

2020: unprecedented rise in deaths in 70 years

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Owing to the Covid-19 pandemic, mortality was exceptionally high in 2020 with nearly 669,000 deaths from all causes, which is 56,000 more than in 2019 (+9%).

Such a rise in mortality has not been recorded in France for 70 years. This rise is, in particular, much higher than those seen during flu outbreaks or severe heatwaves in previous years. France is in a median position among European countries.

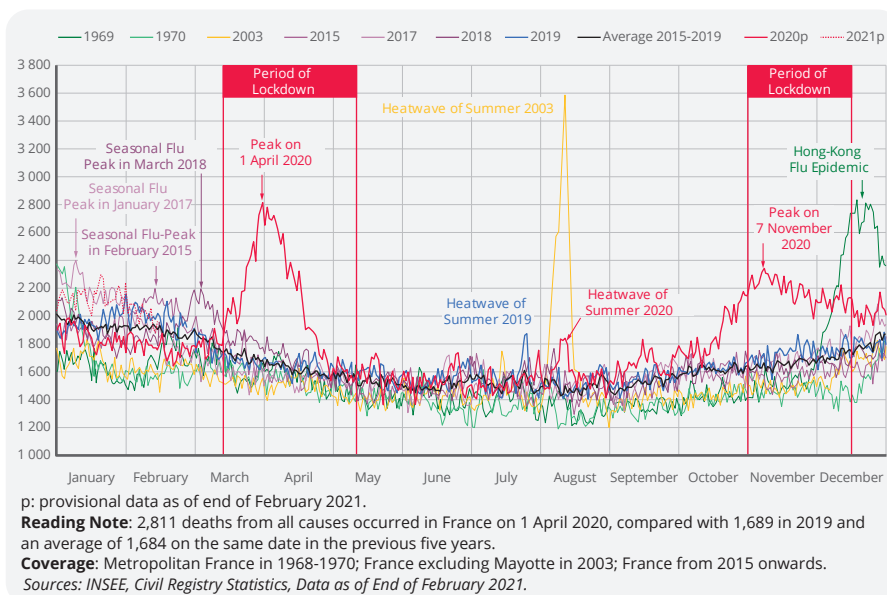
The rise in deaths was slightly greater among men. People aged over 70 were the most affected (+11%), with a fairly even rate above that age. This rise differed greatly by geographic area: it was much higher in the east of Metropolitan France, including Île-de-France. In the end, Mayotte, Île-de-France and Auvergne-Rhône-Alpes are the three regions with the highest excess death rates for the year.

In 2020, deaths from all causes totalled 668,800, which is 55,500 more than in 2019 (+9.1%). The number of deaths has been increasing every year since 2010 as the large generations of Baby Boomers reach ages with higher mortality rates. The rise observed in 2020, however, far exceeds that of previous years. In a scenario with constant life expectancy since 2019, the growth and ageing of the population in 2020 would have led to an increase in deaths of about 14,000. If the improvement in life expectancy had continued at the same rate as seen in the past decade, the increase in deaths would have been less, at somewhere around 6,000. Some of the difference between 2019 and 2020 (about 1,800 deaths) can be explained by the fact that 2020 is a leap year. Most of the rise in deaths in 2020 therefore relates to the increased **mortality rates** in older age groups, due to the Covid-19 pandemic, leading to a marked fall in life expectancy at birth, by a little over 6 months in comparison with 2019 [Papon and Beaumel, 2021].

Two waves of deaths in 2020, in spring and autumn

In March-April 2020, there were an additional 27,300 deaths compared with the same period in 2019 (+27%). Excess mortality between September and December occurred at a lower rate of intensity but for a longer period, leading, in the end, to more excess deaths than in the first wave (+34,300, or +17%).

► 1. Daily Deaths in 2020 Compared with the Last Five Years, the Heatwave of 2003 and the Hong-Kong Flu Epidemic (1968-1970)



In the first fortnight of March 2020, just prior to the first lockdown, the average number of deaths per day from all causes was 1,800, which is of a similar order to the same period in 2019 ► **Chart 1.** It then increased very rapidly, peaking on 1 April with 2,810 deaths. It then decreased quickly, going from an average daily death toll of 2,600 deaths in the first fortnight of April to 1,900 in the second fortnight. Between May and August 2020, the number of deaths is again in line with the average for previous years.

Deaths increase in autumn every year, up to the end of the year. The rise observed in 2020, however, is exceptionally high. Between September and mid-October, the average daily death toll is about 100 higher than for 2019. From mid-October onwards, the gap widens still further. A second lockdown is introduced from 30 October and daily deaths peak at 2,340 on 7 November. The fall in death rate then proves to be significantly slower than in the first wave, with the average number of daily deaths going from 2,260 in the first fortnight of November to 2,030

in the second half of December. Rather than coming to an end, the second wave appears to plateau at the end of 2020, especially as in January 2021, there is a slight increase in deaths once again.

Significantly more excess deaths in 2020 than those caused even by the worst outbreaks of seasonal flu

The death toll for 2020 as a whole includes not just the two waves of mortality in the spring and autumn, but also mortality at the start of the year and between the two waves.

According to Santé Publique France (Public Health France), seasonal flu in 2020 caused few deaths (about 4,000 in 2020, compared with 8,100 in 2019 and 13,000 in 2018). There were 7,500 fewer deaths from all causes in January-February 2020 than in the same period in 2019 (and as many as 9,200 fewer taking into account 2020 being a leap year).

Conversely, the three heatwaves in summer 2020 led to slightly more deaths than the two heatwaves of 2019 (1,900 in comparison with 1,500) [Santé Publique France, 2020]. Between May and August 2020, deaths from all causes turned out to be slightly higher, by nearly 1,200, than those recorded during the same period in 2019.

The overall total of 55,500 additional deaths in 2020 compared with 2019 is significantly higher than those relating to flu outbreaks or heatwaves in the last five years, including the heatwave of 2003, which was more intense but much shorter [Desrivier and Fabre, 2020]. Going further back in time, the second wave of what became known as the Hong-Kong flu epidemic, which struck France in December 1969 and January 1970, was accompanied by 31,900 more deaths than the number that occurred in the same two months a year earlier (+32%), an excess that is higher than that experienced in March-April 2020 but lower than the toll from the two waves of deaths in 2020. Excess mortality in 2020 compared with 2019 is largely due to the Covid-19 pandemic (Box).

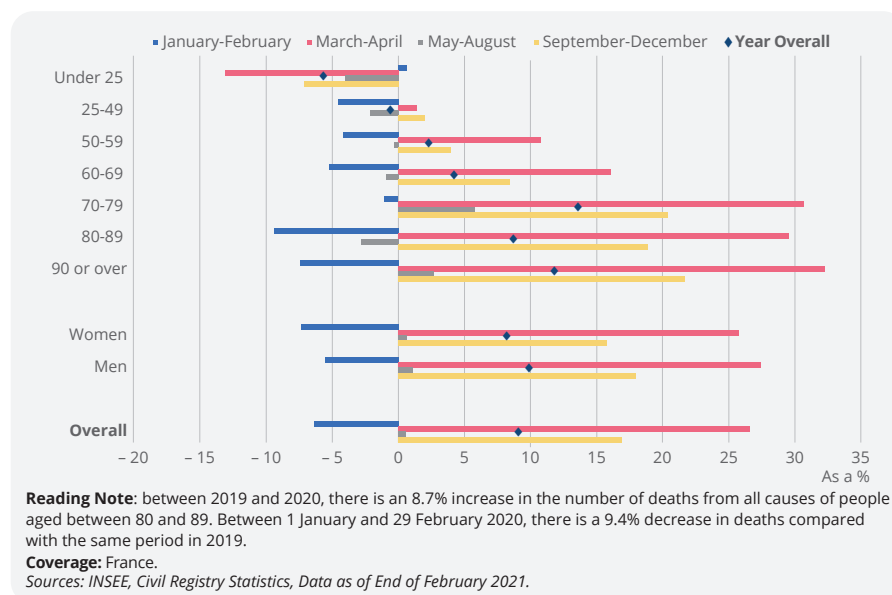
An increase in deaths concentrated among the over-70s

Excess mortality in 2020 compared with 2019 was slightly more pronounced among men (+10%) than among women (+8%)

► **Chart 2.** It also increased with age.

Amongst the oldest, the rise in deaths remains limited in the 60-69 age group (+4%), but is very marked from the age of 70 onwards. It leaps to 14% for the 70-79 age group and is high for those aged 80 to 89 (+9%) and older (+12%). In both waves, the rise is very high, with little

► 2. Trend in Deaths Between 2019 and 2020, by Gender, Age and Time of Year



difference between those in their seventies, eighties or older: +31% in March-April and +20% in September-December for people aged 70 or over. Excess mortality can also be seen to be greater in elderly men than in elderly women (+4 percentage points in both waves).

In total for the year as a whole, the deaths of people aged over 70 increased by 52,100. Despite this rise, there was little change in the pattern of deaths. Out of all deaths in 2020, 79% are of people aged over 70, compared with 78% in 2019; nearly half are accounted for by people aged 85 or over in 2020, as in 2019. Among the under-25s, there were fewer deaths in 2020 than in 2019 (-6%), while the number of deaths among people aged 25-49 remained virtually stable. In the under-25s age group, the fall in deaths is far more marked among men (-7%) than

among women (-4%). It is particularly notable in the two periods of lockdown, especially the first one. However, as there are not many deaths in these age groups, this equates to a fall of about 400 deaths in a year.

A France cut in two halves

The Covid-19 pandemic has not affected the regions in a uniform way. Over the year 2020, the departments where deaths are at least 10% higher than in 2019 are in the eastern half of Metropolitan France, including the Île-de-France region. The only exceptions are Eure (+12%) and Loir-et-Cher (+11%) ► **Chart 3a.** In Metropolitan France, three groups of regions stand out. Firstly, excess mortality for the year as a whole is highest in Île-de-France

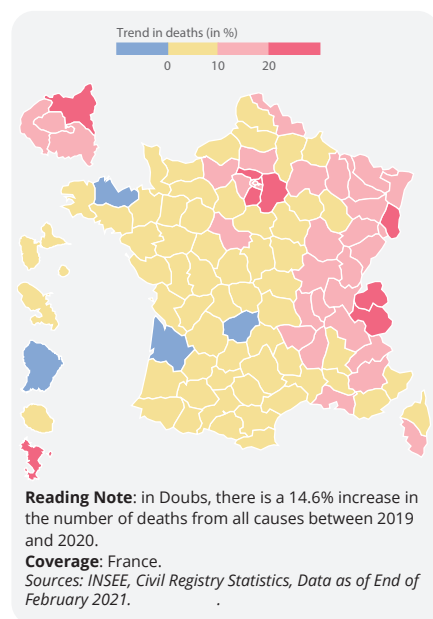
► Excess deaths from all causes consistent with breakdowns of deaths due to Covid-19

Between 1 March and 31 December 2020, Santé Publique France reports 64,600 Covid-19-related deaths in hospitals and care or nursing homes for the elderly, compared with 62,800 excess deaths from all causes and in all locations over the same period in 2020 in comparison with 2019. The two figures are therefore similar, although not directly comparable [Bayet et al., 2020]. The excess deaths observed by INSEE in 2020 are in fact the result both of excess mortality caused directly or indirectly by Covid-19, and reduced mortality due to the protective effect of the lockdowns and preventive measures on other causes of death, such as road or workplace accidents or other viral diseases. Some of the Covid-19-related deaths reported by Santé Publique France would have happened in 2020 even without the pandemic, which only made them occur earlier than would otherwise have been the case [Pison and Meslé, 2021].

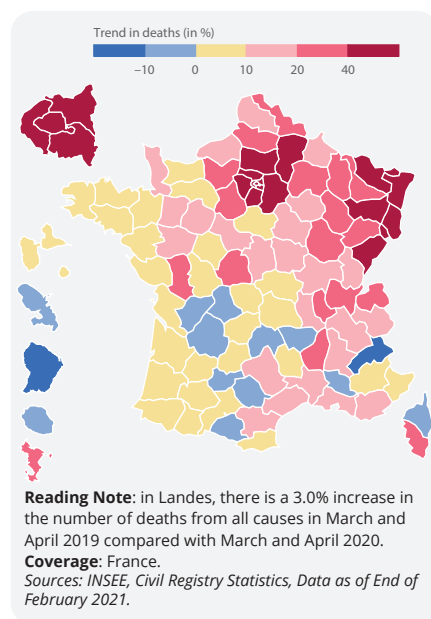
Moreover, between 1 March and 30 November 2020, CépiDc (Centre for Epidemiology of Medical Causes of Death, a unit within INSERM, the French National Institute of Health and Medical Research) reports 63,000 Covid-19 deaths (including 53,400 confirmed), based on an analysis of the causes of death entered on the separate medical section of French death certificates [INSERM CépiDc, 2020]. In the same period, Santé Publique France reports 52,700 Covid-19 deaths (including 36,300 in hospital) and INSEE records 53,700 excess deaths from all causes. An assessment of causes of death is not yet available for all the medical sections of certificates relating to deaths that occurred at the end of the year.

While the orders of magnitude are comparable and illustrate the fact that a large proportion of excess deaths from all causes is due to Covid-19, the trends in the various causes of death are still to be analysed in detail.

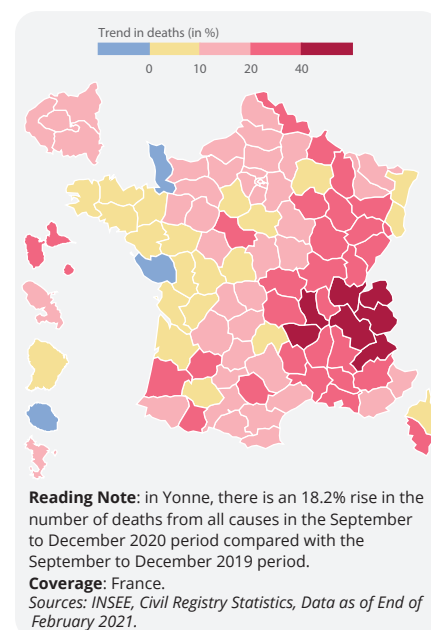
► 3a. Trend in Deaths Between 2019 and 2020



► 3b. Trend in Cumulative Deaths in March and April 2020 Versus Same Period in 2019



► 3c. Trend in Cumulative Deaths Between September and December 2020 Versus Same Period in 2019



(+19%) and Auvergne-Rhône-Alpes (+15%)

► **Chart 4.** Regions geographically close to the first two form the next group, also with very high excess mortality in 2020 but slightly lower than in the first two regions (between +8% and +13%). These are: Grand Est, Bourgogne-Franche-Comté, Hauts-de-France and Provence-Alpes-Côte d'Azur. Lastly, in seven regions which are more in the west of France (except for Corsica), excess mortality is relatively low, between +1% and +6%.

A more deadly first wave in Île-de-France and the Grand Est region

The chronology of the pandemic also differed very greatly from one region to another. It began in Hauts-de-France with a rise in deaths from early March. In March-April 2020 there were 28% more deaths than in the same period in 2019, with a +61% spike in Oise, which has been identified as the location of one of the very first sources of Covid-19 contamination

► **Chart 3b.** The second wave of excess mortality in this region in the autumn was less intense (+19% compared with September-December 2019), but because it lasted longer, in the end it resulted in a similar number of additional deaths as in the first wave.

The Grand Est region also recorded a rise in deaths at a very early stage, as from 11 March.

The average number of daily deaths increased very sharply between the first and second fortnight of March 2020 (+86%, versus +8% in the same fortnights the previous year). With the exception of Ardennes, during this second half of

March, there were more deaths in all of the region's departments, especially in Haut-Rhin (+145%) which was probably the starting point for the spread of the pandemic in this region. The peak was reached on 1 April, as was the case nationally, after which the number of deaths fell rapidly. Between 1 March and 30 April, the number of deaths recorded in the region was 55% higher than in 2019, and up to 85% higher in Vosges and 117% higher in Haut-Rhin. From 1 May up until the end of September, the region returned to similar levels of deaths to those seen in 2019. The second wave of excess mortality began around 20 October and in relative terms was less intense in the Grand Est region (+15% between 1 September and 31 December). In the end, two thirds of the excess deaths in this region in the year as a whole are attributable to the March-April period.

In Bourgogne-Franche-Comté, the number of deaths began rising from 12 March, just after the Grand Est region. The increase in spring (+27% in March-April 2020 compared with March-April 2019) was half the rate seen in Grand Est and the same as in Hauts-de-France. In this region, the autumn wave of excess deaths was as intense as the one in spring but lasted longer. In the end, two thirds of the excess deaths there in 2020 are attributable to the second wave of the pandemic, owing to its duration.

From 16 March, Île-de-France recorded a much sharper rise in mortality than anywhere else. In the second fortnight of March, the areas most affected are in the north of the region, near Oise and Roissy airport [Allard *et al.*, 2020]. The excess mortality rate between 1 March

and 30 April is 91% in the region. Seine-Saint-Denis (+125%) and Hauts-de-Seine (+113%) are particularly affected. Even in Paris and Yvelines, slightly less affected, the level of excess deaths is 70%. Île-de-France was much less affected, however, by the second wave of excess deaths in 2020, with excess mortality of 14% for the September to December period. So, in the end, 80% of the rise in deaths there occurred in spring.

In the autumn, the highest excess death rate is in Auvergne-Rhône-Alpes

The second wave of Covid-19 which happened in the autumn had a greater impact on those regions that had been less affected by the spring outbreak, especially Auvergne-Rhône-Alpes. Between 1 September and 31 December, this region experienced the highest excess death rate (+38%). This rate is lower than the one in Île-de-France in the spring, but lasted twice as long. Departments in this region experienced the highest rises in the whole country during this period, in particular Haute-Loire, Savoie, Loire and Haute-Savoie. In this region, 90% of the annual rise in deaths in 2020 compared with 2019 is explained by the autumn period. Provence-Alpes-Côte d'Azur is the region with the third highest excess mortality rate in the autumn, after Auvergne-Rhône-Alpes and Bourgogne-Franche-Comté, with an excess death rate of 22% in that period, as opposed to 12% in the spring. Hautes-Alpes was the worst affected area (+42%), followed by Alpes-de-Haute-Provence, Vaucluse and Bouches-du-Rhône (around +25%).

An extremely varied situation in French overseas departments

Changes in mortality differed greatly in the overseas departments. In Mayotte, which was struck by a dengue fever epidemic in early 2020, it rose very sharply right from the start of the year. Regardless of time of year, the excess death rate is at least 20% compared with 2019. For the year as a whole, Mayotte is the French department with the highest excess mortality, with a quarter more deaths than in the previous year.

In Guadeloupe, the excess death rate in comparison with 2019 is 8%, with a very marked rise at the end of the year (+24%). In the other overseas departments, the number of deaths in 2020 is either about the same as in 2019 (Martinique and Réunion) or lower (French Guiana).

France: in a median position among European countries

Deaths increased in 2020 in almost all European countries. France sits around mid-table, with a rate of +9% [Ourliac, 2021]. According to data available in mid-March, the rise in deaths is lower in France than in all the bordering countries, with the notable exception of Germany, which was relatively protected (+5%) and Luxembourg (+8%). The rise is equal to or greater than 14% in seven European countries: Spain, Poland, Belgium, Slovenia, Bulgaria, the Czech Republic and Italy.

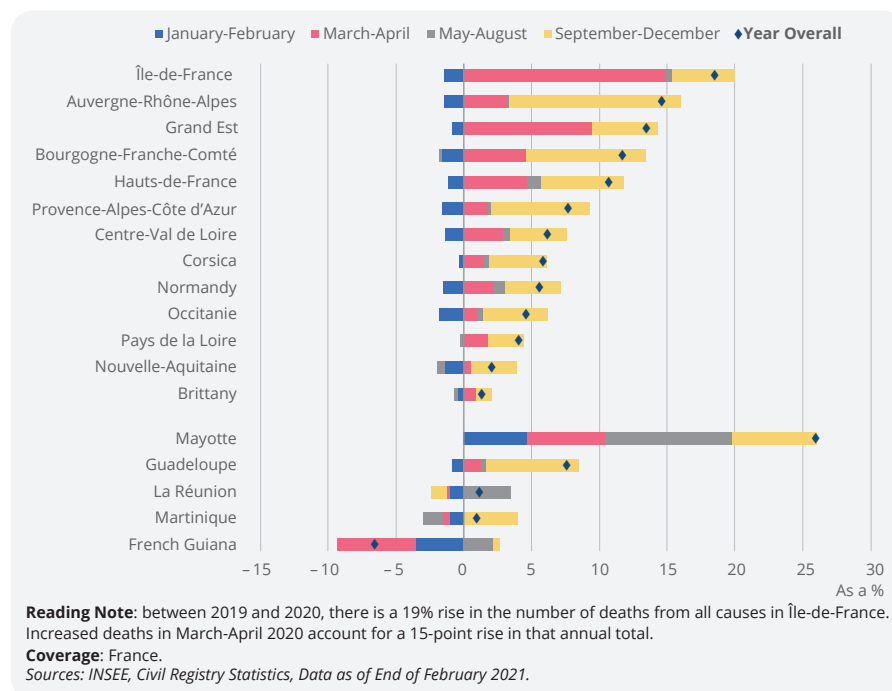
In spring, with the outbreak of the first wave of the Covid-19 pandemic, mortality only increased in seven countries in Europe, whereas in the second wave, in the autumn, the health crisis appears to have spread more widely. In countries where mortality had already risen a lot in

spring, as in France, the excess mortality rate in the autumn was of the same order in overall terms, except for the United Kingdom, where it was lower. ●

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► 4. Trend in Deaths Between 2019 and 2020, by Time of Year



► Sources

Civil Registry death statistics are obtained by processing the information sent by town halls to INSEE. INSEE receives the statistical section of the Civil Registry death certificate, which includes some of the information entered on the death certificate drawn up by the municipality, in particular: the municipality in which the death occurred, the deceased's date of death, surname, forenames, date of birth, gender and municipality of residence. INSEE does not receive information on the causes of death. Data for 2020 and 2021 are still provisional and are derived from the Civil Registry file received at the end of February 2021. Deaths are recorded in the department where they occurred and not in the department in which the person lived.

► Définitions

The **mortality rate** at a given age (or age bracket) is the number of deaths during the year of people of that age as a proportion of the average population in the year of people of the same age.

► Pour en savoir plus

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