
Supercentenarians in France

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Abstract. Three data sources can be used to enumerate French supercentenarians: a list of names compiled from personal archives, death records from vital statistics, and transcripts of individual records from the RNIPP (Répertoire national d'identification des personnes physiques, or National Identification Register of Private Individuals). None of these three sources is exhaustive. A comparison with the English list of supercentenarians shows that the list of names is quite incomplete. Vital statistics contain a lot of erroneous cases due to inaccuracy in the registration of age at death. Furthermore, until 1987, the French National Institute for Statistics and Economic Studies (Institut National de la Statistique et des Études Économiques, or INSEE) deemed all ages at death exceeding 109 to be unacceptable, and did not record any death beyond that age. The RNIPP is the most reliable source. Among the 83 cases of persons who died at age 109+, the age at death was found to be correct for 67 and false for four, while 12 cases have still not been completely investigated. The age at death was verified by checking dates at both the birthplace and the place of death. By comparing cases from the RNIPP to cases from the list of names, the deaths of 46 supercentenarians were confirmed from 1987 to 2000.

In recent decades, the number of centenarians has increased considerably in industrialized countries. In France, the number of centenari-

ans rose from about 200 in 1954, to more than 1,000 in 1970; by 1990, the number had reached 3,500 (Labat and Dekneudt, 1989), and, by 2000, it had exceeded 8,000. According to INSEE's latest estimates, on the first of January of the year 2008, there were more than 20,000 centenarians. According to the central scenario of the most recent INSEE projections they would be more than 30,000 in 2030 and more than 60,000 in 2050 (Robert-Bobée, 2006). Depending on constant or low mortality scenarios, the number of centenarians expected by 2050 varies from 32,000 to 330,000.

Mortality being high at very advanced ages, most centenarians do not survive very long. However, the more centenarians increase in number, the more likely it is that some will reach 110 or even more, leading to the emergence and gradual expansion of a new age group: the supercentenarians. The study of this phenomenon is important for two main reasons: not only because of the emergence of a new age group in itself, but because the growing number of its members should make it possible to measure mortality well after the age of 100, and hence, answer the controversial question of how the mortality curve develops at very advanced ages.

Up until the creation of the International Database on Longevity (IDL), to which France is a contributor⁶, supercentenarians had not been well identified in France, either by amateur research or in official statistics. True, the wide-ranging IPSEN survey on centenarians was conducted in the early 1990s (Allard, 1991; Allard et al, 1996), but the follow-up on the cohorts included in this sample provided no more than a partial view of the issue. This article is based on three different sources, each looking at a different angle of reality with varying degrees of accuracy and coverage: a partial list of supercentenarians identified by name, either through the IPSEN survey or through the press; a listing of deaths taken from death statistics; and a transcript from the *Répertoire national d'identification des personnes physiques* (RNIPP). We will discuss the validity of these three sources and how we can make the most of their respective strengths for the purposes of this computation with the help of a validation procedure.

⁶ The French participation in the IDL is financed by INSERM (ACT Longévité) and by INED (Mortality, Health, Epidemiology Research Unit)

1 Presentation of the data

1.1 An incomplete list of names

It was possible to compile an initial list of supercentenarians thanks to the personal archives of Dany Chambre, a Belgian doctor who for many years has been collecting documents and articles in the press on cases of exceptional longevity in different countries of Europe; and also owing to the systematic detection of centenarians launched in the early 1990s by the IPSEN Foundation (Allard et al., 1996). On July 1, 2005, this list included 37 persons: 33 women and four men whose birth dates had been verified as being correct. Of these persons, three were alive at that date, while the others had died between 1977 and 2005 (see Table 1). During the 1990s, the French media's attention was drawn to centenarians by several events: the survey launched in 1989 by the IPSEN Foundation, "*A la recherche du secret des centenaires*" ("In search of the secret of centenarians"), which drew the attention of the media and of the medical profession; the "*Chronos*" operation of the Jean Dausset Foundation and the Center for the Study of Human Polymorphism (*Centre d'étude du polymorphisme humaine*, or CEPH), which conducted its first study in the early 1990s; the operation "*Les vénérables*" of the IPSEN Foundation, which in the mid-1990s sought to identify, with the help of the press, the oldest persons living in each region of France; the exceptional case of Jeanne Calment, who broke all records for many years before dying at the age of 122 in 1997—a death that was followed by a search for the next oldest person in France. For these various reasons, French supercentenarians are well-known in the media. But, since the end of the 1990s, few new cases have been mentioned in the press. Beyond the search for new record-breaking ages, which have been difficult to find since Jeanne Calment, the French media has shown little interest in supercentenarians; it is also true that, after the excessive media coverage of Jeanne Calment's case, some families prefer to keep secret and protect their elderly members.

As can be easily seen by comparing the results of Table 1 to similar statistics obtained in England and Wales on the basis of a list of names of supercentenarians from the General Register Office (see Thatcher, 2001 and the chapter on England and Wales), the French table is incomplete. Even if France and England and Wales are not strictly comparable, their populations are about the same, and the health situation in both countries has been very similar for over a century. However, 41 supercentenarians were identified in England and Wales before 2000, and only 27 in France for the same period. Figure 1 also shows that the

Table 1. Distribution per sex, year-of-birth group and year-of-death group of the 37 supercentenarians identified in the list of names

Year of birth	1975-		1980-		1985-		1990-		1995-		2000-		Alive on 01.07.2005	Total
	1979	1984	1989	1994	1999	2004								
Males														
1865-1869	1													1
1870-1874														
1875-1879					1									1
1880-1884								1						1
1885-1889								1						1
1890-1894														
1895														
Total	1				1			2						4
Females														
1865-1869	5	1												6
1870-1874		2	1											3
1875-1879			2	2	1									5
1880-1884				4	1									5
1885-1889					4	2								6
1890-1894						5	2							7
1895												1		1
Total	5	3	3	6	6	7	3							33
Total														
1865-1869	6	1												7
1870-1874		2	1											3
1875-1879			2	3	1									6
1880-1884				4	2									6
1885-1889					5	2								7
1890-1894						5	2							7
1895												1		1
Total	6	3	3	7	8	7	3							37

observed cases are not distributed over time in the same way. Whereas in France, no deaths of supercentenarians were detected before 1977, the English list begins in 1968. In addition, although the number of supercentenarians was about the same in France and in England in 1980, since that date there have been fewer in France than in England. It would seem that the French list of names of supercentenarians established in 2005 does not include the earliest cases, which must have appeared in the 1960s, and underestimates more recent deaths of supercentenarians.

Similarly, the distribution of deaths of persons aged over 110, depending on the year of birth of the deceased, shows that the French

list begins only with the 1866 cohort (England goes back to 1856), and underestimates the more recent cohorts (see Figure 2).

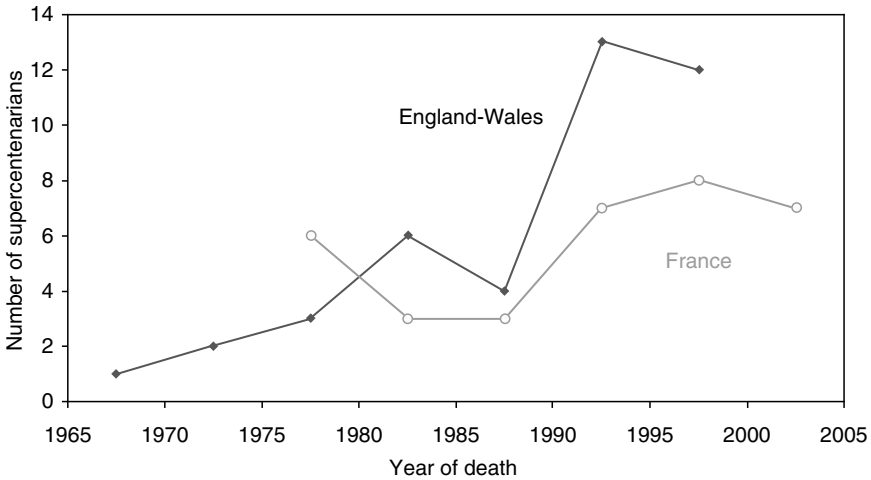


Fig. 1. Trends in the number of deaths at ages over 110 since 1965 in England-Wales and in France

In fact, looking at Figure 3 (restricted to deaths before 2000), it seems that the gaps in the French list concern mainly the deaths of ‘younger’ supercentenarians. Indeed, the number of persons who died at age 110, and, especially, at age 111, is much smaller in France than in England. This may be simply due to the collection method, which is based mainly on the notoriety of these cases—the more advanced the age, the more the curiosity of the public will be aroused and the more likely it is that the case will be mentioned in the press. In addition, we observe a crucial deficit at the age of 111, since the round number of 110 attracts more attention.

For these reasons, before attempting to estimate mortality at those ages, we found it necessary to complete this initial database through other sources of information.

1.2 Individual death records from vital statistics

Since the 1960s, each statistical record transmitted to INSEE at the time of death has been individually entered in a computer database.

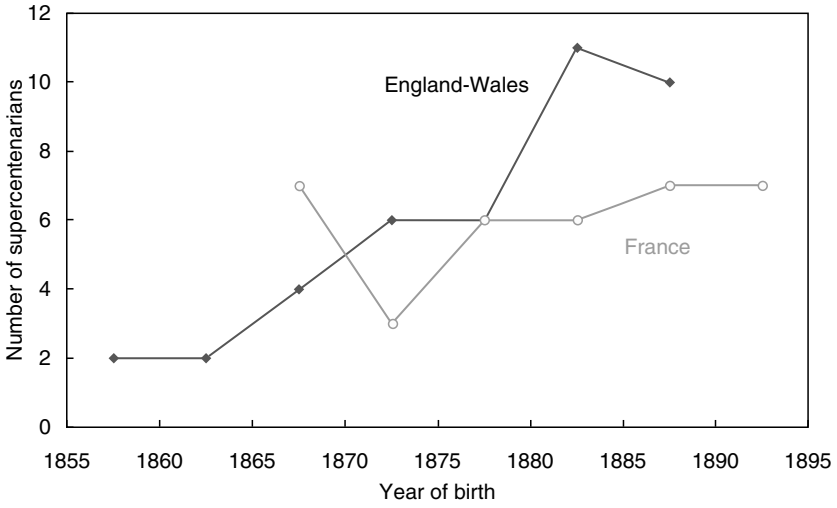


Fig. 2. Distribution of deaths at ages over 110 according to the group of birthdates in England-Wales and in France

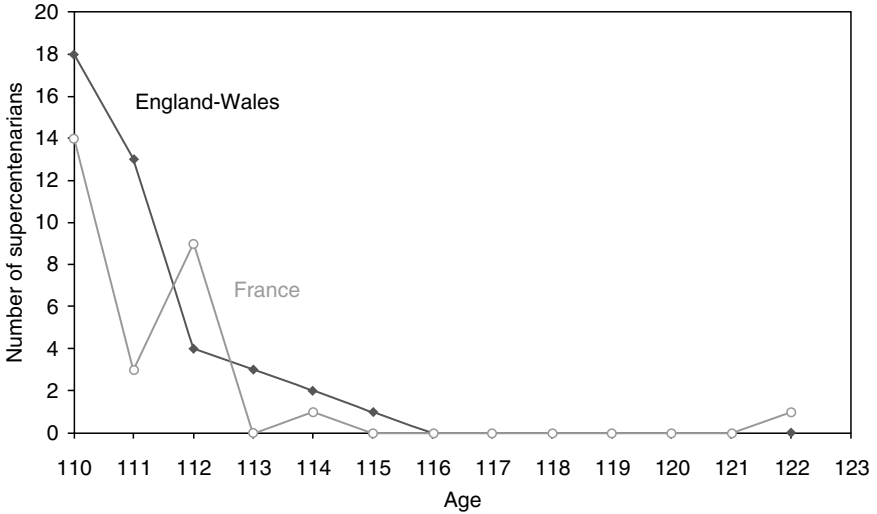


Fig. 3. Distribution of deaths at ages over 110 depending on age at death in England-Wales and in France (excluding recent years after 2000)

In 1999, we obtained a listing of these computer records, which comprised all the deaths of persons aged over 90 between 1968 and 1997⁷ (Meslé et al., 2000). Among them, we found 53 supercentenarians (40 women and 13 men). This database was then completed for the years 1998 to 2003, during which 34 female supercentenarians and 10 male supercentenarians died. Thus, for the entire 1968-2003 period, we counted 97 deaths of supercentenarians recorded by vital statistics (74 women and 23 men). However impressive this figure may be, compared to the 37 deaths drawn from the previous list of names, and to the 41 deaths observed in England and Wales over a longer period (1950-1999), it is nonetheless far from accurate for obvious reasons, among which is the fact that we do not find any record of a death at age 122—this means that Jeanne Calment, who died at 122 on August 4, 1997, is not included in the list. But a greater cause for concern, statistically speaking, is the fact that no death over age 110 appears in the statistics prior to 1988. The reason for this also provides the explanation for Jeanne Calment's absence from the records. Indeed, until 1987, INSEE considered all ages at death exceeding 109 to be unacceptable, and did not record any death beyond that age; however, INSEE does not specify in what way the deaths reported at ages 110 and over had been statistically processed. This rule was somewhat modified in 1988, but only by pushing the limit to 119. Thus, an unknown number of deaths of supercentenarians have remained unrecorded by vital statistics.

If, despite these problems, 97 supercentenarians were identified by vital statistics over a period of 15 years (1988-2003), we may suppose that in some cases the ages were exaggerated. Indeed, the age, or rather the date of birth indicated on the statistical death record, is a simple declaration, and its authenticity is not verified. It is a known fact that the age of very old persons is often exaggerated, even in countries where vital statistics have existed for several centuries and where birthdays are traditionally celebrated every year. It is perfectly possible that some of the persons who supposedly died at ages older than 110 were not that old in reality. This suspicion is all the more justified since French statistics pertaining to deaths at ages over 110 seem to show a strong bias in favor of the male sex: 23 out of 97, or almost one-quarter, of the cases were men. In England and Wales, among the 41 cases recorded over the 1950-1999 period, only two were males (less than 5%). Meanwhile, in the French list of names mentioned above, there

⁷ We are especially grateful to Laurent Toulemon, who was then head of the division of surveys and demographic studies, and who enabled us to obtain these documents.

were only four males, for a total of 37 (10%). The overestimation of ages in vital statistics remains an important problem. In particular, we may suspect that the deaths observed at ages 124 and 120 in 1998 and in 1999, respectively, are due to this type of error.

In order to use this source of information, the exactitude of the date of birth declared at the town hall of the birthplace must first be checked for each supercentenarian death, a process requiring access to individual records by name, something which is not directly possible with vital statistics. On the other hand, we obtained in 2004 permission from the *Commission Nationale de l'Informatique et des Libertées* (CNIL) to access transcripts of individual records of the RNIPP.

1.3 Transcripts of individual records from the RNIPP

The RNIPP was created along with INSEE in 1945, on the basis of individual files drawn up during World War II by the *Service national de la statistique* (see Appendix).

The RNIPP covers all persons born in France, as well as persons born abroad and living in France, and who have requested a social security number. Since the RNIPP was first and foremost designed for administrative purposes and for the certification of the civil status of individuals, persons born outside of France are registered only if their status warrants it. This database first existed in paper form and was kept in the regional offices of INSEE; in the early 1970s it was computerized and centralized, but it was limited to persons born after 1890⁸ (or 1900 for the overseas departments). For persons belonging to older cohorts, the paper listings were preserved in microfiches; they are no longer systematically updated.

The list of persons born in France before 1945 was drawn up by copying birth registers. For later generations, the RNIPP is updated through statistical birth records. Persons born abroad or in overseas territories are included in this listing only when they request a social security number. Deaths are taken into account owing to the death notification form “7 bis” for persons deceased in France. Deaths occurring abroad are accounted for only when they are declared at the French consulate.

This register does not measure mortality with perfect accuracy. In particular, for generations born before 1946, many deaths prior to 1945

⁸ In fact, persons born before 1945 and who died before computerization were not kept in the computer files. Nonetheless, these files do include persons born before 1891 if they are listed in voting registration files or were listed there in the early 1990s.

were ignored (wartime deaths, departures abroad) and, as a result, some persons are wrongly listed in the RNIPP as being alive. Among the cohorts which are now over 90, the number of persons who were supposedly still alive on January 1, 2005 is quite overestimated. On the other hand, the quality of the information concerning the date of birth is higher than that found in the death records of vital statistics, since this date is already specified in the RNIPP regardless of the report made at the time of death.

In early 2001, INSEE gave us a list of names of 83 persons who died between 1987 and 2000,⁹ and for whom, according to the RNIPP, there was a difference of at least 110 years between their date of birth and date of death. Among the 83 persons, there were 75 women and eight men¹⁰. Of course, some had not yet celebrated their 110th birthday and were thus 'only' 109 years old at the time of their death. For each of these cases, the information provided by INSEE concerned data that was more than 100 years old¹¹: name, first name, date, and place of birth. Despite the fact that the information concerning the date of birth given in the RNIPP is probably correct, all the deaths of persons aged 109 and over were systematically checked.

2 Validation of the RNIPP data

In order to determine the validity of the information provided by the RNIPP concerning the deaths of supercentenarians, we must first assess whether the information (in this case, the age) is correct; i.e., we must assess the *specificity* of the observation. Second, we must determine whether the collection system is exhaustive; i.e., we must assess its *sensitivity*.

We first evaluated the specificity of the RNIPP by checking the information concerning the person's birth at the town hall of his or her birthplace, and by taking note of his or her date and place of death

⁹ It seems that deaths of persons aged over 110 were not registered in the RNIPP before 1987.

¹⁰ Recently, INSEE gave us a second list of names of 3,272 persons born in 1883 and thereafter, and who supposedly died after their 104th birthday, beginning in 1988. This second list brings in a few new cases of supercentenarians who died after 2000, but the results shown here only pertain to the first list, for which all necessary verifications were made. The new list contains the dates and places of death as we get official permission from the CNIL.

¹¹ Civil status information more than 100 years old is accessible without confidentiality limitations. However, a request of permission to gather this information has been submitted to the "Informatique et Liberté" Committee.

indicated on the birth record. We then turned to the town hall of the commune where the person had died in order to obtain the exact time of death, which, for confidentiality reasons, INSEE had been unable to provide with the 2001 list. These two pieces of information, date of birth and date of death, enabled us to determine whether the age at death of the given person had been correctly recorded.

Second, to evaluate the sensitivity of the RNIPP, we compared all the deceased persons of the RNIPP, who were identified as real supercentenarians, to the supercentenarians included in the list of names (Section 1.1) who had died during the same period. Clearly, this list of names does not represent a “gold standard” since it cannot be used to measure precisely the sensitivity of the list provided by INSEE. In particular, we are aware that this initial list of names is incomplete. In any case, the proportion of cases mentioned in the media and also known to INSEE provides an idea of the sensitivity of the INSEE list.

2.1 Reliability of the RNIPP data

We were able to verify the ages of 71 individuals out of a total of 83 by checking dates at both the birthplace and the place of death (86% of cases). For the other 12 cases (14%), the verification process at the local town halls remains unfinished (see Table 2).

There is a larger proportion of men (three men to nine women, or 25%) among the 12 cases for which we were unable to check the age, than among those for whom the age was verified (five men to 66 women, or 7%); this leads us to believe that for many unverified cases, the age was exaggerated at the time of the notification of death, since we know that this type of bias usually tends to affect men. In addition, there is a high proportion among the unverified cases of persons born outside of metropolitan France (nine out of 12), and, in particular, a high proportion of persons born in Algeria. Indeed, verifications are particularly difficult to carry out for persons born abroad for several reasons: first, because the information pertaining to the place of birth in the RNIPP is less precise when the event took place outside of metropolitan France; and, second, because in some countries the vital statistics system is not as old and reliable as it is in France. This high proportion of foreign births may partly explain the high proportion of men, since these generations of immigrants in France were mostly male, but it also calls into question the ages registered for the 12 unsubstantiated cases. Nonetheless, only four of these files cannot be verified at all, while the others are still being researched.

Table 2. Distribution of the 83 persons who supposedly died at 109 and over between 1987 and 2000, according to the Répertoire national d'identification des personnes physiques (RNIPP) of the INSEE, after validation

	Males	Females	Both sexes	in %	
Age checked					
Age validated					
109	2	24	26		
110+	2	39	41		
<i>Sub total</i>	4	63	67	94.4	
Age invalidated					
89	1		1		
95		1	1		
103		1	1		
104		1	1		
<i>Sub total</i>	1	3	4	5.6	
Sub total	5	66	71	100	85.5
Age unchecked					
Sub total	3	9	12	100	14.5
Total	8	75	83		100

Out of the 71 cases for which we checked the ages, 67 individuals (94% of the verified cases) had actually reached age 109 or above, and 41 were age 110 or above at the time of death. Only four cases were errors (6%), with real ages under 109 (respectively, 89 instead of 113, 95 instead of 113, 103 instead of 113, and 104 instead of 114) (see Table 2). None of these errors applied to the year of birth. In the four cases, the date of death was incorrect and the error was made during entry: in two cases, 1992 was entered instead of 1982; in one case, 1992 was entered instead of 1974; and in one case, 1990 was entered instead of 1966. These errors artificially lengthened these persons' life spans (twice by 10 years, once by 18 years, and once by 24 years), creating fake supercentenarians and reducing the specificity of the RNIPP data. The opposite error, one that would reduce the life span, cannot be observed here; this error would lead to the exclusion of real supercentenarians. This problem concerns the evaluation of the sensitivity of RNIPP data, and will be discussed in the following section.

Table 3 provides results in terms of specificity. If, for all the deaths at ages 109 and over, the specificity of the RNIPP is 94%, it is only 91% for all deaths at ages 110 and over because all the errors concern supercentenarians. In addition, it varies according to sex. At ages 110 and over, 93% of the observations are correct for women, compared with only 67% for men. It is true that, due to the small sample size, the estimation of specificity is not very precise for men.

Table 3. Specificity of the INSEE list of persons who supposedly died at 109 or over between 1987 and 2000, according to the Répertoire national d'identification des personnes physiques (RNIPP) and on the basis of 71 validated cases

Validation	109 years and over			110 years and over		
	Females	Males	Both sexes	Females	Males	Both sexes
TRUE	63	4	67	39	2	41
FALSE	3	1	4	3	1	4
Total	66	5	71	42	3	45
Specificity	0.95	0.8	0.94	0.93	0.67	0.91

2.2 Sensitivity of the RNIPP data

Each of the 41 cases of death at ages 110 or over listed in the RNIPP was compared and checked against the 21 deaths which occurred between 1987 and 2000 among the supercentenarian deaths of the initial list of names. This comparison made it possible to evaluate the RNIPP's capacity to detect supercentenarians, i.e., its sensitivity (see Table 4). Overall, 46 cases of deaths of supercentenarians were identified either through the RNIPP or through the initial list of names. Sixteen supercentenarians were found in both sources, another 25 were identified through the RNIPP only, and five were in the initial list of names only. On this partial basis, the sensitivity of the RNIPP was established at 89%.

Once again, we observe a considerable difference between the sexes (91% for females and 67% for males), but the male estimate is not very accurate given the very small number of cases.

As may be observed, the five cases unknown to INSEE belong to the first part of the period under consideration (1987, 1989, 1990, 1991, and 1992). For these older cases, this lack of sensitivity is most likely due to

Table 4. Sensitivity of the RNIPP regarding deaths of persons aged 110 or more between 1987 and 2000

Both sexes			
<i>RNIPP</i>	<i>Name list</i>		
	Yes	No	Total
Yes	16	25	41
No	5	-	5
Total	21	25	46
Sensitivity			0.89
Males			
<i>RNIPP</i>	<i>Name list</i>		
	Yes	No	Total
Yes	2	0	2
No	1	-	1
Total	3	0	3
Sensitivity			0.67
Females			
<i>RNIPP</i>	<i>Name list</i>		
	Yes	No	Total
Yes	14	25	39
No	4	-	4
Total	18	25	43
Sensitivity			0.91

errors made in the RNIPP entries concerning the year of birth or year of death. Indeed, as we have seen above, this type of error can lead to the exclusion of real supercentenarians. The ideal solution would now be to research the birth and death dates entered for these individuals in order to find out where the error lies. The differences between periods suggest that the sensitivity of the list has probably improved over time, and that, currently, it may be higher than shown in Table 4. But the opposite may also be true, since sensitivity is estimated here on the basis of an initial list of names which in no way represents a perfect 'gold standard'.

This evaluation of the quality of INSEE data pertaining to very advanced ages reflects the general quality of this data. The list of supercentenarians deceased between 1987 and 2000 provided by INSEE through the RNIPP has a specificity of 94% and a sensitivity of 89%, which is, globally, quite satisfactory. From another point of view, these scores mean that 6% of the deaths that occurred at ages 109 and over according to INSEE in fact occurred earlier, and that 11% of deaths of

supercentenarians are not recorded by INSEE. These figures may seem considerable to anyone studying mortality trajectories between 110 and 120 years and wishing to establish the correct numerators and denominators in order to calculate precise mortality rates. Furthermore, this data suggests that the sensitivity of INSEE data is clearly improving. There is also the question of the 'immortals,' i.e., persons who are never crossed off the lists. There could be among them real supercentenarians whose deaths were never registered by the RNIPP.

Even if we cannot generalize the results of this validation procedure to lists from other countries where specificity and sensibility may be different, this first study provides us with an idea of the quality of the data at very advanced ages in a country which has had a vital statistics system for a very long time. In any case, even in a country with a vital statistics system of supposedly good quality, simple death statistics are not sufficient to estimate mortality rates at very advanced ages (Meslé et al, 2000). For anyone wishing to work with data which are as reliable and complete as possible, it seems impossible to do without national population registers, such as the RNIPP, which link together birth and death data on an individual basis. However, we recommend that after the validation procedure, the data found in such registers be checked at the places of birth and death in order to determine their specificity. We also recommend, with a view to evaluating the sensitivity of the data, the comparison of validated cases with cases known through the media.

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Appendix

The RNIPP, a precious source of information for longitudinal mortality analyses

The National Identification Register of Private Individuals (Rèpertoire national d'identification des personnes physiques, or RNIPP) was created at the same time as the National Institute for Statistics and Economic Studies (Institut National de la Statistique et des Études Économiques, or INSEE). The RNIPP is based on the files established during World War II by the Service national de la statistique (SNS, which replaced the Statistique générale de la France, or SGF, during the war) under the directorship of R. Camille. The decree n47-834 of 13 May, 1947 (article 6) entrusted INSEE with the task of “drawing up and updating the inventories of the statistical and demographic units, and constituting registers of identification.” By giving each individual a number which theoretically never changes, this system makes it possible to identify persons without error, a useful tool for social and fiscal administrative purposes.

The RNIPP includes all persons born in France, as well as persons born abroad but living in France and who have requested a social security number¹². Since the RNIPP is first and foremost an administrative instrument designed for the certification of the civil status of individuals, persons born outside of France are listed only when necessary. The RNIPP was first constituted as a set of paper files kept in the INSEE's regional offices, but in the early 1970s it was computerized and centralized, and limited to persons born after 1890¹³ or 1900 for the overseas departments (DOM). For persons belonging to older generations, the paper files were kept in the form of microfiches, but they are no longer systematically updated.

¹² In 1988, INSEE transferred the section of the RNIPP devoted to persons born in overseas territories (TOM) or abroad to the national pension fund (CNAV) and retained the persons born in metropolitan France or in the overseas departments (DOM).

¹³ In fact, persons born before 1945 and deceased before computerization were not kept in the computer files. However, the files do contain persons born before 1891 if they are on voter registration lists or were on these lists in the beginning of the 1990s.

Following the 1978 law “Informatique et Libertés,” the decree n82-103 of January 22, 1982 specifies the contents of the RNIPP (see textbox).

The RNIPP includes only the following items pertaining to the civil status of each listed person:

1. Name and given names
2. Sex
3. Date and place of birth
4. Date and place of death
5. If possible, the numbers of the birth and death certificates
6. If necessary to identify a person, in particular in the case of homonyms, the names of the parents and the married name.

The RNIPP also includes:

- A registration number described in article 4
- Indications necessary for the application of article 9
- Any modifications made in the civil status of the registered persons

For persons born in France before 1945, the RNIPP was established by copying the data kept in birth registers. For later cohorts, the data is provided by the birth records that the IGREC (Instruction Générale Relative l'État Civil, or General Instruction Concerning Civil Status, issued by the Ministry of Justice) requests that the municipalities of cities of birth complete at the same time as the birth certificate¹⁴. Persons born abroad or in the overseas territories are included in the list only when they request a social security number. Deaths are accounted for thanks to the “death notification form 7 bis”, for deaths occurring in France. Those occurring abroad and reported at the French consulate are also entered in the RNIPP.

The information pertaining to an individual recorded in the RNIPP may also be changed due to other events: recognition of an illegitimate child or a subsequent marriage legitimizing a birth can lead to a name change, full adoptions also require some modifications in order to prevent access to information which must be kept secret.

As it stands, the RNIPP is not frequently used in demographic research. If it were complete and if the information were perfectly accurate, it could be an excellent tool for measuring the mortality of persons born in France. However, this is not the case. In particular, as regards

¹⁴ Today, most municipalities that have maternity wards are computerized, and the information concerning a birth and entered in the statistical records is often directly transmitted through the computer system.

the cohorts born before 1946, many deaths which occurred prior to 1945 are not indicated (deaths during wartime, departures abroad); as a result these persons are registered as being alive. Among the cohorts older than 90, the number of persons supposedly alive as of January 1st, 2000 is overestimated and the mortality level is thus underestimated. The RNIPP could be used for cohorts born after 1945, but there is little point in using it since mortality can be measured with traditional methods; that is, by comparing the number of deaths given by vital statistics with the total population figure known through censuses or intercensal estimates.

On the other hand, the RNIPP can be effectively used with Vincent's extinct generations method. Indeed, the information concerning the date of birth is of higher quality than that found in death statistics. If we take into account the fact that very old persons who were born in France rarely travel abroad, the RNIPP allows, or rather will allow, a near perfect reconstruction for the cohorts born after 1890, since these generations are not yet extinct.

The RNIPP is a more useful tool for demographic studies when it is combined with other sources. It is often used for longitudinal mortality studies, and also to ensure the good quality of the permanent demographic sample (EDP)¹⁵. The way the RNIPP has been used in French longitudinal studies is rather interesting; a sample of persons is selected through a census, their complete identities are established by checking with vital statistics, with the agreement of the CNIL (Commission Nationale de l'Informatique et des Libertés, or National Commission for Data protection and the Liberties); these identities and birth dates are then once again verified in the RNIPP. Once the sample has been defined, the deaths occurring among this group are periodically recorded; this makes it possible to measure mortality in the context of the information collected during the census. These studies thus benefit from the advantages of both sources. The RNIPP is incomplete as concerns the record of events, but the dates of birth and death are accurate. On the contrary, the census contains errors in dates (reporting errors, omissions, errors when entering the information on the computer), but its coverage is excellent.

¹⁵ For all the persons born on one of four days of the year (about 1%), the EDP collates all the information collected during censuses (beginning with the 1968 census) and from vital statistics records. Professional or geographical mobility studies can thus be conducted by comparing individual situations at different dates; methodological studies can be conducted for example through comparison of information stemming from various sources or collected at different times, which in theory should be identical.

Using this method, a study of mortality at very advanced ages is now under way: the civil status of all women aged over 97 and males aged over 93, and of a sample of slightly younger men and women, was collected in the 1999 census, and identified in the RNIPP. Very soon, we will be able to measure the mortality since 1999 of the persons who were identified in the RNIPP.