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Deaths related to COVID-19 in Switzerland and compared with other countries

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1. Key points

- **Deaths with COVID-19:** A total of 9,200 people have died with coronavirus in Switzerland and Liechtenstein (FL) since the beginning of the pandemic (as at: 19.02.2021). Of these deaths, more than three quarters (7,368) have occurred since early October 2020 (week 41). More men than women have died with COVID-19 (54% versus 46%). More than 90% of all people who have died with COVID-19 were over 70 and the majority of whom suffered from at least one underlying health condition.
- **Deaths in care homes:** Around half of those who have died with COVID-19 since October 2020 died in a care home, of whom 41% were men and 59% women. Those who died with COVID-19 in care homes were older on average than people who died with COVID-19 in hospital. More women than men live in care homes. Before the COVID-19 epidemic (in 2019), 44% of all deaths occurred in care homes.
- **Deaths in intensive care units (ICUs):** Since the beginning of the COVID-19 epidemic, the COVID-19 Hospital Based Surveillance (CH-SUR: a sample of Swiss hospitals) has recorded 10,013 persons admitted to hospital with a laboratory-confirmed and reported case of COVID-19. Of these patients, 1,444 (14%) were treated in intensive care, of whom 406 (28%) died. The median age of patients who died in ICU was 74. The proportion of patients in ICU who died increased with age. Patients aged between 60 and 69 spent the longest time in ICU before they died.
- **Excess mortality in Switzerland and compared with other countries:** The FSO recorded two phases with excess mortality in 2020: in the spring (March/April) and from autumn (end of October). From the second half of October 2020 (week 43), excess mortality was recorded again, in particular among those aged 65 or over, and this lasted until January 2021 (week 4). This excess mortality was higher than in other special periods over the past ten years (flu seasons, heatwaves). The coding and analysis of causes of death in 2020 by the FSO are not yet available. The FOPH therefore only describes deaths related to COVID-19. Over the entire COVID-19 pandemic, Switzerland's case fatality rate is below the European average.

2. Deaths related to COVID-19 in Switzerland

Please note: Information on cause(s) of death recorded by doctors on death certificates in 2020 is not yet available. However, regardless of the cause of death, the FOPH records all people who die with a laboratory-confirmed SARS-CoV-2 infection as 'deaths related to COVID-19'.

Since the beginning of the COVID-19 epidemic, a total of 9,200 people have died with COVID-19 in Switzerland and Liechtenstein (as at 19.02.2021, Figure 1). In the first phase (March–May 2020), the number of deaths rose until early April (02.04.2020) and then fell until mid-May (1,716 deaths in total). From the beginning of June to the beginning of October 2020, the number of deaths was low (112 in total). From October (week 41), the number of deaths increased again, stabilising at a high level until the end of the year. Since week 41, 7,368 people have died with COVID-19, which equates to 81% of the total COVID-19 death toll. Since the beginning of 2021, the number of deaths has been steadily falling.

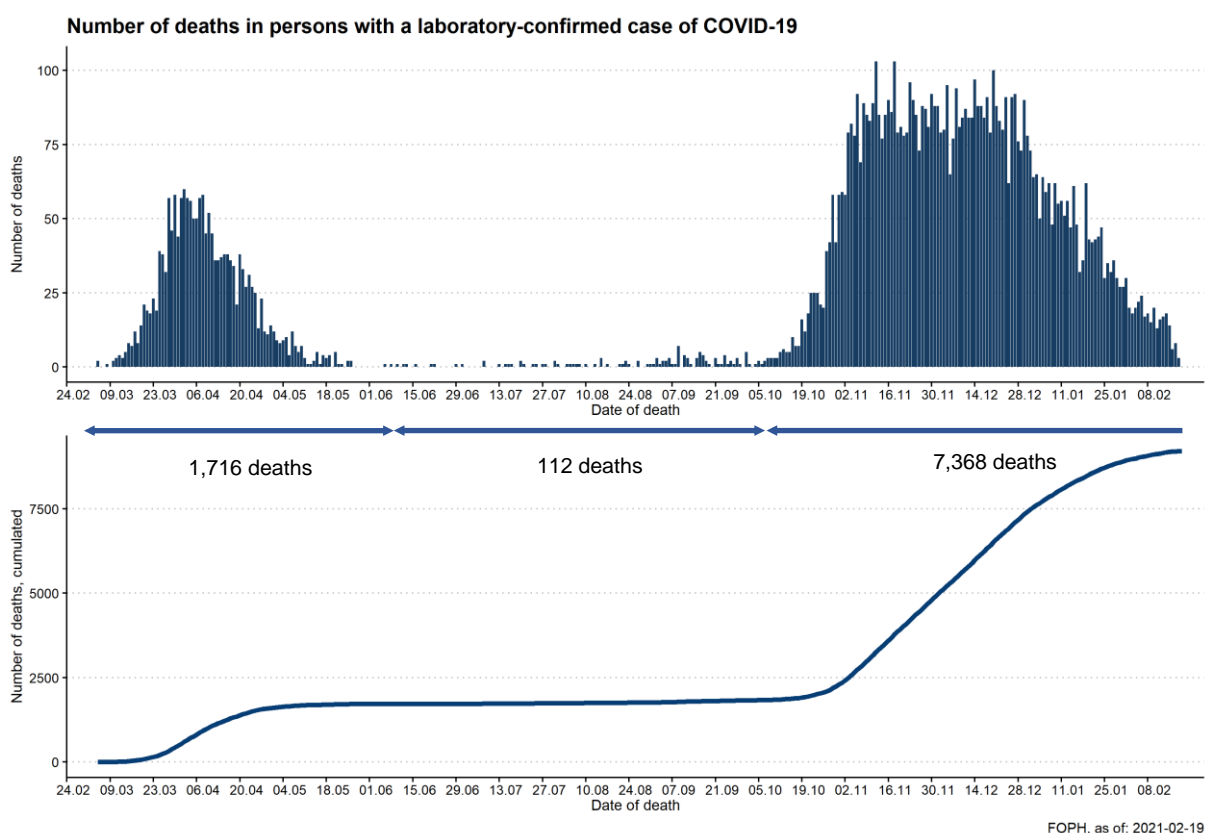


Figure 1: Number of deaths per day and cumulated since the beginning of the COVID-19 epidemic

Currently, the 14-day death rate per 100,000 population is 2.5 (as at 19.02.2021), fluctuating in the cantons and in Liechtenstein between 0 (Appenzell Innerrhoden, Glarus) and 7.2 (Appenzell Ausserrhoden) deaths per 100,000 population. The highest 14-day death rate since the beginning of the COVID-19 epidemic was recorded on 22 December 2020 with 14.2 per 100,000 population.

Since the beginning of the epidemic, the cumulative death rate per 100,000 population is 106, with 85 deaths per 100,000 population since the beginning of October (week 41). The cumulative death rate for all cantons and Liechtenstein is between 35 (Nidwalden) and 142 (Ticino) per 100,000 population since the beginning of October. More deaths in people with laboratory-confirmed COVID-19 have been recorded in all major regions in this period than in the first phase (up until 07.06.2020, Figure 2), as higher case numbers were recorded

over a longer period.

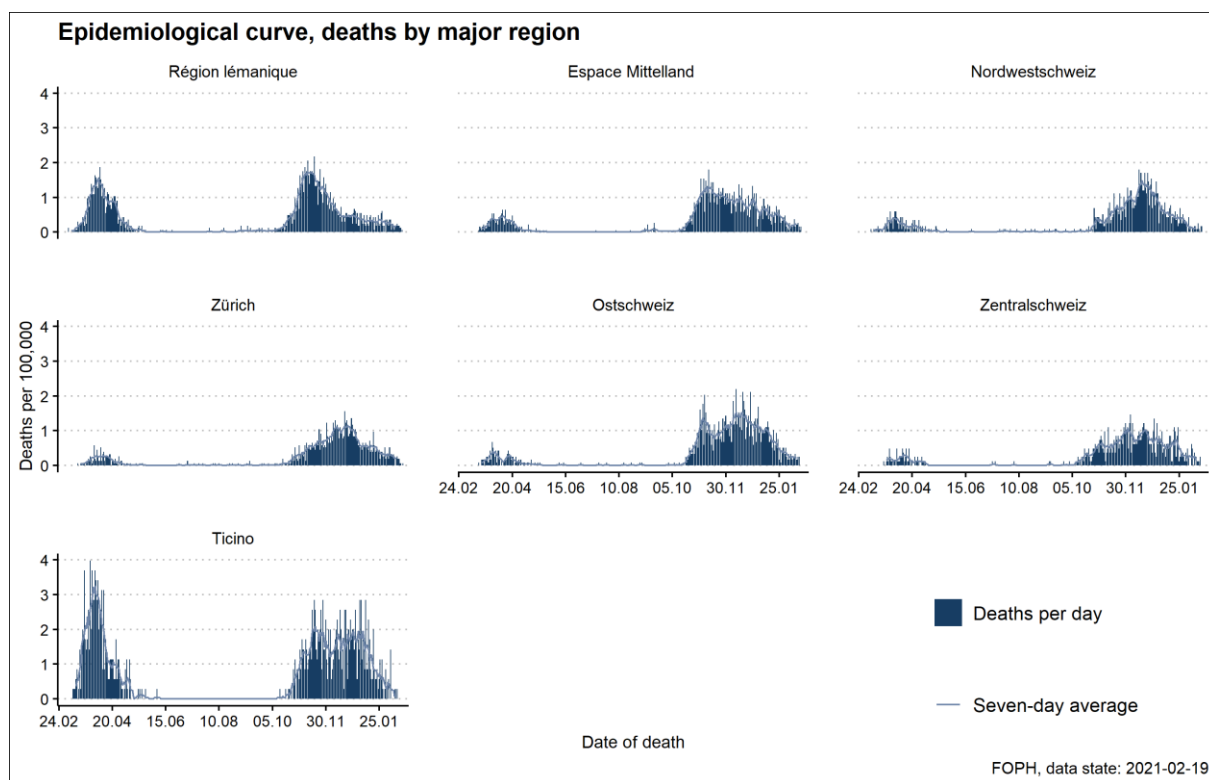


Figure 2: Number of deaths in Switzerland's major regions since the beginning of the COVID-19 epidemic

The median age of persons dying with COVID-19 since the beginning of the epidemic is 85. The median age of patients hospitalised with COVID-19 over the same period is 74. More than 90% of deaths were in people over 70. To date, five people aged under 30 have died with COVID-19. The death rate increases with age (see attachment, Table A).

Overall, the death rate is higher for men than for women (see attachment, Table B), with men accounting for 54% of deaths and women 46%. This difference was even more marked during the first phase, with men accounting for 57% of deaths and women 43%. Since the beginning of October (week 41), men have accounted for 53% of deaths and women 47%. The risk of dying with COVID-19 is generally higher for men.

The proportion of deaths among infected persons (case fatality rate) is 1.5% overall since the beginning of October (case date from week 41). It peaked in early December (week 49) at 2.2% (see attachment, Figure C).

Nearly all (97%) of the 8,876 people who have died since the beginning of the epidemic for whom complete data are available **suffered from at least one underlying health condition.** The five most common underlying health conditions in people who died are cardiovascular diseases (62%), high blood pressure (61%), diabetes (27%), chronic respiratory diseases (19%) and cancer (14%). The frequency of underlying health conditions in people who died has remained unchanged throughout the course of the epidemic.

The proportion of people who died with at least one underlying health condition is higher among those aged 70 or above (97% compared with 92%). Older people who died with COVID-19 were more likely to suffer from high blood pressure and cardiovascular diseases, which are age-related, and less likely than younger people who died to suffer from diabetes and chronic respiratory diseases.

3. Focus areas

3.1. Deaths related to COVID-19 in care homes

Of the 7,222 COVID-19-related deaths recorded since early October (week 41) for which a clinical report is available, 49% occurred in care homes (3,532), 40% in hospitals and 2% elsewhere. In 9% of deaths, no place of death was stated. A large proportion of deaths also occurred in care homes in previous years: in the five years before the pandemic (2015–19), 43-44% of all deaths in Switzerland occurred in care homes (source: FSO).

The median age of people who died with COVID-19 in care homes was 88. Of those who died in a care home, 87% were aged 80 or over, 11% between 70 and 79, 2% between 60 and 69, and less than 1% were under 60 (Figure 3). The age distribution of people living in care homes should be taken into account here. In 2019, 75% of care home residents were 80 or over, 17% were between 70 and 79, 5% were between 60 and 69 and 3% were under 60 (source: FSO). The risk of dying with COVID-19 for care home residents is significantly increased in the older age categories, as is the case for the general population.

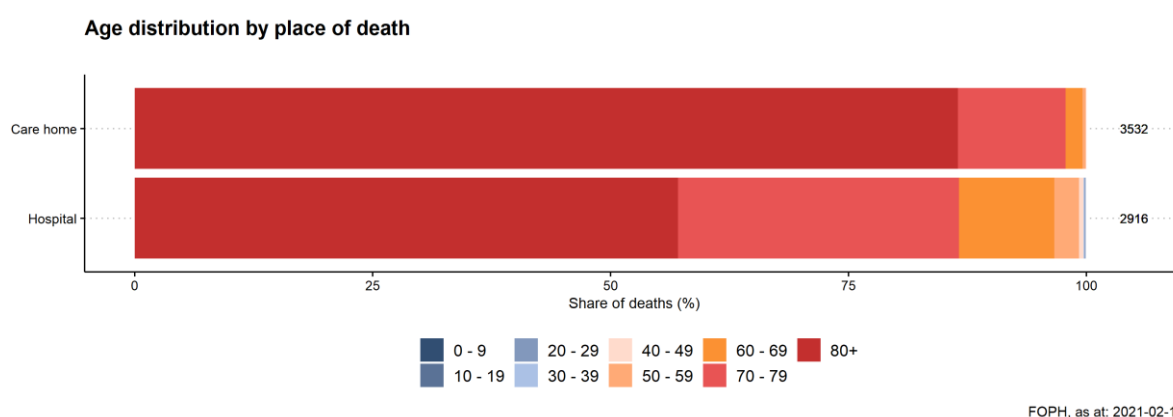


Figure 3: Place of death of persons who have died with COVID-19 since October, by age category. This chart only shows the age distribution of people who have died with COVID-19 in a care home or hospital since the beginning of October.

Of the 3,447 people who have died in a care home, 41% were men and 59% women. The gender distribution of people living in care homes should be taken into account here. In 2019, 33% of care home residents were men and 67% women (source: FSO). Among care home residents, the risk of dying with COVID-19 is higher for men than for women, as is the case for the general population.

When interpreting these figures, it should be noted that an indeterminable proportion of people who died in hospital previously lived in a care home. In addition, people may have died at home or in a care home without the disease being confirmed with a test. These deaths are not included in the FOPH's statistics. The total number of care home residents who have died with COVID-19 is therefore not known.

3.2. Deaths related to COVID-19 in intensive care units

Since the beginning of the COVID-19 epidemic, as part of the COVID-19 Hospital Based Surveillance (CH-SUR, a sample of Swiss hospitals), 13,161 hospitalisations of persons with a confirmed case of SARS-CoV-2 have been recorded (as at 09.02.2021, see point 2.1 in the attachment for details of methodology used). This is around 57% of all COVID-19 hospitalisations that are subject to the notification requirement (22,889 hospitalisations in total at the same date). Eleven per cent of hospitalised patients recorded in the CH-SUR died, and 15% were transferred, in most cases to a care facility or another hospital. Only just under half (49%)

of hospitalised patients were discharged. Of the other hospitalised patients (25%), no conclusive report is yet available with information on discharge from hospital.

Of the 10,013 people hospitalised with a completed report, 1,444 (14%) were treated in an intensive care unit (ICU) at least once. Twenty-eight per cent (406) of these ICU patients died, 76% of whom were men and 24% women. This gender distribution in ICU deaths is reflected in the proportion of men and women admitted to intensive care (see attachment, Figure D).

The median age of patients who died in ICUs was 74, and is about the same for both men and women. Ten per cent of those who died were under 60, 25% between 60 and 69, 38% between 70 and 79, and 27% were 80 or over. The smaller proportion in those aged 80 or over may be due to the fact that people in this age group are less likely to be admitted to intensive care.

The proportion of ICU patients who died increases with age. The amount of time spent in ICU before dying increased with age up to age 60 to 69, and fell in the older age category (see attachment, Table E). This is presumably due to the more critical general condition of older patients.

3.3. Excess mortality according to the FSO's mortality monitoring compared with reported COVID-19 deaths (FOPH)

The Federal Statistical Office (FSO) recorded a total of around 76,000 deaths in 2020. The expected weekly number of deaths was significantly exceeded for 17 weeks (Figure 4, see point 2.2 of methodology section in attachment). This weekly excess mortality amounted to around 9,000 deaths in total, 150 of which were among those aged under 65 and some 8,800 among those aged 65 or over. In the first four weeks of 2021, there were approximately 1,200 excess deaths. No excess mortality has been recorded since week 5.

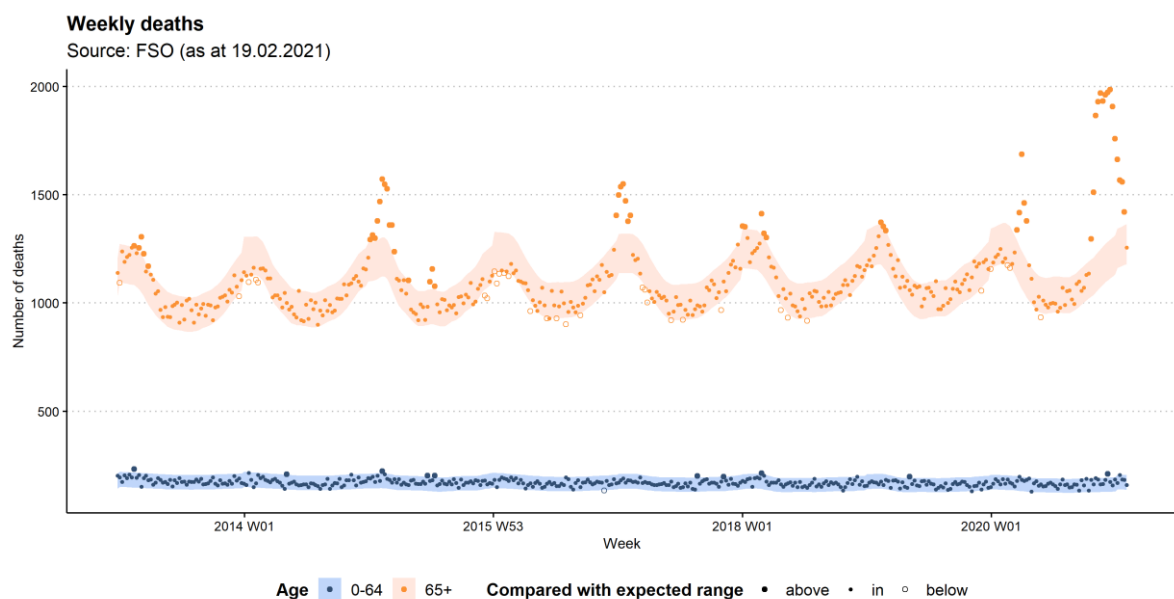


Figure 4: Weekly deaths reported to the FSO, including the expected range, since 2013, by age category. The points above the expected range are highlighted for both age categories. They represent the weeks with excess mortality.

During the first wave of the COVID-19 epidemic, excess mortality of around 1,700 deaths (9-42% more per week, Figures 4 and 5) was recorded throughout Switzerland for six weeks (mid-March to mid-April). In the same period, 1,510 deaths in persons with a laboratory-confirmed case of COVID-19 were reported to the FOPH (Figure 5). The 2019–20 flu season was

relatively less pronounced and the number of flu cases had already fallen in this period. Therefore, flu probably only contributed marginally to excess mortality. Most of the deaths during this period were recorded at the beginning of April: in week 14, at 1,871 deaths in total, 554 more people died than expected (42%). The most deaths with COVID-19 (382) were also reported to the FOPH in this week of the first phase.

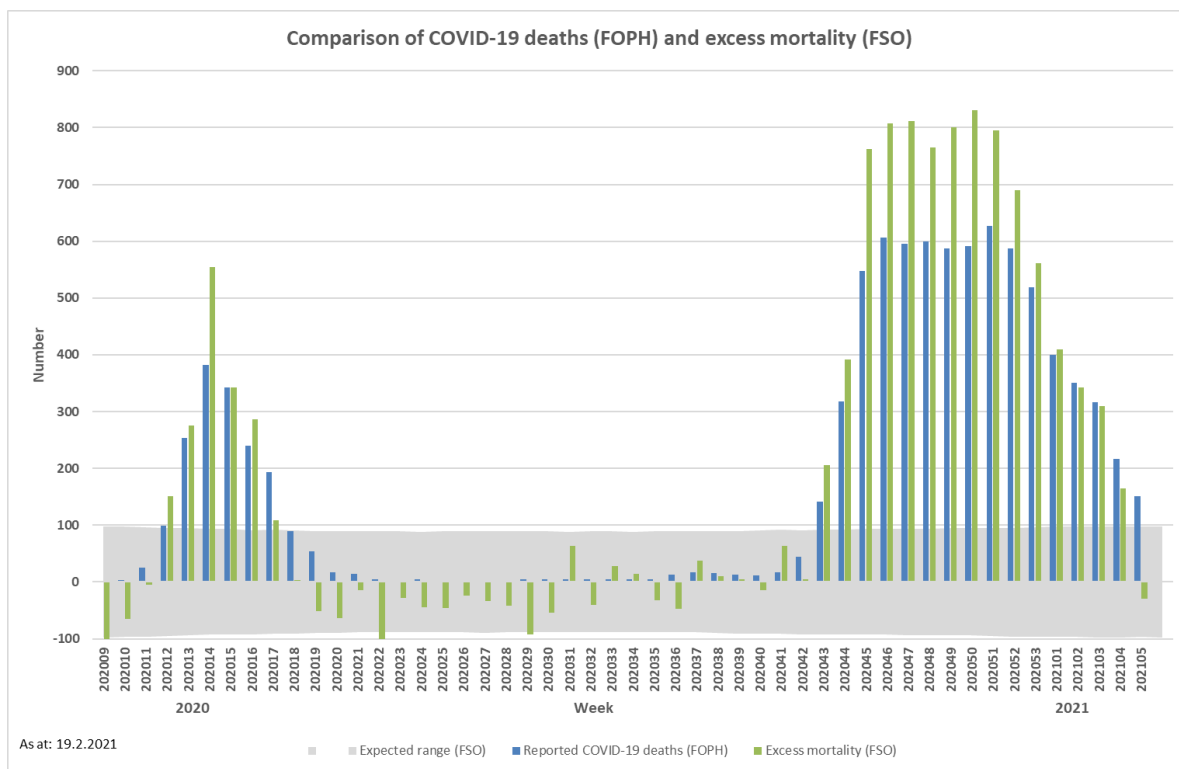


Figure 5: Comparison of reported COVID-19-related deaths (FOPH) with the estimated excess mortality (FSO), and with the range of expected fluctuation

From the second half of October 2020 (week 43), excess mortality was again recorded, lasting until the end of January 2021 (week 4) (Figures 4 and 5). In this 15-week period, there were some 9,000 more deaths than expected, 7,800 of which occurred in 2020 (11-62% more per week). During the 15 weeks when the FSO recorded excess mortality, 7,006 deaths related to COVID-19 were reported to the FOPH (Figure 5). During this period, there was no flu season for the first time. Flu can thus be ruled out as a cause of this excess mortality during this period. Most of the deaths during this phase were recorded by the FSO between the beginning of November and mid-December (weeks 45-51), with around 800 (60%) more deaths than expected per week, amounting to 5,600 over the seven weeks. In these weeks, 5,721 deaths with COVID-19 were reported to the FOPH.

The excess mortality recorded by the FSO largely tallies with the number of deaths related to COVID-19 reported to the FOPH (Figure 5). This suggests a correlation between the observed excess mortality and the COVID-19 epidemic. During the 17 weeks with very high mortality rates, the FSO recorded around 24% more excess deaths than the number of COVID-19-related deaths reported to the FOPH. The majority of this discrepancy could be attributed to undiagnosed or unreported cases of COVID-19. The FOPH only publishes deaths in persons with a reported, laboratory-confirmed SARS-CoV-2 infection. Both the total number of weekly deaths and the number of deaths related to COVID-19 decreased shortly after the containment measures were tightened on 22 December 2020 and 18 January 2021. Excess mortality is therefore a good point of reference on which to assess COVID-19 mortality.

The total number of excess deaths is much higher than in the worst seasonal flu epidemics of previous years (Figure 4). In the 2015 flu season, the FSO recorded a total of 2,300 more deaths than expected over a 10-week period (9-30% per week). In the 2017 flu season, around 1,200 excess deaths were recorded during five weeks (12-26% per week). No restrictive measures were taken at the time to prevent infections. During a two-week period in the very hot summer of 2015, around 460 more deaths were recorded than expected (10% and 25% more). In the very hot summer of 2003, a total of around 300 more deaths than expected were recorded in July and August (5% and 9%).

The highest monthly excess mortality since 1901 was seen during the 1918 Spanish Flu pandemic, when 60-150% more deaths than expected were recorded every month for five months (source: FSO). This is followed by November and December 2020, each with 30% more deaths than expected (source: FSO).

Over the course of the epidemic, differences have been observed between cantons (see attachment, Table F). For example, during the first phase, excess mortality was recorded by the FSO in some cantons from mid-March (week 11) and in others it lasted until almost the end of April (week 17). In the second phase, excess mortality was recorded in all cantons, starting between the second half of October (week 43) in some cantons and early December (week 50) in others.

3.4. Deaths and case fatality rate in Switzerland and compared with other countries

Please note: Differences in the way in which deaths are recorded and in testing strategies make it difficult to compare with other countries.

Over the whole epidemic, Switzerland has recorded a COVID-related death rate of 106 per 100,000 population (Table 1). This puts it in the top half of European countries. The death rate is lower than in e.g. Belgium, Italy, Spain, France and Sweden, but higher than in Germany and Austria.

If we compare case fatality rates (Table 1), Switzerland (at 1.7%) is below the European average over the whole COVID-19 epidemic. Italy, Germany and France have a higher case fatality rate, Austria's is the same and Denmark's is lower. On this basis, we can conclude that the high death rate in Switzerland compared with other European countries is down to higher case numbers rather than higher mortality.

Table 1: Cases and deaths in Switzerland and compared with other countries

	Laboratory-confirmed cases		Deaths			
	Total number	Cases per 100,000 population last 14 days	Total number	Deaths per 100,000 population last 14 days	Cumulative deaths per 100,000 population	Deaths as a proportion of all cases
Switzerland (incl. FL)	547 775	176.6	9 200	2.5	106.4	1.7%
WORLDWIDE	109 481 529	69.9	2 441 550	2.0	31.6	2.2%
EUROPE	32 926 535	253.1	784 089	7.7	104.8	2.4%
Germany	2 372 209	127.3	67 245	7.9	80.3	2.8%
Italy	2 765 412	277.8	94 887	7.7	156.9	3.4%
Austria	439 841	222.5	8 312	4.2	92.3	1.9%
France	3 596 156	438.3	83 542	8.9	128.0	2.3%
Belgium	746 302	236.9	21 821	4.8	188.3	2.9%
the Netherlands	1 057 116	290.9	15 211	5.0	88.8	1.4%
Spain	3 121 687	445.4	66 704	12.6	142.7	2.1%
UK	4 095 187	282.1	119 614	13.5	176.2	2.9%
Sweden	627 022	419.3	12 598	5.6	124.7	2.0%
Denmark	206 753	99.0	2 320	2.3	40.1	1.1%
Israel	741 934	766.2	5 509	5.9	63.6	0.7%
Russia	4 079 407	140.2	80 587	4.5	55.2	2.0%
AMERICA	49 228 481	241.9	1 166 647	7.6	114.6	2.4%
USA	27 896 041	367.3	493 082	9.8	149.0	1.8%
ASIA	23 494 071	20.1	389 542	0.3	8.5	1.7%
China (mainland)	100 136	<0.1	4 816	<0.1	0.3	4.8%
Singapore	59 832	3.6	29	<0.1	0.5	0.0%
South Korea	86 127	11.7	1 550	0.2	3.0	1.8%

Data sources: confirmed cases and deaths: OWID (as at: 18.02.2021), FOPH (as at: 19.02.2021). Population data: OWID (as at: 18.02.2021), Federal Statistical Office (as at: 19.02.2021)

If we only look at the current situation in Switzerland and the number of deaths in the last 14 days, the death rate is 2.5 per 100,000 population (based on data available on 19 February). This is slightly above the European average (2.2), about the same as Denmark, but lower than in Germany, Italy, France and Austria (Table 1).

Euromomo¹ compiles comparative statistics on excess mortality in European countries, where data are available (see attachment, Figure G). Excess mortality was observed in the first phase in many European countries from the beginning of March to the beginning of May 2020. In Switzerland, it was shorter and lower than in most other countries. Since mid-October 2020, excess mortality has again been observed in many countries, although it was higher in Switzerland than most other countries and took longer to fall.

Attachment:

- Other tables and charts, and methodology used

¹ www.euromomo.eu/graphs-and-maps