then, we see a marked contrast between the countries of western and eastern Europe, but health inequalities in terms of BMI show a different picture. For the 6 countries for which we have data, the proportion of the population which is overweight or obese (BMI $\geq$ 25kg/m<sup>2</sup>) ranges from 37,5% in France to 61% in the UK (see Map 3). Finally, the proportion of daily smokers is relatively constant between countries, varying from 25% to 30% of the total population (see Map 4), except for Sweden (18%) and Spain (32%).

This brief analysis shows that the choice of an appropriate health indicator depends both on comparable terminology and careful interpretation. The same indicator may show big inter-country differences, but country rankings may vary depending on the indicator chosen. It is therefore imperative to consider which other factors may limit the comparison. Hence many studies have examined the concept of perceived health, in an attempt to understand how individuals rate themselves on the proposed scales. This work has shown that what constitutes good health is culturally specific (Jylhä, 1998; Shmueli, 2003). Furthermore it is difficult to rank countries on the basis of a single health indicator, given that each indicator describes a particular dimension of health.

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This study has confirmed the need to harmonise information on health and economic activity at the European level. Two different approaches to this are already underway:

- Reflection across the European Union has led to standardised questionnaires designed for inclusion

### Further information

This paper is based on a report financed by the International Longevity Centre – France, Barnay T., Jusot F., Rochereau T., Sermet C. (2005), « Comparability of health surveys in Europe », report for the International Longevity Centre of France, downloadable from the following addresses:

[http://www.irdes.fr/En\\_ligne/DocTrav/ILCReport.pdf](http://www.irdes.fr/En_ligne/DocTrav/ILCReport.pdf)

[http://www.irdes.fr/En\\_ligne/DocTrav/ILCAAppendix.pdf](http://www.irdes.fr/En_ligne/DocTrav/ILCAAppendix.pdf)

#### See as well:

Aromaa A., Koponen P., Tafforeau J., Vermeire C. (2003), « Evaluation of Health Interview Surveys and Health Examination Surveys in the European Union », *European Journal of Public Health*, 13, supplement 3: 67-72.

Barnay T. (2005), « Une analyse microéconométrique de la cessation d'activité : l'effet de l'état de santé », *Cahiers de Recherche EURISCO*, 2005-01.

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in national health surveys within the framework of the European Health Survey System (Bonte, 2003). These questionnaires are presented as thematic modules. The health module is now available, and translated versions are being validated. These surveys, which are comparable thanks to these common modules, enable in-depth analysis of the major health issues affecting individual countries.

- The implementation of European surveys using identical methodologies and questionnaires. These are more limited in terms of content and numbers of people surveyed, but because they are carried out regularly they can be used to monitor

change in simple indicators over time. The SILC survey is a survey of this type, and SHARE, with a first wave in 2004, is pursuing a similar objective.

Looking beyond the harmonisation of surveys and questionnaires, we need to reflect on the development of indicators which synthesise health status and activity. Clearly these are of interest with regard to behaviour at the end of working life and more generally in terms of population ageing. The construction of an indicator of healthy active life, on the basis of indicators of disability free life expectancy, could thus open a new chapter of research on the transition from active life to retirement