

Extreme longevity in the past : validation of centenarians who died before WWI

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Abstract

The validation of the ages of alleged centenarians is essential for scientific research in demography, genetics, epidemiology, and medicine. Age inaccuracy was often observed in past populations, and is still commonly observed today in populations without efficient civil registration. Most of alleged centenarians born before the XIX century cannot be validated and moreover JEUNE concluded that no centenarian died before 1800. In this contribution we reconsider the point with a scrupulous investigation of all alleged centenarians in Belgium and we extended the period to include all those who died before WWI. We also consider Sardinian centenarians from the same period. Based on 400 validated centenarians we characterise the survival above 100 years of age of these early centenarians. Our contribution will demonstrate that there were numerous centenarians born in the XVIII century and that their survival above 100 years was similar to the one of centenarians today.

Research question

In the Old Testament, the old Patriarch's age at death are as high as 900 years and above. Even if the age of these Patriarch's become more reasonable after the deluge, it stayed largely above 100 years. For the Modern Times, the Luxdorph' eighteen century gallery of long livers present a long list of alleged centenarians. Unfortunately only a few of them had an age validated and these did not reach the 100 milestone. The best documented of an almost centenarian before 1800, Elisabeth Chavigny died at 99 years. She was born in December 1648, baptized on 31 January 1649 and died on 24 January 1748. The example of Antoine HASECH is illustrative. He died in 1526 at 125 years and was said that he was the priest of a local village during 100 years...



Most of alleged centenarians born before the XIX century cannot be validated and JEUNE (1995) concluded that no centenarian was born before 1800. In this contribution we reconsider the point with a scrupulous investigation of all alleged centenarians in Belgium who died before WWI. Finally, based on 400 validated centenarians we intend to characterise the survival above 100 years of age of these early centenarians. Our contribution aims demonstrating that there were centenarians born in the XVIII century and their survival above 100 years is similar to the one of centenarians today.

Age validation : a crucial point

The validation of the ages of alleged centenarians is essential for scientific research in demography, genetics, epidemiology, and medicine. Age inaccuracy was often observed in past populations, and is still commonly observed today in populations without efficient civil registration. Studies show that inaccurate reporting of age may be significant, tends to increase with age, is more often observed in illiterate populations, and is more common among males than among females. Any centenarian's study that does not include a strict validation of age will lose its significance and this particularly true for early centenarians for whom age validation is a crucial point.

Data sources for age validation

We shall consider successively all these potential sources of information on centenarians in order to check the reliability and the completeness of the data and the possibility to validate the exact age of all potential centenarians.

1. Censuses

Censuses data are definitively one of the earliest possibilities to detect the existence of centenarians among a given population on an exhaustive base. Therefore the census form must contain the age as variable in order to compile the age structure of the population. If all ages are considered and more precisely ages over 100 years, we have the possibility to count the number of centenarians living in a specific country at the time of the census.

Following the French revolution, the newly-organised municipalities were obliged to keep « *un état des habitants de leur ressort respectif contenant le nom, leurs prénoms, lieu de naissance, dernier domicile, profession, métier et autre moyen de subsistance* (loi du 19-22 juillet 1791, titre 1, articles 1 et 2) ». Since 1796, in Belgium as in France, some nominative lists of inhabitants with indication of age may be found in archives while statistical tables with age and sex structure are generally provided at department level. On this base, french statistics in the first decade of the XIXth century are probably the first ones that give an account of the number of centenarians for Belgium. These numbers of centenarians as well as the complete age structure are based on the list of inhabitants established by each municipality separately with indication of age for each individual. As it was very difficult to update systematically these lists of inhabitants, censuses were systematically organised in order to renew completely these lists. Considering the statistical reliability of these first censuses, we may consider that the ones of 1801 (an IX), 1804 (an XII) and 1806 have been seriously organised. However it is clear that these data have to be treated with caution on the reliability point of view because there were probably no systematic check of the exact age, mostly for individuals born outside the municipality. In the same perspective we have to keep in mind that the age structure constructed through all censuses during the first decades of the XIXth century were based on age declaration and not on exact date of birth. Therefore, as far as centenarians are concerned, we have to deal with the problem of age exaggeration. As a concrete example, Pérès, Préfet of the Département of Sambre-et-Meuse, wrote in his *Mémoire Statistique du Département de Sambre-et-Meuse*, under the chapter Population, page 9 : *On trouve enfin 8 individus âgés de plus de cent ans sur la population totale du département de Sambre-et-Meuse*. The total population at that census (1804) was 177.566 inhabitants while the same number of centenarians has been numbered in the previous census (1801) among a total population of 155.574 individuals (Archives Nationale de Paris, F²⁰ 147). As a matter of fact, these numbers correspond to a proportion of 50 centenarians per million and that is a value observed in Belgium only several years ago in the beginning of the '90.

The 1846 belgian census organised by Quetelet is considered as the first census of the modern statistical era and the richness of the data gathered is exceptionnal. However the question related to age is still the self-declaration of age and not the year of birth. So the 14 male centenarians and 17 female centenarians identified in the 1846 census are 31 persons that have declared to be aged 100 years. According to this number the proportion of centenarians in the total population was at that time 7 per million inhabitants and that is considerably less than the proportion calculated in the *Département de Sambre-et-Meuse* in the first decade of the century. But nevertheless, this rate is still too high.

Hopefully, Adolphe QUETELET was definitively the first statistician that suspect the existence of false centenarians in the census data. Therefore he launched a validation process through the governor of each belgian provinces. Each communes where a centenarian has been detected through the census data has to validate the centenarian giving exact names and physical and mental state. The last two pages of the volume of the 1846 census gave the result of this validation work. Among the 31 centenarians reported through census data, Quetelet's initiative gives way to the validation of only 21 centenarians and he explains the differences in this words :

Parmi les 31 centenaires dénombrés à l'occasion de ce recensement, une vérification auprès des provinces et des communes a permis de vérifier que seuls 21 étaient réellement des centenaires alors que dans les 10 autres cas, il s'agissait d'erreurs de transcription à des stades divers de la procédure du recensement. For the 21 remaining centenarians, 8 male centenarians and 13 female centenarians, some biographical informations are given through the reports send to the governors. Full name and surnames, place of birth, age at census, place of residence at census, and possible death date between the census date and the validation survey. There are also indications about the place of birth, timing of marriage and widowship and the number of children by sex. Finally some qualitative informations were given on physical and mental state and on ways of subsistence.

But, even if Quetelet has done a very innovative statistical test, do we have a deep conviction that these 21 centenarians correspond to the exhaustive sub-population aged 100 years and over in Belgium on 18 octobre 1846 ? The rate of 5 centenarians per million is probably too high compared to the level that will be calculated later at the end of the century. Therefore we has developped a new validation check and table 2 gives a summary of all informations gathered in civil and parish registers in order to try to validate these 21 centenarians. The following checks have been carried out :

1. Do we find the death record ?
2. If yes, what age is indicated in the record ?
3. Do we find an exact date of birth ?
4. Do we find a place of birth ?
5. Do we have an identification of the parents of the potential centenarian ?
6. And finally, do we have an indication of the marital status and the name of the spouse.
7. Do we find a corresponding birth ou baptism record in the place of birth register ?
8. Are the surname and first name identical to the one in the death record ?
9. Are the parents the same ?
10. If the names or the parents are not the same or if the parents are not indicated, do we have other birth(s) with similar name and surnames ?

In the 1856 census and in the new population register legally adopted since 1857(see below), the declared age has definitively been replaced by the date of birth and we can assume that this information will become more and more reliable comparing one census with the next one. However, centenarians are definitively the persons for which this type of data will remain very difficult to check untill the end of the century because the birth certificates have to be found in the parish registers during the last decades of the XVIIIth century. Table 1 proposes the number of centenarians by sex at the different belgian censuses between 1846 and 1991.

The evolution of the number of centenarians as shown in table 1 gives a indication that the data seems to be more reliable for the 1890 census and the following ones. As our tests prove, there is a huge overestimation of the number of centenarians for the earlier censuses and it will not be a surprise if two centenarians out of three were false centenarians.

Table 1. Number of centenarians by sex at the different belgian censuses 1846-1991

Year of the census (*)	Male centenarians	Female centenarians	Total Number of centenarians
1846	14(**)	17(**)	31(**)
1856	9	8	17
1866	6	13	19
1880	5	17	22
1890	2	5	7
1900	3	5	8
1910	5	11	16
1920	4	14	18
1930	7	16	23
1947	4	13	17
1961	22	51	73
1970	54	139	193
1981	54	189	143
1991	108	440	548

(*)Between 1856 and 1970, the census takes place on the 31st December with at the 1981 and 1991 it was the 1st March.

(**) Of which only 8 males and 13 females were validated as real centenarians through a post-census specific survey.

2. Parish and civil registers for births and deaths

As we have seen, the only way to validate the age of a centenarian is to go back to his birth or baptism' record in the civil or parish registers. First of all, some words are needed about the parish registers. In the Old Regime, until 1791 in Belgium, the priest was the only person responsible for recording births at local level and more precisely baptisms. The completeness and the reliability of these registrations increase with time so that we can assume that the coverage of births is relatively good in Belgium since the beginning of the XVIIIth century while the content and the quality of the records in itself improve largely after 1770 due to strict rules edicted under the austrian regime. As a consequence of these improvements, the research of a birth record is greatly facilitated after 1770 while it is highly harsardous in the XVIIth century and the beginning of the XVIIIth.

Starting around 1793, the civil birth registers were not completely exhaustive until the coming of the dutch regime in 1815. A few number of births are missing and these will usually only been found in the birth registers at the time of the marriage more than twenty years later. Fortunately the probability not to find a precise birth record during the first decades of the XIXth century is as low as a few percents.

Moreover, in the parish registers as well as in the civil registers, some difficulties may appear due to the spelling of the surname or problem of isonymy. Basically speaking, the birth and death records are fullfill on the base of an oral declaration, therefore, the transcription of the surname will probably be correct on a phonetic point of view while some difference may appear in the interpretation of the exact spelling. As far as the first name is concerned, we must be carefull to the fact that the commonly used first name, the one that will be used in the death register, is not necessary the first name given in the birth register. Moreover two brothers or sisters may have the same first names due to the fact that the oldest dies very young and has been replaced in the mind of their parents by the second one.

As a conclusion of these points, the age or the date of birth as reported in the death record is based on a declaration and some validation checks have certainly be done at local level using the birth registers. However, for persons born outside the commune or parish, persons with surnames with potential different spellings, persons with very common first names or persons with an older brother or sister holding the same first name and died very young, some problems of reliability exist and more often with very old persons. Therefore the complete validation of a centenarian died in the XIXth century involves successive actions as we have done with the 1846's centenarians identified in the census.

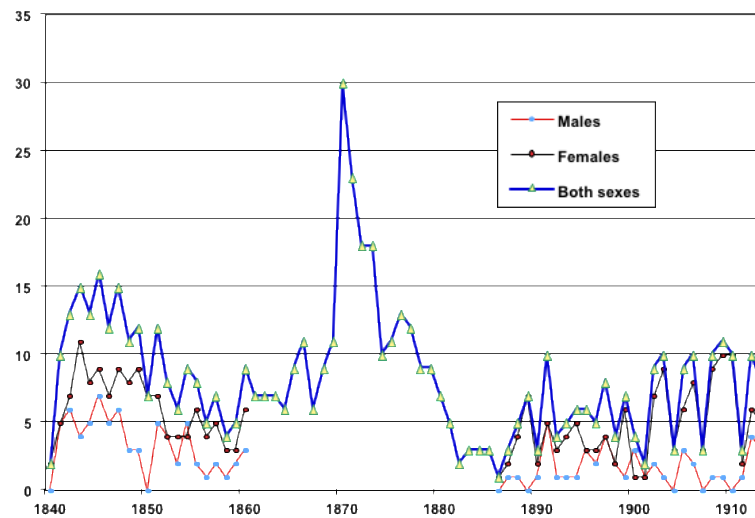
For all persons, including all centenarians, died since the beginning of this century, the age at death as recorded in the death register is systematically checked with the corresponding birth act and the probability to do an error is quite inexistant except in very specific cases where, for example, the died persons cannot be identified.

3. Annual demographic statistics on age at death

According to Dr. Biraben (1970), the civil registration was established under the french regime with very strict regulations. Statistical tables were requested to all departments with the annual change of population : births, deaths and mariages. A specific table presents the distribution of age at death by sex and yearly age groups. Starting in 1802 (an X), this classification is done by half year and in 1806, the marital status is also considered. In each of these table, deaths at 100 years and over are reported in the last column of the table with an indication of exact age at death. In the *Mouvement de la population de la France au cours de l'an XI* (ANP F* n°132), we found two persons died at 103 years in the department of Escaut (Flandre orientale) and one died at 118 years in the one of Jemappes (Hainaut). One year later, in a similar statistical table, one person died at 100 years old in the department of Lys (Flandre occidentale) and two at 101 years old in the department of Ourthe (Liège). These three centenarians died in *an XI* are part of the 41 centenarians died in the whole french population during the same year.

Starting in 1840 until 1849, statistical tables on age at death are again available on an annual base by sex and month of death. Annual values are also available through different publications for the period between 1850 and 1886 while, starting in 1886, annual statistics exist at the communal level. Figure 1. shows the evolution of the number of deaths since 1840 and gives again a clear indication for age exageration until 1880.

Figure 1. Number of deaths at age 100 and over by year of observation between 1840 and 1913 for both sexes in Belgium



Age validation methods

- If the person is dead, the age validation should prove that there is a perfect and unambiguous link between the death and the birth records attributed to this person. If the person is alive, the age validation should consist of attributing a given birth record to a living person based on all elements of identification, which should be without ambiguity. The ideal validation procedure will consist of the following steps:
- Identification of an alleged centenarian is based on the declaration of age, on a newspaper article, on a special investigation carried out place by place, or on an available official list of inhabitants or centenarians.
- If the alleged centenarian is alive, collect all basic information through identity cards, passports, family or household books, or any other pieces of identification that may be available. If the alleged centenarian is dead, locate the death record.
- In both cases, regardless of whether the alleged centenarian is alive or not, locate the birth record.
- Collect all documented life events related to the centenarian, including information on marriage(s), characteristics of the spouse, and births of all children.
- 5. Finally, collect all data on births, marriages, and deaths among the centenarian's parents and brothers and sisters, and identify among the newborns of the period following the birth of centenarian any other newborns with similar names and surnames.

Age validation of early Belgian centenarians who died prior WWI

Table 2. Results of the validation process

Status of alleged centenarians	1751-1840	1841-1914
Unknown (no name)	11	234
Not validated (birth record not yet found)	252	43
True centenarian (validated)	82	320
False centenarian (invalidated)	135	70
TOTAL	480	667
Proportion of (in) validated centenarians	45,3%	58,5%
Proportion of true centenarians	37,8%	82,1%

Table 3. Comparison of the validation process between Belgium and Denmark

Status of alleged centenarians	Belgium 1751-1840	Belgium 1751-1840	Funen (DK) 1644-1840	Funen (DK) 1644-1840
	Male	Female	Male	Female
Unknown (no name)	1	9	na	na
Not validated (birth record not yet found)	131	122	88	112
True centenarian (validated)	35	47	7	7
False centenarian (invalidated)	63	72	12	20
Total	230	250	107	139
Proportion of (in) validated centenarians	42,6%	47,6%	17,8%	19,4%
Proportion of true centenarians	35,7%	39,4%	36,8%	25,9%

Status of alleged centenarians	Belgium 1841-1899	Belgium 1841-1899	Belgium 1841-1899	Denmark 1841-1899
	Male	Female	Total	Total
Unknown (no name)	80	133	213	81
Not validated (birth record not yet found)	16	27	43	22
True centenarian (validated)	96	224	320	50
False centenarian (invalidated)	22	48	70	46
Total	214	432	646	191
Proportion of (in) validated centenarians	<i>55,1%</i>	<i>63,0%</i>	<i>60,4%</i>	<i>48,2%</i>
Proportion of true centenarians	<i>81,4%</i>	<i>82,4%</i>	<i>82,1%</i>	<i>52,1%</i>

Preliminary results (to be completed and discussed)

Sex ratio of true early centenarians is 1,35 before 1840 and 2,33 between 1841 and 1915. The life expectancy at 100 is 1,337 for men and 1,486 for women, these values are slightly lower compared to data available in HMD.