Office for National Statistics

Article

Comparisons of all-cause mortality between European countries at local levels: 28 December 2019 to week ending 1 July 2022

Comparisons of all-cause excess mortality in local areas across Europe, including cities and Nomenclature of Territorial Units for Statistics level 3 (NUTS3).

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1 . Main points

NUTS3 areas

- The Nomenclature of Territorial Units for Statistics level 3 (NUTS3) local area with the highest relative age-standardised mortality rate (rASMR) across the time series was Bergamo in northern Italy, which was 800.5% above average for the area in week ending 20 March 2020.
- The peak national rASMR in Italy was 74.1% in week ending 27 March 2020, while Spain and France had their peak national rASMR a week later (week ending 3 April 2020) with the mortality mainly concentrated in and around their respective capitals, Madrid and Paris.
- In the UK, excess mortality in NUTS3 areas was mainly concentrated in and around London in the country' s peak rASMR week (week ending 17 April 2020), but it was more geographically spread out than most other European countries, with 41.9% of NUTS3 areas showing at least double the average mortality in the peak week.
- This differed by constituent country, where England had 50.4% of NUTS3 regions showing at least double the average mortality, whereas Northern Ireland had no NUTS3 areas with at least double the expected mortality.

Cities

- Birmingham (239.5% above average), London (220.8%), Manchester (206.8%), Cardiff (146.6%) and Edinburgh (111.6%) had their peak in the same week as the UK (week ending 17 April 2020), whereas Glasgow (123.0% above average) and Belfast (81.0%) had their peak the week after the UK.
- Focusing on age differences, London had the highest proportion of weeks in Europe where excess mortality was greater in people aged 0 to 64 years than in those aged 65 years and over, at 60.4% of weeks.
- Bucharest, Romania, had the highest proportion of weeks with at least 50% excess mortality in people aged 0 to 64 years (26.7% of weeks) and also in those aged 65 years and over (24.4% of weeks).
- Reykjavik, Iceland, had the highest proportion of weeks with at least double (100% excess) expected mortality in people aged 0 to 64 years, at 9.6% of weeks; Bucharest had the highest proportion of weeks in those aged 65 years and over, at 4.4% of weeks.

2 . Differences from previous publications

During the coronavirus (COVID-19) pandemic, we published our Comparisons of all-cause mortality between European countries and regions articles, which compared all-cause excess mortality on a weekly basis since the beginning of 2020. Our previous articles mainly focussed on the national picture of the UK, its constituent countries and 28 European countries, while this article focuses on the local areas of these countries. We use the Nomenclature of Territorial Units for Statistics level 3 (NUTS3) geographical areas, of which there were 179 in the UK and 1,166 across the 24 European countries (that supplied data to Eurostat) in 2020. All the data used in this article have been published previously, but this article provides a deeper look into the story at sub-national level.

This article uses relative age-standardised mortality rates (rASMRs) to look at excess mortality in each individual week, defined as the proportional difference between the ASMR for that week and average ASMR for that week in the five years from 2015 to 2019 inclusive. We also use relative cumulative age-standardised mortality rates (rcASMRs) to look at mortality over a period of weeks. The methodology for this analysis can be found in our Comparisons of all-cause mortality between European countries and regions: 28 December 2019 to week ending 1 July 2022 article or our accompanying Comparing all-cause mortality between European countries and regions methodology.

3 . Nomenclature of Territorial Units for Statistics level 3 (NUTS3) compared with country level

Figure 1: Relative age-standardised mortality rates by week for local authorities (NUTS3 areas) of Europe

Interactive map, persons, all ages, week ending 3 January 2020 to week ending 1 July 2022

Notes:

1. Data are provisional.
2. For the UK countries, non-residents are excluded for figures from England, Scotland and Wales but are included for Northern Ireland. The numbers of non-residents recorded are very small.
3. Information about whether non-residents are included for countries outside the UK is not provided by Eurostat.
4. UK data are based on date of death registration rather than date of death occurrence. Most other European countries are based on date of death occurrence.
5. Age-standardised mortality rates (ASMRs) are standardised to the 2013 European Standard Population.
6. Relative age-standardised mortality rates (rASMRs) are expressed as the percentage change per week from the average ASMR in 2015 to 2019.

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Italy was the first European country to begin to show increased mortality in the week ending 13 March 2020, rising to a relative age-standardised mortality rate (rASMR) of 29.7% above average (2015 to 2019), from 2.1% in the week prior. This was mainly concentrated in the northern region, with Bergamo showing the greatest rASMR in that week (532.0% above average).

Italy was also the first country to have a peak rASMR, which was in week ending 27 March 2020 at 74.1% above average. This was again concentrated in northern Italy, with Bergamo again showing the greatest rASMR that week (725.6% above average). This was the second highest rASMR for all NUTS3 areas across Europe in the whole timeseries. The highest was Bergamo in the previous week (week ending 20 March 2020) at 800.5% above average. In week ending 27 March 2020, 21.8% of the NUTS areas in Italy (24 of 110) had an rASMR of over 100.0%; this indicates these areas had at least double the expected mortality, compared with the average mortality for the same week in 2015 to 2019.

Spain and France then both peaked in week ending 3 April 2020, with an rASMR of 138.5% and 50.2% above average, respectively. Spain's rASMR was also the highest across all European countries in the time series. Above average mortality for this week was mainly seen in central Spain, with Segovia showing the highest rASMR (620.4% above average), followed by Madrid and Ciudad Real at 422.0% above average. Of the 59 NUTS3 areas in Spain, 23 (39.0%) had an rASMR over double the five-year average.

In France, above average mortality was mainly concentrated in and surrounding Paris; the highest rASMR in week ending 3 April 2020 was just northeast of Paris, in Seine-Saint-Denis, at 276.6% above average. Paris itself had the eighth highest rASMR of the 101 NUTS3 areas in France, at 149.9% above average. Above average mortality was also seen in areas of eastern France, but the rASMRs were generally lower than areas surrounding Paris and more evenly distributed across the local areas. In France, 14.9% of the NUTS3 areas (15 of 101) had an rASMR indicating double the expected mortality.

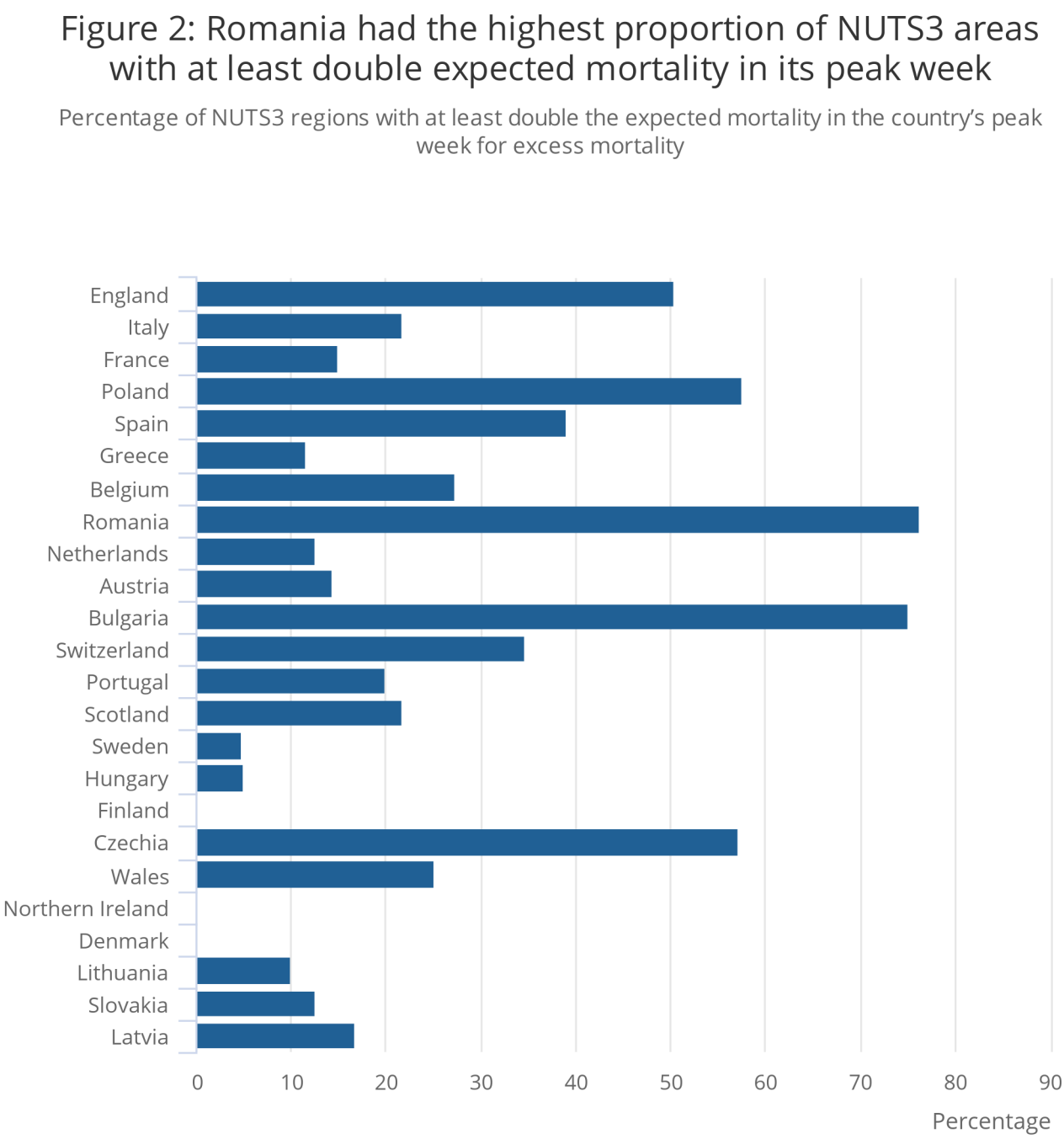
The UK had its peak national rASMR in week ending 17 April 2020, at 97.9% above average. England, Wales, and Scotland also had their peak rASMRs the same week, at 104.5%, 67.4%, and 73.3% above average, respectively. Northern Ireland's peak rASMR followed the week after (week ending 24 April 2020), at 48.8% above average.

Like most other European countries, the majority of above average mortality in England was concentrated in and around the capital. The highest rASMR in England in week ending 17 April 2020 was in Brent (Northwest London) at 333.9% above average. However, unlike most other European countries, above average mortality was distributed widely across the country. Of the 133 NUTS3 areas in England, 67 (50.4%) had at least double the expected mortality for the area.

In Wales, the NUTS3 area with the highest rASMR in week ending 17 April 2020 was in Cardiff and the Vale of Glamorgan, at 146.6% above average; 25.0% of the NUTS3 areas (3 of 12) had an rASMR in this week of over 100.0%. Northern Ireland's capital, Belfast, also had the highest rASMR in its peak week (week ending 24 April 2020), at 81.0% above average. Northern Ireland was the only UK country to have no NUTS3 areas with over double excess mortality in their peak week. In Scotland, the NUTS3 area of Inverclyde, East Renfrewshire and Renfrewshire had the greatest rASMR in week ending 17 April 2020, at 122.8% above average. Of the country's 23 NUTS areas, 5 (21.7%) had over double the expected mortality for the area's average.

Figure 2: Romania had the highest proportion of NUTS3 areas with at least double expected mortality in its peak week

Percentage of NUTS3 regions with at least double the expected mortality in the country's peak week for excess mortality



Source: Office for National Statistics, National Records of Scotland, Northern Ireland Statistics and Research Agency, Eurostat

Notes:

1. Data are provisional.

2. Ordered by the number of NUTS3 regions by country, highest to lowest.

3. For the UK countries, non-residents are excluded for figures from England, Scotland and Wales but are included for Northern Ireland. The numbers of non-residents recorded are very small.

4. Information about whether non-residents are included for countries outside the UK is not provided by Eurostat.

5. UK data are based on date of death registration rather than date of death occurrence. Most other European countries are based on date of death occurrence.

6. Age-standardised mortality rates (ASMRs) are standardised to the 2013 European Standard Population.

7. Croatia, Malta, and Slovenia did not provide data by NUTS3 level to Eurostat at the time of analysis, so have not been included in this figure.

8. Estonia had some NUTS3 level data available in 2020, but not at its peak week in 2021; Norway only had data available for two NUTS3 regions at time of analysis. Both have been omitted from this figure.

9. Cyprus and Luxembourg have only one NUTS3 area so have been omitted from this figure. Iceland has two NUTS3 areas and has also been omitted.

10. Some countries included in this figure have a small amount of NUTS3 areas, so figures should be interpreted with caution; Latvia has 6, Slovakia has 8 and Lithuania has 10 NUTS3 areas.

Table 1a: Top 10 highest rASMRs in 2020 across local areas in Europe, and highest rASMR in the UK

Rank	NUTS3 Area	Country	Week ending	rASMR (%)
1	Bergamo	Italy	20 Mar 2020	800.5
2	Bergamo	Italy	27 Mar 2020	725.6
3	El Hierro	Spain	13 Mar 2020	621.0
4	Segovia	Spain	3 Apr 2020	620.4
5	Segovia	Spain	27 Mar 2020	558.7
6	Cremona	Italy	20 Mar 2020	554.6
7	Cremona	Italy	27 Mar 2020	544.3
8	Bergamo	Italy	13 Mar 2020	532.0
9	Piacenza	Italy	20 Mar 2020	478.4
10	Brescia	Italy	27 Mar 2020	474.3
25	Fermanagh and Omagh	Northern Ireland	25 Dec 2020	384.0

Source: Northern Ireland Statistics and Research Agency, Eurostat

Notes

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3. Information about whether non-residents are included for countries outside the UK is not provided by Eurostat.

4. UK data are based on date of death registration rather than date of death occurrence. Most other European countries are based on date of death occurrence.

5. Age-standardised mortality rates (ASMRs) are standardised to the 2013 European Standard Population.

6. Relative age-standardised mortality rates (rASMRs) are expressed as the percentage change per week from the average ASMR in 2015 to 2019.

7. Data for Fermanagh and Omagh should be treated with caution; it has the smallest population of any NUTS3 area in Northern Ireland and data for week ending 25 December 2020 may have been affected by bank holidays around the Christmas period.

Table 1b: Top 10 highest rASMRs in 2021 across all local areas in Europe, and highest rASMR in the UK

Rank	NUTS3 Area	Country	Week ending	rASMR (%)
1	El Hierro	Spain	19 Mar 2021	595.7
2	Lungau	Austria	3 Sep 2021	389.1
3	Mayotte	France	26 Feb 2021	379.1
4	Guadeloupe	France	20 Aug 2021	347.5
5	Appenzell Innerrhoden	Switzerland	17 Sep 2021	336.2
6	Guadeloupe	France	27 Aug 2021	304.8
7	Evrytania	Greece	25 Jun 2021	272.6
8	Mayotte	France	19 Feb 2021	241.9
9	Mayotte	France	12 Feb 2021	241.5
10	El Hierro	Spain	29 Oct 2021	238.1
20	Tower Hamlets	England	22 Jan 2021	200.9

Source: Office for National Statistics, Eurostat

Notes

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3. Information about whether non-residents are included for countries outside the UK is not provided by Eurostat.

4. UK data are based on date of death registration rather than date of death occurrence. Most other European countries are based on date of death occurrence.

5. Age-standardised mortality rates (ASMRs) are standardised to the 2013 European Standard Population.

6. Relative age-standardised mortality rates (rASMRs) are expressed as the percentage change per week from the average ASMR in 2015 to 2019.

7. This table covers a period when lower levels of mortality were observed. Therefore, the areas with the highest rASMRs tend to be in areas of small population where the rASMRs will be more volatile.

Table 1c: Top 10 highest rASMRs in 2022 (up to week 32) across all local areas in Europe

Rank	NUTS3 Area	Country	Week ending	rASMR (%)
1	Lungau	Austria	8 Jul 2022	376.0
2	Außerfern	Austria	8 Jul 2022	228.9
3	Eilean Siar (Western Isles)	Scotland	6 May 2022	184.1
4	Orkney Islands	Scotland	15 Jul 2022	182.9
5	La Gomera	Spain	1 Jul 2022	179.2
6	El Hierro	Spain	25 Mar 2022	176.2
7	Lefkada	Greece	22 Jul 2022	164.3
8	Osttirol	Austria	20 May 2022	146.6
9	Thesprotia	Greece	29 Jul 2022	141.2
10	Appenzell Innerrhoden	Switzerland	24 Jun 2022	139.8

Source: National Records of Scotland, Eurostat

Notes

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2. For the UK countries, non-residents are excluded for figures from England, Scotland and Wales but are included for Northern Ireland. The numbers of non-residents recorded are very small.
3. Information about whether non-residents are included for countries outside the UK is not provided by Eurostat.
4. UK data are based on date of death registration rather than date of death occurrence. Most other European countries are based on date of death occurrence.
5. Age-standardised mortality rates (ASMRs) are standardised to the 2013 European Standard Population.
6. Relative age-standardised mortality rates (rASMRs) are expressed as the percentage change per week from the average ASMR in 2015 to 2019.
7. This table covers a period when lower levels of mortality were observed. Therefore, the areas with the highest rASMRs tend to be in areas of small population where the rASMRs will be more volatile.

4 . European cities compared with country level

Age-standardised mortality rates (ASMRs) in individual weeks

Figure 3: Cities in Spain and England had the largest peaks in excess mortality

Relative age-standardised mortality rates (rASMRs) for important European cities, by week, persons, all ages, week ending 3 January 2020 to week ending 15 July 2022

Notes:

1. Data are provisional.

2. Figures are ordered alphabetically by cities in UK constituent countries, then alphabetically by other European city names.

3. For the UK countries, non-residents are excluded for figures from England, Scotland and Wales but are included for Northern Ireland. The numbers of non-residents recorded are very small.

4. Information about whether non-residents are included for countries outside the UK is not provided by Eurostat.

5. UK data are based on date of death registration rather than date of death occurrence. Most other European countries are based on date of death occurrence.

6. Age-standardised mortality rates (ASMRs) are standardised to the 2013 European Standard Population.

7. Relative age-standardised mortality rates (rASMRs) are expressed as the percentage change per week from the average ASMR in 2015 to 2019.

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Data at the cities level tend to fluctuate more than the national picture because of the smaller populations. For example, Reykjavik, in Iceland, shows excess mortality earlier in 2020 than some other cities but this is followed by large decreases compared with the average and could be because of their smaller population (around 140,000 people, according to Statistics Iceland).

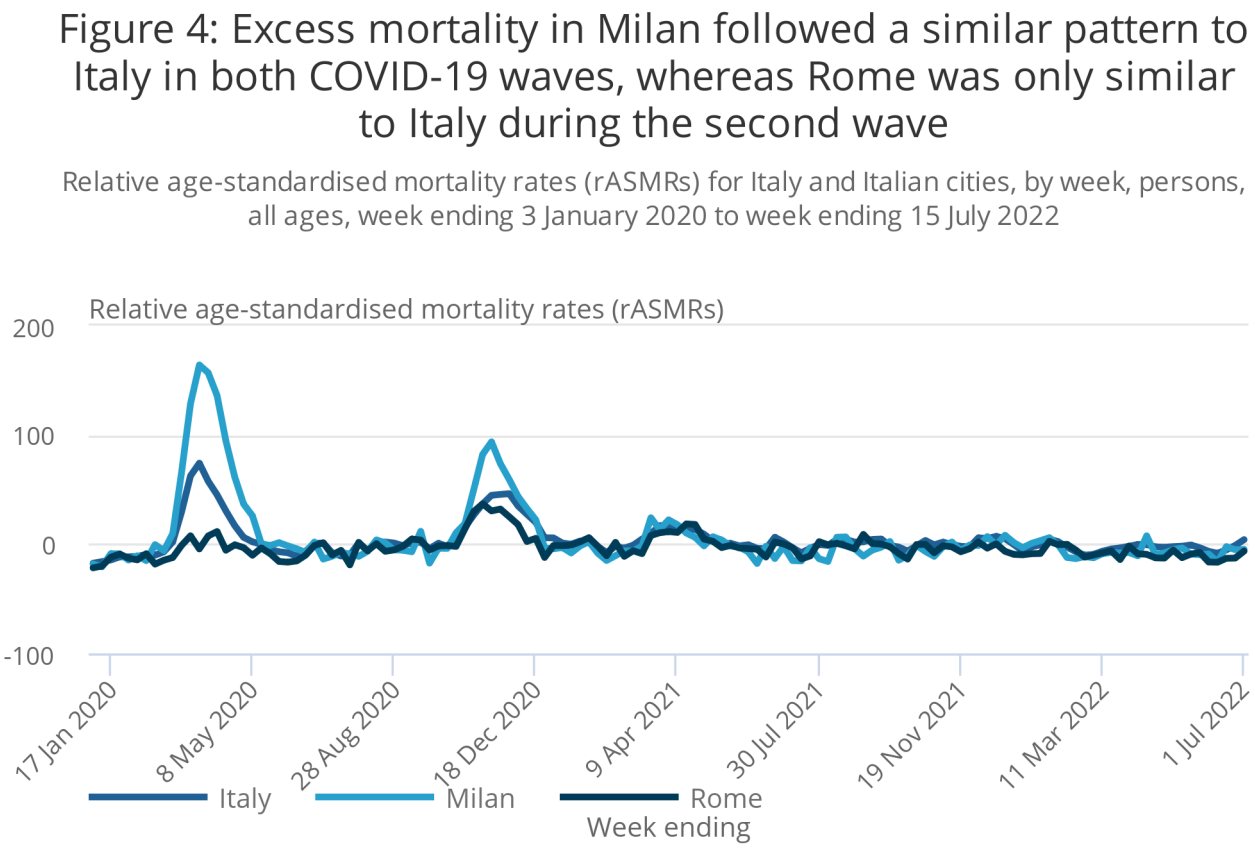
As noted in Section 3: Nomenclature of Territorial Units for Statistics level 3 (NUTS3) compared with country level, Italy and Spain were the first European countries to show excess mortality brought on by the coronavirus (COVID-19) pandemic. This is reflected in the city level data, with Milan and Madrid showing the first large excesses in week ending 13 March 2020 with a relative age-standardised mortality rate (rASMR) of 66.2% and 51.9%, respectively.

Within Italy, Milan followed a pattern similar to the national picture. Milan's peak in the first wave was in the same week as Italy as a whole (week ending 27 March 2020), with 164.0% mortality above average compared with Italy's 74.1% above average. The peak in Italy's second wave was in week ending 27 November 2020, with 46.2% above average; Milan's peak in the second wave was two weeks earlier, with 93.6% above average.

Unlike Milan, Rome did not show high excess during the first wave of the pandemic in Italy. There was either a small or negative excess mortality during the period of the first wave. Within the second wave, Rome showed a pattern more similar to Italy and Milan, but to a lesser extent. The peak in Rome came in week ending 6 November 2020, with 36.9% above the average.

Figure 4: Excess mortality in Milan followed a similar pattern to Italy in both COVID-19 waves, whereas Rome was only similar to Italy during the second wave

Relative age-standardised mortality rates (rASMRs) for Italy and Italian cities, by week, persons, all ages, week ending 3 January 2020 to week ending 15 July 2022



Source: Eurostat

Notes:

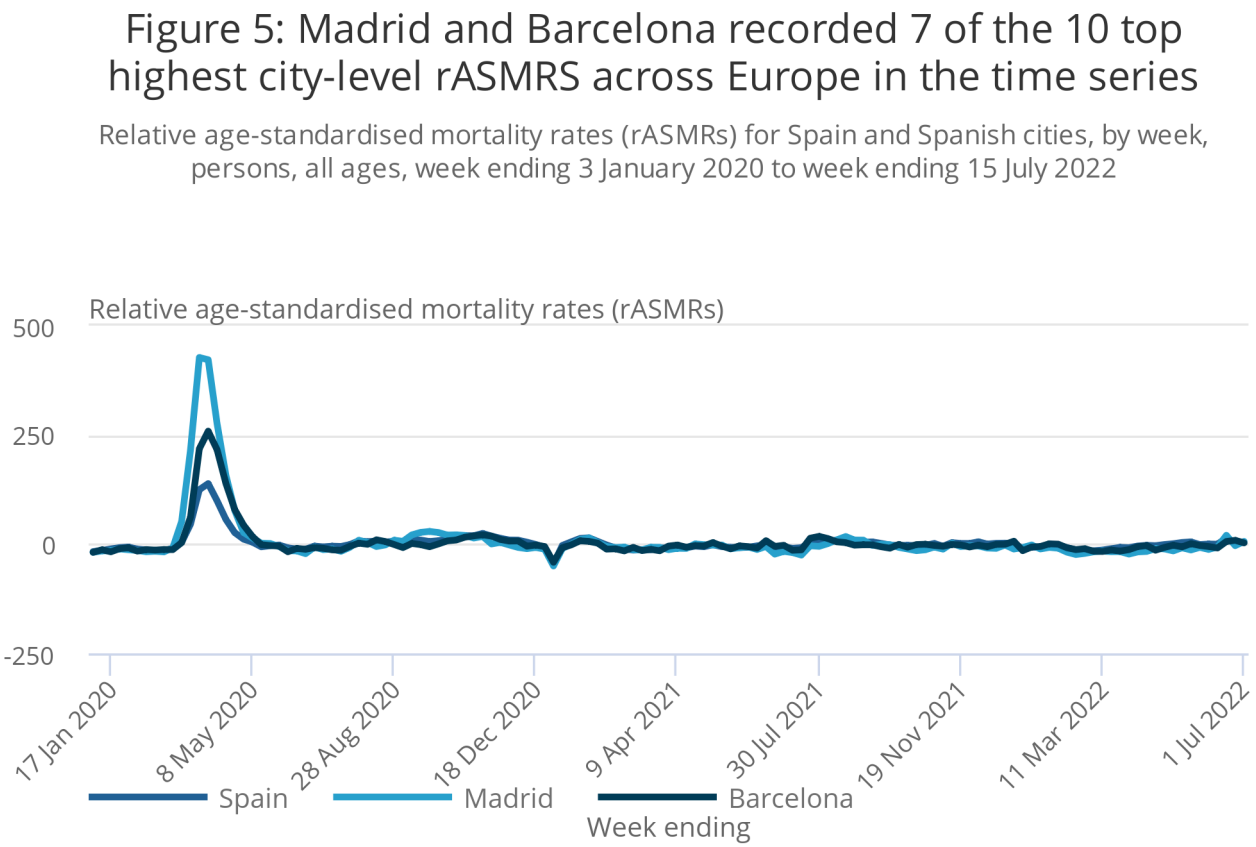
1. Data are provisional.
2. Information about whether non-residents are included for countries outside the UK is not provided by Eurostat.
3. Most European countries are based on date of death occurrence rather than registration.
4. Age-standardised mortality rates (ASMRs) are standardised to the 2013 European Standard Population.
5. Relative age-standardised mortality rates (rASMRs) are expressed as the percentage change per week from the average ASMR in 2015 to 2019.

In Spain, the highest rASMRs among cities during the country's largest peak were seen mainly in Madrid and Barcelona. Seven of the ten highest city-level rASMRs within the whole time series were seen in Madrid in the four-week period ending 10 April 2020, and Barcelona in the three-week period ending 10 April 2020.

Excess mortality in Madrid increased from 8.4% below average in week ending 6 March 2020 to 51.9% above average in the following week and 427.1% above average in week ending 27 March 2020, the week prior to Spain's national peak. The highest excess in Barcelona was in the same week as the national peak, in week ending 3 April 2020, with 258.5% above average. Unlike a lot of other countries, Spain and its cities appear to have had only one large wave of excess mortality throughout the period.

Figure 5: Madrid and Barcelona recorded 7 of the 10 top highest city-level rASMRS across Europe in the time series

Relative age-standardised mortality rates (rASMRs) for Spain and Spanish cities, by week, persons, all ages, week ending 3 January 2020 to week ending 15 July 2022



Source: Eurostat

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4. Age-standardised mortality rates (ASMRs) are standardised to the 2013 European Standard Population.
5. Relative age-standardised mortality rates (rASMRs) are expressed as the percentage change per week from the average ASMR in 2015 to 2019.

Similar to Spain, the cities with available data in the four constituent countries of the UK had higher rASMRs compared with their national average. All seven cities of the UK included in this analysis had their highest excess mortality in either week ending 17 or 24 April 2020, the weeks with the two highest rASMRs at the UK level. Birmingham (239.5% above average), London (220.8%), Manchester (206.8%), Cardiff (146.6%) and Edinburgh (111.6%) had their peak in the same week as the UK (week ending 17 April 2020), whereas Glasgow (123.0% above average) and Belfast (81.0%) had their peak the week after the UK.

Figure 6: All cities of the UK which are included in this analysis had their highest excess mortality in the two weeks with the highest rASMRs at the UK level

Relative age-standardised mortality rates (rASMRs) for UK constituent countries and their cities, by week, persons, all ages, week ending 3 January 2020 to week ending 15 July 2022

Notes:

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3. Based on date of death registration rather than date of death occurrence.
4. Age-standardised mortality rates (ASMRs) are standardised to the 2013 European Standard Population.
5. Relative age-standardised mortality rates (rASMRs) are expressed as the percentage change per week from the average ASMR in 2015 to 2019.

Download the data

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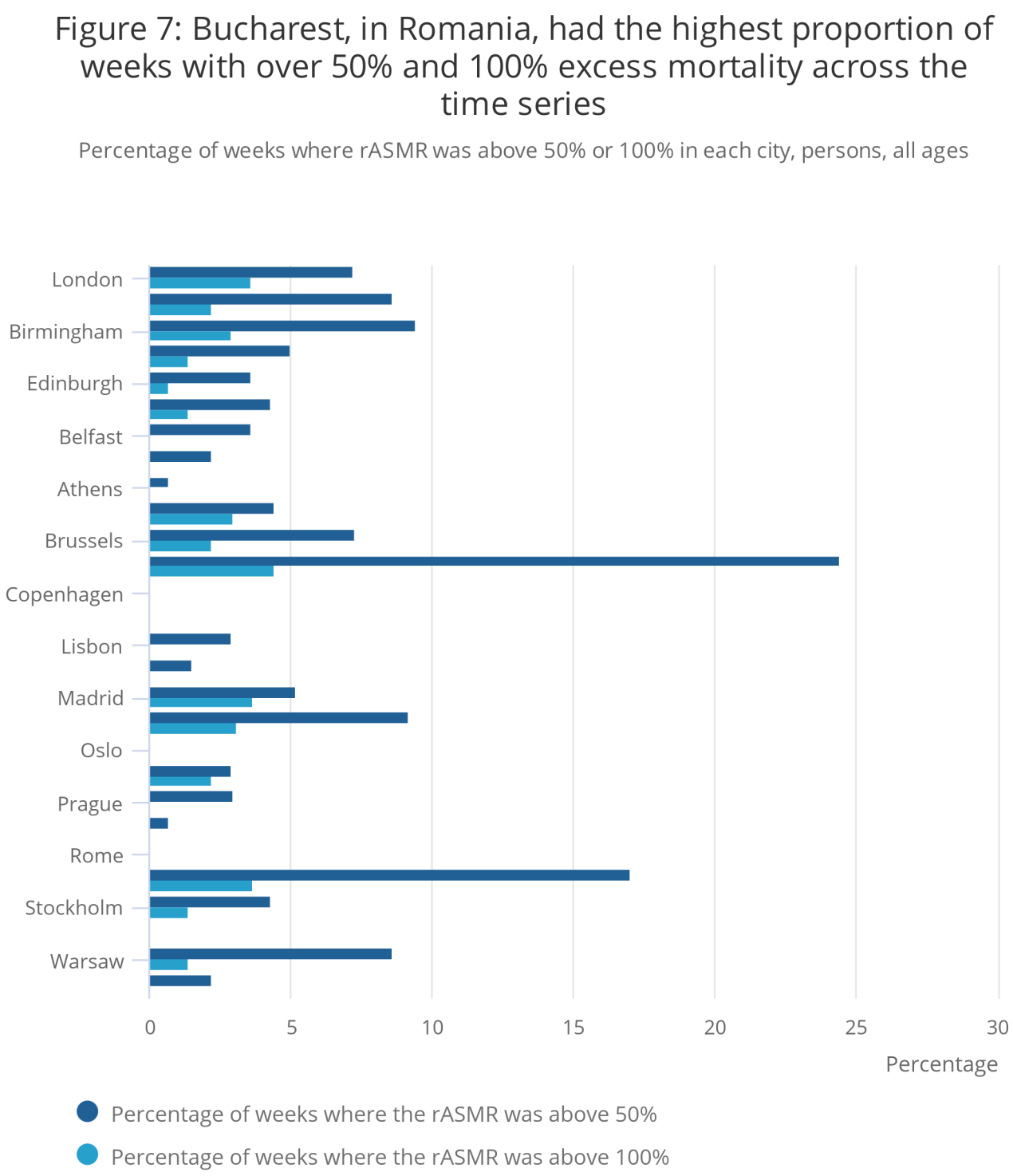
Looking across all 28 cities reported in this release and the whole time period available (which differs for each city), we can see how many times an rASMR is reported at a value of at least 50% or 100% (that is, double the expected ASMR).

Bucharest, in Romania, had the highest proportion of weeks with at least 50% excess, with 24.4% of weeks. This was followed by Sofia, in Bulgaria, and Birmingham, in England, with 17.0% and 9.4% of weeks, respectively.

Bucharest again had the highest proportion of weeks, with over double the expected ASMR, with 4.4% of weeks. This was followed by Madrid, in Spain, and Sofia, both with 3.7% of weeks.

Figure 7: Bucharest, in Romania, had the highest proportion of weeks with over 50% and 100% excess mortality across the time series

Percentage of weeks where rASMR was above 50% or 100% in each city, persons, all ages



Source: Office for National Statistics, National Records of Scotland, Northern Ireland Statistics and Research Agency, Eurostat

Notes:

1. Data are provisional.

2. Figures are ordered by cities in UK constituent countries, then alphabetically by other European city names.

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6. Age-standardised mortality rates (ASMRs) are standardised to the 2013 European Standard Population.

Looking at ASMRs across weeks (rcASMRs)

As well as looking at excess mortality in individual weeks, we can also look at the cumulative excess mortality across the period. We use the relative cumulative age-standardised mortality rates (rcASMRs) to look at mortality over a period of weeks. For this analysis, ”end 2020” covers all weeks in 2020, ”end 2021” covers all weeks in 2020 and 2021 and so on.

Most cities observed their highest rcASMR at the end of 2020, followed by decreases in 2021 and further decreases in 2022. Between 28 December 2019 and week ending 1 January 2021, Bucharest, in Romania, had the highest excess mortality with 33.5% above average for the period. This increased to 43.8%, including the 2021 period, before decreasing to 40.3% by week ending 1 July 2022. Bucharest had the highest rcASMR for all three periods.

Madrid, in Spain, had the second highest rcASMR between 28 December 2019 and week ending 1 January 2021, with 28.4% above average. This was followed by Milan, in Italy, with 21.0% above average. The second highest excess mortality between 28 December 2019 and week ending 31 December 2021 was Sofia, in Bulgaria, with 22.3% above average, followed by Birmingham, in England, with 16.7% above average. These two cities also had the second and third highest excess mortality when looking to the period to the week ending 1 July 2022, with 19.3% above average for Sofia and 13.0% above average for Birmingham.

Figure 8: Bucharest, in Romania, had the highest cumulative excess mortality since week ending 3 January 2020 by end 2020, end 2021 and week ending 1 July 2022

Relative cumulative age-standardised mortality rates (rcASMRs) across European cities at week ending 1 January 2021, week ending 31 December 2021 and week ending 1 July 2022

Notes:

1. Data are provisional.

2. Figures are ordered by relative cumulative age-standardised mortality rates (rcASMRs) at week ending 1 July 2022, highest to lowest.

3. For the UK countries, non-residents are excluded for figures from England, Scotland and Wales but are included for Northern Ireland. The numbers of non-residents recorded are very small.

4. Information about whether non-residents are included for countries outside the UK is not provided by Eurostat.

5. UK data are based on date of death registration rather than date of death occurrence. Most other European countries are based on date of death occurrence.

6. Age-standardised mortality rates (ASMRs) are standardised to the 2013 European Standard Population.

7. Relative cumulative age-standardised mortality rates (rcASMRs) are expressed as the percentage change per week of the cumulative age-standardised mortality rate from the average ASMR in 2015 to 2019.

Download the data

.xlsx

5 . European city comparisons by age

Figure 9: Relative age-standardised mortality rates by week for cities of Europe by broad age group

Notes:

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3. Information about whether non-residents are included for countries outside the UK is not provided by Eurostat.

4. UK data are based on date of death registration rather than date of death occurrence. Most other European countries are based on date of death occurrence.

5. Age-standardised mortality rates (ASMRs) are standardised to the 2013 European Standard Population.

6. Relative age-standardised mortality rates (rASMRs) are expressed as the percentage change per week from the average ASMR in 2015 to 2019.

Download the data

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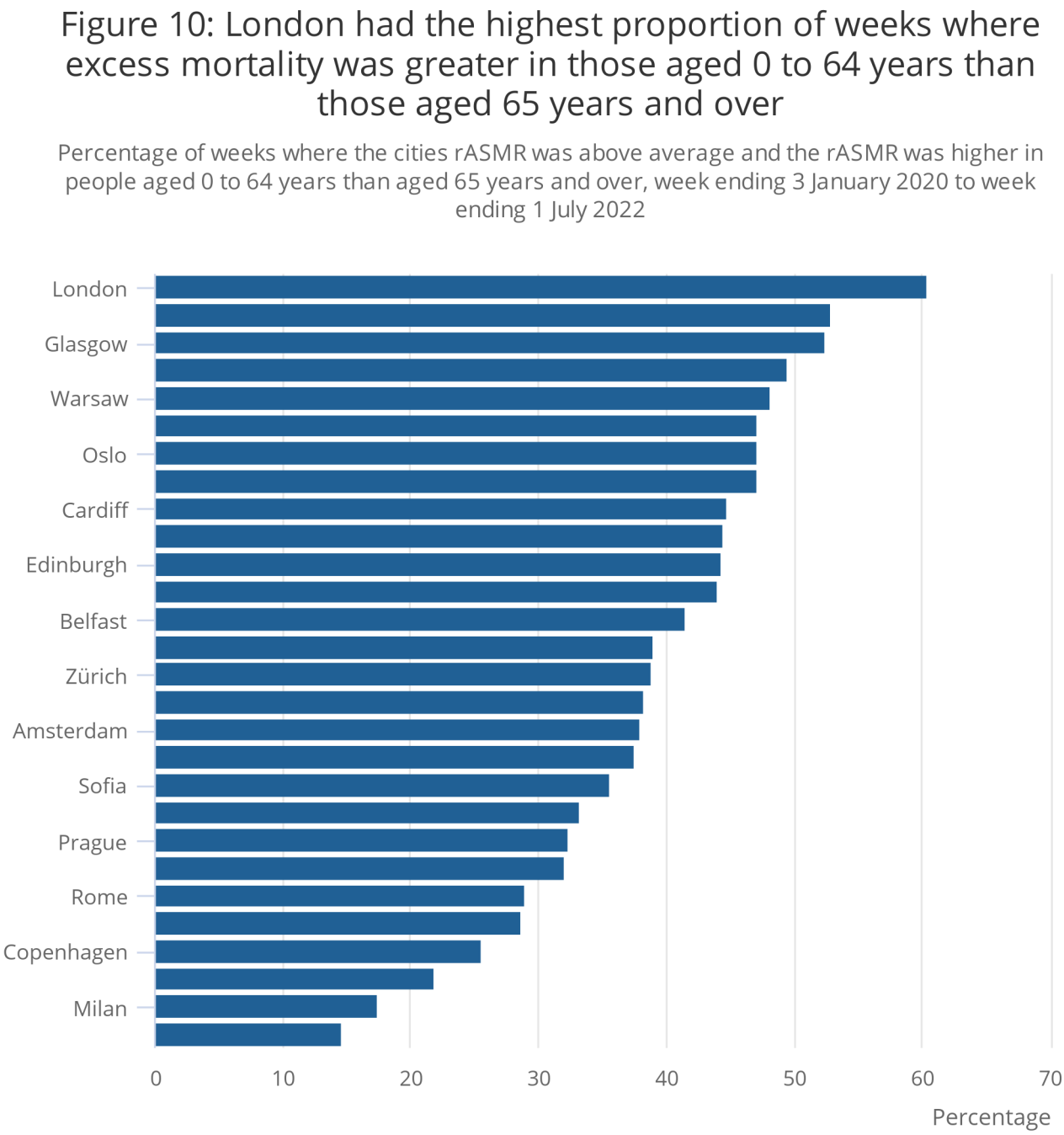
As highlighted in our Comparisons of all-cause mortality between European countries and regions article, out of the 33 countries analysed, the majority had a greater proportion of weeks with excess mortality in people aged 65 years and over than those aged 0 to 64 years.

This also held true when looking at city level excess mortality. Out of the 28 cities analysed, only three had a higher proportion of weeks where the rASMR was above average and was higher in people aged 0 to 64 years than those aged 65 years and over; these were all in the UK.

Figure 10: London had the highest proportion of weeks where excess mortality was greater in those aged 0 to 64 years than those aged 65 years and over

Percentage of weeks where the cities rASMR was above average and the rASMR was higher in people aged 0 to 64 years than aged 65 years and over, week ending 3 January 2020 to week ending 1 July 2022



Source: Office for National Statistics, National Records of Scotland, Northern Ireland Statistics and Research Agency, Eurostat

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4. UK data are based on date of death registration rather than date of death occurrence. Most other European countries are based on date of death occurrence.

5. Age-standardised mortality rates (ASMRs) are standardised to the 2013 European Standard Population.

London had the greatest proportion of weeks where excess mortality was greater in the people aged 0 to 64 years than those aged 65 years and over, at 60.4% of weeks. This was followed by Birmingham (52.9%) and Glasgow (52.4%). Manchester was the fourth-highest city where excess mortality was higher in the younger age group than the older age group, at 49.4%. The remaining UK cities all fell in the top 13 cities, the lowest being Belfast, with 41.5% of weeks having higher excess mortality in those aged 0 to 64 years than those aged 65 years and older.

Of the non-UK cities, Warsaw had the greatest proportion of weeks where excess mortality was greater in people aged 0 to 64 years than those aged 65 years and over, at 48.1% of weeks. This was followed by Luxembourg, Oslo and Reykjavik, all with 47.1% of weeks.

The cities with the lowest proportion of weeks where excess mortality was greater in younger age groups than older age groups were Paris and Milan, at 14.3% and 17.4% of weeks, respectively. Interestingly, these were cities in the countries which reached their peak rASMR first out of all 33 countries analysed, France and Italy. This could be because at the start of the coronavirus (COVID-19) pandemic, we weren't fully aware of what characteristics would be more vulnerable to the virus. Therefore, in the countries where excess mortality peaked first (such as Italy and France), there were not the precautions in place to safeguard older individuals from the virus.

Figure 11: Bucharest, in Romania, had the highest proportion of weeks with over 50% and 100% excess mortality for both age groups, except for weeks with over 100% excess mortality in those aged 0 to 64 years, where the highest proportion was in Reykjavik in Iceland

Percentage of weeks where rASMR was above 50% or 100% in each city by age group, week ending 3 January 2020 to week ending 1 July 2022

Notes:

1. Data are provisional.

2. For the UK countries, non-residents are excluded for figures from England, Scotland and Wales but are included for Northern Ireland. The numbers of non-residents recorded are very small.

3. Information about whether non-residents are included for countries outside the UK is not provided by Eurostat.

4. UK data are based on date of death registration rather than date of death occurrence. Most other European countries are based on date of death occurrence.

5. Age-standardised mortality rates (ASMRs) are standardised to the 2013 European Standard Population.

Download the data

.xlsx

Bucharest, in Romania, had the highest proportion of weeks with at least 50% excess for those aged 0 to 64 years, with 26.7% of weeks. This was followed by Reykjavik, in Iceland, and Sofia, in Bulgaria, with 21.5% and 16.3% of weeks, respectively.

In those aged 65 years and over, Bucharest again had the highest proportion of weeks with at least 50% excess with 24.4% of weeks. This was followed by Sofia and Milan, in Italy, with 16.3% and 9.2% of weeks, respectively.

Most cities (16 out of 28 analysed) did not show over 100% mortality above what would be expected in those aged 0 to 64 years. Of the cities that did show double the expected mortality, Reykjavik had the greatest proportion, at 9.6% of weeks with at least double expected mortality. This was followed by Bucharest and Manchester, in England, at 5.2% and 5.0% of weeks, respectively.

Bucharest had the highest proportion of weeks with over 100% of excess mortality in those aged 65 years and over, at 4.4% of weeks. This was followed by Milan, at 3.8%, and Madrid, in Spain, and Sofia, both with 3.7% of weeks. This mirrors the weeks with at least double the excess mortality for all ages, as seen in the previous section. This suggests that double excess mortality at city level was likely contributed to by the older age groups.

As mentioned above, Manchester had one of the highest proportions of weeks with over double excess mortality in those aged 0 to 64 years of all the cities analysed. In comparison, Glasgow, in Scotland, had no weeks with double excess mortality in this age group; this was also the only UK city to not have 50% or 100% excess mortality across either of the age groups.

Among the seven UK cities analysed, Manchester also had highest proportion of weeks with at least 50% excess in the younger age group in the UK, with 12.9% of weeks; this was joint with Cardiff, in Wales. Manchester also has the highest proportion of weeks with 50% excess mortality in those aged 65 years and over, at 8.6% of weeks. Of the weeks with double the expected mortality in the older age group, London had the greatest proportion of weeks, at 3.6%.

Out of the 28 cities analysed, three did not show any weeks where the excess was at least either 50% or 100% higher than expected mortality: Copenhagen, Rome, and Vienna. This aligns with Section 4: European cities compared with country level's similar analysis, where none of these cities had any weeks with over 50% or 100% excess. However, unlike the previous section, Helsinki and Oslo did show a few weeks where excess mortality was at least 50% above what would be expected in those aged 0 to 64 years, at 0.7% and 2.8% of weeks, respectively.

6 . Glossary

Age-standardised mortality rate

Age-standardised mortality rates (ASMRs) are used to allow comparisons between populations that may contain different proportions of people of different ages. The 2013 European Standard Population is used to standardise rates. See our Comparing all-cause mortality between European countries and regions methodology for how these are calculated.

Relative age-standardised mortality rate

Relative age-standardised mortality rates (rASMRs) are expressed as the percentage change per week from the average age-standardised mortality rate in 2015 to 2019.

A negative value indicates a weekly 2020 ASMR below what is expected given the five-year average. In contrast, a positive value indicates a weekly ASMR above the five-year average.

Relative cumulative age-standardised mortality rate

Relative cumulative age-standardised mortality rates (rcASMRs) are expressed as the percentage change per week of the weekly cumulative age-standardised mortality rate from the average cumulative age-standardised mortality rate in 2015 to 2019.

A nil value for rcASMR indicates that age-standardised mortality for the period has been equal to the average. A positive value indicates above average mortality, and a negative value indicates below average mortality.

7 . Data sources and quality

Measuring the data

We use weekly all-cause death registration data published by Eurostat from contributing nations of the European Union and European Free Trade Association. There are clear criteria set out by Eurostat for data to be submitted to their database, based on official recording of deaths occurring in all settings, to maximise comparability.

For the UK, we use Office for National Statistics (ONS) data for England and Wales, National Records of Scotland (NRS) data for Scotland, and Northern Ireland Statistics and Research Agency (NISRA) data for Northern Ireland.

Analysis of all-cause mortality allows us to examine the impact of the coronavirus (COVID-19) pandemic, not only from deaths due to COVID-19, but also excess deaths that have occurred as a result of the wider impacts of the virus on healthcare systems and society. Given the widely differing practices in recording and reporting deaths relating to COVID-19, it is not possible at this time to conduct accurate international comparisons of deaths involving COVID-19 specifically.

More information can be found in our Comparing all-cause mortality between European countries and regions methodology.

Strengths and limitations

The data provided to Eurostat have a strict measuring criteria, which means that we can get comparable data for all European countries that submit to Eurostat. As we look at age-standardised mortality rates (ASMRs), rather than numbers of deaths, we are able to make robust comparisons across countries as we take into account the population size and age structure of each country and regions within countries.

As we rely on data provided to Eurostat, we are limited to the countries that provide information and can only make comparisons across Europe as we standardised our rates to the European Standard Population.

More information can be found in our Comparing all-cause mortality between European countries and regions methodology.

This report measures excess deaths and mortality rates compared with the five-year average. Other methods for determining expected mortality are also used within England, and each have their advantages and disadvantages. Information on different measures of excess mortality can be found in our Comparing different international methods of measuring excess mortality article.

8 . Related links

[Comparisons of all-cause mortality between European countries and regions]
Article | Released 20 December 2022
Comparisons of all-cause excess mortality on a weekly basis since the start of the coronavirus (COVID-19) pandemic. Measures include relative age-standardised mortality rates and relative cumulative age-standardised mortality rates.

[International comparisons of possible factors affecting excess mortality]
Article | Released 20 December 2022
Comparisons of select pre-existing causal factors that may result in all-cause and cause-specific excess mortality before and during the coronavirus (COVID-19) pandemic.

[Comparing different international methods of measuring excess mortality]
Article | Released 20 December 2022
Outlines the different statistical measures used to calculate all-cause excess mortality and outlines their strengths and limitations depending upon the context and geographical coverage for their application.

[Eurostat data explorer]
Webpage | Updated regularly
Deaths by week, five-year age group and nomenclature of territorial units for statistics 3 (NUTS 3) region.

[NISRA Weekly deaths]
Webpage | Updated weekly
Weekly death registrations in Northern Ireland from the Northern Ireland Statistics and Research Agency (NISRA).

[Weekly and monthly data on births and deaths registered in Scotland]
Webpage | Updated weekly
Summary weekly and monthly data on births and deaths. All the figures for 2022 are provisional and may be revised.

[Deaths registered weekly in England and Wales, provisional]
Bulletin | Updated weekly
Provisional number of deaths registered in England and Wales, including deaths involving coronavirus (COVID-19), in the latest weeks.

[Excess mortality and mortality displacement in England and Wales: 2020 to mid-2021]
Article | Released 15 October 2021
Deaths registered in England and Wales by week, from 28 December 2019 to 2 July 2021. Breakdowns include country, sex, age group, region, place of death, and leading cause. Includes analysis of excess deaths and relative cumulative age-standardised mortality rates.

9 . Cite this article

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