LEGOS
Laboratoire d'Economie et de Gestion des Organisations de Santé

European Network of Economic Policy Research Institutes

AGIR Project

Work Package 1 : Bio-demographic aspects of ageing

LEGOS Working Paper: data and results for France

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1 Introduction

The AGIR project (Ageing, health and retirement in Europe) is a European Commission research program. The aim is to establish how much the health of the elderly has improved and to provide projections of this measure for the future. These bio-metric projections will be used to produce estimates of the demand for health care by the elderly in the future and to predict whether the trend in early retirement will continue along with the projected improvement in fitness of the elderly. Scenarios will be produced for the development of pension and health expenditure, with different options for social and budgetary policy.

The work program is implemented in two main phases: a phase of data collection and descriptive analysis and a phase of analysis, scenario calculations, synthesis and di55ssemination.

The first part of the project consists of three work packages.

- Work Package 1 (WP1) studies *bio-demographic aspects of ageing*;
- Work Package 2 (WP2) studies *use of health and nursing care by the elderly*;
- Work Package 3 (WP3) studies *determinants of retirement*.

The first work package is managed by FEDEA (Spain), assisted by CEPS (Belgium) and J-M Robine as scientific adviser with contributions in the field of collection and compilation of data from DIW (Germany), ETLA (Finland), CPB (Netherlands), FPB (Belgium), NIESR (UK) and EURIsCO-LEGOS (France).
The aim is to get a better understanding of the nature of ageing of the European population. This work package combines purely demographic data with data on the health of different cohorts, analyses national data on indicators of quality of life, in order to obtain a better view of past developments, the current state and the potential future development of the health of the elderly.

French data gathered from LEGOS for WP1 are presented in this working paper.

The first section covers data on the French population from 1950 to 2050. The mortality section covers mortality tables and life expectancies. The life course section provides data on life cycle evolutions. In the morbidity section, we collected data on disabilities (blindness, deafness, mental health, mobility restrictions) and data on perceived health. Based on these data on subjective health and disability, healthy life expectancies and disability-free life expectancies have been calculated.

In each section, data are presented as follows. After retireving the data required, French data provided to FEDEA are defined and commented upon. Each time, an extract of data is given. When necessary, a methodology definition is given.

2 French population

2.1 Data required: French population from 1950 up to 2050

The longest possible time series of national population by gender and age, both for historical data (back to 1900 or 1950, according to the data needed) and for projections up to 2050, are required, year-on-year when possible. Assumptions concerning fertility, mortality and migration should be clearly stated when providing the projections data.
A simple spreadsheet should be the starting point for this data :

Population by age and gender (31 December)					
Country:					
Year	age	Men	women	total	Observations
1950	0				
1950	1				
1950	2				
1950	3				
1950	....				
1950	....				
1950	....				
1950	94				
1950	95				
1950	96				
1950	97				
1950	98				
1950	99				
1950	100 and +				Or up to the highest possible age and +
More years (year by year if possible) up to 2000					
When possible add years (even if scattered) before 1950 down to 1900.					
Do your best to get population by point age rather than by age groups or cohorts					
Projections up to 2050, year by year when possible, in a separate sheet.					
May be that official population figures are only available up to somewhere in the 90s.					
In that case, please continue with population projections					

2.2 Data available for French Population: 1950-1998

2.2.1 Definitions

The number of inhabitants by region and population distribution by age are well known in France. The forecasting carried-out is reliable. INSEE (National Institute of Statistical and Economic Studies) provides population statistics for **metropolitan France** by age and gender, from 0 up to 100 years old, on 1st January, from 1899 up to 1998.
Data are available yearly in the « Bilan démographique » based on « Statistiques de l'Etat civil et les enquêtes Villes » (Insee 2002).

An example of data collected (*PopulationWP1.xls,* tables 1a, 1b and 1c) is given in table 1c. In this table, the population has been collected for metropolitan France by age and gender, from age 0 up to 100 years, on 1st January, from 1950 up to 1998.

2.2.2 Extracts of Data

Table 1c
Populations by age, from age 0 to 100 years old, on 1st january, from 1950 up to 1998, men and women
Source : INSEE

Year	age 0	1	2	…	95 +	90 +
1950	836295	819438	813290		4237	37307
1951	830471	823701	818596		5077	40687
1952	794893	817156	823086		5492	41742
1953	795463	780862	815316		6356	45506
1954	778016	785590	777491		5021	46446
1955	787606	769594	785053		5471	48736
1956	786158	781890	771244		6256	50598
1957	789784	783242	785544		6633	51784
1958	801192	789283	788081		7391	52389
1959	795980	798417	792237		7906	54304
1960	812518	793492	800703		8281	57765
1961	802750	810678	796130		8454	61096
1962	823417	800046	813445		9190	63510
…	…	…	…		…	…
1975	781166	833251	855221		19641	129609
1976	721204	769858	834362		18659	129864
1977	698167	716456	777306		20026	133500
1978	722557	693192	723519		21653	139387
1979	715195	716932	699652		22913	145895
1980	735846	709823	723683		24347	153014
1981	778436	730441	716607		25494	156036
1982	780938	772858	737254		26150	159584
1983	781055	776551	780407		27922	165903
1984	732582	775593	783134		28931	173927
1985	744328	726484	780824		30653	183487
1986	753321	738062	731240		31281	190385
1987	763482	747663	742869		32653	201625
1988	753352	758227	753500		34856	214844
1989	756819	748604	764408		38680	228367
1990	751370	752283	755238		41488	241922
1991	749986	746979	757314		43595	256291
1992	747116	745395	752079		47354	277494
1993	731763	741838	749762		51115	298967
1994	699587	726504	746032		54216	316059
1995	699438	694727	730861		58299	335759
1996	718767	694879	699210		62993	353718
1997	723060	714146	699232		69338	370149
1998	716519	718749	718813		75533	385451

Sources: INSEE, INED (National Institute of Demographic Studies): Vallin and Meslé, french mortality tables and forecasts for the 19th and 20th centuries, statistics data, n°4-2001.
See *PopulationWP1.xls*

2.3 Population Projections: 2000-2050

2.3.1 Definitions

In table 2 Population Projections have been collected for metropolitan France by age groups and gender up to 2050.
Projections are based on the metropolitan population in January 2000 and use data on mortality, fecundity and migration from 1970 up to 1998. Projections presented hereafter are based on the central scenario.

The Central scenario is based on trends continuity for each component of population evolution.
- Since 1975, the economic fertility index is the medium level observed: **1,8 children per woman**.
- Since 1970, the **fall in mortality ratio** (death probability) by gender and age has followed an observed pattern. In 2050, the life expectancy at birth is 84,3 years for men, and 91 years for women. Application of the mortality ratios implies a maximum kife-span of 115 years during the total projection period. According to this hypothesis, the yearly rises in life expectancy at birth are equal to 2 months from 2000 to 2050.
- Migratory balance is the most difficult variable to determine. It is equal to **+ 50 000 persons**, *i.e.* the average level observed during recent years ; it is equally distributed by gender and age structure corresponding to the observed average during the period 1990-1999.

Owing to components of uncertainty in population evolution over fifty years, other scenarios have been tested changing one of these three hypotheses. So, central hypotheses have been compared to high and low hypotheses.

- High fecundity hypothesis: 2,1 children per woman from 2015 (generation renewal level).
Low fecundity hypothesis: 1,5 children per woman from 2015 (EU and Japan level in recent years).
- High mortality hypothesis: slowdown in the reduction of the mortality ratio observed in the last 30 years.
Low mortality hypothesis: acceleration in the reduction of the mortality ratio for the oldest. Applies the pattern observed during the last 30 years of mortality fall for the 65-74 age group, to the 75 and over age group.
The yearly rise in life expectancy at birth is equal to 1 month with the high mortality hypothesis and 3 months with the low hypothesis.
- The high hypothesis for migratory balance is +100 000 persons per year from 2015.

2.3.2 Data: 2000-2050

Table 2
Population projections for metropolitan France - central scenario
Population by gender and age group (by thousands of people)

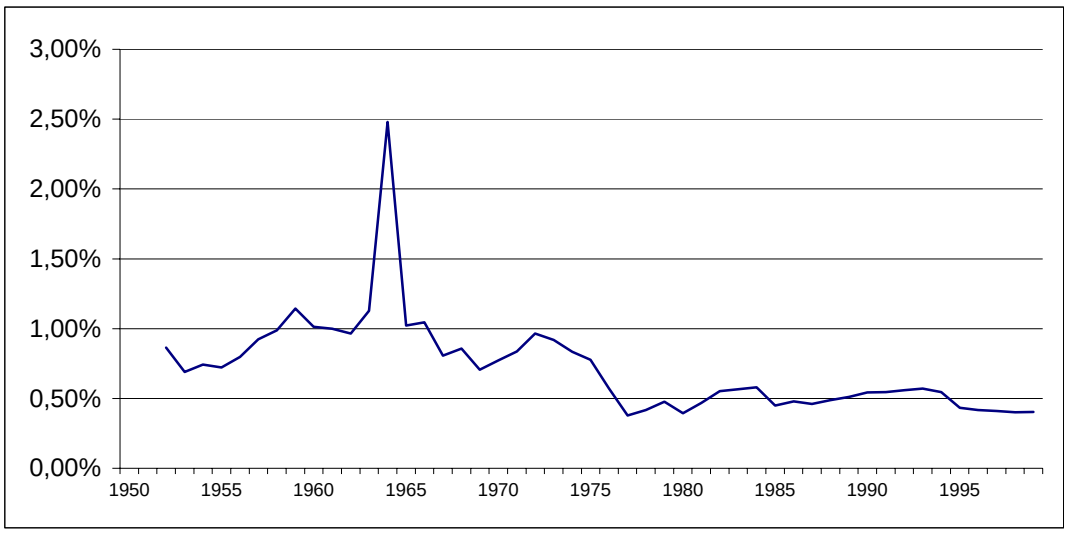
YEARS	MEN				WOMEN			
	Before 20 years	20-59 years	60-64 years	65 or more	Before 20 years	20-59 years	60-64 years	65 or more
2000	7 680	15 738	1 298	3 812	7 333	15 875	1 407	5 601
2005	7 575	16 205	1 295	4 069	7 226	16 393	1 356	5 864
2010	7 437	16 112	1 823	4 291	7 087	16 321	1 919	6 071
2015	7 346	15 891	1 892	4 968	7 002	16 051	2 043	6 782
2020	7 226	15 711	1 881	5 647	6 894	15 772	2 062	7 541
2025	7 077	15 497	1 935	6 260	6 751	15 466	2 110	8 281
2030	6 971	15 253	1 925	6 862	6 649	15 148	2 073	9 046
2035	6 879	14 975	1 950	7 361	6 561	14 818	2 064	9 718
2040	6 786	14 886	1 754	7 776	6 471	14 709	1 829	10 257
2045	6 692	14 669	1 866	7 919	6 382	14 477	1 930	10 402
2050	6 593	14 459	1 856	8 132	6 287	14 252	1 911	10 542

See PopulationWP1.xls
Source : Demographic Projections, Insee Première n°762 (2001)

2.4 Some statistics on the French population: 1950-2050

From 1950 up to 2000, the population of metropolitan France increased by 17 million (41,6 millions to 58,7 millions people). From 1950 up to 1975, this growth happened quickly (+1% on average annually) because of the baby-boom and substantial migration. From 1975 to 1990, it slowed down (+ 0,5%) (see figure 1).

Figure 1 : Growth ratio of total France population 1951-2000



Under the central scenario assumption, the total population of metropolitan France increases until 2040. The population would increase from 58,7 millions in 2000 to 62,7 millions in 2020, and to 64,5 millions in 2040. Then il would decrease to 64,0 millions in 2050.
Only the high fecundity hypothesis implies a rise in population up to 2050.

In table 3 and figure 2, the French population has been split into age-groups and sex for the period 1950 to 2050.

Table 3 - Population distribution by gender and age-groups 1950-2050										
	men					women				
	0-19	20-59	60-74	75 +	***60 +***	0-19	20-59	60-74	75 +	***60 +***
1950	31,8%	54,5%	10,7%	2,9%	***13,6%***	28,6%	52,8%	14,1%	4,4%	***18,5%***
1960	33,9%	52,6%	10,5%	3,1%	***13,5%***	30,7%	49,6%	14,2%	5,5%	***19,7%***
1970	34,6%	50,4%	12,0%	3,0%	***15,0%***	31,8%	47,3%	14,7%	6,2%	***20,9%***
1980	32,0%	53,9%	10,2%	3,9%	***14,1%***	29,2%	50,9%	12,4%	7,5%	***19,9%***
1990	29,2%	54,7%	11,4%	4,8%	***16,2%***	26,5%	51,8%	13,1%	8,7%	***21,8%***
1995	27,5%	55,3%	13,0%	4,3%	***17,2%***	24,9%	52,4%	14,8%	7,8%	***22,7%***
1998	27,1%	55,3%	12,7%	4,9%	***17,6%***	24,6%	52,5%	14,4%	8,6%	***22,9%***
2000	26,9%	55,2%			***17,9%***	24,3%	52,5%			***23,2%***
2010	25,1%	54,3%			***20,6%***	22,6%	52,0%			***25,4%***
2020	23,7%	51,6%			***24,7%***	21,4%	48,9%			***29,8%***
2030	22,5%	49,2%			***28,3%***	20,2%	46,0%			***33,8%***
2040	21,7%	47,7%			***30,5%***	19,5%	44,2%			***36,3%***
2050	21,2%	46,6%			***32,2%***	19,1%	43,2%			***37,7%***
Source :our calculations from INSEE data provided, see PopulationWP1.xls										

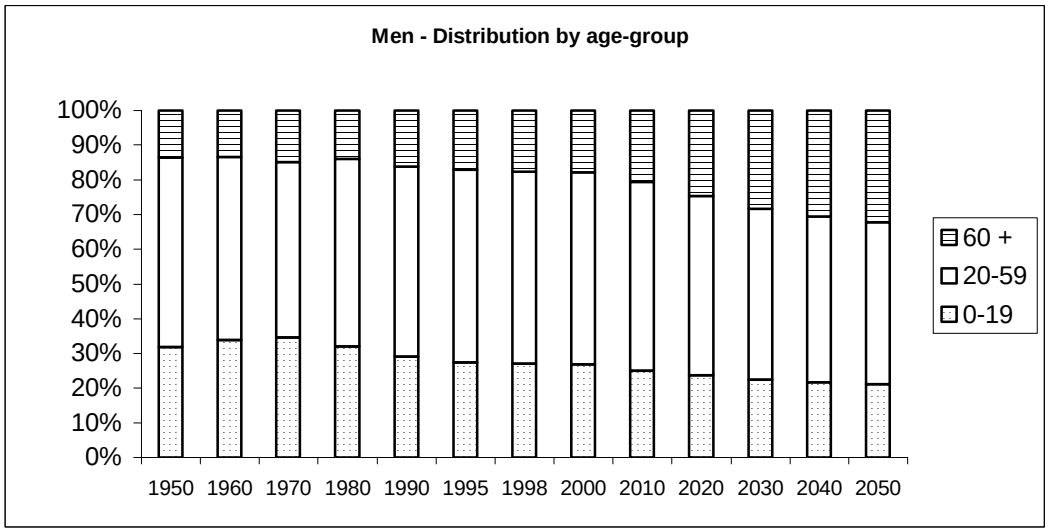
From 1950 to 2000:

- Share of 0-19 years age group reduced from 30,1% to 25,6%;
- Share of 20-59 years age group stagnated;
- Share of 60 years or more age group increased from 16,2% (6,7 millions) to 20,6% (12 millions);
- Share of 65 years or more age group increased from 11,4% to 16%.

From 2000 to 2050:

- Share of 0-19 years age group reduces from 25,6% to 20,1%;
- Share of 20-59 years age group reduces from 53,8% to 44,8%;
- Share of 60 years or more age group increases from 20,6% to 35,1%;
- Share of 65 years or more age group increases from 16% to 29,2%.

Figure 2 : Distribution of population projection, by age and sex, 1950-2050



In conclusion, whichever scenario is considered, the metropolitan population continues ageing. In 2050, in accordance with different variants of fertility, the share of the elderly (more than 60 years old) in the total population would be between 32,1% and 38,7%.

2.5 Dependent elderly numbers : survey and projections

Evaluation of the number of the dependent elderIy is more complicated. In this domain, data are partial. Dependence is not defined as the observation of a pathology. The main evaluation methods are based on limitations in Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL).

- OECD projections of disabled elderly people in France

OECD projections of disabled elderly people (Jacobzone *et al.*, OECD 1998) are based on "severe disability", which includes individuals aged 65 or more limited at least for one ADL.
In 1994, this included 1 290 000 people. According to the hypothesis retained for projections, in 2000 this would include 1 274 000 people (dynamic projection) or 1 397 000 (constant trends) people.
Growth rates for 2020/2000 would range between 25 % in dynamic projections (*ie* 1 590 000) and 43 % in constant trends projections (*ie* 1 992 000)

- HID projections of disabled elderly people in France

The HID survey (Handicaps-Impairments-Dependency, see annex) gives a better knowledge of this sector of the population living at home or an institution (Colin and Coutton 2000, Bontout, Colin and Kerjosse 2002...).

The number of the dependent elderly aged 60 years or more is estimated using the HID survey with two main evaluation methods for dependence in France : the Colvez and AGGIR scales (Colin and Coutton 2000) (see tables 4 and 5). These methods partially overlap ; estimations depend on methodological choices.

Table 4 - Number of dependent elderly aged 60 years or more according to the Colvez scale (at home and in institutions) in 1998-1999

Level 1 (confined to bed or to an armchair)	225 000
Level 2 (help needed for washing or for dressing)	403 000
Level 3 (help needed for going out)	789 000
Total	**1 417 000**
Source : Colin and Coutton 2000, table 01, HID surveys 1998-1999	

Table 5 - Number of dependent elderly aged 60 years or more according to the AGGIR scale (at home and in institutions) in 1998-1999

Equivalent Gir 1 (the most dependent)	69 000
Equivalent Gir 2	262 000
Equivalent Gir 3	201 000
Equivalent Gir 4 (the least dependent but classified as dependent)	264 000
Total	**796 000**
Source : Colin and Coutton 2000, table 03, HID surveys 1998-1999	

According to the severe disability definition (limited at least for one ADL) and HID survey, there were **1 405 000** persons aged 60 or more who were "severely" disabled in 1998-1999 (at home and in institutions), a bit more than in the OECD projections mentioned above.

The projections for GIR 1 to 4 people were estimated from the HID survey (Bontout, Colin and Kerjosse 2002). Whatever the scenario considered (optimistic, central or pessimistic), the ageing of the French population should bring about an increase in the dependent elderly population aged 60 years or more. Growth rates for 2020/2000 would range between 13 % in central projections (*i.e.* 904 000) and 31 % in pessimistic projections (*i.e.* 1 048 000). Over the period 2000 to 2040 the increase should be about 35% to 80% depending on the scenario considered.

3 Births and fertility

3.1 Definitions

The **total period fertility** rate, which is the sum of the fertility rates by age for a given year, may be interpreted as the *mean number of children a woman would give birth to if she were subjected to the fertility conditions observed for that year during her whole reproductive life.*

Of a level often comparable with the **completed fertility of generations** or **lifetime fertility** (the average number of children born to women belonging to the same generation *once they have reached the end of their reproductive life*, in practice at the age of 50), the total period fertility indicator may differ for long periods when fertility timing changes: a delay in timing leads to a drop in the total fertility rate even if the completed fertility of the generations is not modified.

3.2 Data from 1950 to 2002

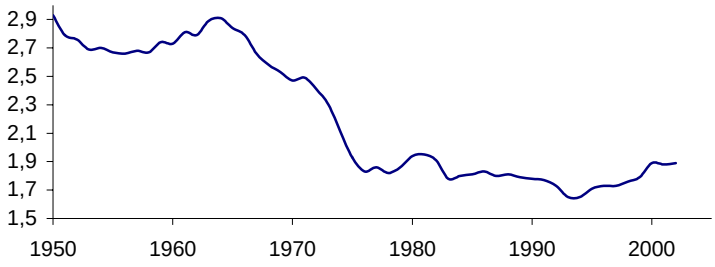
	Table 6		
Year	Living births	total period fertility rate	Births outside marriage (%)
1950	862310	2.93	7.0
1951	826722	2.79	6.8
1952	822204	2.76	6.7
1953	804696	2.69	6.6
1954	810754	2.70	6.5
1955	805917	2.67	6.4
1956	806916	2.66	6.3
1957	816467	2.68	6.1
1958	812215	2.67	6.1
1959	829249	2.74	6.1
1960	819819	2.73	6.0
1961	838633	2.81	5.9
1962	832353	2.79	5.9
1963	868876	2.89	5.9
1964	877804	2.91	5.9
1965	865688	2.84	5.9
1966	863527	2.79	5.9
1967	840568	2.66	6.1
1968	835796	2.58	6.3
1969	842245	2.53	6.5
1970	850381	2.47	6.8
1971	881284	2.49	7.0
1972	877506	2.41	7.5
1973	857186	2.30	8.2
1974	801218	2.11	8.4
1975	745065	1.93	8.5
1976	720395	1.83	8.5
1977	744744	1.86	8.8
1978	737062	1.82	9.4
1979	757354	1.86	10.3
1980	800376	1.94	11.4
1981	805483	1.95	12.7
1982	797223	1.91	14.2
1983	748525	1.78	15.9
1984	759939	1.80	17.8
1985	768431	1.81	19.6
1986	778468	1.83	21.9
1987	767828	1.80	24.1
1988	771268	1.81	26.3
1989	765473	1.79	28.2
1990	762407	1.78	30.1
1991	759056	1.77	31.8
1992	743658	1.73	33.2
1993	711610	1.65	34.9
1994	710993	1.65	36.1
1995	729609	1.71	37.6
1996	734338	1.73	38.9
1997	726768	1.73	40.0
1998	738080	1.76	40.7
1999	744791	1.79	41.7
2000	780300	1.89	42.6
2001	770 945	1.88	43.7
2002	762 700	1.89	

Source: INED
See *Natalité-fécondité.doc*

3.3 Comments

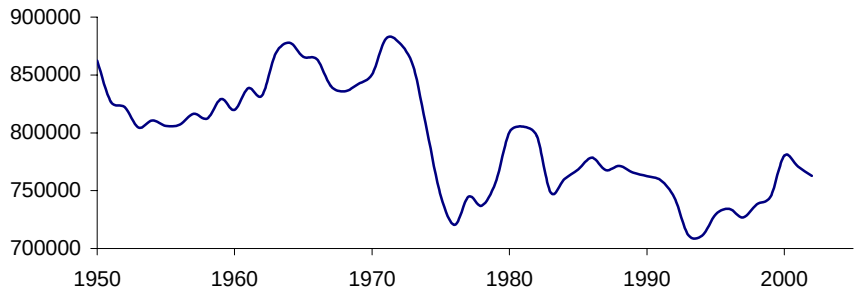
Since the mid-90's, the number of births in France and the fertility rate have been increasing (see figures 3 and 4). The fertility rate comes back to nearly 1,9 children per woman.
As seen later in this paper (in the lifecourse section), motherhood is delayed but the number of children per family (lifetime fertility) is quite stable, close to 2 children: motherhood before 30 has become less common but this is compensated by motherhood after 30.

Figure 3 - Total period fertility rate (1950 - 2002)



Source: INED

Figure 4 - Living births (1950 - 2002)



The fertility rate in France is the highest, after Ireland, in the EU. So, the decreasing fertility rate seems to be less important in France than it is in some other European countries.

4 Mortality

4.1 Data required: Mortality Tables and Life Expectancies (1950-2050)

Concerning mortality, death tables and survivor statistics are in principle both needed, from the earliest possible year by age. Several longevity indicators can be derived from these data.

Deaths by age and gender

Country:	

Year	age	men	women	total
1950	0			
1950	1			
1950	2			
1950	3			
1950	....			
1950	....			
1950	....			
1950	95			
1950	96			
1950	97			
1950	98			
1950	99			
1950	100			

When possible add years (even if scattered) before 1950 down to 1900.
Do your best to get # of deaths by point age rather than by age groups or cohorts
More years (year by year if possible) up to 2000

Survivors by age and gender (100.000 cohorts)

Country:	

year	Age	men	women	both
1950	0	100 000	100 000	100 000
1950	1			
1950	2			
1950	3			
1950	....			
1950	....			
1950	....			
1950	96			
1950	97			
1950	98			
1950	99			
1950	100			

When possible add years (even if scattered) before 1950 down to 1900.
Do your best to get survivors by point age rather than by age groups or cohorts
More years (year by year if possible) up to 2000

Life expectancy by age and gender

Country:	

year	age	men	women	both	Observations
1950	0				
1950	5				
1950	10				
1950	15				
1950	20				
1950	25				
1950	30				
1950	35				
1950	40				
1950	45				
1950	50				
1950	55				
1950	60				
1950	65				
1950	70				
1950	75				
1950	80				
1950	85				
1950	90				
1950	95				
1950	100				Or up to the highest possible age

When possible add years (even if scattered) before 1950 down to 1900.

More years (year by year if possible) up to 2000 — Or up to the nearest possible year

Projections up to 2050 — Even if at every X years

4.2 Data available

4.2.1 Definitions

INSEE provides a mortality table for each year from 1950 to 2050. In each table, survivors, deaths and life expectancy by point age and gender are available (see tables 4a, 4b and 4c).

Sources are INSEE and INED (National Institute of Demographic Studies): Vallin and Meslé, mortality tables and forecasts for France, statistics data, n°4-2001.

Tables are constructed with a q_x ratio by age and with a birth index point $S_0=100\,000$ at the beginning of a series of survivors S_x with age x. With successive iterations, for each series, the series S_x of survivors are calculated for each birthday and the series $d_{(x,x+1)}$ of deaths between two successive birthdays. Thus :
$d_{(0,1)} = S_0 * q_0$ *and* $S_1 = S_0 - d_{(0,1)}$, and by iteration : $d_{(x,x+1)} = S_x * q_x$ *and* $S_{x+1} = S_x - d_{(x,x+1)}$,
up to the final age ϖ : $d_{(\varpi-1,\varpi)} = S_{\varpi-1} * q_{\varpi-1}$ *and* $S_{\varpi-1} = S_{\varpi-1} - d_{(\varpi-1,\varpi)}$.

The life expectancy e_x at age x is obtained with the sum of survivors after age $x+1$:

$$e_x = 0{,}5 + \frac{\sum_{y=x+1}^{\omega} S_y}{S_x}$$

Beyond 105 years old, the necessary data to calculate the mortality ratio are very uncertain, so the tables stop at this age.

Extrapolations continue up to 2050:

There are several possible choices of assumptions for mortality forecasting because of specialist preferences.
The assumption applied in this section is the continuity of mortality falling with a relatively conservative position about human longevity limits. Mortality ratios were always extrapolated. However, each annual ratio at age x was extrapolated with its last real value and with past trends of five-years ratio at age $x-2$ so not to give more importance to unknown quantities (Meslé and Vallin, 2001).

4.2.2 Extract of Data: a survival table

Tables 4a
Survivors and deaths by age and gender (100.000 observations) - Life expectancy by age and gender
Men and women - PROJECTIONS 1998-2050

x	age
Sx	survivors at age x
D(x,x+a)	deaths between age x and age x+1
aQx	rate of mortality at age x
Ex	life expectancy at age x
P(x,x+a)	stationary population between age x and age x+1

1998

x	Sx	D(x,x+a)	aQx	Ex	P(x,x+a)
0	100000	454	0.00454	78.70	99773
1	99546	43	0.00043	78.06	99524
2	99503	25	0.00025	77.09	99491
3	99478	22	0.00022	76.11	99467
4	99456	17	0.00017	75.13	99448
5	99440	14	0.00014	74.14	99433
6	99426	13	0.00013	73.15	99419
7	99413	13	0.00013	72.16	99406
8	99400	12	0.00012	71.17	99394
…	…	…	…	…	…
84	44933	3583	0.07975	6.60	43141
85	41350	3749	0.09068	6.13	39475
86	37600	3799	0.10103	5.69	35701
87	33801	3823	0.11310	5.28	31890
88	29978	3819	0.12740	4.89	28069
89	26159	3772	0.14419	4.53	24273
90	22387	3509	0.15675	4.20	20633
91	18878	3272	0.17332	3.89	17242
92	15606	2955	0.18936	3.60	14129
93	12651	2589	0.20466	3.33	11356
94	10062	2274	0.22601	3.06	8925
95	7788	2109	0.27083	2.80	6733
96	5679	1620	0.28529	2.66	4869
97	4059	1206	0.29711	2.52	3456
98	2853	900	0.31549	2.37	2403
99	1953	648	0.33162	2.23	1629
100	1305	461	0.35316	2.09	1075
101	844	323	0.38218	1.96	683
102	522	213	0.40890	1.87	415
103	308	131	0.42598	1.82	243
104	177	73	0.41085	1.80	141
105	104			1.70	177

See SurvDeath5097.xls SurvDeath982050.xls

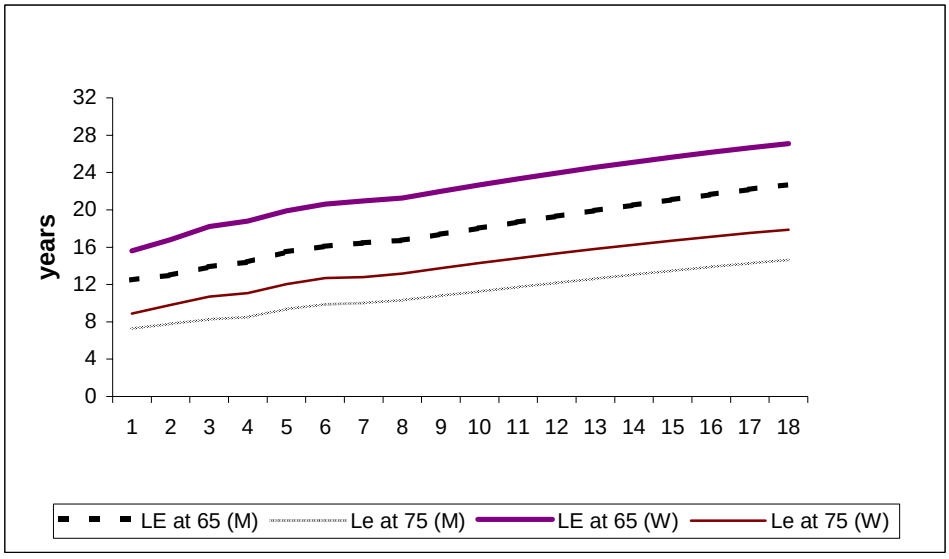
4.2.3 Life expectancies

Life expectancies at a few ages (at birth, at 65 and at 75) have been extracted from lifetables.

Table 7 : Life expectancies for different ages

	Men			Women		
Life expectancy…	at 0	at 65	at 75	at 0	at 65	at 75
1950	63,45	-	6,97	69,21	-	8,36
1960	67,01	12,5	7,26	73,59	15,6	8,90
1970	68,38	13	7,78	75,84	16,8	9,80
1980	70,19	13,9	8,27	78,42	18,2	10,70
1985	71,26	14,4	8,51	79,44	18,8	11,08
1990	72,76	15,5	9,38	80,96	19,9	12,04
1995	73,94	16,1	9,87	81,91	20,6	12,68
1997	74,61	16,47	10,02	82,28	20,97	12,81
2000	75,41	16,74	10,31	82,92	21,27	13,16
2005	76,69	17,40	10,79	83,93	21,98	13,74
2010	77,89	18,05	11,26	84,89	22,67	14,29
2015	79,04	18,69	11,73	85,79	23,32	14,82
2020	80,12	19,31	12,18	86,64	23,95	15,32
2025	81,15	19,92	12,62	87,44	24,55	15 ,8
2030	82,11	20,52	13,06	88,2	25,11	16,26
2035	83,03	21,09	13,47	88,9	25,65	16,7
2040	83,89	21,65	13,88	89,57	26,16	17,12
2045	84,71	22,19	14,28	90,19	26,64	17,51
2050	85,48	22,71	14,66	90,77	27,09	17,88

Figure 5 : Life expectancies at 65 and 75 by sex



A substantial gap in life expectancy between men and women (table 7 and figure 5) is specific to France and is explained by a high level of male over-mortality (French health report 1994, HCSP, annexs, p. 153).
However, the fall in mortality rates at earlier ages and the gains in life expectancy at the most advanced ages imply rectangularization in survival curves.

In the 60-74 age-group, from the beginning of the 80's, the main cause of death has now been explained to be tumours (the second cause is cardio - vascular diseases (Dupâquier, 1997). In

contrast for the 75 years or more age group, cardio-vascular diseases are the most important cause, followed by tumour and cerebro-vascular infections.
Tumour mortality displays a reducing trend for women, but it is increasing for men, and that is the reason for the gender mortality difference beyond 60 years old.

But recent behaviour could reduce the gender gap for life expectancy.
Indeed, new cohorts of women tend to adopt harmful behaviours mainly observed up to then for men (alcohol, tobacco). Although tobacco consumption is reducing for men, it is increasing for women: the number of women who are regular smokers has not stopped increasing in recent years (INSEE 2000). For example, from 1990 to 1998, the proportion of regular smokers among men reduced from 47% to 35%. In the same period, the proportion of women who were regular smokers increased from 17% to 23% (Aliaga, 2002).

4.3 Data available for Deaths

4.3.1 Definitions

The number of deaths have been collected by age and gender from 1950 to 1997.
The number of deaths at a given age x are divided into deaths in two cohorts: cohort g reaches age x within the year; cohort g-1 reaches age x the year before. The sum of the deaths in the two cohorts gives the number of deaths at a given age.
Source is INSEE.

4.3.2 Extract of Data: Deaths

Table 8 - Deaths, from 1950 up to 1997, men and women

Year	age					…				
	0	0	1	1	2		121	122	122	age not declared
	g	g-1	g	g-1	g		g-1	g	g-1	
1950	32747	12096	2441	1649	791		0	0	0	144
1951	30621	11369	2852	1726	834		0	0	0	136
1952	26783	10356	2477	1971	782		0	0	0	180
1953	25671	8066	1846	1446	729		0	0	0	134
1954	24832	8196	1771	1446	606		0	0	0	106
1955	23368	7762	1871	1346	596		0	0	0	117
…	…	…	…	…	…		…	…	…	
1991	4487	1024	245	247	121		0	0	0	0
1992	4041	1034	208	191	131		0	0	0	0
1993	3678	926	200	209	118		0	0	0	0
1994	3437	756	174	172	117		0	0	0	0
1995	3014	531	184	173	98		0	0	0	0
1996	2986	515	172	148	104		0	0	0	0
1997	2954	485	160	162	83		0	1	0	0

See tables 5a, 5b and 5c in *Deathswp1.xls*

4.3.3 Deaths and causes of deaths

If we consider the number of deaths in relation to the population structure (mortality rate), we notice a decline in death probabilities. Since 1995-96, the fall in the mortality rate for those aged 56 or more has been less pronounced.

The main causes of deaths (not premature) are (in 1996, HCSP 1998): cardio-vascular diseases (32% of the total mortality rate), tumours (28%), violent deaths (9%) and respiratory diseases.

5 Lifecourse

5.1 Data required

Regarding lifecourses, it is necessary to find even scattered data for as many major events as possible in a typical (hypothetical) life span. We are not following actual generations, but rather offering a picture of a hypothetical generation made up of different ones. We are interested in cross comparison between countries for age, in different years, that these major events take place for the average individual or household. This evidence must be around in different sources.

Data required concerning in Life courses by gender

Country	1950	up to	2001
Age at which school ends			
Age at household formation			
Age at first child			
Retirement age			
Age at widowhood			

School ending should be secondary education or studies previous to a University degree
Age is for the average individual living at a given year and undergoing a given event (hypothetical generations)

5.2 Data available

Partial data on life courses have been collected (*lifecourse.xls, Widowedlegos.xls*) :

- mean age at full-time school termination (table 9) for 1940 and 1968 cohorts.
- mean age at retirement (table 10) from 1970 up to 2001
- mean age at leaving parental home for 1963 and 1970 cohorts (table 11)
- mean age at first birth (table 12)
- mean age at first marriage (table 13)
- mean age of widowed people in the year (figure 6)

Table 9 : Mean age at full-time school termination

1940 born cohort	16 years and 2 months
1968 born cohort	19 years and 4 months

INSEE, see *lifecourse.xls*

Table 10 – Mean age at retirement
age at asserting rights to retirement

years	(Total rights) Mean age
1970	64.63
1975	63.83
1980	63.73
1985	62.92
1990	62.34
1991	62.26
1992	61.95
1993	61.92
1994	61.94
1995	61.98
1996	62.02
1997	62.05
1998	62.04
1999	62.03
2000	62.17
2001	62.16

CNAV : www.cnav.fr
See *lifecourse.xls*

Table 11 : Mean age at leaving parental home

1963 born cohort	21 years
1970 born cohort	23 years

INSEE (1996), See *lifecourse.xls*

Table 12 – Mean age of mother at first birth

1950	24
1955	24,3
1960	25
1977	26,5
1980	26,8
1985	27,5
1990	28,3
1992	28,5
1993	28,7
1994	28,8
1995	29
1996	29
1997	29,2
2000	29,3

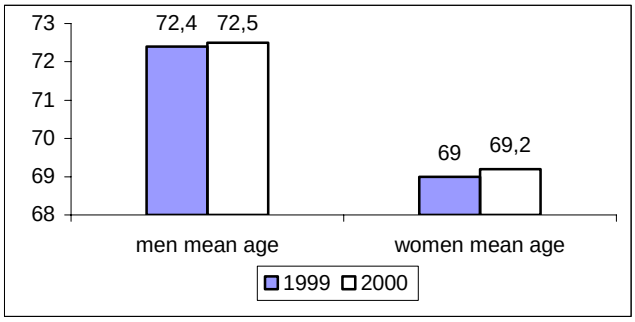
See *lifecourse.xls*

Table 13 - Mean age at first marriage

	women	men
1970	22,4	24,4
1990	25,7	27,8
1992	26,3	28,3
1994	27	29
1997	27,7	29,7

INSEE (French economy tables), See *lifecourse.xls*

Figure 6 : Mean age of widowed people (for widowed people in a given year)



INSEE data about civil status provide the number of widowed people in a given year by age and birth year. Thus, we can calculate the mean age of widowed men and women (figure 6). On average, widowed men are older than women because of mortality disparities (women die later than men). Increasing life expectancy is apparent in a small rise in mean age between 1999 and 2000.

5.3 Comments on life courses

- Working life duration reduction:

For several decades, active life (an active person is working or unemployed) has been growing shorter in France. Indeed, a rise in age at shool end and a fall in retirement age have been jointly observed.

Studying at school lasts longer so the age at which school ends has risen. However, there are still 50 000 young people who leave school each year without a diploma certificate.

The legal age for retirement fell from 65 to 60 in 1983.
There are a few definitions of retirement age: legal age; average age for leaving activity (57,5 in 2000). Under these definitions it falls. However, the average age at asserting total rights to retirement has been nearly 62 since 1991.

In France, these trends conduce to weak employment rates in extreme age-groups: for example, in 2000, male employment rates were 56% for 20-24 year olds; 67% for 55-59 year olds, and 15,5% for 60-64 year olds (see WP2).

- Delay of life-cycle steps:

Over recent decades, a rise in age for the main steps has been observed: there has been a rise in median age at leaving the parental home, and a rise in average age at first marriage and at first birth.
New family structures appeared. Non marital cohabitation and births outside marriage grew more numerous: in 2000 they represented 43% of births (see section 3).
However, since the mid-70's, the French fertility rate has been stable at around 1,9 children per woman, and the average number of children born to women belonging to the same generation, once they have reached the end of their reproductive life, is nearly 2 children.

- The problem of retirement in France

The working life shortening has contributed to the rise in the **demographic dependence ratio** (the number of people aged 60 or + compared to the number of people of working age 20-60). In 1995, the demographic dependence ratio was 4 retired people per 10 workers (the unemployed included). Forecasts evaluate 7 retired people per 10 workers for this ratio in 2040 (table 14).

Table 14 : Demographic dependence ratio

	1995	2005	2010	2020	2030	2040
60+ /20-60	**0,39**	0,40	0,43	0,53	0,64	**0,71**

French pension scheme : **pay-as-you-go scheme**

- Equal to 12.6 % of GDP (10,4% in Europe)
- High pension level
- High buying power relative to the working age population
- French pension scheme is not homogeneous : 26 social security systems

- There are complementary mandatory systems (AGIRC, ARRCO)

- Weak rates of participation to the labor market (activity rates) in extreme age-groups. For example, 56% of male population aged 20-24 years participated in the labour market in 2000; 67% of men aged 55-59 and only 15,5% of men aged 60-64 **(**cf. WP2)

In 1983, the legal retirement age reduced from 65 to 60 whereas it *increased in others countries.*

1993 reform (Balladur):

- Private sector only concerned
- Extension of contribution length : from 37,5 to 40 years
- Extension of reference length for pension calculation : from 10 to 25 best years
- pension index-linked to inflation (before linked to wages)

Reforms are difficult to impose in the public sector (big strikes in 1995)

Recommendations:

- Extension of contribution length : from 40 to 42,5 years (Charpin, 1999)
- Extension of employment population: increase in the employment rate for senior (aged 55 years or more) persons. Recommendation of European Commission in 1999 : employment rate should be equal to 50% for the 55-64 years age group.
- More flexibility in the choice of retirement age (Taddéi, 2000)

Today ?

A reform should be carried out this year.

Initially, the Raffarin government would seem to reduce inequities between the private sector and state employees. It is possible it will be decided to increase the contribution length for state employees.

6 Morbidity

6.1 Data required

Morbidity includes both health and disability.
Concerning health, the numbers of people declaring their perceived health status and the total number of respondents to the different surveys are required. Categories should be: very bad, bad, average, good and very good, or similar.
Concerning disability, the categorisation is more complicated. We are thinking of establishing four major categories (that must be synthetic): blindness, deafness, motorial disability and mental insufficiency, and grades within each category. Deaf-mutism will be included in deafness. Motorial disability must be a synthesis of several items (we are working on that). Mental insufficiency must exclude mental disorders but refer to permanent conditions.

6.2 Data available for 1998-1999

Two surveys conducted by INSEE provide information on *perceived* health:

The permanent survey of living conditions in households, May 1999 (in French, Enquête permanente Conditions de vie (EPCV)).

Households interviewed for EPCV are representative of those living in ordinary homes (institutions are not included).
Surveys on household lifestyles are conducted three times per year. The May 1999 survey deals with health questions. It was carried out face to face by INSEE interviewers.
57 800 households responded to the May 1999 survey. In each household, a random selection of persons age more than 14 years old (at most three persons per household) were interviewed: the sample finally constituted 10 987 individuals.

Handicaps, Impairments, and Dependency Survey (1998-1999) (in French, Handicaps-Incapacités-Dépendance HID, see annex) :

The first wave of the INSEE survey on handicaps, impairments, and dependency (hereafter HID) was carried out in late 1998. It covered a sample of about 15 000 people living in institutions even temporarily, as is the case with many people treated for mental illness. The institutions included homes for the elderly, homes for young and adult persons with disabilities, and psychiatric institutions. The same persons were surveyed again in late 2000.
The second wave comprised only people living at home: 17 000 individuals were interviewed twice, in 1999 and in 2002.

So, two HID surveys are available :
- HID in institutions 1998 (with weighting : 220 000 men and 419 000 women)
- HID at home 1999 (with weighting : 22,7 millions of men and 24,4 millions of women)
To obtain a complete population, results of both surveys (institution and home) have been added.

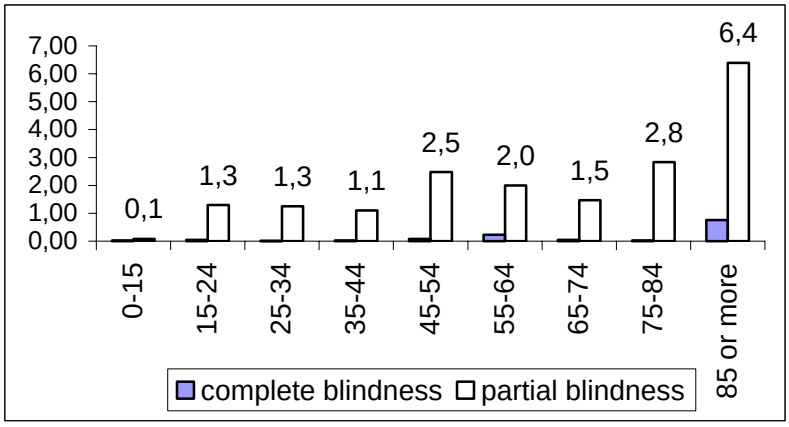
These national surveys do not include information on observed health: ***all indicators are declared by the respondents and not by doctors.***

6.2.1 Vision impairment

Two levels of handicap are defined: complete blindness and partial blindness (in fact "partially sighted" in HID data). Other troubles with vision are not considered (colours, visual scope,…).
The proportion of the population suffering partial blindness should be under-represented because others vision troubles, like colour problems or reduced scope of vision, are not considered.
In 1999, on average less than 2 % of the population was suffering vision impairment as defined here.

Figures 7 and 8 show the proportion of the population by gender, with vision impairment. There is a relationship between age and eyesight problems, particularly for women.

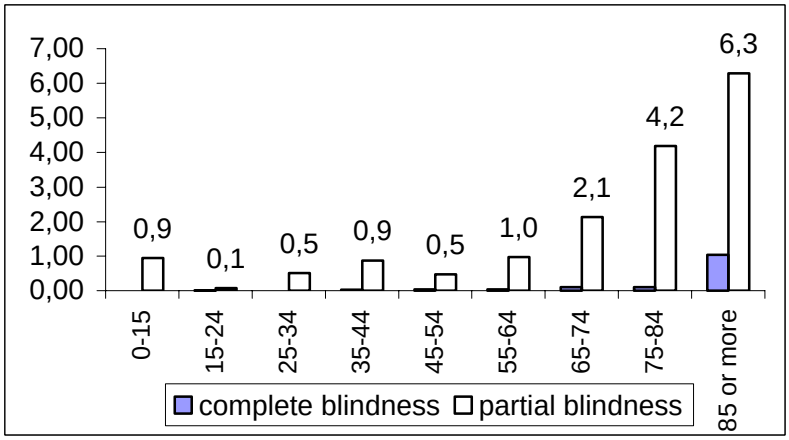
Figure 7 Vision impairment by age group, men, 1998-1999 (%)



source HID 98-99, see file morbiditylegos.xls – "blindness" indicator

In 1999, complete blindness affected only a very small part of the male population. We can only note that the proportion of blindness increases significantly beyond age 85 years - even if the percentage stays very low). The evolution of partial blindness (which measures the number of person who are partially sighted) is non-linear. Nevertheless from age 65 years it increases in an exponential manner, growing from 1,5 % for men aged 65-74, to 2,8 % for the 75-84 age-group and to more than 6 % for the oldest age group.

Figure 8 Vision impairment by age group, women, 1998-1999 (%)



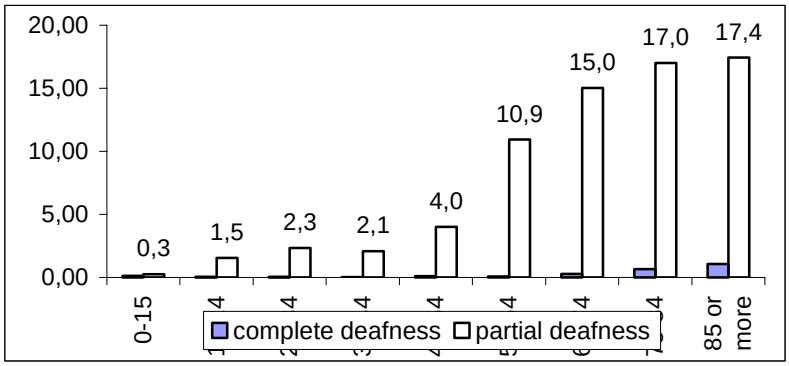
source HID 98-99, see file morbiditylegos.xls – "blindness" indicator

The same observations for the female population (see figure 8) give the same results and in the same proportions. But, in contrast to men, the evolution of partial blindness for women is truer to intuition, with substantial increases from age 45 years: from 0,5 % for women aged 45-54 to 6,3 % for women aged 85 or more.

6.2.2 Deafness

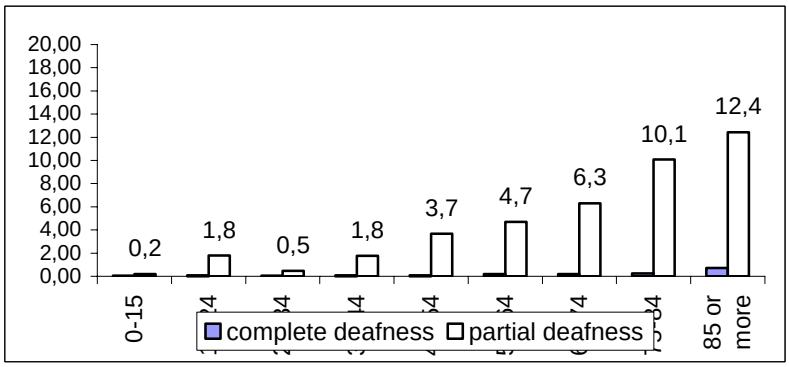
In the database, two modalities describe hearing impairment : complete deafness and partial deafness (hearing impaired people). Deafness affects 5 % of the entire population.
There is a gender gap in favour of women: 6,4 % of men suffer hearing impairment whereas only 4,4 % of women are affected. From age 55 up to 75 years, the proportion of men suffering in the population increases strongly (respectively 4%, 10 % and 15 % by increasing age-group). After age 75 years, the growth is less important (only 2 points).
Gender differences grow with age: reaching a maximum for the 55-64 age group (9 points).
Therefore, the link between age and hearing problems is clearer than for vision impairment. And this type of health problem is more frequent in the population than vision impairment.

Figure 9 Hearing impairment by age group, men, 1998-1999 (%)



Source HID 1998-1999, see file morbiditylegos.xls –"deafness" indicator

Figure 10 Hearing impairment by age group, women, 1998-1999 (%)



Source HID 1998-1999, see file morbiditylegos.xls 1 – "deafness" indicator

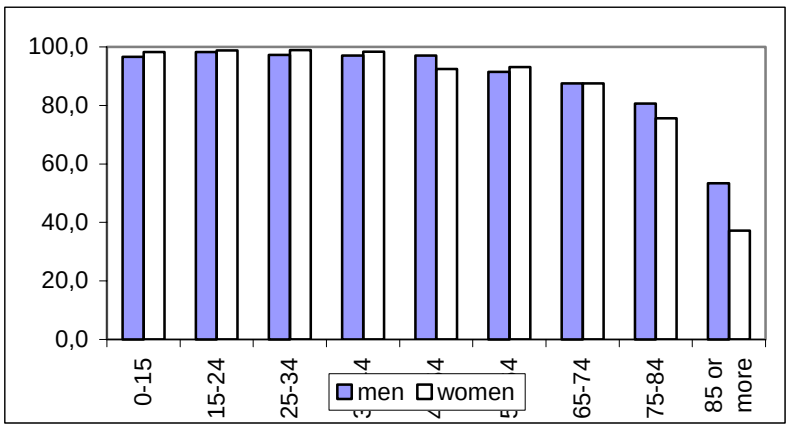
6.2.3 Mobility handicap

- Colvez scale

The HID survey provides the French Colvez scale which gives a measure of mobility handicap. It contains four modes.
Three modes determine a dependency situation: confined at home, need care for toileting or dressing, and need care for going out. The rest of the population is in the last mode which represents no limitations to mobility.

The following figure presents the non-dependent population (in institutions and at home).

Figure 11 Population with no limitation on mobility (COLVEZ scale) by age group (1998-1999) (%)



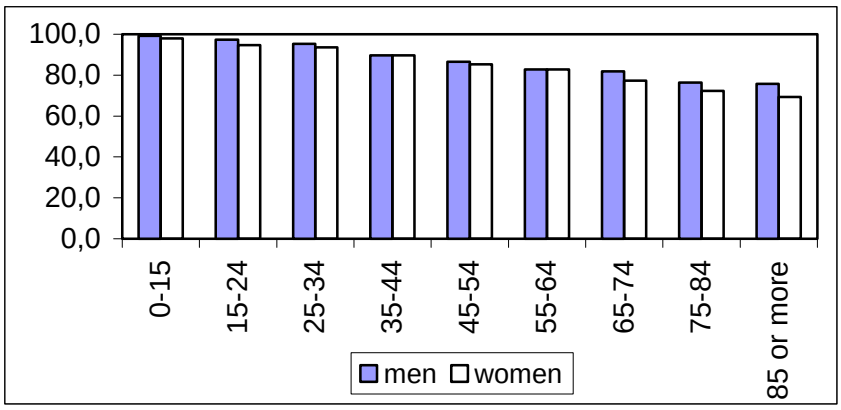
Source HID 1998-1999, see file morbiditylegos.xls – Colvez scale

Of course, the proportion of the population with no limitations on mobility drops with age. The restriction of mobility is constant until age 54 years (less than 10 %), and mobility handicap clearly increases beyond this age. From age 75, mobility handicap is heterogeneous by sex and affects men more often than women. In the oldest age-group, 37,2 % of women have no limitation in mobility, whereas the proportion of non-dependent men represents 53,3 % of the male population. An age effect can explain part of this gap: women are older on average than men in this group.

- Mobility indicator

We define another mobility indicator using the dependencies declared in HID studies.
Dependent people are persons who suffer motor problems: hemiplegia, tetraplegia, paraplegia and other motor problems.
There is a strong link between age and problems of mobility. The drop in the proportion of the non-dependent population is constant in contrast to the drop as measured with the Colvez indicator. However, this indicator seems to over-valuate the non-dependent population because a big majority (over 70 %) of the oldest age group is in the non-dependence category.
Even if the figures from these two indices are different (see figures 11 and 12), the trend is similar: the population has more mobility problems with increasing age and this is slightly more pronounced for women in most age groups.

Figure 12- Population with no limitation on mobility by age group (MOBILITY indicator), 1998-1999 (%)



Source HID, see file morbiditylegos.xls –"mobility" indicator

6.2.4 Mental health

Two indices measure mental health in the HID Survey.

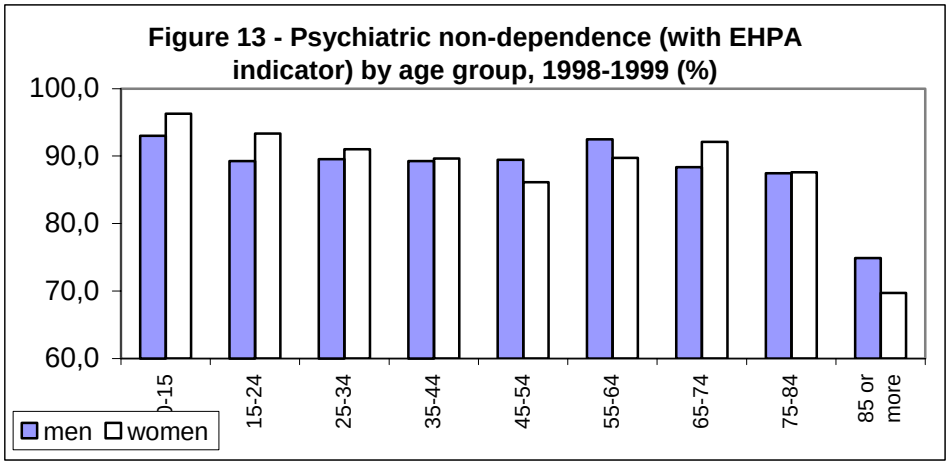
One index, the French EHPA indicator (figure 13), is a crossed variable between psychiatric (*psychique* in French) dependence and the Colvez scale (see previous section). This index permits categorisation of psychiatric dependence.
The second index (figure 14) is calculated directly from declarations of dependencies. It defines psychiatric dependence as persons suffering from psychological troubles (behaviour, personality, relationship abilities, depression, humour). Other persons are considered psychiatrically non-dependent.

Psychiatric non-dependence is presented by age group. Applying the above definitions of psychiatric non-dependence provides different results. However, neither indices allow a correlation between age and psychiatric non-dependence to be established (in particular on figure 12). An analysis of gender differences highlights womens' greater propensity toward psychiatric dependence at the end of the life course, whereas men display greater dependence among the young age-group.

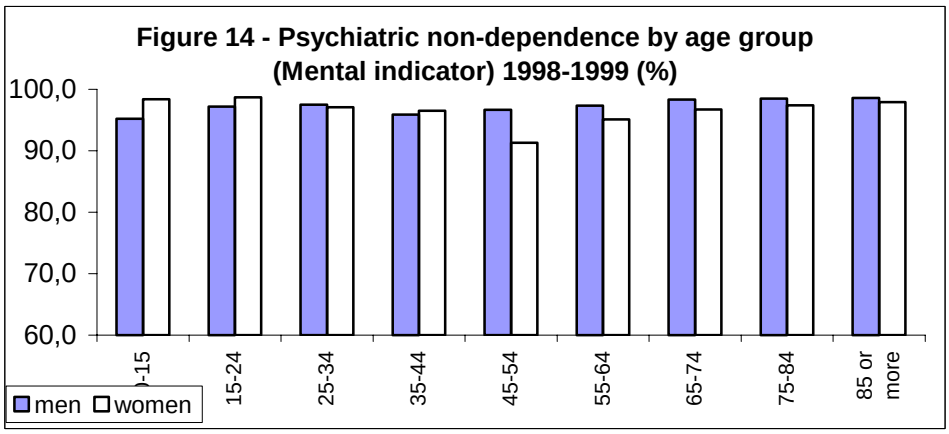
Some divergence appears between these two indices.
On one hand, according to the EHPA index the disparities are clear: the differences are more pronounced (than with the second definition) between genders (for the oldest age group the

gap is 5 points in favour to men: 75 % of men are psychiatrically non-dependent compared with 70 % of women).
On the other hand, the differences between age groups are more substantial for women (96 % for the 0-15 years age-group compared with 70 % for the oldest women) than for men (93 % at the beginning of life compared with 75 % at the end).

The measure of psychiatric non-dependence in the second case (figure 12) is fairly constant with age and gender. In fact, the proportion of the population with good health always represents more than 90 % of the population. This means that its usefulness for comparative analysis is very limited.



Source HID, see file morbiditylegos.xls – "ehpa" indicator



Source HID, see file morbiditylegos.xls –"mental" indicator

6.2.5 Perceived health status

Tables 15 and 16 present data collected on perceived health status in 1999, by age group and gender.

The source is the Permanent survey of household living conditions (may 1999, EPCV, INSEE).

Respondents answered to the question :
" At the moment, do you consider that your health status is : very good, good, fair, bad or very bad ?"

This question does not consider precise symptoms or pathologies but it reflects personal perceptions depending on psychological factors (family, living conditions etc). Perceived morbidity will be different to declared morbidity, and morbidity which brought about recourse to care.
More than 33 % of interviewed men declare that they consider their health status as "very good" and 45 % as "good" (see table 15). Women declare "very good" health status less often (see table 16).

Table 15 : health status (men) in 1999

	very good	good	fair	bad and very bad	total
0-15	38,2	49,3	11,7	0,8	100
15-24	53,2	38,4	8	0,4	100
25-34	45,4	45,8	8,4	0,4	100
35-44	37,9	48,6	12,3	1,2	100
45-54	23,5	53,3	20,7	2,5	100
55-64	15,9	44,7	33,2	6,2	100
65-74	8,5	38,4	46	7,1	100
75-84	4,7	31,6	49,3	14,4	100
85 or more	5,4	26,2	59,5	8,9	100
Total	33,2	45,4	18,8	2,6	100

Source : EPCV 1999, see *lifecourse.xls*

Table 16 : health status (women) in 1999

	very good	Good	fair	bad and very bad	total
0-15	37,9	48,3	13,4	0,4	100
15-24	44,5	44,9	10,1	0,5	100
25-34	37,6	51,1	10,1	1,2	100
35-44	32	50,3	16	1,7	100
45-54	23,8	50,9	22,7	2,6	100
55-64	11,3	49,3	35,4	4	100
65-74	5,9	36,7	50,6	6,8	100
75-84	3,3	24,8	62,1	9,8	100
85 or more	3	25	55	17	100
Total	27,7	45,9	23,4	3	100

Source : EPCV 1999, see *lifecourse.xls*

6.2.6 *Healthy Life Expectancy*

Studying changes in Life Expectancy (LE) is not sufficient in itself because the quality of further years of life is not considered.
Healthy Life Expectancy (HLE) permits the measurement of years in good health.

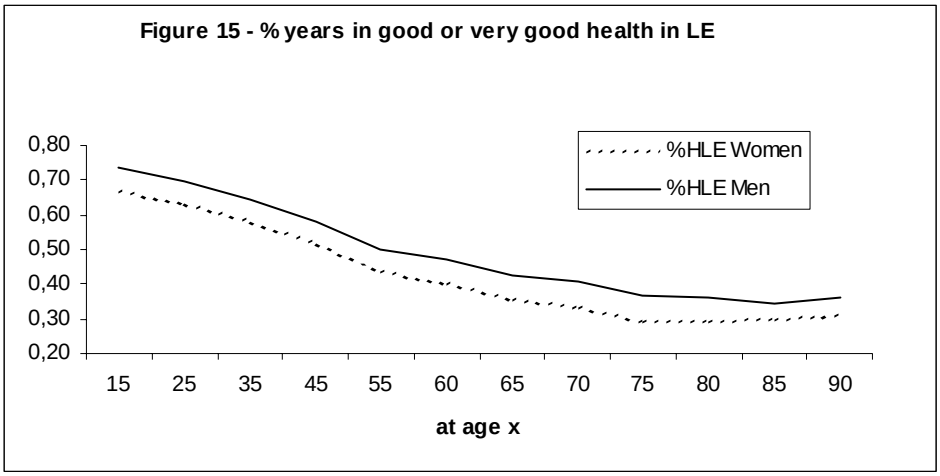
In the previous section, the proportion of the population that declared a good or very good health status has been calculated by age (tables 15 and 16). From these data and the mortality tables of INSEE, HLEs have been calculated for different ages using the Sullivan method.
Health status is considered constant in the age-groups defined in tables 15 and 16.

Table 17 provides LE, HLE, and the difference between LE and HLE (equal to the number of years in bad health) and the percentage % HLE (of course equal to the probability of being in good health)

Table 17 - Life expectancy and Healthy Life expectancy at different ages (in good or very good health) in 1999

	Women					Men				
	LE	% good	HLE	LE-HLE	%HLE	LE	% good	HLE	LE-HLE	%HLE
15	68,18	0,894	45,65	22,53	0,67	60,7	0,916	44,58	16,12	0,73
25	58,38	0,887	36,84	21,54	0,63	51,19	0,912	35,76	15,43	0,70
35	48,64	0,823	28,12	20,52	0,58	41,78	0,865	27,03	14,75	0,65
45	39,12	0,747	20,15	18,97	0,52	32,69	0,768	18,93	13,76	0,58
55	29,95	0,606	13,07	16,88	0,44	24,22	0,606	12,05	12,17	0,50
60	25,47	0,606	10,25	15,22	0,40	20,27	0,606	9,51	10,76	0,47
65	21,12	0,426	7,46	13,66	0,35	16,6	0,469	7,06	9,54	0,43
70	16,97	0,426	5,61	11,36	0,33	13,25	0,469	5,37	7,88	0,41
75	13,05	0,281	3,80	9,25	0,29	10,21	0,363	3,75	6,46	0,37
80	9,54	0,281	2,81	6,73	0,30	7,52	0,363	2,74	4,78	0,36
85	6,59	0,28	1,98	4,61	0,30	5,31	0,316	1,84	3,47	0,35
90	4,42	0,28	1,38	3,04	0,31	3,69	0,316	1,32	2,37	0,36

Source : Insee Mortality tables, EPCV Perceived Health status 1999



The percentage of years in good (or very good) health over total life expectancy is higher for men at all ages. It is decreasing with age but it is quite stable after 80.

6.2.7 The Katz dependence indicator

The Katz indicator has been collected in the HID data for men and women (households and institutions, together and separately). As recommended, we only consider the population over age 15.

The Katz indicator has many dependence levels. It is defined by 8 modalities (A to H) by limitation in the following activities of daily living: washing, dressing, toileting, getting in and out of bed, continence and eating.

A- Non-dependence
B- One ADL dependence
C- Two ADL dependences (washing included)
D- Three ADL dependences (washing and dressing included)
E- Four ADL dependences (washing, dressing, toileting, and getting in and out of bed included)
F- Five ADL dependences (washing, dressing, toileting, getting in and out of bed included, and continence included)
G- Complete dependence
H- Dependence on more than one ADL (different of C-D-E-F)

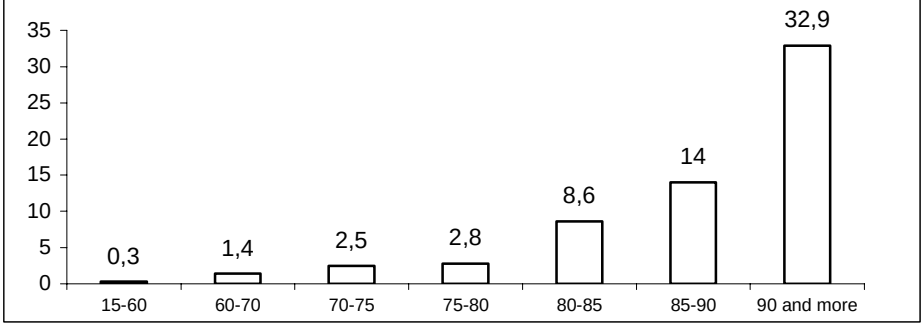
Table 18 - Dependence degree: KATZ indicator (men at home 1999, %)

KATZ	15-60	60-70	70-75	75-80	80-85	85-90	90 or more	*total*
A	98,4	95,2	92,9	89,3	87,3	77,7	70,7	***96,9***
B	1,2	3,4	4,2	6,1	4,9	12,6	9,5	***1,97***
(…)	(…)	(…)	(…)	(…)	(…)	(…)	(…)	(…)
H	0,05	0,1	0,1	0,3	0,1	0,3	2,1	***0,1***

Extract from *katz.xls*
Note : 98,4 % of males in the age-group 15-60 are non-dependent

If we compare home and institution surveys, the degree of non-dependence (only A) is naturally higher for persons at home than in institutions: in the household HID 1999, 97% of men are non-dependent compared with 54,9% in HID 1998 in institutions.
Dependence, defined by limitation for at least one ADL, increases with age. See for example figure 16, women dependence at home.

Figure 16 - Women dependence at home, at least one ADL



6.2.8 Disability-free life expectancy

Disability-Free Life Expectancy (DFLE) measures the number of expected years without disability.

DFLE is calculated from data on disability provided in the HID survey by the KATZ indicator.
As defined in the previous section, people without disability are classified in KATZ's category A.
The proportion of disability-free people is calculated for the entire population (home and institutions).

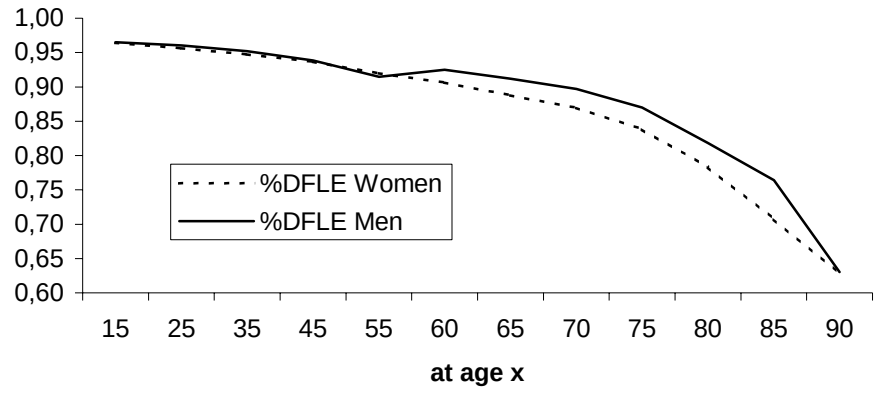
DFLE is calculated according to the Sullivan method with INSEE mortality tables (section 4).

Table 17 - Life expectancy and Disability-Free Life expectancy in 1999

	Women					Men				
	LE	% katz A	DFLE	LE-DFLE	%DFLE	LE	% katz A	DFLE	LE-DFLE	%DFLE
15	68,18	0,995	69,54	2,60	0,96	60,7	0,986	58,57	2,13	0,96
25	58,38	0,998	55,82	2,56	0,96	51,19	0,995	49,17	2,02	0,96
35	48,64	0,988	46,08	2,56	0,95	41,78	0,995	39,78	2,00	0,95
45	39,12	0,985	36,64	2,48	0,94	32,69	0,991	30,67	2,02	0,94
55	29,95	0,988	27,55	2,40	0,92	24,22	0,87	22,16	2,06	0,91
60	25,47	0,98	23,09	2,38	0,91	20,27	0,961	18,75	1,52	0,92
65	21,12	0,944	18,75	2,37	0,89	16,6	0,937	15,14	1,46	0,91
70	16,97	0,941	14,75	2,22	0,87	13,25	0,934	11,89	1,36	0,90
75	13,05	0,923	10,94	2,11	0,84	10,21	0,912	8,88	1,33	0,87
80	9,54	0,848	7,47	2,07	0,78	7,52	0,827	6,15	1,37	0,82
85	6,59	0,722	4,66	1,93	0,71	5,31	0,77	4,06	1,25	0,76
90	4,42	0,565	2,77	1,65	0,63	3,69	0,555	2,33	1,36	0,63

Source : Insee Mortality tables, HID 1998-1999

Figure 17 - % of years without disability in LE
(no disability defined as KATZ = A)



The percentage of years without disability (in terms of Katz modality "non-dependence") in total life expectancy is similar for men and women before age 60 (see figure 17). Over age 60, women have a greater propensity to develop at least one form of disability.

In conclusion, women live longer but also spend a greater proportion of their life in bad health (in terms of HLE and DFLE).

7 Concluding remarks

For this work package, we collected purely demographic data and data on the health of the different cohorts. The WP1 aim is then to analyse national data on indicators of quality of life in order to obtain a better view of past developments, the current state and the potential future development of the health of the elderly.

Projections from demographic data of the population are convergent: the French population is ageing. For several decades, the proportion aged sixty or more has been increasing, from 13,6% in 1950 to 18% in 2000, and it should be no less than 32% in 2050.
Life expectancies should increase: in 2050, the additional life expectancy at age 65 should exceed 22 years for men and 27 years for women.
Womens' additional life expectancy should be reduced. On one hand, healthy life expectancy is greater for men because the probability of being in good health is more likely for men whatever age: women live longer but they also spend longer in bad health. On the other hand, new generations of women have adopted harmful behaviours which could reduce their advantage in life expectancy compared with men.
Considering births in France, the decrease in fertility seems to be not so great as it is in some other European countries. Indeed, since the mid-70's, the French fertility rate has been close to 1,9 children per woman and lifetime fertility has remained at around 2 children per woman.

As mortality declines and life expectancies at different ages increase, it affects many other aspects of individual life. Human life is lengthened and at the same time there are evolutions and changes in life courses. Overall, individuals take important steps later: average ages for important lifetime transitions have been steadily increasing in the last few decades.
French people enter working life later and leave it close to 62 years old (this would change with retirement reform): indeed, the participation to the labour market rates are very low for extreme age-groups compared with other European countries.
They marry less and later. Nevertheless the average number of children per woman has been stable, which infers a large proportion of births outside marriage.

Changes in mortality and life expectancies prompt the question on population health evolution: does an increase in quantity of life imply an increase in the quality of life? According to previous studies (Robine, Mormiche) French healthy life expectancy without disability increased between 1981 and 1991 in parallel with life expectancy.
In 1999, as in Robines' studies, life expectancies (at birth, in good health, without disability) are longer for women but the proportion of years in good health is smaller for women. This could be explained by the longer survival of women after disabilities appear.

Because of an increased probability of mental diseases, it would be important to take this into account, as for example in the work by Richie (see Dupâquier 1997 "life expectancy and mental health" by Richie K.).

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9 Annex

9.1 Data provided by LEGOS

- July 2002

Since February 2002, LEGOS has been trying to collect the data necessary for WP1 of the AGIR project. Some data have been collected easily and are enclosed. However, we have encountered some problems for life course and morbidity data.

In this presentation, we follow your data requirement order. Data files are Excel 2000.

1) Population

In *PopulationWP1.xls* the data collected are:

- Population for metropolitan France by age and gender, from age 0 up to 100 years, on 1st January, from 1950 up to 1998 (tables 1a, 1b and 1c).

Source is INSEE (National Institute of Statistical and Economic Studies)

- Population Projections for metropolitan France by age group and gender (Table 2) up to 2050. Projection hypotheses are: trend mortality, fecundity: 1.8, net migrations: + 50 000 per year

Source is INSEE, Insee Première n°762.

2) Survival and mortality, and 3) Life Expectancies

In *SurvDeath5097.xls* the data collected are:

- Survivors, deaths and life expectancy by age and gender from 1950 up to 1997 (tables 3a, 3b and 3c). There is a mortality table for each year from 1950 up to 1997.

In *SurvDeath982050.xls* the data collected are:

- Projections for survivors, deaths and life expectancy by age and gender from 1998 up to 2050 (tables 4a, 4b and 4c). There is a mortality table for each year from 1998 up to 2050.

Sources: INSEE, INED (National Institute of Demographic Studies): Vallin et Meslé, Tables de mortalité françaises et projections, Données statistiques, n°4-2001.

In *Deathswp1.xls* the data collected are:

- Number of deaths by age and gender from 1950 up to 1997 (tables 5a, 5b and 5c). Numbers of deaths at a given age x are divided into deaths in two cohorts: cohort g reaches age x within the year; cohort g-1 reaches age x within the previous year. The sum of the deaths in the two cohorts gives the number of deaths at a given age.

Sources: INSEE

According to other data on longevity (life endurance, median duration, modal life duration, maximum age): we didn't find direct information. However, life endurance and median duration might be deduced from mortality tables *SurvDeath5097.xls*; and, modal life duration from *Deathswp1.xls*.

We are less optimistic about maximum age. In all mortality tables the maximum age is 105.

4) Morbidity

Two surveys conducted by INSEE provide information on *perceived* health:

- The Living conditions Survey, May 1999 (Enquête permanente Conditions de vie (EPCV)). Persons interviewed for EPCV are representative of those living in households (institutions are not included)
- The National disability interview (HID) in which data have been collected separately for people living in institutions (HID-Institutions 1998) and in households (HID-Households 1999).
- The Katz indicator is available.

The national surveys do not include information on observed health. All indicators are declared by the respondents and not by doctors.

In *lifecourse.xls* the data collected are :

- Perceived health status in 1999, by age group and gender (table 6)

Source: Enquête permanente Conditions de vie (EPCV), mai 1999, INSEE

The Katz indicator distribution for the whole population will soon be available with the HID data.

If necessary, it might be possible to provide individual characteristics combined with perceived health status.
For data on disability we have information in the HID survey but we need more precision in the disability categories definition.

5) Life course

We found only partial life course data.
In *lifecourse.xls* the data collected are:

- average age at full-time school termination (table 7) for the 1940 and 1968 generations
- average age at retirement (table 8) from 1964 up to 1994
- median age at leaving parental home for 1963 and 1970 generations (table 9)
- average age at first birth (table 10)
- average age at first marriage (table 11)

- January 2003

The Katz indicator by HID

- March 2003

Widowedlegos.xls; morbiditylegos.xls

9.2 Handicaps, Impairments, and Dependency Survey (HID)

In France, concerning disability data, there are recent surveys carried-out by INSEE since 1998.

INSEE
Surveys periods : late 1998 and late 2000 for HID data collected in medical institutions
late 1999 and late 2001 for HID data collected at home
Scope: whole population (individuals with disabilities over-represented but representative after weighting)

Survey foci:	Trips
Cause and origin of disabilities	Education and degrees
Description of disabilities	Employment
Social and family environment	Income
Technical aids and housing adjustments	Leisure activities, holidays, culture
Housing conditions	Main carer (at home)

The emphasis of this survey is such that individuals with incapacities are over-represented. Nevertheless, the representativity problem can be corrected after weighting.

Two surveys are available :
- HID in institutions in 1998 (with weighting : 220 000 men and 419 000 women)
- HID at home in 1999 (with weighting : 22,7 millions of men and 24,4 millions of women)

In fact, this survey is composed of two samples of individuals :

- The first sample is concerning people living in institutions (medical or not). 15 000 individuals have been interviewed twice, in 1998 and in 2001. Nearly 70% of the first sample have been interviewed in the second wave. Some died between the two dates and others went back home.
- The second sample is concerning people living at home. 17 000 individuals have been interviewed twice in 1999 and in 2002.

The first wave of the INSEE survey HID was carried out in late 1998. It covered a sample of about 15 000 people living in institutions even temporarily, as is the case with many people treated for mental illness.
The institutions included homes for the elderly, homes for young and adult persons with disabilities, and psychiatric institutions. The same persons were surveyed again in late 2000.
“The HID survey looks at the effects of health problems on people's physical integrity, daily living, and social relationships. The emphasis is on social issues rather than medical ones—specifically, the technical and human assistance needs, and the assistance actually provided. The survey paints a broader picture of the health field without overstepping its bounds.” [*Extract from Mormiche 2001*]

In this survey, information about perceived disabilities is very rich. In particular, many mobility indicators are detailed, like abilities to dress oneself, to wash oneself, to feed oneself, …

These data allow three subjective indicators for psychiatric dependency and physical incapacity to be calculated.

Although this survey is rich in perceived health status indicators, there is little objective information. We can only find an individual invalidity rate used by official social security services in France to set social benefits.

Finally, the HID survey contains many personal characteristics too, such as education, household income and social situation.

9.3 Healthy life expectancies calculation

Sullivan method

Survivors and deaths by age and gender (100 000 cohorts)

- Life expectancy by age and gender - Men 1999

x	age
Sx	survivors at age x
D(x,x+a)	deaths between age x and age x+1
Ex	life expectancy at age x
P(x,x+a)	stationary population between age x and age x+1

NB: % in good health are given for age groups (0-14) (15-24) … (75-84), 85 or more

x	Sx	Ex	P(x,x+a)	% good health	# years in good health	HLE	LE-HLE	%HLE
0	100000	75,15	99757	0,875	87500	57,28	17,87	0,76
1	99514	74,51	99492	0,875	87074,75	56,68	17,83	0,76
2	99470	73,54	99456	0,875	87036,25	55,83	17,71	0,76
3	99442	72,56	99432	0,875	87011,75	54,97	17,59	0,76
4	99422	71,58	99413	0,875	86994,25	54,11	17,47	0,76
5	99404	70,59	99396	0,875	86978,5	53,24	17,35	0,75
6	99387	69,6	99379	0,875	86963,625	52,38	17,22	0,75
7	99371	68,61	99364	0,875	86949,625	51,51	17,10	0,75
8	99357	67,62	99351	0,875	86937,375	50,64	16,98	0,75
9	99344	66,63	99336	0,875	86926	49,77	16,86	0,75
10	99329	65,64	99322	0,875	86912,875	48,91	16,73	0,75
11	99316	64,65	99310	0,875	86901,5	48,04	16,61	0,74
12	99304	63,66	99295	0,875	86891	47,17	16,49	0,74
13	99287	62,67	99277	0,875	86876,125	46,30	16,37	0,74
14	99266	61,68	99250	0,875	86857,75	45,44	16,24	0,74
15	99235	60,7	99215	0,916	90899,26	44,58	16,12	0,73
16	99195	59,73	99169	0,916	90862,62	43,68	16,05	0,73
17	99143	58,76	99113	0,916	90814,988	42,78	15,98	0,73
18	99082	57,79	99040	0,916	90759,112	41,89	15,90	0,72
19	98998	56,84	98949	0,916	90682,168	41,01	15,83	0,72
20	98899	55,9	98851	0,916	90591,484	40,14	15,76	0,72
21	98803	54,95	98747	0,916	90503,548	39,26	15,69	0,71
22	98692	54,01	98639	0,916	90401,872	38,39	15,62	0,71
23	98586	53,07	98529	0,916	90304,776	37,51	15,56	0,71
24	98472	52,13	98416	0,916	90200,352	36,64	15,49	0,70
25	98360	51,19	98307	0,912	89704,32	35,76	15,43	0,70

26	98253	50,25	98197	0,912	89606,736	34,89	15,36	0,69
27	98140	49,3	98082	0,912	89503,68	34,01	15,29	0,69
28	98023	48,36	97969	0,912	89396,976	33,14	15,22	0,69
29	97914	47,41	97855	0,912	89297,568	32,26	15,15	0,68
30	97796	46,47	97732	0,912	89189,952	31,39	15,08	0,68
31	97669	45,53	97604	0,912	89074,128	30,52	15,01	0,67
32	97539	44,59	97470	0,912	88955,568	29,65	14,94	0,66
33	97402	43,65	97334	0,912	88830,624	28,77	14,88	0,66
34	97267	42,71	97193	0,912	88707,504	27,90	14,81	0,65
35	97119	41,78	97037	0,865	84007,935	27,03	14,75	0,65
36	96956	40,85	96869	0,865	83866,94	26,21	14,64	0,64
37	96782	39,92	96689	0,865	83716,43	25,39	14,53	0,64
38	96595	39	96494	0,865	83554,675	24,57	14,43	0,63
39	96393	38,08	96281	0,865	83379,945	23,76	14,32	0,62
40	96168	37,16	96053	0,865	83185,32	22,95	14,21	0,62
41	95939	36,25	95806	0,865	82987,235	22,13	14,12	0,61
42	95674	35,35	95529	0,865	82758,01	21,33	14,02	0,60
43	95384	34,46	95225	0,865	82507,16	20,52	13,94	0,60
44	95066	33,57	94899	0,865	82232,09	19,72	13,85	0,59
45	94732	32,69	94553	0,768	72754,176	18,93	13,76	0,58
46	94375	31,81	94180	0,768	72480	18,23	13,58	0,57
47	93985	30,94	93774	0,768	72180,48	17,53	13,41	0,57
48	93563	30,08	93340	0,768	71856,384	16,84	13,24	0,56
49	93116	29,22	92867	0,768	71513,088	16,15	13,07	0,55
50	92618	28,37	92358	0,768	71130,624	15,46	12,91	0,55
51	92099	27,53	91825	0,768	70732,032	14,78	12,75	0,54
52	91552	26,69	91262	0,768	70311,936	14,09	12,60	0,53
53	90972	25,86	90651	0,768	69866,496	13,41	12,45	0,52
54	90330	25,04	89997	0,768	69373,44	12,73	12,31	0,51
55	89664	24,22	89309	0,606	54336,384	12,05	12,17	0,50
56	88954	23,41	88570	0,606	53906,124	11,54	11,87	0,49
57	88186	22,61	87790	0,606	53440,716	11,03	11,58	0,49
58	87393	21,81	86944	0,606	52960,158	10,52	11,29	0,48
59	86494	21,03	86007	0,606	52415,364	10,01	11,02	0,48
60	85520	20,27	85011	0,606	51825,12	9,51	10,76	0,47
61	84503	19,5	83946	0,606	51208,818	9,02	10,48	0,46
62	83389	18,76	82783	0,606	50533,734	8,52	10,24	0,45
63	82177	18,03	81522	0,606	49799,262	8,03	10,00	0,45
64	80868	17,31	80177	0,606	49006,008	7,55	9,76	0,44
65	79486	16,6	78752	0,469	37278,934	7,06	9,54	0,43
66	78017	15,91	77245	0,469	36589,973	6,72	9,19	0,42
67	76473	15,22	75619	0,469	35865,837	6,37	8,85	0,42
68	74764	14,55	73889	0,469	35064,316	6,04	8,51	0,42
69	73013	13,89	72068	0,469	34243,097	5,70	8,19	0,41
70	71124	13,25	70121	0,469	33357,156	5,37	7,88	0,41
71	69118	12,62	68063	0,469	32416,342	5,05	7,57	0,40
72	67009	12	65894	0,469	31427,221	4,72	7,28	0,39
73	64780	11,39	63609	0,469	30381,82	4,40	6,99	0,39
74	62437	10,8	61236	0,469	29282,953	4,08	6,72	0,38
75	60034	10,21	58759	0,363	21792,342	3,75	6,46	0,37
76	57483	9,64	56173	0,363	20866,329	3,54	6,10	0,37

77	54862	9,08	53479	0,363	19914,906	3,33	5,75	0,37
78	52095	8,54	50612	0,363	18910,485	3,13	5,41	0,37
79	49129	8,02	47605	0,363	17833,827	2,93	5,09	0,37
80	46081	7,52	44501	0,363	16727,403	2,74	4,78	0,36
81	42921	7,04	41283	0,363	15580,323	2,55	4,49	0,36
82	39646	6,58	37999	0,363	14391,498	2,37	4,21	0,36
83	36353	6,13	34642	0,363	13196,139	2,18	3,95	0,36
84	32931	5,71	31234	0,363	11953,953	2,01	3,70	0,35
85	29536	5,31	27834	0,316	9333,376	1,84	3,47	0,35
86	26133	4,94	24478	0,316	8258,028	1,72	3,22	0,35
87	22822	4,58	21214	0,316	7211,752	1,61	2,97	0,35
88	19606	4,25	18062	0,316	6195,496	1,50	2,75	0,35
89	16517	3,95	15059	0,316	5219,372	1,41	2,54	0,36
90	13600	3,69	12323	0,316	4297,6	1,32	2,37	0,36
91	11046	3,43	9895	0,316	3490,536	1,24	2,19	0,36
92	8745	3,2	7781	0,316	2763,42	1,17	2,03	0,37
93	6816	2,97	6019	0,316	2153,856	1,09	1,88	0,37
94	5222	2,72	4546	0,316	1650,152	1,01	1,71	0,37
95	3869	2,49	3281	0,316	1222,604	0,94	1,55	0,38
96	2692	2,37	2250	0,316	850,672	0,90	1,47	0,38
97	1808	2,28	1499	0,316	571,328	0,87	1,41	0,38
98	1190	2,21	989	0,316	376,04	0,84	1,37	0,38
99	789	2,07	639	0,316	249,324	0,80	1,27	0,38
100	489	2,04	400	0,316	154,524	0,77	1,27	0,38
101	311	1,92	255	0,316	98,276	0,72	1,20	0,38
102	199	1,71	154	0,316	62,884	0,63	1,08	0,37
103	109	1,71	84	0,316	34,444	0,58	1,13	0,34
104	58	1,77	46	0,316	18,328	0,50	1,27	0,28
105	33	1,7	57	0,316	10,428	0,32	1,38	0,19