Recent trends in male and female disability-free life expectancies in France: to what extent is the "gender health paradox" reinforced?

Emmanuelle Cambois

In France, as in most countries, female advantage in life expectancy (LE) is balanced by a larger number of unhealthy years. Furthermore, recent trends in male and female disability-free life expectancies (DFLE) appear less favourable than in previous decades and especially for women. This paper further explores trends in DFLE in France using several dimensions of the disablement process to identify possible gender-specific health and disability patterns.

An increasing number of surveys in France allow computing a full range of DFLE at age 50 estimations which can be classified according to various disability dimensions: 7 different French population surveys conducted over the 1990's and the 2000's period are used. Meanwhile, except for 3 of these surveys, inconsistency in questionnaire and design prevent from building robust time series on disability. Trends were therefore (1) assessed through a mortality/disability decomposition of the DFLE changes based on the 3 repeated surveys and (2) consolidated by a linear regression on the DFLE using the 7 surveys DFLE estimations, classified by disability dimensions.

The unfavourable trend in recent years in DFLE at age 50 is due to a decrease in the 50-65 age group for women's physical limitations and activity restrictions and for men's cognitive limitations. At age 65, trends in DFLE were more favourable, except for physical and sensory limitations and general activity (for men exclusively in the decomposition vs for both sexes with the regression) as observed in previous decades.

The two approaches both highlight an unexpected increasing gender gap for a selection of disability dimensions in the 50-65 cohorts. Possible reasons for the these findings range from change in sex-specific health exposure and behaviours, but also change in social, family and work situations in these cohorts which could differently affect women’s and men's health, self-perception of health and consequences on functioning.

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In almost all developed countries, women benefit longer life but spend a larger part of it in poor health, disability and dependency. The female advantage in life expectancy (LE) is somehow balanced by the share between healthy and unhealthy years. In the European Union of the 27 member states, despite large disparities in mortality and disability patterns, the "gender paradox" applies [1, 2].

These findings raise question on the type of functional disorders reported by men and women and possible variation in the sex-gap according to the disability dimensions. Indeed, disability can be defined trough various dimension which are inter-related and are differently associated for men and women [3]: impairments, which might induce functional limitations (sensory, locomotor, dexterity, cognition…), which expose to the risk of restrictions in a number of elementary activities threatening an independent living. This risk of activity restriction partly depends on the type and severity of the underlying functional limitations. But it also depends on personal and environmental resources which facilitate or prevent compensation strategies. These disability dimensions therefore correspond to specific situations and specific needs. Even inter-related they also are driven by specific determinants explaining possible diverging trends over time or different patterns for men and women. Men and women trends in DFLE are the result of sex-specific exposures to diseases and disorders and to sex-specific health management. They are also the result of sex-specific social situations, roles, knowledge and expectations towards health which might impact both exposure and health management. In that respect, disentangling the various disability dimensions is important to understand trends and gender differences.

France has accumulated a large number of surveys on health issues, encompassing various disability indicators over three decades. Although not directly comparable, these data offer a very broad view of the French disability situation allowing disentangling disability dimensions and to consolidate conclusions, based results issued from several sources. This paper takes the opportunity of this multi-source information to depict trends and patterns in disability-free life expectancies and discuss recent trends in sex differences.

Concepts, indicators and surveys

Conceptual framework. Health can be defined in terms of morbidity (symptoms, conditions, chronic diseases etc.), functional health (impairment, disability, handicap etc.), subjective health (self-perceived health, quality of life etc.). These dimensions can be described as a process advancing from disease through to dependence via a variety of situations [4-6]. Chronic diseases or accidents may affect the organs and the basic metabolism (impairments), leading to deterioration of the body functions (locomotor, sensory and cognitive functional limitations), which in turn leads to difficulties in or inability to perform daily activities (activity restrictions), in interaction with individual resources and environmental factors (Box 2). There are unequal risks that a given disease (or accident) will lead to functional disorders and that these functional limitations will lead to activity

restrictions. This depends in part on the person's resources and environment, especially availability of technical aids, and home or workplace adaptation to compensate for functional decline and to maintain activity [7, 8]. We use various indicators to disentangle these health and disability statuses in order to document social differentials in health. We assume that unequal social/work participation is the result of either unequal exposure to risk factors of poor health and of disease and functional limitations on the one hand, and/or unequal resources to compensate for their impact on daily activities (care, devices…) on the other.

Health Survey and health indicators. We used various French surveys conducted on a representative sample of private households. Self-reported information on health status, prevention and health behavior was obtained via face to face interviews. All these surveys included module of questions on the various disability dimensions (Table 1).

1) *Physical and sensory functional limitations* (reporting difficulty in at least one of the following situations: clearly seeing newspaper print, recognizing someone's face across the street, clearly hearing what is said in a conversation, walking a certain distance, going up or down stairs, using hands and fingers to manipulate small objects). These questions are based on proposals from mid-1960s [9]. In this study, we focus on residual functional limitations (difficulties despite aids and devices) to capture forms of body function alterations which are not (sufficiently) compensated and which expose people to restriction in daily activities. *Cognitive/mental functional limitations* were assessed by a set of questions on memory problems / difficulties in time and in space orientation / inappropriate behaviors / learning difficulties.

2) *General Activity Limitation Indicator* (*GALI*) (reporting "*being limited for at least six months in the activities people usually do, due to health problems"*). It is also part of the Minimum European Health Module and has been especially developed for the European union and for calculation of the EU-HE indicator, under the name of "Healthy Life Years" [10]. GALI refers to general restriction in activity without specifying the type of activity concerned (work, household chores, leisure, personal care etc.). GALI was found to be correlated to functional limitations, restrictions for personal care or domestic activities and to reflect work disability in the working-age population [11].

3) *ADL-restrictions* (difficulty or need of assistance for washing, getting dressed, feeding, getting in and out of bed). They correspond to the most severe level of activity restrictions, usually defined as difficulties in activities of daily living [12]. They reflect situations of dependence requiring human assistance. They are a common measurement instrument but represent a limited range of disability situations. *ADL-restrictions* reflect situations of social exclusion in many areas of life due to severely impaired functioning. *IADL restrictions* (difficulty or need of assistance for preparing meals, shopping, housework, solving administrative issues). They correspond to the difficulties for leaving alone independently. Due to the specific nature of such activities, they become frequent difficulties when individuals have functional limitations; these activities can be more easily performed by someone else than personal care activities. They reflect less severe disability than ADL.

Calculation. We used the Sullivan method [13], based on health prevalences drawn from standard population health surveys, life tables and long term care (LTC) institutionalization rates, stratified by sex, age group (drawn from population censuses). We first broke down the 5-year-age-group person-years of the life table into years lived in LTC institutions and years lived in private households, based on the age-specific LTC institutionalization rates for men and women. The "person-years in institutions" are all considered as "person-years with disability" as suggested in Sullivan's method. Second, we broke down the remaining person-years into person-years in good and poor health by applying the 5-year-age-group specific weighted prevalence of disability obtained from the health survey. Finally, $DFLE_{age\ x}$ is the sum of the 5-year-age-group "disability free person-years" from age *x* divided by the total survivors at age *x*. Total LE is the sum of the DFLE and the LE with disability (LEwD).

The paper focuses on the 65 and over age group which is the most at risk of functional decline and care needs, but it also considers the 50-65 age group in which some functional problems already threaten and which figures also out future needs. Partial $DFLE_{50-65}$ is obtained by summing the 5-year-age-group "disability free person-years" from age 50 to age 64, divided by the survivors at age 50. DFLE confidence intervals were estimated taking into account the sample sizes of the mortality follow-up and of the health survey [14]. We computed $DFLE_{50}$, $DFLE_{65}$ and partial $DFLE_{50-65}$.

Assessing trends. French surveys on health and disability are not continuous surveys. They underwent multiple changes over time making impossible to draw chronological series. Nevertheless, since two decades, almost all population surveys questioning health devote a large space to disability allowing distinguishing several indicators corresponding to the various health dimensions. Furthermore, the previous French study which used such a multi-source approach, has demonstrated that similar disability dimensions are very close even if they are measured through different survey [15]. Only three surveys are repeated and can be used to assess trends. But series are either short or based only on single disability questions. Trends cannot be robustly measured by these sources meanwhile these sources provide accumulation of evidences allowing the observation of converging or diverging trends between sexes, for the 50-65 and 65+ age groups and according to the disability dimensions.

On this basis, we propose two approaches to assess and compare recent trends in DFLE. The first one suggests to gather DFLE measures according to the dimension and to assess dimension-specific trends based on the accumulation of estimations. Linear regression parameters are estimated to represent annual trends for men and women, 50-65 and 65+ age group and for each disability dimension. The second approach is to apply the decomposition technique using the data from the three repeated surveys (SHARE ; ESPS ; SILC) which remained comparable over time [16]. We decomposed the year change in LE into change in DFLE and change in LEwD; than we decompose the latter to assess the contribution of change in disability prevalence and change in mortality risks (not by causes).

Table 1. French population surveys used to produce DFLE estimates

Survey names	Caractéristiques de l'enquête				Number of questions (items) on…			Number of questions (items) on…		
	Year	Adminis-tration	Age range and response rate (TR)	Sample size 50+ (unweighted % ≥65ans) *	Physical functional limitations	Sensory functional limitations	Cognitive functional limitations	ADL	IADL	GALI or alike
HID	1999	face-to-face	All TR1999 = 77,8%	11 097 (68%)	5	2	-	5	-	
ECHP	1994	face-to-face	≥17 years old TR1994 : 79% TR1995-2001≥90%	4 432 (52%)	-	-	-	-	-	1
	1995			4 432 (52%)						
	1996			4351 (52%)						
	1997			4052 (53%)						
	1998			3 935 (53%)						
	1999			3 783 (53%)						
	2000			3 655 (54%)						
	2001			3 676 (54%)						
ESSM	2002-03	face-à-face	All TR=78%	13 446 (46%)	6	3	-	6	6	1
HSM	2008	face-à-face	All TR2008=78%	13 682 (52%)	5	3	8	7	6	1
SILC	2004	face-à-face	≥ 16 years old TR=84-86%	7 969 (45%)	-	-	-	-	-	1
	2005			7 857 (44%)						
	2006			8 302 (44%)						
	2007			8 832 (44%)						
SHARE	2004	face-à-face	≥ 50 years old TR2004=81%	3 038 (46%)	8	-	-	5	7	1
	2006			2 871 (49%)						
ESPS	1990	Auto-questionnaire / face-to-face pour les 65 ans et +	All TR2006= 63% (then 78%r eturned questionnaire on health)	9 025 (37%)	-	-	-	2	1	-
	1994			10 404 (38%)						
	1997			12 938 (40%)						
	2001			11 874 (40%)						
	2006			5 623 (41%)	3	3	1	-	-	1
	2008			5 621 (41%)				1		

Scope: France Métropolitaine, household population

** In the general population census in 2008, the age group 65 years and over was 46% of the household population (France métropolitaine)*

RESULTS

DFLE patterns according to age group and sex

Table 2 present the most recent estimations of DFLE, based on the surveys conducted in 2008 in France (HSM and ESPS). In 2008, LE at age 50 was 30 years for men and 36 years for female. Around 14 years of it is lived free of either physical or sensory limitation for both sexes. Female additional years of LE are years lived with such functional limitations. This is also found after age 65 at which both men and women can expect to live 5.5 years free of functional limitation out of their respectively 18 and 22.5 year LE. Sensory and physical functional limitations occur before the age of 65, covering 5 years for men and 6 years for women within the 50-65 life span. Mental/cognitive limitations are less frequent; around 85% of LE_{50} is free of such limitations. Women live longer than men free of cognitive limitation, but they also spend more years with such limitation in their longer LE. Functional limitations are largely prevalent after age 65 but also occurred before, especially sensory limitations for men (earing) and physical limitations for women.

Regarding activity restriction, men at age 50 can expect to live 60% of their LEw-*GALI*, women a little less. General activity limitation occurred before age 65. Around 4 years are to be lived with activity limitations between age 50 and 65 for both sexes. This is definitely not the case for more severe disability, especially for the years of ADL restrictions which are in majority lived after age 65: slightly less than 3 years for men and around 5 years for women. Regarding IADL restrictions, women are much more concerned than men, whatever the age group under consideration: at age 50, LEw-*IADL restriction* is 4 years for men and more than twofold for women. Interestingly, for men, *ADL restriction*-FLE and *IADL restrictions*-FLE are similar while for women *IADL restrictions*-FLE is 4 year shorter than *ADL restriction*-FLE. Years with IADL restriction for both men and women are mainly lived after age 65.

Looking at men and women differences, it appears that women longer LE induces generally both more years with and without disability. The exceptions in disfavour of women are the even female shorter *physical limitations*-FLE before and after age 65, *GALI*-FLE before age 50 and *IADL restriction*-FLE before and after age 65. The exceptions in disfavour of men are a slightly longer LEw-*sensory limitations* and LEw-*ADL restriction* before age 65.

DFLE trends according to age group and sex

All the available estimations of $DFLE_{50}$ are displayed in the Figure 1 for men and 2 for women. The overview first demonstrates the increased number of estimations in recent years and second more variation in the trends. Until the beginning of the 2000's, *ADL restrictions*_FLE (ESPS series and data from HID and ESSM) indicate a positive trends, close to the LE trends for both sexes. The General handicap question (ECHP series) and the functional limitation (from HID and ESSM) were not on such a positive trend rather indicating a stable trend, meaning an increasing LEwD. Since the beginning of the 2000's, *ADL restrictions*_FLE seem to remain stable, while LE still increase (except in SHARE data for men) and some of the physical and *sensory limitation*_FLE seem to be decreasing.

Table 2. Life expectancy (LE), disability-free life expectancy (DFLE), life expectancy with disability (LEwD) according to various disability dimensions, France 2008.

MEN		At age 50		50-64 years age group		At age 65	
LE		30.1 years		14.2 years		18.2 years	
DFLE & LEwD		DFLE (%LE)	LEwD	DFLE (%LE)	LEwD	DFLE (%LE)	LEwD
Functional limitations	LF (phy or sens)_HSM	13.9 (46%)	16.2	9.1 (64%)	5.1	5.5 (30%)	12.8
	LFcog_ESPS	26.1 (88%)	3.7	13.1 (92%)	1.1	14.9 (83%)	3.1
	LFcog_HSM	25.8 (86%)	4.3	12.8 (90%)	1.4	14.9 (82%)	3.4
	LFsens_ESPS	21.2 (70%)	9.0	11.4 (80%)	2.8	11.2 (61%)	7.0
	LFsens_HSM	18.3 (61%)	11.8	10.6 (75%)	3.6	8.8 (48%)	9.4
	LFphy_ESPS	21.4 (71%)	8.7	12.4 (87%)	1.8	10.5 (58%)	7.7
	LFphy_HSM	20.3 (67%)	9.8	11.8 (83%)	2.4	9.7 (53%)	8.5
Activity restrictions	GALI_SILC	17.6 (58%)	12.5	10.3 (73%)	3.9	8.3 (46%)	9.9
	GALI_ESPS	18.6 (62%)	11.6	11.0 (77%)	3.2	9.3 (51%)	8.9
	GALI_HSM	17.4 (58%)	12.7	10.2 (72%)	4.0	8.3 (45%)	9.1
	IADL_HSM	26.3 (87%)	3.9	13.5 (95%)	0.7	14.7 (80%)	3.6
	Toilette_ESPS	27.2 (91%)	2.8	13.4 (95%)	0.8	15.8 (87%)	2.4
	ADL_HSM	27.3 (90%)	2.9	13.6 (96%)	0.6	15.6 (85%)	2.7
WOMEN		**At age 50**		**50-64 years age group**		**At age 65**	
LE		35.9 years		14.6 years		22.5 years	
DFLE & LEwD		DFLE (%LE)	LEwD	DFLE (%LE)	LEwD	DFLE (%LE)	LEwD
Functional limitations	LF(phy or sens)_HSM	13.5 (38%)	22.4	8.4 (57%)	6.3	5.5 (24%)	17.0
	LFcog_ESPS	30.1 (84%)	5.6	13.1 (90%)	1.5	17.8 (80%)	4.6
	LFcog_HSM	30.2 (84%)	5.6	13.4 (92%)	1.2	17.8 (79%)	4.7
	LFsens_ESPS	24.9 (69%)	11.0	12.1 (83%)	2.5	13.5 (60%)	9.0
	LFsens_HSM	23.6 (66%)	12.3	11.8 (81%)	2.8	12.5 (55%)	10.0
	LFphy_ESPS	21.7 (61%)	14.2	12.4 (84%)	2.3	9.9 (44%)	12.6
	LFphy_HSM	16.9 (47%)	18.9	10.1 (69%)	4.6	7.3 (32%)	15.2
Activity restrictions	GALI_SILC	19.2 (53%)	16.7	10.5 (72%)	4.2	9.2 (41%)	13.3
	GALI_ESPS	21.2 (59%)	14.7	11.0 (75%)	3.7	10.8 (48%)	11.7
	GALI_HSM	18.5 (52%)	17.3	9.9 (68%)	4.7	9.1 (41%)	13.4
	IADL_HSM	26.9 (75%)	8.9	13.4 (92%)	1.2	14.3 (64%)	8.2
	Toilette_ESPS	30.4 (85%)	5.4	14.2 (97%)	0.5	17.2 (77%)	5.2
	ADL_HSM	31.0 (87%)	4.8	14.2 (97%)	0.5	17.9 (80%)	4.6
WOMEN-MEN		**At age 50**		**50-64 years age group**		**At age 65**	
#**LE women-LE men**		+5,8		+0,4		+4,3	
DFLE & LEwD		DFLE (%LE)	LEwD	DFLE (%LE)	LEwD	DFLE (%LE)	LEwD
Functional limitations	#LF(phy or sens)_HSM	-0,4	+6,2	-0,8	+1,2	+0,1	+4,2
	#LFcog_ESPS	+3,9	+1,9	0	+0,4	+2,8	+1,5
	#LFcog_HSM	+4,5	+1,3	+0,6	-0,2	+3,0	+1,3
	#LFsens_ESPS	+3,8	+2,0	+0,7	-0,3	+2,3	+2,0
	#LFsens_HSM	+5,3	+0,5	+1,2	-0,8	+3,7	+0,6
	#LFphy_ESPS	+0,3	+5,5	-0,1	+0,5	-0,6	+4,9
	#LFphy_HSM	-3,3	+9,1	-1,8	+2,2	-2,4	+6,7
Activity restrictions	#GALI_SILC	+1,6	+4,2	+0,1	+0,3	+0,9	+3,4
	#GALI_ESPS	+2,7	+3,1	-0,1	+0,5	+1,5	+2,8
	#GALI_HSM	+1,2	+4,6	-0,3	+0,7	0	+4,3
	#IADL_HSM	+0,8	+5,0	-0,1	+0,5	-0,3	+4,6
	#Toilette_ESPS	+3,2	+2,6	+0,7	-0,3	+1,5	+2,8
	#ADL_HSM	+3,9	+1,9	+0,5	-0,1	+2,4	+1,9

The DFLE linear regression parameters in Table 3 indicate decreasing trends for *physical limitation*_FLE and *sensory limitation*_FLE for both sexes, before and after age 65 as well as for *cognitive limitations*_FLE in the 50-65 age group.

In spite of the negative trends in functional limitation after age 65, trends in *activity restriction*_FLE are stable or positive after age 65 for both sexes. Nonetheless, they appear stable or negative in the 50-65 age group. Although it remains difficult to comment and compare the size of the rate with a multi-source analysis, and because the DFLE levels are also different, the rates indicate different trends for women and women: less favourable for women in the 50-65 age group regarding *physical functional* _FLE and *activity restriction*_FLE; less favourable for men for *cognitive limitations*_FLE.

Table 3: DFLE annual rates of change derived from linear regression based on the available estimates for the period 2004 to 2008, according to the disability dimension

	Men			Women		
	50 ans	50-65 ans	65 ans	50 ans	50-65 ans	65 ans
LE	**0,57%**	**0,06%**	**0,91%**	**0,31%**	**0,01%**	**0,49%**
DFLE_Lcog	-0,20%	-0,53%	0,07%	**0,73%**	-0,13%	**1,48%**
DFLE _Lsens	-2,40%	-2,43%	-2,47%	-2,31%	-1,76%	-2,80%
DFLE _Lphy	-0,84%	-0,21%	-1,38%	-4,65%	-4,01%	-5,39%
DFLE _GALI	0,04%	-0,08%	**0,81%**	**0,59%**	-0,21%	**1,59%**
DFLE _IADL	**2,10%**	**0,33%**	**4,28%**	**1,86%**	-0,07%	**4,44%**
DFLE _ADL	**3,42%**	**1,25%**	**5,93%**	**2,34%**	**0,70%**	**4,03%**

The "bold" font indicates larger gains of years free of disability / the grey font indicates larger gains of years lived with disability

Table 4 presents the results of the decomposition technique applied to the DFLE trends from SILC, SHARE and ESPS surveys. It shows first whether trends in LE were composed of gains in DFLE, gains in LEwD or both. Decomposition also allows assessing whether gains in DFLE or LEwD were due to change in the prevalence of disability or change in the survival chances. This information is important at age 65 where gains in LE are still large and could impact on DFLE, even if disability prevalence did not change.

While LE remained stable in 50-65 age group for both sexes, female free LE without functional limitations decreased (based on the 2 point ESPS series), up to almost 3 years for physical limitation. For men, only sensory limitation-free LE followed a negative trend. Activity restriction free LE is also decreasing in this age group for both sexes, except for ADL for men. Decreases are larger for women than for men leading to steeper differences between sexes at these ages. Increase in the prevalence of self-reported disability is responsible for these changes.

At age 65, trends are more favourable with an increase in DFLE except for *cognitive limitation*-FLE, *physical limitation*-FLE and one of the *GALI*-FLE indicators for men; for the latter, the increase in the prevalence of disability have compensated the effect of LE gained. Gains in LE were both contributed both to DFLE and to LEwD, but the decrease in disability prevalence induces finally an increase in DFLE. The gain in LE at this age

was larger for men than for women in recent years, meanwhile, women gained more years of DFLE than men which might contribute to reduce the sex difference for a number of indicators.

Table 4. Decomposition of changes in LE between years of DFLE and years of LE with disability [part of the change due mortality risks and due to change in disability prevalence].

	MEN			WOMEN		
Decomposition of ΔLE in age group 50-65	**ΔLE_{50-65} =**	**$\Delta LEwD_{50-65}$ [Mor +/- Dis]**	**$\Delta DFLE_{50-65}$ [Mor +/- Dis]**	**ΔLE_{50-65} =**	**$\Delta LEwD_{50-65}$ [Mor +/- Dis]**	**$\Delta DFLE_{50-65}$ [Mor +/- Dis]**
LFc_ESPS (2006-2008)	0,02 =	0,01 [0,00+0,01]	0,01 [0,02-0,01]	0,00 =	0,37 [0,00+0,37]	-0,37 [0,00-0,37]
LFs_ESPS (2006-2008)	0,02 =	0,29 [0,00+0,29]	-0,27 [0,02-0,29]	0,00 =	0,72 [0,00+0,72]	-0,72 [0,00-0,72]
LFp_ESPS (2006-2008)	0,02 =	-0,06 [0,00-0,06]	0,08 [0,02+0,06]	0,00 =	2,82 [0,00+2,82]	-2,82 [0,00-2,82]
GALI_ESPS (2006-2008)	0,02 =	0,41 [0,01 + 0,41]	-0,39 [0,02 - 0,41]	0,00 =	0,79 [0,00+0,79]	-0,79 [0,00 - 0,79]
GALI_SHARE (2004-2006)	0,02 =	0,76 [0,01 + 0,75]	-0,74 [0,02 - 0,75]	0,01 =	0,26 [0,00+0,26]	-0,25 [0,01 - 0,26]
GALI_SILC (2005-2008)	0,03 =	0,39 [0,01+ 0,39]	-0,37 [0,02 - 0,39]	0,00 =	1,13 [0,00+1,13]	-1,13 [0,00 - 1,13]
IADL_SHARE (2004-2006)	0,02 =	0,13 [0,00 + 0,13]	-0,11 [0,02 - 0,13]	0,01 =	0,87 [0,00+0,87]	-0,86 [0,01- 0,87]
ADL_SHARE (2004-2006)	0,02 =	-0,01 [0,00- 0,01]	0,03 [0,02 + 0,01]	0,01 =	0,55 [0,00+0,55]	-0,54 [0,01 - 0,55]
Decomposition of ΔLE at age 65	**ΔLE_{65} =**	**$\Delta LEwD_{65}$ [Mor +/- Dis]**	**$\Delta DFLE_{65}$ [Mor +/- Dis]**	**ΔLE_{65} =**	**$\Delta LEwD_{50-65}$ [Mor +/- Dis]**	**$\Delta DFLE_{50-65}$ [Mor +/- Dis]**
LFc_ESPS (2006-2008)	0,30 =	0,25 [0,07+0,18]	0,04 [0,22-0,18]	**0,18 =**	**-1,55 [0,06-1,61]**	**1,74 [0,13+1,61]**
LFs_ESPS (2006-2008)	**0,30 =**	**-0,28 [0,14-0,42]**	**0,57 [0,15+0,42]**	**0,18 =**	**-0,53 [0,08-0,61]**	**0,72 [0,11+0,61]**
LFp_ESPS (2006-2008)	0,30 =	0,22 [0,17+0,05]	0,07 [0,13-0,05]	**0,18 =**	**-0,53 [0,10-0,63]**	**0,71 [0,08+0,63]**
GALI_ESPS (2006-2008)	0,30 =	1,32 [0,17 + 1,15]	-1,02 [0,13 - 1,15]	**0,18 =**	**-0,87 [0,09 - 0,96]**	**1,06 [0,09+0,96]**
GALI_SHARE (2004-2006)	**0,48 =**	**0,15 [0,32 - 0,17]**	**0,33 [0,16 + 0,17]**	**0,51 =**	**-1,62 [0,27 - 1,89]**	**2,12 [0,23+1,89]**
GALI_SILC (2005-2008)	**0,45 =**	**0,12 [0,30 - 0,19]**	**0,33 [0,15 + 0,19]**	**0,31 =**	**-1,63 [0,17 - 1,81]**	**1,94 [0,13+1,81]**
IADL_SHARE (2004-2006)	**0,48 =**	**-0,25 [0,21-0,47]**	**0,74 [0,27 + 0,47]**	**0,51 =**	**-0,55 [0,26 - 0,81]**	**1,05 [0,24+0,81]**
ADL_SHARE (2004-2006)	**0,48 =**	**-1,07 [0,16 - 1,23]**	**1,55 [0,32 + 1,23]**	**0,51 =**	**-0,29 [0,19 - 0,48]**	**0,80 [0,32+0,48]**

The "bold" font indicates larger gains of years free of disability / the grey font indicates larger gains of years lived with disability

DISCUSSION

Recent trends in various disability-free life expectancies at age 50 in France first indicate less favourable trends in recent years than in previous decades. This has led to a steeper sex difference over the last 5 year period for *physical limitation*-FLE and *activity restriction*-FLE. Second, these new figures indicate that the less favourable trends concern the 50-65 age group. At age 65, the trends remain favourable for most indicators. While mortality is still on a decreasing trends showing that progress are still made, trends in the number of years free of disability is less favourable than in previous decades, especially in the 50-65 age group.

Although these trends have to be interpreted with caution due to the lack of robust time series, it seems that several methods show similar patterns and found contrasted results for men and women, for age group 50-65

and 65+ and for period 1990's and most recent years. These results also converge with findings in the USA and in Sweden underlying unfavourable trends for some population groups [17, 18].

In this study we found a worsening of the situation for women regarding physical limitations, general activity limitation and IADL between 50-65 years old, in a larger extent than for men. Men also undergo a worsening of the situation regarding sensory and cognitive limitations at these ages.

These conclusions can be read in the light of recent health and social changes. Regarding health patterns, this can be the result of an increasing knowledge and expectation towards health and healthy aging in the baby-boomers generation which went through large progress in health and public health information system. This pattern could explain a better detection and management of health problems conducting to both to an increase in the prevalence of some problems and to an increase in the years to be lived with such problems. This could also partly be the result of female health behaviours being more prone to smoke and drink in this 50-65 cohort than in previous ones [19-22] while such behaviour contribute to disability [23-25].

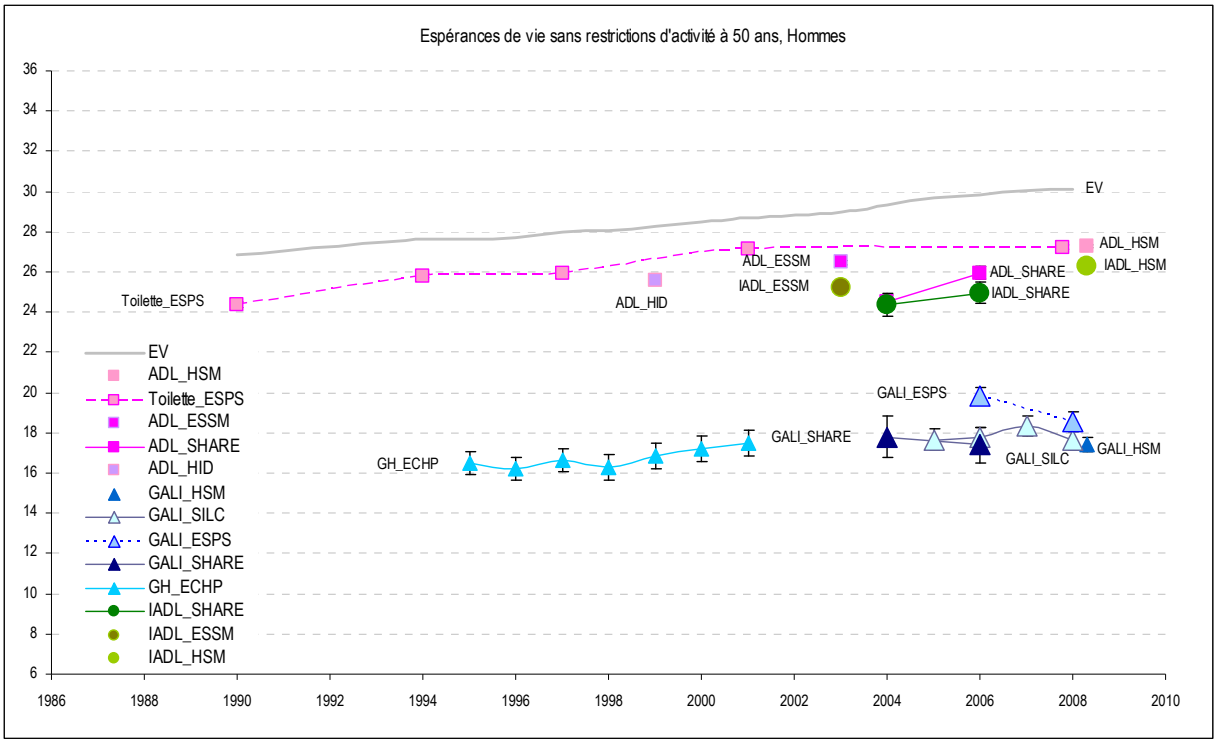
Regarding social trends, the literature over the 1990's identified socio-cultural determinant of sex differentials in health, linked to the roles that society assigns to men and women and that unevenly expose to diseases and accident over the life course [26-28]. Life and work exposures over the life course might have been more damageable in recent years and for the cohort ending their professional careers (increasing work instability, work intensity, risk of unemployment) [29-32] [33]. Women have long been protected from the risks directly attributable to work, but women of the 50-65 groups have been largely involved also in job market, with more instability and lower rewards in terms of wages than men. This situation might contribute to the recent trends in DFLE [34-40].

Women of the 50-65 cohorts have been the first one participating massively to the job market but are still largely in charge of the parental and domestic activities in the household [28, 41-44]. For a part of them, they also are in charge of parents in functional decline [45].

Our results pointed out the decline in *GALI*-FLE and *IADL*-FLE in the 50-65 age group for both sexes but with a more unfavourable trends for women. Interestingly, previous studies showed that self-reported GALI is correlated with work disability, after controlling for functional limitations [11, 46]; the *GALI*-FLE might be further studied in relation to the work related situation to understand the observed decrease. In the same idea, IADL being generally linked to chore activities (even if more men oriented tasks were introduced in the module of questions) and women in this generation being still largely in charge of it, despite their participation to the labour market, the question of a possible harmful double burden for women can be raised to further explain the *IADL*-FLE increase in this age group.

Further analysis will be conducted in these different directions in order to understand whether the observed trends in DFLE in recent years can be viewed as cohort pattern mixing the effect of better health knowledge, increasing health expectation and changing social role and participation or whether this trend would continue over the following generations.

Figure 1: DFLE (activity restriction and functional limitation) at age 50 estimated through various surveys for metropolitan France. Men



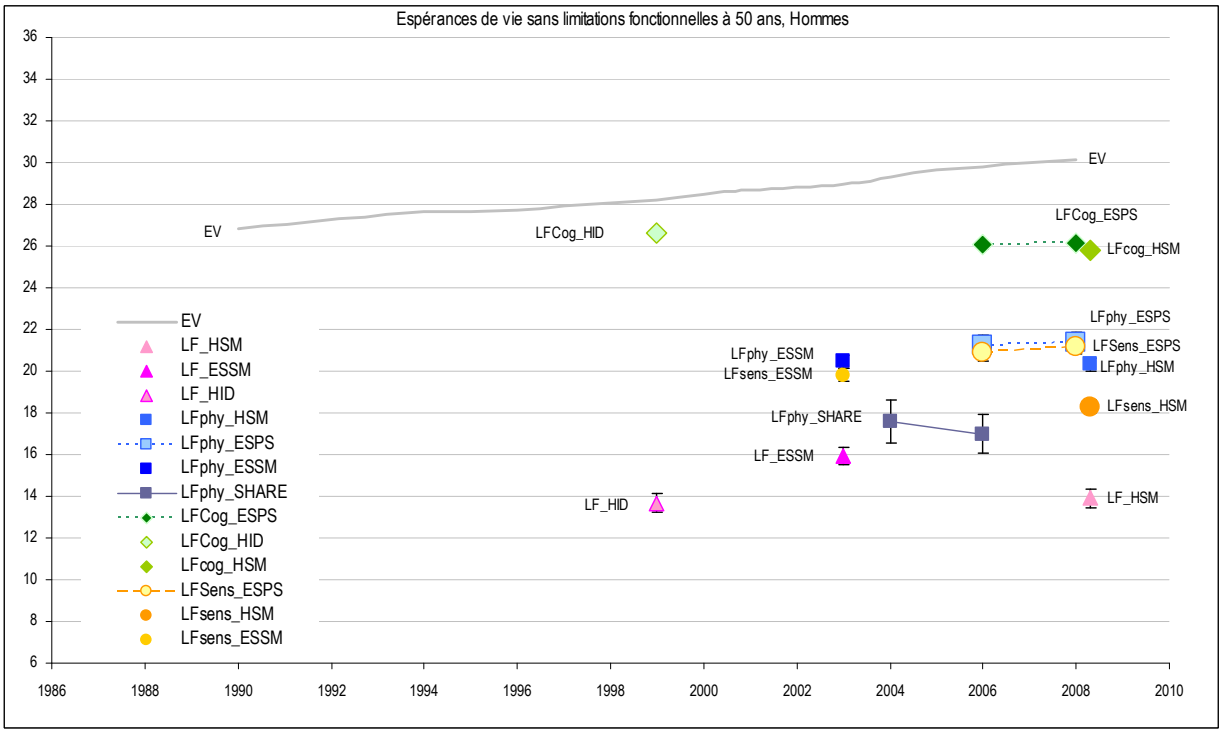
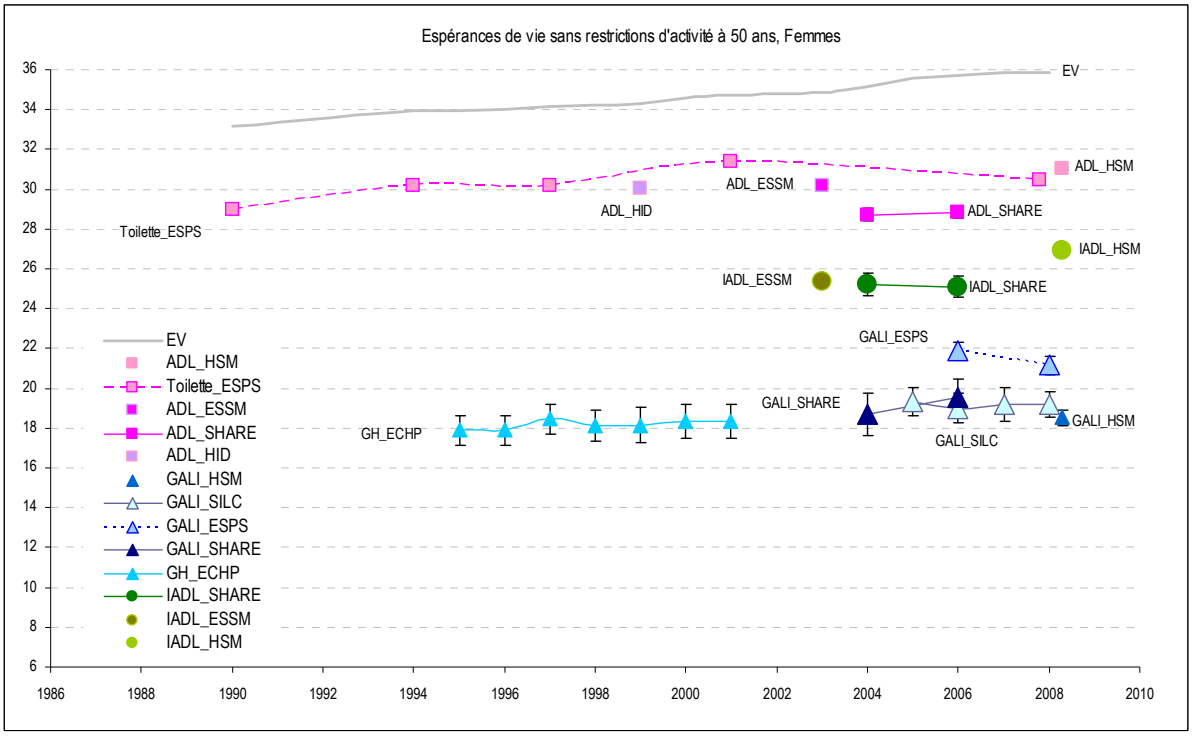
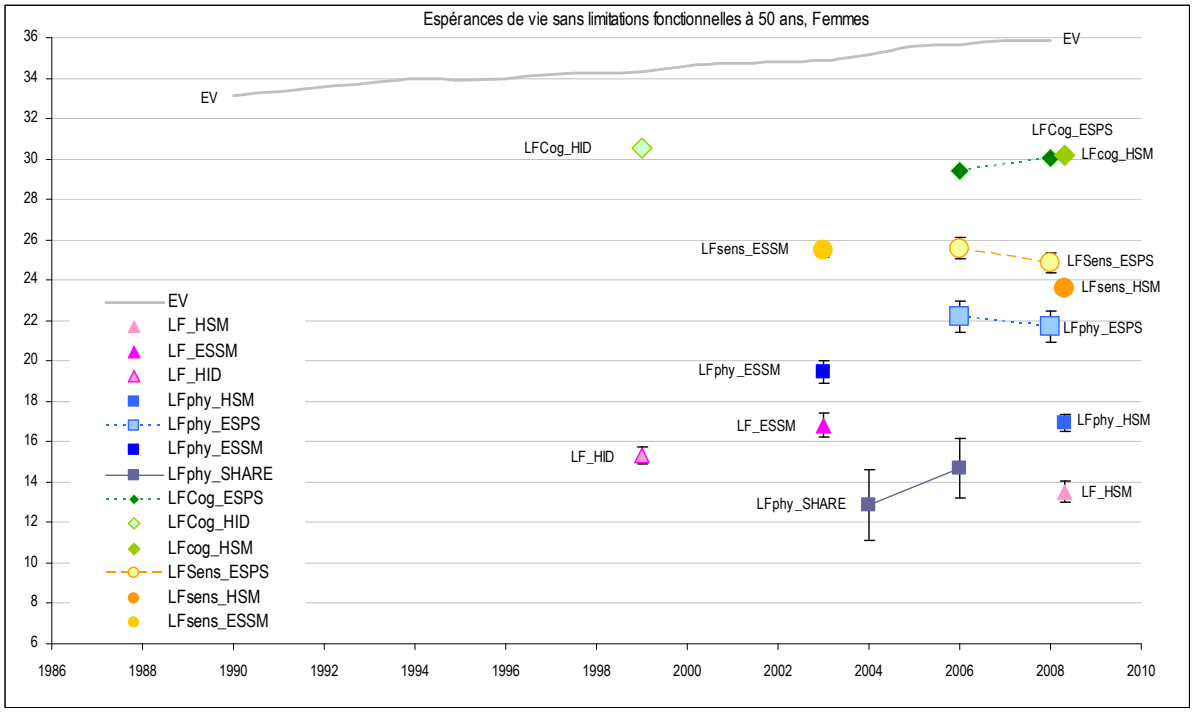


Figure 2: DFLE (activity restriction and functional limitation) at age 50 estimated through various surveys for metropolitan France. Women





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