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Measuring Age-related Frailty in the General Population: a Comparison of the ESPS and SHARE Surveys

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Research potential provided by the recent development of studies on age-related frailty is considerable, particularly in terms of gaining a better understanding of the mechanisms leading to old age dependency. Several studies have used data collected by the Survey on Health, Ageing and Retirement in Europe (SHARE) to identify individual determinants leading to the loss of autonomy. A specific questionnaire dealing with frailty was added to the IRDES Health, Health Care and Insurance survey (ESPS) in 2012. However, due to differences in the methodologies used, the measure of frailty in SHARE and ESPS is not identical.

Consequently, it therefore seemed appropriate to compare the frailty indicators obtained in the two surveys: in other words, can the measure of frailty accommodate a certain degree of freedom regarding data collection methods, or should they be identical in each survey?

The comparison revealed slight discrepancies in the prevalence rates of frailty, not only between the two surveys through the use of different questions (ESPS and SHARE), but also through the use of dissimilar measures within the same survey (SHARE). Despite these differences, it also revealed relative homogeneity between the determinants of frailty. Both surveys thus provide potential data resources for research on frailty. In this respect, observed social inequalities in later life frailty in both SHARE and ESPS provide an avenue for future research that should not be neglected. Finally, this first study also confirms that ESPS can effectively contribute to research on age-related frailty.

Gaining knowledge on the various mechanisms leading to loss of autonomy is one of the core factors in a series of important health, social and economic issues. In this respect, the recent development of studies on age-related frailty presents an important avenue for research (Sirven, 2013). A better understanding of the mechanisms leading

to severe disability would provide an earlier means of identifying persons at risk of dependency, both in a clinical context and in the general population.

The term "frailty" used in gerontological-geriatric literature aims to describe the multi-system decline of function affecting certain elderly people and limiting their

bodies' ability to respond to even minor stressors. This state of physiological instability exposes the individual to the risk of functional decompensation, loss of autonomy, institutionalisation and death.

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T1

Comparison of the variables composing the frailty index

		ESPS 2012	SHARE 2011 (wave 4)				
Criteria	Exhaustion	Q1. In the last 4 weeks, have you had a general feeling of weakness, fatigue, or lack of energy? 1. Not at all / 2. A little / 3. Often If (Q1=2 3): Q2. Was the fatigue mainly? 1. Psychological / 2. Physical / 3. Both (physical and psychological) Dimension coding: 1: if the individual reports having lacked energy and if it is not exclusively psychological. 0: otherwise.	Q1. Over the last month, have you lacked the energy to do the things you wanted to do? 1. Yes 2. No Dimension coding: 1: if the individual reports having lacked energy. 0: otherwise.				
	Involuntary weight loss	Q1. Have you involuntarily lost weight over the last 12 months, outside any form of diet? 1. Yes 2. No If (Q1=1): Q2. How much weight have you lost in kilos? Dimension coding: 1: if weight loss is greater than a 5% loss of original weight. 0: otherwise.	Q1. How is your appetite? 1. Loss of appetite 2. No loss of appetite 3. Unspecific or non-codeable respons Q2. Do you eat more or less than you do usually? 1. Less / 2. More / 3. Neither more nor less Dimension coding: 1: if the individual reports a loss of appetite or if the response is specific, if the individual reports having eaten less than usual. 0: otherwise.				
	Muscle strength	Q1. Do you have difficulty carrying a 5kg bag, such as a heavy bag of groceries, without help? Q2. Do you have difficulty using your hands and fingers without technical assistance? Q3. Do you have difficulty bending or kneeling down without help? 1. No difficulty / 2. Some difficulty / 3. A great deal of difficulty / 4. Incapable Dimension coding: 1: if the individual reports having a great deal of difficulty (3) or if he/she considers himself/herself incapable to carrying out (4) at least one of the two activities mentioned. 0: otherwise. If an individual reports having difficulty carrying a 5kg bag, he/she must report not having difficulties using hands and fingers for the response to be valid.	<table border="0"> <thead> <tr> <th>Objective measure</th> <th>Self-assessed measure</th> </tr> </thead> <tbody> <tr> <td> Q1. Grip strength test. Dimension coding: 1: if the maximal value for the grip test is lower than the first distribution quintile, by body mass index and gender. 0: otherwise </td> <td> Please look at card 11. Due to a physical or health problem, do have difficulties carrying out any of the activities mentioned on the card? Do not include temporary difficulties which you believe will be resolved within the next three months. Q1. Lifting or carrying more than 5 kilos, such as a heavy bag of groceries. 1. Yes / 2. No Dimension coding: 1: if the individual reports having difficulty carrying out the activity mentioned. 0: otherwise </td> </tr> </tbody> </table>	Objective measure	Self-assessed measure	Q1. Grip strength test. Dimension coding: 1: if the maximal value for the grip test is lower than the first distribution quintile, by body mass index and gender. 0: otherwise	Please look at card 11. Due to a physical or health problem, do have difficulties carrying out any of the activities mentioned on the card? Do not include temporary difficulties which you believe will be resolved within the next three months. Q1. Lifting or carrying more than 5 kilos, such as a heavy bag of groceries. 1. Yes / 2. No Dimension coding: 1: if the individual reports having difficulty carrying out the activity mentioned. 0: otherwise
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Weakness	Q1. Do you have difficulty walking 500 metres without help? Q2. Do you have difficulty going up or down a dozen or more steps without help? For each question: 1. No difficulty 2. Some difficulty 3. Great difficulty 4. Incapable Dimension coding: 1: if the individual reports a great deal of difficulty (3) or if he/she considers being incapable (4) of carrying out at least one of the two activities mentioned. 0: otherwise.	Please take a look at card 11. Due to a physical or health problem, do you have difficulty carrying out any one of the activities mentioned on the card? Do not take into account temporary difficulties that will be resolved in the next three months. Q1. Going up several flights of stairs without resting. Q2. Going up one flight of stairs without resting. For each question: 1. Yes 2. No Dimension coding: 1: if the individual reports one limitation in one of the two activities proposed. 0: otherwise.					
Physical activity	Q1. During the course of a normal week, on how many days do you take a walk lasting at least 10 minutes? Q2. During the course of a normal week, on how many days do you ride a bicycle for at least ten minutes? Q3. During the course of a normal week, on how many days do you practice a sport (jogging, fitness, swimming, VTT, etc.) for at least 10 minutes continuously? For each question: ... days (0 if never) Precisely, how much time per day do you spend on these activities ... h ... min. Dimension coding: 1: if the individual reports not participating in any of the three activities proposed. 0: otherwise.	Q1. How often do you take part in activities requiring moderate physical efforts, such as gardening, cleaning the car or going for a walk? 1. Several times a week 2. Once a week 3. One to three times a week 4. Rarely or never Dimension coding: 1: if the individual reports more than once a week. 0: otherwise					

Source: The Health, Health Care and Insurance survey (ESPS), 2012.

Realisation: Irdes.

ESPS and SHARE: factors in common and differences

The Health, Health Care and Insurance survey (ESPS) and the Survey of Health Ageing and Retirement in Europe (SHARE) have many factors in common. Using a longitudinal perspective, they both collect individual data among the general population in metropolitan France based on multidisciplinary questionnaires (health, social, economic). In addition, both surveys are produced by IRDES: the first 4 waves of (from 2004 to 2011) were conducted in France by IRDES in partnership with INSEE; and ESPS has been conceived and conducted at IRDES since 1988. Finally, the fieldwork phase for ESPS and part of SHARE (new entrants in 2011) were carried out by the same market research institute, GfK-ISL¹ which contributes to the homogeneity of data collection.

The main differences between the two surveys are the following:

- ESPS covers all ages whereas SHARE only interviews households in which one member is aged at least 50;
- ESPS uses a multimodal methodology combining telephone and one-to-one interviews whereas SHARE only interviews on a one-to-one basis;
- ESPS only collects self-assessed information whereas SHARE also uses objective measures of health (cognitive tests, grip strength test using a dynamometer, etc.);
- ESPS matches collected data with National Health Insurance reimbursement data whereas SHARE, despite plans for a similar data link project at participating country level, currently only provides survey data;
- SHARE is an international survey, conducted by means of a common questionnaire, created in English and translated into participating countries' languages so as to provide comparable data.

¹ INSEE was responsible for data collection for the "historical" section of the SHARE panel in 2011. Even in this case, it should be noted that certain INSEE interviewers also work for GfK-ISL.

Among the different approaches proposed in recent literature is the model developed by Fried *et al.* (2001), based on the analysis of physiological changes and age-related muscle degeneration provoked by senescence in certain people. The Fried frailty phenotype includes the following five dimensions: fatigue or poor endurance, loss of appetite, muscle weakness, slower walking speed, sedentariness and low physical activity levels.

Within the framework of a research project on the health care consumption of people suffering from loss of autonomy financed by the CNSA, a specific questionnaire on frailty was included in the 2012 edition of the Health, Healthcare and Insurance survey (ESPS) conducted by IRDES. Studies conducted by Brigitte Santos-Eggimann *et al.* (2009) using data from the first wave of SHARE in 2004 served as a reference in the construction of our frailty questionnaire module. However, due to differences in methodological approaches, the measure of frailty in SHARE and ESPS is not identical.

Consequently, it seemed appropriate to compare the frailty indicators obtained in each of the surveys so as to validate the measures employed. The methodological challenge lay in ascertaining whether the measure of frailty in population-based studies can tolerate a degree of freedom in data collection methods or whether rigor-

ous measures should be applied identically in each survey. In this respect, it should be reminded that the ground-breaking research conducted by Fried *et al.* (2001) was based on the secondary use of a survey originally designed to study cardiovascular risks.

Ideally, a comparison of the different measures of frailty would include a comparison of each indicator's precision in predicting individual loss of autonomy. Unfortunately, this type of comparison requires longitudinal data which will only be available after repeated use of the frailty questionnaire module in future waves of ESPS. In the meantime, focus was placed on the comparison of frailty distribution and its common determinants in SHARE and ESPS. The data used in this study are composed of individual responses collected in ESPS 2012 and the fourth wave of SHARE France (2011) [Insert and Methods].

A comparison of frailty distributions in ESPS and SHARE

In ESPS, 5,167 individuals aged 50 and over completed the questionnaire module on frailty (individuals for which age and gender information was provided). In SHARE, 5,415 individuals completed the

METHOD

Measures of frailty and its determinants

Table 1 presents the variables retained for the five dimensions of frailty used in each of the surveys respectively. A dichotomous variable was created for each of the five dimensions. The frailty index is constructed as a score (simple addition) from the five binary variables: its theoretical value thus ranges from 0 to 5. SHARE has the singularity of using a series of both observed and self-assessed measures to determine the "muscle weakness" dimension. As it is the only observed measure composing the frailty index, it was possible to compare the ESPS frailty index with the other two SHARE indexes, one constructed solely from self-assessed variables and another replacing the self-assessed measure with an objective measure for the muscle weakness dimension.

The potential determinants of frailty level were firstly the main confounding health measures; we thus retained simple physiological factors (age and gender), and risk factors (alcohol and tobacco consumption). As far as possible, special attention was given to socio-economic variables in order to check for social health inequalities with regard to frailty (Sirven, 2012). A comparison of the determinants of frailty must be based on the dual criteria of pertinence and similarity (or at least relative similarity) between explanatory variables for the determinants of frailty in the two surveys. For example, level of education in ESPS was redefined a posteriori so that it corresponded with the ISCED-97 nomenclature used in SHARE. Finally, comparable health status indicators from the European mini-module were added in order to identify the effects of explanatory variables on

frailty independent of confounding effects from other health measures.

In the end, the following variables, common to both surveys, were grouped together to create a single database: age, gender, education level, income level (quintiles per consumption unit), having experienced financial difficulties in the past, participation in an associative activity, currently a smoker, having smoked in the past, regularity of alcohol consumption, self-reporting at least two functional limitations within the Katz scale, and self-reporting a chronic disease.

Definition of working samples

The population in both surveys was restricted to individuals aged at least 50 at the time of the survey, a common determinant imposed on ESPS by SHARE. The analysis of the working sample was envisaged in two phases.

In the first phase, the focus was placed on individuals aged at least 50 having answered the frailty questionnaire module in ESPS and SHARE wave 4. The aim was to retain the maximum number of respondents so as to be as precise as possible in establishing the prevalence of frailty. In this respect, the use of individual weightings enabled representativeness at national metropolitan population level. A comparison of frailty index distributions was carried out according to age and gender as these two variables are rarely prone to missing information.

In a second phase, the comparison of the determinants of frailty had to be based on a sample without missing values for all the explanatory variables retained. We retained the hypothesis of a random distribution of missing information.

T2

ESPS and SHARE samples

	Men		Women		Total	
	Obs.	%	Obs.	%	Obs.	%
ESPS						
50-54 years	486	19.8	543	20.0	1,029	19.9
55-59 years	480	19.5	534	19.7	1,014	19.6
60-64 years	454	18.5	467	17.2	921	17.8
65-69 years	393	16.0	405	14.9	798	15.4
70-74 years	223	9.1	229	8.5	452	8.7
75-79 years	191	7.8	225	8.3	416	8.1
80-84 years	144	5.9	169	6.2	313	6.1
85 and more	86	3.5	138	5.1	224	4.3
Total	2,457	100	2,710	100	5,167	100
SHARE: sample 1						
50-54 years	370	15.6	490	16.1	860	15.9
55-59 years	449	18.9	540	17.7	989	18.3
60-64 years	478	20.2	526	17.3	1,004	18.5
65-69 years	308	13.0	370	12.2	678	12.5
70-74 years	275	11.6	336	11.0	611	11.3
75-79 years	244	10.3	337	11.1	581	10.7
80-84 years	158	6.7	256	8.4	414	7.6
85 and more	88	3.7	190	6.2	278	5.1
Total	2,370	100	3,045	100	5,415	100
SHARE: sample 2						
50-54 years	352	16.1	441	16.6	793	16.4
55-59 years	416	19.0	494	18.6	910	18.8
60-64 years	450	20.6	484	18.2	934	19.3
65-69 years	288	13.2	333	12.5	621	12.8
70-74 years	247	11.3	300	11.3	547	11.3
75-79 years	222	10.2	273	10.3	495	10.2
80-84 years	142	6.5	210	7.9	352	7.3
85 and more	70	3.2	127	4.8	197	4.1
Total	2,187	100	2,662	100	4,849	100

Note: Sample 1: composed of non-missing observations for a frailty index composed of self-assessed variables only. Sample 2: composed of non-missing observations for a frailty index including performance-based measures for muscle weakness.

Source: The Health, Health Care and Insurance survey (ESPS), 2012.

Realisation: Irdes.

 [Download the Excel® file on the IRDES web site.](#)

self-assessment module enabling the creation of a frailty score. Of these, 566 did not participate in the grip strength test (for health reasons or refusal) so that the "objective" performance-based frailty indicator including a variable measuring muscle weakness was available for only 4,849 respondents in the 4th wave of SHARE France. Even if ESPS is not specifically aimed at elderly people, its statistical power is comparable to that of SHARE when the sample is limited to the 50+ age group.

Table 2 presents the three samples decomposed according to age and gender. Restricting the ESPS sample to the 50+ age group automatically reduces its size, but we noted a lower participation rate of individuals aged 50-54 in SHARE; it is often difficult to recruit participants for a survey specifically concerned with "ageing" among this population as they often consider they are not yet concerned. The percentage of men and women is very well-balanced in all samples and all age brackets.

A comparison between the frailty prevalence rates obtained in ESPS and the self-assessed frailty index obtained from SHARE showed that the differences in prevalence rates were relatively more pronounced in younger individuals and women (Graph 1). These differences tend to stabilise in the 65 and over age bracket, which can be partially explained by the fact that frailty is generally an age-related syndrome. Furthermore, the prevalence of frailty increases exponentially with age with over 10% of men aged 65 and over considered as frail. This figure doubles for women in the same age bracket, whatever the measure used. Graph 2, which compares ESPS results with the "objective" grip strength measure obtained in SHARE, presents the same results but the differences are often more pronounced. Results show that in the general population, the frailty syndrome is especially observed in individuals aged 65 and over, which suggests that an analysis of the determinants of frailty should be focused on this population category¹.

¹ It should be noted that the results obtained are not altered whether or not we take individual weightings specific to each survey into account.

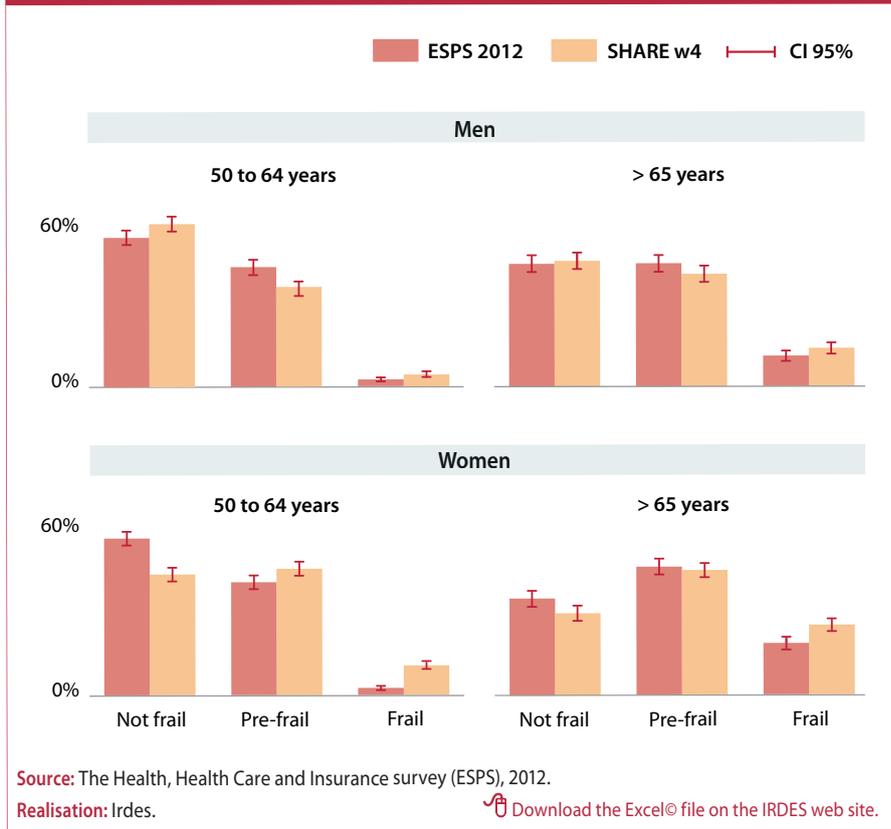
CONTEXT

This *Issues in Health Economics* falls within the framework of a research project on health care consumption among individuals suffering from loss of autonomy financed by the National Solidarity Fund for Autonomy (CNSA). It follows on from a series of IRDES publications on the theme of frailty, notably: 'Frailty and Preventing Loss of Autonomy, a Health Economics Approach' (Sirven, 2013); 'An Analysis of the Socio-economic Determinants of Age-related Frailty using SHARE Panel and Retrospective Data' (Sirven, 2013).

Graphs 1 and 2 respectively compare frailty prevalence rates obtained from ESPS with the "self-assessed" and "measured" frailty indexes obtained from the 4th wave of SHARE. The distribution of the frailty index is often presented in three categories²: robust with a null frailty score, pre-frail with a score of between 1 and 2, and frail with a score of 3, 4 or 5. Comparisons are presented by age group (50-64 years old and 65 and over) and by gender. The confidence intervals carried over to the graphs provide the differences in 5% error threshold rates.

G1

SHARE frailty index incorporating self-assessed frailty indicators



Comparison of the determinants of frailty in ESPS and SHARE

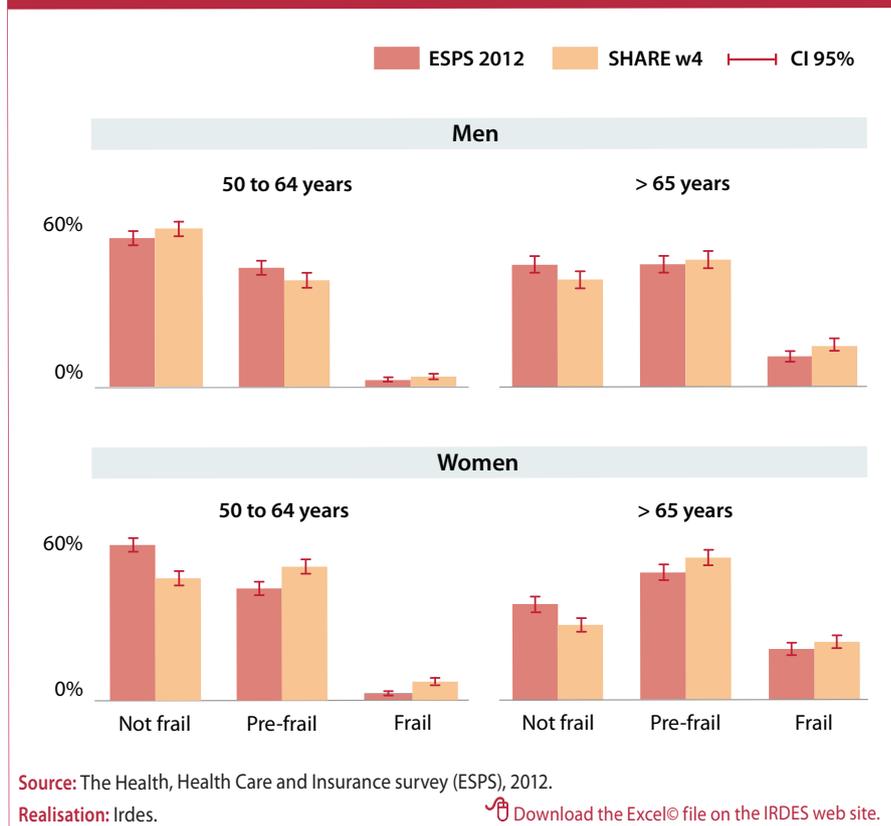
Principle common factors in the determinants of frailty

In Table 3, models 1 to 3 respectively present the parameters estimated from their level of significance concerning (1) the ESPS frailty indicator, (2) the "self-assessed" SHARE frailty indicator, and (3) the "measured" SHARE frailty indicator. Broadly speaking, these models produce relatively comparable results. In SHARE, women have higher frailty levels than men with a 14.5% to 38.4% difference according to whether indicators are "self-assessed" or "measured". In ESPS, women are on average 20.5% frailer than men.

² The use of arbitrary thresholds is especially useful for medical decision-making as it enables the geriatrician to deliver a diagnosis and administer one type of treatment rather than another. We respect these thresholds in the comparison of index distributions.

G2

SHARE frailty index incorporating objective grip-strength measurement



T3

Estimation of the determinants of frailty among respondents aged 65 and over
Relative risks (Poisson)

Frailty index:	ESPS	SHARE		Ensemble	
	Self-assessed	Self-assessed	Measured	Self-assessed in both surveys	Self-assessed (ESPS) and measured
Explanatory variables \ Model:	(1)	(2)	(3)	(4)	(5)
Sexe					
Woman	1.205 ***	1.340 ***	1.145 ***	1.281 ***	1.157 ***
Man	Ref.	Ref.	Ref.	Ref.	Ref.
Age (Splines)					
65-69 years	1.002	1.039 *	1.058 ***	1.020	1.025 *
70-79 years	1.047 ***	1.036 ***	1.050 ***	1.040 ***	1.050 ***
80 and more	1.019 **	1.033 ***	1.032 ***	1.028 ***	1.026 ***
Education					
None-primary	Ref.	Ref.	Ref.	Ref.	Ref.
Secondary	0.928	0.981	0.954	0.961	0.942 *
Higher	0.939	0.876 **	0.909	0.890 **	0.913 *
Income					
Quintile 1	Ref.	Ref.	Ref.	Ref.	Ref.
Quintile 2	0.952	0.984	0.982	0.974	0.965
Quintile 3	0.915	0.947	0.943	0.931 *	0.928 *
Quintile 4	0.909	0.864 **	0.855 ***	0.877 ***	0.871 ***
Quintile 5	0.695 ***	0.798 ***	0.779 ***	0.753 ***	0.740 ***
Missing	0.781			0.793	0.788
Retrospective well-being					
Financial difficulties	1.146 ***	1.091	1.059	1.122 ***	1.119 ***
Missing		0.993	1.003	1.003	1.033
Social capital					
Association membership	0.822 ***	0.744 ***	0.782 ***	0.773 ***	0.796 ***
Risk behaviours					
Current smoker	1.220 **	1.171 **	1.093	1.193 ***	1.143 **
Have smoked in the past	1.043	1.074	1.022	1.061 *	1.025
Consumer of alcohol	0.787 ***	0.832 ***	0.884 ***	0.830 ***	0.862 ***
Consumer of alcohol (squared)	1.083 ***	1.040 ***	1.032 ***	1.043 ***	1.039 ***
Health status					
Limitations AVQ 2+	1.854 ***	1.811 ***	1.748 ***	1.829 ***	1.789 ***
Chronic disease	1.710 ***	1.727 ***	1.539 ***	1.724 ***	1.595 ***
Difference ESPS/SHARE					
ESPS				Ref.	Ref.
SHARE				1.227 ***	1.298 ***
Observations	1,615	2,511	2,204	4,126	3,819

Note: * p<.1, ** p<.05, *** p<.01. Robust standard deviations obtained using the White method. Marginal relative risks = exp(coefficients).

Reading: in model 1, women have a 20.5% higher frailty score than men.

Source: The Health, Health Care and Insurance survey (ESPS), 2012.

Realisation: Irdes.

 Download the Excel® file on the IRDES web site.

These results corroborate those observed in descriptive statistics. Similarly, where the age effect is modelled using splines, we find a frailty score that increases with individuals' age.

The effects of other health variables suggest that frailty scores increase with the presence of chronic diseases and functional limitations. The moderate consumption of alcohol is also associated with a lower frailty score than that obtained for heavy consumers or for individuals reporting never drinking or having stopped drinking.

We also observe similarities between models in the case of socio-economic variables. Frailty scores are lower among individuals participating in a social activity within an associative framework. Furthermore, scores are lower among individuals with income levels (per consumption unit) in the higher quintiles. We finally noted that in SHARE, income level is imputed for all respondents, avoiding cases of missing information. This is, however, not the case in ESPS and the "missing" questionnaire module has been added. This has had a non-significant effect suggesting that "missing" information, if randomly distributed, does not modify the results described below.

Principle differences in the determinants of frailty

The principle differences between models in the determinants of frailty concern levels of education, retrospective financial difficulties and smoking. In the first case, the effect is only significant from the 10% threshold ($\text{Chi-2} = 4.74$; $p = 0,093$), so that education effects can be ignored in model 2 and give the same results as in models 1 and 3.

In the case of retrospective financial difficulties, it should be noted that the question was not asked in SHARE before the third survey wave concerning life stories (SHARELIFE). The information was therefore only available for previous wave panel respondents. New entrants to wave 4 were not questioned on this dimension which explains the "missing" attribute in models 2 and 3. As in the case of income, the effect of this attribute is non-significant. A comparison of relative risks

between models 1 and 3 indicates that retrospective financial difficulties are on average associated with a 14.6% higher frailty score in the ESPS sample. On the other hand, even if relative risks produce similar results, no effect is statistically significant in the SHARE samples. This lack of effect in models 2 and 3 can be attributed to the lack of statistical power without, however, indicating any real difference in its ability to demonstrate the role played by this variable in determining level of frailty. Moreover, the effect of financial difficulties on frailty has largely been demonstrated by SHARE data provided by panel participants from waves 1 to 4 (Sirven, 2012).

Finally, in the case of tobacco consumption, models 1 and 2 suggest that smokers have a higher frailty score than non-smokers whereas the effect disappears in model 3. What explanation can be given for this? Among the 307 SHARE respondents who failed to participate in the grip strength test (for an objective measurement of muscle weakness), only 8.1% declared being smokers whereas the proportion of smokers among grip strength test participants was 16.2%. Furthermore, the 307 missing individuals in model 3 have higher self-assessed frailty scores ($2.23 > 1.18$; a comparison of score averages indicate that with $t = 13.21$; $p=0,000$). On balance, the proportion of smokers and more robust individuals is higher in model 3, which could explain the decreased effect of smoking.

Whether it concerns education, financial difficulties or income effects, model 2 appears to be more sensitive to social inequalities than model 3. One could conclude that this particularity is due to the use of an objective variable in the construction of the frailty index in model 3. The analysis of the percentage of frail individuals in models 2 and 3 tends to minimise the effects of this argument, suggesting selection bias: model 3 respondents being in better relative health (lower frailty indexes) than those in the model 2 sample.

* * *

The questionnaire module on frailty included in ESPS 2012 was based on SHARE survey questions. However, due

to methodological differences specific to each survey, the measure of frailty is not identical in the two surveys. More specifically, to measure factors relating to frailty, SHARE uses two questions, one objective and the other self-assessed. The comparison of levels of frailty and their determinants thus make it possible to compare several aspects in the construction of a population-based frailty index.

As expected, the comparative analysis reveals significant differences between the two surveys (ESPS and SHARE) regarding the frailty scores obtained using different questions, and also within the same survey (SHARE) using dissimilar measures. The prevalence of frailty is thus likely to vary from one study to the next until a common definition of the variables used and their combination is agreed on. Yet, considering the heterogeneity of current methods and instruments to measure frailty, it appears unlikely that a consensus will be reached in the near future. As a result, it will only be possible to measure the incidence of frailty if the indicators used in a same survey remain constant, and assuming this is the case, the prevalence of frailty will nevertheless remain contestable within this type of framework.

The survey comparison, however, also indicated that differences in the measure of frailty between the different measurement instruments used tended to decrease in the population aged 65 and over. This can be explained by the fact that frailty is an age-related phenotype. Furthermore, comparing the determinants of frailty in the 65 and over age group, we observed relative homogeneity in the effects of the different explanatory variables. In other words, the different surveys (including some that were not initially intended to measure frailty), are potential data sources for research into the causes and maybe even the consequences of frailty. In this respect, the presence of social inequalities in the distribution of frailty observed in both the SHARE and ESPS surveys provides an avenue for research that should not be neglected. Finally, it should be underlined that the models used provided similar results indicating that modelled approaches to frailty in research would not be a problem whereas monitoring indicators would require a rigorous and unvary-

ing methodology. In this respect, this first study confirms that ESPS can effectively contribute to research on age-related frailty. It presents the first phase in a broader research project (COMPAS, *cf.* Contexte) aiming to gain knowledge on frail elderly persons' health expenditures in metropolitan France. Future studies will also allow cross-referencing the ESPS frailty measure with linked reimbursement data from the National Health Insurance database. ♦

FOR FURTHER INFORMATION

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