

Article

# Impact of registration delays on mortality statistics in England and Wales: 2018

An analysis of the time taken to register deaths, by cause of death, by area of usual residence and certification type.

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# 1 . Main points

- Since 2001, the median time between a death occurring and being registered (referred to as the "registration delay") in England and Wales increased from 2 days in 2001 to 5 days in 2018.
- In registration year 2018 (that is, deaths registered in the calendar year 2018, regardless of when they occurred) 73.8% of deaths were registered within 7 calendar days, compared with 92.7% in registration year 2001.
- In registration year 2018, Wales had a higher percentage (82.6%) of deaths registered within 7 days of occurring than any region of England (73.2% in England overall); this was the 7th consecutive year that Wales had a higher proportion of deaths registered within 7 calendar days.
- Within England, the percentage of deaths registered within 7 days was highest in the North East (81.9%) and lowest in the South East (68.2%).
- Between registration year 2001, when 22.6% of all deaths were registered by a coroner (120,250 coroner-registered deaths) and registration year 2018, when 17.5% of all deaths were registered by a coroner (94,610), there was an increase in the median delay between occurrence and registration for deaths registered by a coroner from 5 days in 2001 to 18 days in 2018.
- The proportion of deaths registered within 7 days was lowest for suicide deaths at 0.2% in 2018, a decline from 0.6% in 2001.

## 2 . Things you need to know about this release

Important information for interpreting these mortality statistics:

- mortality statistics are compiled from information supplied when deaths are certified and registered as part of civil registration, a legal requirement; according to the Births and Deaths Registration Act 1953, a death should be registered within five days unless it is referred to a coroner for investigation
- mortality statistics for a given time period can be based on occurrence (death-date) or registration (registration-date); registration delay is the difference between date of occurrence and date of registration
- this bulletin uses breakdowns of 7 calendar days as an alternative to the 5 days used previously, to allow for deaths that occur on or just before weekends and bank holidays, when it is unlikely that registrations will be recorded until the next working day
- causes of death are coded using the World Health Organization's (WHO) [International Classification of Diseases, Tenth Revision \(ICD-10\)](#)
- for information on how deaths are registered and mortality statistics are produced please see the [Quality and methodology section](#)

The mortality publications the Office for National Statistics (ONS) produces are based on death registrations. For the majority of publications we report by the year a death was registered, but there are a limited number of publications that are based on the year a death occurred, or feature tables based on the year a death occurred, for example, [excess winter mortality](#).

The use of registration year data allows the statistics to be produced in a timely way and avoids the need for annual figures to be updated, as deaths that occurred in a completed year are registered subsequently.

Each summer we release an annual bulletin of death registrations, which reports deaths registered in the previous year. The most recent release in 2019 was for [deaths registered in 2018](#). Death registrations are potentially limited in their completeness, as registration delays result in the annual data not showing all death occurrences in a year. For example, the need for a post-mortem can impact how long it takes for a death to be registered, which in some cases can result in a death occurring in one calendar year and then being registered in a subsequent year.

Following the deaths registrations release, in the autumn an annual dataset is created based on the date a death occurred rather than was registered. This is used for seasonal analysis of mortality data and several infant mortality outputs.

As a way of measuring the quality of the mortality data, it is important to regularly assess the impact of registration delays. This article looks at what the delay is between the date a death occurred and the date it was registered, how this has changed over time, and what factors influence the delay in registration. A subsequent article will deal with possible ways to estimate and adjust for registration delays prospectively (see [Next steps section](#)).

### **3 . The delay between death occurrence and registration has increased in 2018**

There were 535,857 death occurrences in England and Wales in 2018. Of these deaths, 99.7% were registered within a year (365 days) of occurrence.

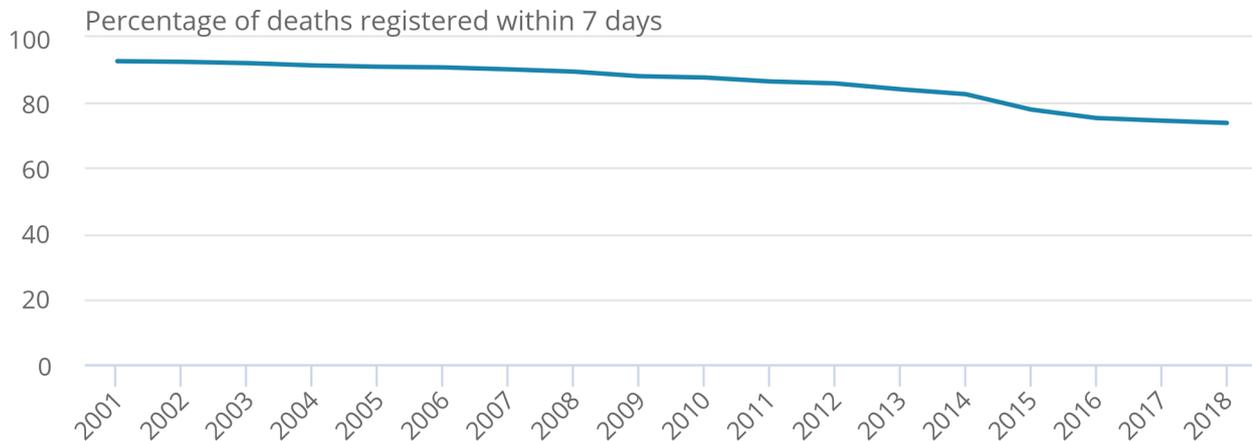
Since registration year 2001, there has been an increase in registration delays when we look at the proportion of deaths registered within 7 days from the death occurrence (Figure 1). From 2001 to 2014, there was a gradual decline in the number of deaths being registered within 7 calendar days, of approximately 10 percentage points from 92.7% in registration year 2001 to 82.6% in 2014. This decline has become more marked in recent years, with a sharp decline to 74.5% of deaths being registered within 7 calendar days in 2017, and 73.8% in 2018.

## Figure 1: Deaths registered within 7 days or fewer have decreased since 2001

England and Wales, 2001 to 2018

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England and Wales, 2001 to 2018



Source: Office for National Statistics – Death registrations

#### Notes:

1. Figures include deaths of non-residents.
2. Deaths that do not provide enough information to calculate the delay have been excluded.

From registration year 2014 to registration year 2018, there was a steep increase from 8.7% of deaths registered between 8 to 14 days (one to two weeks) in 2014 to 14.5% in 2018 (Figure 2). Similarly, there was an increase in death registrations between 15 to 21 days (two to three weeks) during this period, with an increase of 1.8 percentage points between registration years 2014 (1.1%) and 2018 (2.9%).

**Figure 2: Since 2014 there has been a sharp increase in deaths being registered 1 to 2 weeks after occurrence**

England and Wales, 2001 to 2018

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England and Wales, 2001 to 2018



Source: Office for National Statistics – Death registrations

Notes:

1. Figures include deaths of non-residents.
2. Deaths that do not provide enough information to calculate the delay have been excluded.
3. The time period 1 to 2 weeks means 8 to 14 days, 2 to 3 weeks means 15 to 21 days, 3 weeks to 1 month means 22 to 30 days, 1 to 3 months means 31 to 91 days, 3 to 6 months means 92 to 183 days, 6 months to 1 year means 184 to 365 days, over 1 year means a registration over 365 days after the death occurred.

## 4 . The impact of cause of death on registration delays

The delay between death occurrence and death registration can differ depending on the cause of death (Reference Table 2 in Impact of registration delays on mortality statistics dataset). The following section refers to the [International Classification of Diseases, Tenth Revision \(ICD-10\)](#) chapters where there were more than 100 deaths registered within England and Wales. Therefore, ICD-10 Chapters 7, 8 and 15 have been excluded because of the small number of deaths within these chapters.

Since registration year 2001, of the four ICD-10 chapters accounting for most deaths (neoplasms, respiratory, circulatory, mental and behavioural disorders), neoplasms (cancers) (Chapter 2) has always had the highest percentage of deaths registered within 7 days.

In registration year 2018, 86.6% of deaths with neoplasm as the underlying cause were registered within 7 days of the deaths occurring, however, this percentage has decreased over time and is at its lowest since 2001 (97.3%).

Generally, deaths from external causes (ICD-10 Chapter 20), such as accidental injuries and assaults, are least often registered within 7 days of occurrence as they are referred to a coroner. For these causes there was a decrease in timeliness since 2001, from 18.6% of deaths registered within 7 days to 10.3% in 2018.

In 2018, 23.8% of deaths from external causes had a registration delay between 6 months and a year, while a further 9.2% took longer than a year to be registered. This is because of potentially lengthy inquests, and in some cases the need for a criminal trial, before the cause of death can be determined.

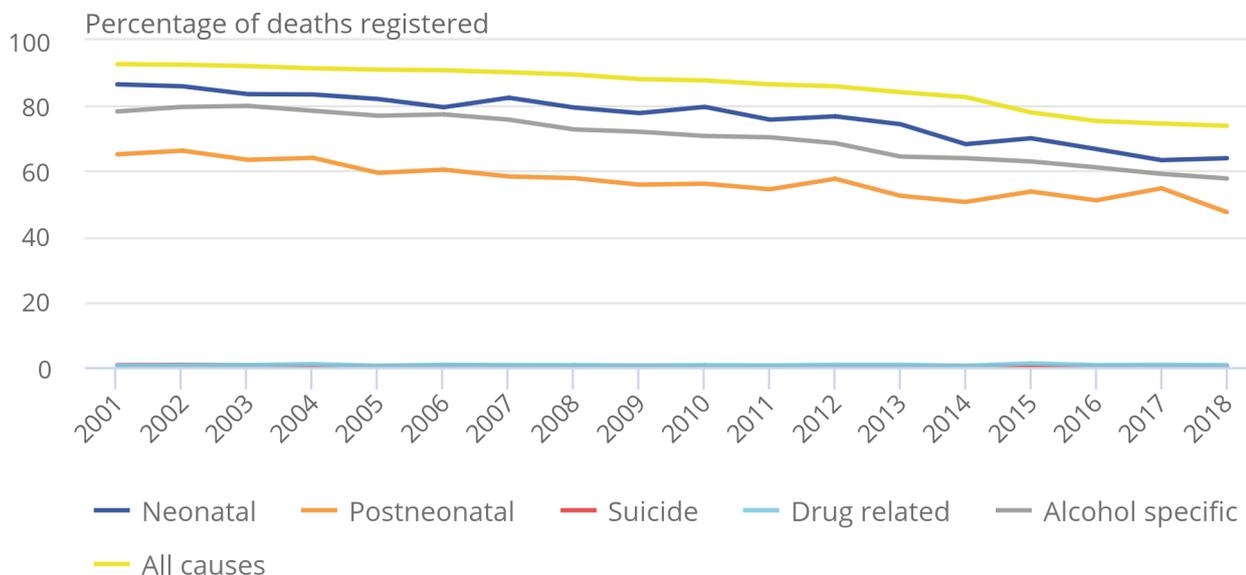
For specific causes of death that require coroner's inquests (alcohol-specific, suicide, drug-related, neonatal and postneonatal deaths), timeliness decreases greatly in comparison with other causes (Figure 3). For deaths related to suicide and drugs, the proportion of registrations within 7 days of occurrence was as low as 0.2% and 0.6% in 2018, respectively.

**Figure 3: There are fewer deaths registered within 7 days for specific causes in comparison with overall deaths**

England and Wales, 2001 to 2018

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England and Wales, 2001 to 2018



Source: Office for National Statistics – Death registrations

Notes:

1. Figures include deaths of non-residents.
2. Deaths that do not provide enough information to calculate the delay have been excluded.
3. Suicide death figures are for persons aged 10 years and over.

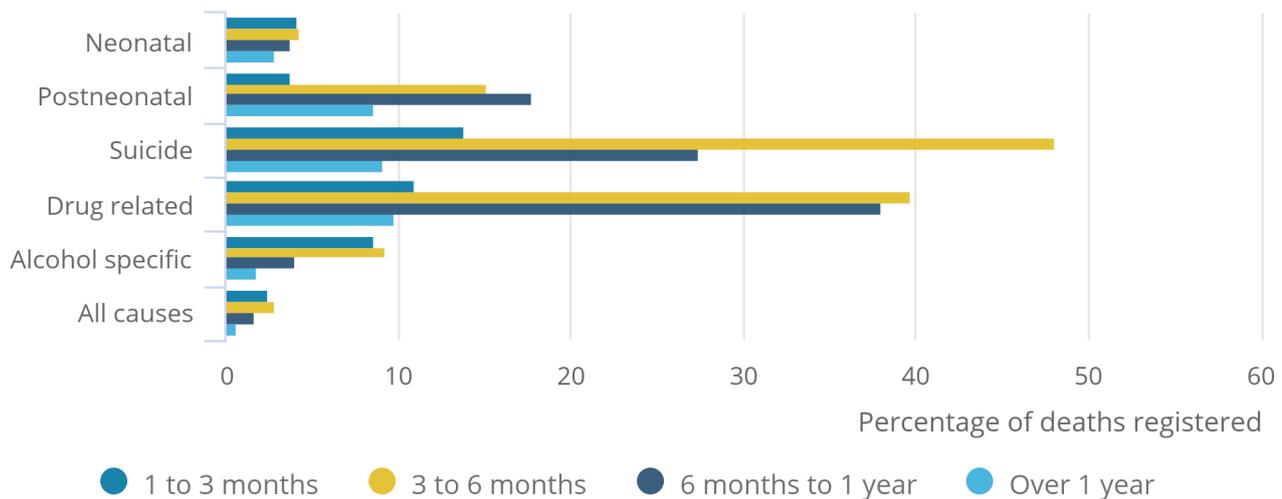
Looking at the proportion of deaths that took over a month to be registered, the specific causes mentioned previously (neonatal, postneonatal, suicide, drug-related and alcohol-specific) have higher registration delays than for all causes combined (Figure 4). In registration year 2018, most suicide and drug-related deaths were registered 3 to 6 months after the occurrence (48.1% and 39.7% respectively). In registration year 2018, nearly one-tenth of suicide (9.1%) and of drug-related deaths (9.8%) took longer than 1 year to be registered. More than 94% of suicide and drug-related deaths required an inquest and post-mortem.

**Figure 4: Deaths from specific causes take longer to register in comparison with other causes, registration year 2018**

England and Wales, 2018

Figure 4: Deaths from specific causes take longer to register in comparison with other causes, registration year 2018

England and Wales, 2018



Source: Office for National Statistics – Death registrations

Notes:

1. Figures include deaths of non-residents.
2. Deaths that do not provide enough information to calculate the delay have been excluded.
3. Please note the time period 1 to 3 months means 31 to 91 days, 3 to 6 months means 92 to 183 days, 6 months to 1 year means 184 to 365 days, over 1 year means a registration over 365 days after the death occurred.
4. Suicide death figures are for persons aged 10 years and over.

## 5 . Registration delays by certification type.

The length of registration delay can vary greatly, with some deaths taking much longer to be registered than the majority. Deaths certified by a coroner after inquest generally take much longer to be registered than the more "routine" deaths certified by a doctor. A few delays are extremely long - in 2018, the longest time it took a death to be registered was just under 33 years.

Deaths with very long delays tend to be those involving a long investigation or criminal trial, such as unlawful killings, and cases where there is no body of the deceased or a body is found after many years. There are also some special cases where deaths are re-registered at a later date because of a retrial or an official inquiry. To reduce the impact these outliers have on the measurement of the average registration delay we calculate the median, lower and upper quartile registration delay.

In registration year 2018, the lowest median delay occurred when deaths were registered by a doctor (4 days) regardless of whether a post-mortem was required, whereas the longest median delay occurred when the death was registered by a coroner when a full inquest and a post-mortem were required (173 days) (see Reference Table 8 in Impact of registration delays on mortality statistics dataset).

Since registration year 2001, there has been an increase in the proportion of deaths being certified by a doctor and a decrease in deaths being certified by a coroner (see Reference Table 7 in Impact of registration delays on mortality statistics dataset). In registration year 2018, 82.1% of deaths were registered by a doctor, which is higher than any previous year since 2001 (77.3%).

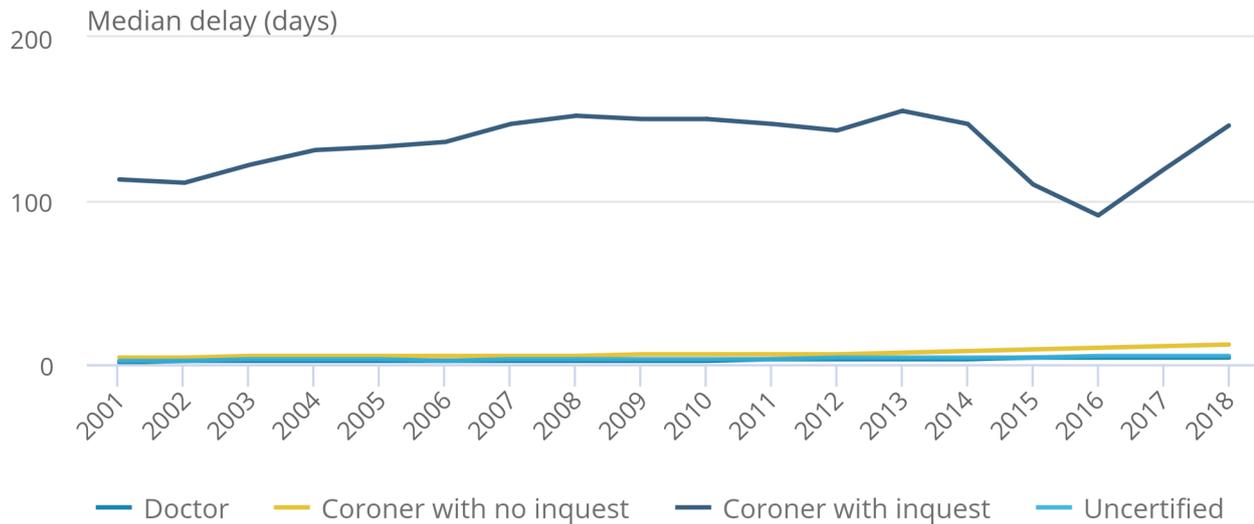
Conversely, 17.5% of deaths registered in 2018 were registered by a coroner (94,610, of which 30,897 went to inquest), the lowest proportion since 2001 (22.6%; 120,250 coroner-registered deaths in registration year 2001, of which 24,218 went to inquest). This decrease was driven partly by the percentage of registrations coming from coroners where no inquest or post-mortem is conducted, falling to 11.8% in 2018 from 18.0% in 2001. Despite the decrease in deaths being certified by a coroner, since 2001 there has been an increase in the median delay between occurrence and registration when deaths are certified by a coroner (Figure 5). This is because the proportion of deaths that go to the coroner and require an inquest has increased from 20.1% in 2001 to 32.7% in 2018, suggesting that the workload per coroner has increased over time. This in turn impacts the overall upward trend in registration delays.

**Figure 5: In 2018 there was an increase in the median delay for deaths being certified by a coroner**

England and Wales, 2001 to 2018

Figure 5: In 2018 there was an increase in the median delay for deaths being certified by a coroner

England and Wales, 2001 to 2018



Source: Office for National Statistics – Death registrations

Notes:

1. Figures include deaths of non-residents.
2. Deaths that do not provide enough information to calculate the delay have been excluded.

The decrease in median registration delay for coroners with an inquest between 2014 and 2016 is likely to be because of a change in official guidance around DoLS (Deprivation of Liberty Safeguards) deaths, which are cases where (for example) the deceased was in a locked area to prevent self-harm or accidental injury. The [Coroner's Statistics Annual 2018](#) explains the recent change in average delay as follows:

"This can largely be attributed to DoLS deaths where, in accordance with the Chief Coroner's guidance, in uncontroversial cases, there could be a 'paper inquest', i.e. not decided in open court but on papers without the need for witnesses or a postmortem - such cases took less time to process and as a result, reduced the average time to process inquests overall. Following the removal of the requirement to report DoLS deaths to coroners in April 2017, there has been an increase in the average time to process an inquest, reversing the downward trend seen in the last few years when there were many DoLS cases."

## 6 . Registration delay by area of residence

In registration year 2018, 82.6% of deaths registered in Wales were within 7 days of occurrence, which was 9.4 percentage points higher than the 73.2% of deaths in England registered within 7 days. Except for 2001 and 2002, Wales consistently has had a higher proportion of deaths registered within 7 days than England.

In registration year 2018, the North East (81.9%), North West (79.9%) and Yorkshire and The Humber (78.6%) had results higher than England for deaths registered within 7 days (Figure 6).

In registration year 2018, Yorkshire and The Humber (92.9%), the West Midlands (93.7%), East of England (92.7%), South East (93%) and South West (92.8%) all had results higher than England for deaths registered within 1 month (92.2%).

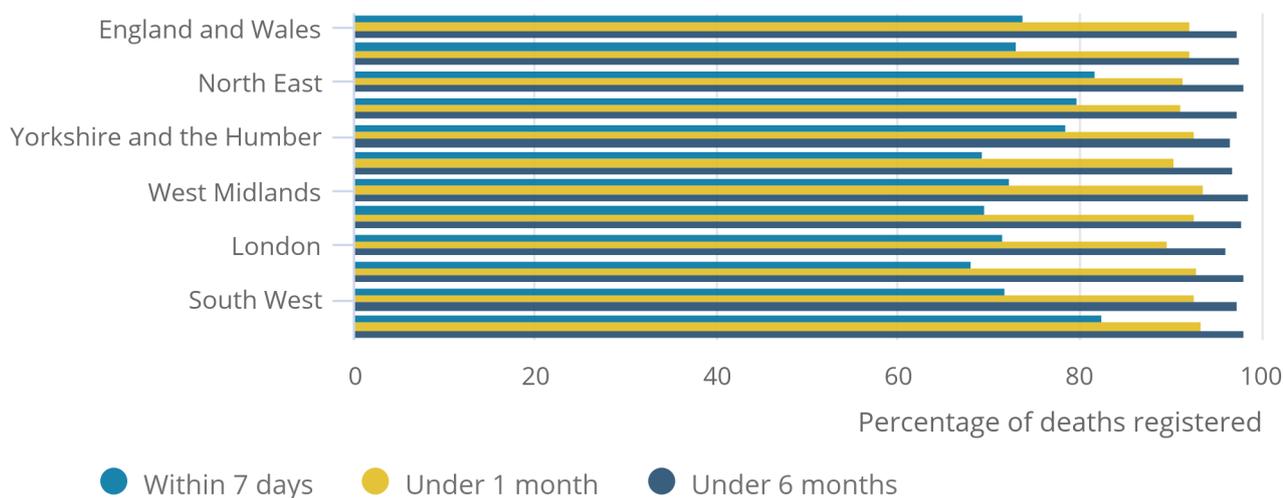
As evident in Figure 6, the majority of deaths in England and Wales (97.6%) were registered within 6 months following the death. A full list of delays by area of residence can be seen in Reference Table 4 in [Impact of registration delays on mortality statistics dataset](#).

**Figure 6: In registration year 2018, Wales saw the highest percentage of deaths registered within 7 days**

England and Wales, 2018

## Figure 6: In registration year 2018, Wales saw the highest percentage of deaths registered within 7 days

England and Wales, 2018



Source: Office for National Statistics – Death registrations

### Notes:

1. Figures include deaths of non-residents.
2. Deaths that do not contain enough information to calculate the delay have been excluded.
3. England and Wales includes deaths where usual residence is outside England and Wales.
4. Under 1 month refers to less than 31 days. Under 6 months refers to less than 184 days.
5. Figures are for persons usually resident in each country and region, based on boundaries as of November 2019.

## 7. The difference between delays based on registrations and occurrences

This article looks mainly at delays based on registration year, but we have provided some information based on year of occurrence in the [dataset](#). It is important to note the difference when looking at year of registration and year of occurrence (Table 1).

Table 1: The percentage of deaths that take over a year to be registered is consistent for registration year

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Registration year</b>	0.7	0.7	0.7	0.6	0.8	0.9	0.5	0.5	0.5	0.7
<b>Occurrence year</b>	0.6	0.7	0.7	0.7	0.5	0.4	0.4	0.4	0.3	0.2

Source: Office for National Statistics – Death registrations

#### Notes

1. Figures include deaths of non-residents but exclude neonatal deaths (deaths under 28 days) which are not assigned an underlying cause. Neonatal deaths are included in final totals. [Back to table](#)
2. Deaths that do not contain sufficient information to calculate the delay have been excluded from the analysis. Hence totals do not match those previously published. [Back to table](#)

Data based on registration year are seen as complete, which means the numbers of deaths taking over a year to be registered will not need to be revised in following years. However, a death occurrence can be registered at any point after the death, meaning that these numbers will need to be revised each year. The older years are less likely to change but we would expect the number of deaths taking longer than a year to be registered in more recent years, like 2018, to increase as we receive more death registrations. Since there is no limit to how long it can take a death to be registered, we may never be able to say that we have a complete set of occurrences.

## 8 . Next steps

We are planning to further explore the trends in registration delays, looking at the impact over time of age and sex to improve the insights we can provide on this important issue. We also aim to look in more detail at the coroner-certified deaths across regions of England and Wales.

We also hope to provide this publication annually and in a more timely manner following the next Deaths registered in England and Wales release. The optimal time for publication depends on a balance between timeliness and completeness of the data.

To address the issues with the increase in registration delays highlighted within this article, we will publish a methods article later this year exploring methods for rapid estimation of death occurrences.

## 9 . Quality and methodology

The information used to produce mortality statistics is based on details collected when certified deaths are registered by informants with their local registration service. In England and Wales, deaths should ideally be registered within 5 days of the death occurring, but there are some situations that result in the registration of the death being delayed.

Deaths considered unexpected, accidental or suspicious will be referred to a coroner who may order a post-mortem or carry out a full inquest to ascertain the reasons for the death. The coroner can only register the death once any investigation is concluded and they are satisfied that the death has been thoroughly investigated with a correctly certified cause of death. The time taken to investigate the circumstances of the death can often result in a death registration exceeding the 5-day period. While registration delays are commonly only a few days, they can occasionally extend into years.

Mortality statistics are usually presented based on the number of deaths registered in a period, rather than the number of deaths that occurred in that period. This method is used because there is a requirement for timely data, despite the potential limitation in completeness caused by registration delays.

Unlike the other countries of the UK, there is no system of coroners' inquests in Scotland; instead, unexpected deaths are investigated by an official known as a procurator fiscal. However, Scotland has a slightly different process, which allows up to 8 days for the registration of a death, in which time the cause of death for accidental, sudden or suspicious deaths may not yet be established. These deaths are still registered within this period, where cause of death would later be updated in the Register of Corrected Entries (now the Register of Corrections Etc (RCE), following an investigation.

Details of deaths are received by the Office for National Statistics (ONS) from register offices in England and Wales electronically. Where the deceased was aged 28 days and over, the cause of death is automatically coded for around 80% of records using a software package called IRIS. The remainder of the records are manually coded to the International Classification of Diseases, Tenth Revision (ICD-10) by experienced coders. Deaths that have been certified after an inquest are also manually coded, as the software cannot interpret the free text format used by coroners.

ICD-10 is used to translate diagnoses of diseases and other health problems from words on the death certificate into an alphanumeric code to permit easier storage, retrieval and analysis. Our [User guide to mortality statistics](#) provides information on data quality, legislation and procedures relating to deaths. It also provides details of the ONS short list of cause of death codes, using ICD-10.