Deaths related to drug poisoning in England and Wales QMI

Quality and Methodology Information for deaths related to drug poisoning in England and Wales, detailing the strengths and limitations of the data, methods used, and data uses and users.

Contact:
Asim Butt
health.data@ons.gov.uk
+44 01633 455952

Release date:
13 October 2020

Next release:
To be announced

Table of contents

1 . Output information

National Statistic	
Data collection	Death Registrations (Administrative data)
Frequency	Annual
How compiled	Administrative data processing
Geographic coverage	England and Wales
Related publications	[Deaths related to drug poisoning in England and Wales](#) [Suicides in the UK](#) [Quarterly suicide death registrations in England](#) [Deaths of homeless people in England and Wales](#)

2 . About this Quality and Methodology Information report

This quality and methodology report contains information on the quality characteristics of the data (including the European Statistical System five dimensions of quality) as well as the methods used to create it.

The information in this report will help you to:

- understand the strengths and limitations of the data

- learn about existing uses and users of the data

- understand the methods used to create the data

- decide suitable uses for the data

- reduce the risk of misusing the data

3 . Important points

- The main figures presented are based on registration year rather than occurrence year; as most of the drug-related deaths (99.4% in 2019) are certified by coroners, the years reflect the date a death was certified as opposed to when the death happened.

- Many deaths involve more than one type of drug and/or alcohol and it is not possible to tell which substance was primarily responsible for the death.

- The figures include accidents and suicides involving drug poisonings, as well as deaths from drug abuse and drug dependence; they do not include other adverse effects of drugs (for example, anaphylactic shock), or other types of accidents (for example, a car crash) where the driver was under the influence of drugs.

- Causes of death are coded using the International Statistical Classification of Diseases and Related Health Problems; due to changes in this (and the software used for coding) over time, the deaths by underlying cause data is not a consistent time series.

4 . Quality summary

Overview

The [Deaths related to drug poisoning in England and Wales](#) statistical bulletin contains main findings and commentary on the latest years of data, with a time series of figures from 1993. Annual figures are broken down by cause of death, sex, age, place of usual residence of the deceased and the substance(s) involved in the death.

The output is compiled using a drug-related deaths database that Office for National Statistics (ONS) developed to facilitate research into deaths related to drug poisoning. The drug-related deaths database is extracted from the national mortality database for England and Wales. Deaths are included if the underlying cause of death is regarded as drug-related, according to the National Statistics definition (see Concepts and definitions section).

ONS mortality data (including data on drug-related deaths) come from the information collected when a death is registered. Information about the underlying mortality data, including details on how the data are collected and coded are available in the [User guide to mortality statistics](#). The majority of deaths related to drug poisoning are registered following a coroner's inquest and the text on the coroner's death certificate is used to code all of the substances involved in the death.

Uses and users

There is widespread policy, professional and public interest in the deaths related to drug poisoning and drug misuse. Main users of the data include:

- the Department of Health and Social Care and Public Health England

- other devolved health administrations

- public health observatories

- local and health authorities

- academics

- charity organisations

- media organisations

Figures provide evidence to inform decision making and policy monitoring at a national and local level; this can save lives through enabling policymakers and support services to target their resources most effectively. Table 1 provides detail on how users use this data.

Table 1: Uses and users of deaths related to drug poisoning in England and Wales.

Users	Uses
Public Health England	Public Health Outcomes Framework Feeds into the substance misuse strategy
Public Health Wales and Welsh Government	Individual level drug data is provided to monitor the impact of the national substance misuse strategy in Wales
Home Office	Data used to support the government's Drug strategy 2017
Drugs, Alcohol and Justice Cross-Party Parliamentary Group	ONS presents latest evidence on drug deaths
Advisory council for the misuse of drugs (ACMD)	Uses drug deaths data to make recommendations to government on the control of dangerous or otherwise harmful drugs
European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)	Along with Scottish and Northern Ireland drug poisoning data, published by the National Records of Scotland and the Northern Ireland Statistics and Research Agency,

Source: Agencies website

Strengths and limitations

Strengths

- Deaths related to drug poisonings, including drug misuse deaths, are compiled using information supplied when deaths are registered, which gives complete population coverage.

- Figures are presented in England and Wales from 1993 onwards.

- Coding for cause of death is carried out according to the World Health Organisation (WHO) ICD-9 and ICD-10, based on internationally agreed rules.

- We report two statistical measures – age-standardised rates and age-specific rates: age-standardisation is undertaken using the European Standard Population 2013, it weights data according to its age structure, thereby enabling populations with different age structures to be compared validly.

Limitations

- The main figures presented are based on death registration year rather than death occurrence year, this provdes timely and consistent time series but makes it more difficult to evaluate sudden changes in the drug-related deaths.

- There is no internationally agreed definition of what constitutes a drug-related death; figures cannot be compared with those produced by other organisations.

- More than half of all drug poisoning deaths involve more than one drug and sometimes also alcohol, and it is often not possible to tell which substance was primarily responsible for the death.

- ONS data cannot shed any light on other types of short-term harm associated with drug use (for example, social or psychological), the long-term damage that using such substances may cause, or the numbers of surviving individuals using such substances.

- The ONS does not have access to post-mortem reports or toxicology results, so the accuracy of figures on deaths related to drug poisoning depends on the information provided by the coroner on the death certificate.

- Due to this variation, the findings relating to specific substances should be interpreted with care. In particular, figures on the number of deaths involving New Psychoactive Substances (NPSs) should be treated with caution because these types of drugs are constantly evolving and it may not always be possible to identify new substances during post-mortem investigations.

- It is our best practice not to calculate rates based on small numbers, as they are imprecise and susceptible to inaccurate interpretation; rates based on fewer than 20 deaths are marked with a "u" to warn users that their reliability is low; for reliability, age-standardised rates are not calculated for when there are fewer than 10 deaths, while age-specific rates are not calculated when there are fewer than three deaths.

Recent improvements

There are two recent improvement in the data processing of drug related deaths.

In 2019 we made improvements to the statistical program used to search individual records for information on drugs and other substances. The new statistical program is more efficient, and has reduced the level of error, when compared with its predecessor.

Deaths where the only identified controlled substance is found within a compound analgesic or cold remedy is not included in the definition of drug misuse as they are likely to contain relatively small quantities of any controlled substance. In 2020, this approach has been aligned with that of the National Records of Scotland (NRS) and a new set of compound analgesics, such as Pholcodine and "Codeine and brompheniramine maleate", are added to our drug lookup.

5 . Quality characteristics of the deaths related to drug poisoning in England and Wales data

Relevance

(The degree to which statistical outputs meet users' needs.)

Drug use and drug dependence are known causes of premature mortality, with drug poisoning accounting for 16.4% of deaths among people in their 20s and 30s in 2019. Accidental poisoning was a leading cause of death for males aged 35 to 49 years in 2018. Consequently, there is considerable political, media and public interest in these figures.

The annual statistical bulletin presents figures on deaths related to drug poisoning in England and Wales for the latest years and there is a time series from 1993 to the latest year available. These figures are based on data collected on a coroner's death certificate; this is part of the Statement of Administrative Sources.

Counts of deaths are broken down by:

- country and region of usual residence

- underlying cause of death

- sex and age of the deceased

- substances involved in the death

Age-standardised mortality rates are available alongside the numbers by sex and some selected substances. Age-specific mortality rates are included for sex and age breakdowns. Figures broken down by local authority of usual residence and sex of the deceased are released in datasets alongside the bulletin. These local authority level counts and rates are aggregated to rolling three-year periods in line with disclosure control principles and to ensure the robustness of estimates; the time series is available from 2001 to 2003. Drug misuse death numbers and rates are also available from Public Health England's Public Health Outcomes Framework (PHOF) at various geographic levels (see 'Alternative sources of data' for more information).

There are many potential uses of these figures, ranging from monitoring trends in deaths from specific substances to comparing mortality rates across geographies, sex, and age. But it is important to bear in mind that it may not be possible to identify new substances during post-mortem investigations and so deaths involving these substances may not be accurately represented in Office for National Statistics (ONS) statistics. In addition, ONS data cannot shed any light on other types of short-term harm associated with drug use (for example, social or psychological), the long-term damage that using such substances may cause, or the numbers of surviving individuals using such substances.

Numbers and rates of drug-related deaths are presented by registration year (the date that the death was registered by a coroner following an inquest), rather than the date that the death occurred. We are aware that some users would find analysis by occurrence year useful, so we provided drug related deaths by occurrence year in the accompanying reference tables.

The disadvantage of using registration-based figures is that it is harder to examine the relationship between drug-related deaths and other factors. For example, researchers may wish to examine the impact of banning New Psychoactive Substances (NPSs; so-called "legal highs") on drug-related deaths, but this is difficult to do using registration figures because they do not show whether the death actually occurred before or after the ban – only when the death was registered.

To combat this, we published an article on deaths involving legal highs in England and Wales. This analysis used dates of death occurrence (rather than registration) to compare drug-related death rates before and after specific categories of NPS became illegal. The annual bulletin also includes the number of deaths involving NPSs that were still legal at the time of death. For example, 39 of the 123 NPS-related deaths registered in 2016 involved NPS drugs that were not controlled under the Misuse of Drugs Act at the time of death.

More detailed statistics on drug-related deaths are available on request. Because these figures are based on confidential information contained on the coroner's death certificate, these statistics will be subject to disclosure control. To meet with the requirements in the ONS policy on protecting confidentiality within birth and death statistics it is sometimes necessary to suppress small cell counts, or the table may be redesigned (for example, several years of data may be combined). Discussions are always held with the customer in order to provide the most useful non-disclosive table.

Accuracy and reliability

(The degree of closeness between an estimate and the true value.)

The legal requirement to register all deaths occurring in England and Wales means that death registrations provide an almost complete data source for mortality statistics. More information about the quality assurance and accuracy of the underlying mortality data can be found in the User guide to mortality statistics and the Mortality statistics in England and Wales Quality and Methodology Information.

Office for National Statistics (ONS) does not have access to post-mortem reports or toxicology results, so the accuracy of figures on deaths related to drug poisoning depends on the information provided by the coroner on the death certificate. There is wide variation in the level of detail given by individual coroners. Some provide a detailed description of the circumstances surrounding the death and list all the substances found at post-mortem, including the amount of drugs that were taken. Others may list only some of the substances involved or provide only a general category of substance, such as "prescribed medication" or "painkillers". To add, in around 21.3% of drug poisoning deaths, registered in 2019, no drug type is recorded on the coroner's death certificate (for example, records only mention "drug overdose" or "multiple drug toxicity" or "No mention").

Due to this variation, the findings relating to specific substances should be interpreted with care. In particular, figures on the number of deaths involving New Psychoactive Substances (NPSs) should be treated with caution because these types of drugs are constantly evolving and it may not always be possible to identify new substances during post-mortem investigations.

Another potential source of error is the coding of substances mentioned on the death certificate. Automatic coding looks for key words or phrases within the coroner's text, but it has limitations. For example, new, unusual or some misspelt substances may not be identified by the automatic coding. In addition, automatic coding can sometimes "over-code" the data, because it cannot take account of the context. For example, if both "opiate" and "heroin" are mentioned in the text, usually only heroin should be coded as we assume that heroin is the opiate that is being referred to. Our automatic coding tries to limit over-coding by removing generic drug names if a specific substance from the same family of drugs has been mentioned. Manual checks are in place to further minimise these errors.

To add, the underlying cause of death is assigned manually, which is another potential source of error. Nevertheless, this risk is minimised as the coding is carried out by highly-trained, experienced staff who apply standardised International Classification of Diseases (ICD) coding rules. We carry out extensive quality checks on the underlying cause of death before the drugs extract is taken and further checks are conducted as part of the manual drugs coding process.

Registration delay

In England and Wales, most drug-related deaths are certified by a coroner following an inquest and cannot be registered until the inquest is completed. This can take months or even years and we are not notified of the death until it is registered. The length of time it takes to have an inquest creates a gap between the date of death and the date of death registration, referred to as a registration delay.

For all-cause deaths registered in 2019 in England and Wales, 5.4% occurred prior to 2019. The percentage is much higher when looking at deaths relating to drug poisonings and drug misuse, with 54.5% and 54.4% of deaths occurring prior to 2019, respectively. Due to the length of time it takes to hold an inquest, around half of drug-related deaths registered in 2019 have occurred in earlier years, and many deaths that occurred in 2019 will not yet be included in the figures.

The latest data shows that the median delay between the date of death and the date of registration was 185 days in England, 189 days in Wales (see Table 2).

Table 2: Median registration delay in days for deaths related to drug poisoning in England and Wales, deaths registered between 1993 and 2019

Registration year	England	Wales
2019	185	189
2018	181	168
2017	172	167
2016	162	157
2015	157	157.5
2014	162	149
2013	178	155
2012	170	171
2011	171	167
2010	169	182
2009	165	199.5
2008	169	163
2007	156	200
2006	140	228
2005	138	192
2004	136	182
2003	128	175
2002	115	155
2001	120.5	151
2000	108	147.5
1999	104	138
1998	102	137
1997	96	138
1996	86	109
1995	79.5	98
1994	73	92
1993	69	96

Source: Office for National Statistics

Notes

1. The registration delay is calculated as the difference between the date each death occurred and the date it was registered, measured in days. The average delay is represented using the median.

In common with most other mortality statistics, figures for drug-related deaths are based on deaths registered in a particular calendar year. If we were to produce data based on the year a death occurred, publication would be delayed by at least six months in order to allow enough time for most of the deaths that occurred in a given year to be registered. If it were produced any earlier the data would be incomplete, inaccurate and hence require several repeated revisions.
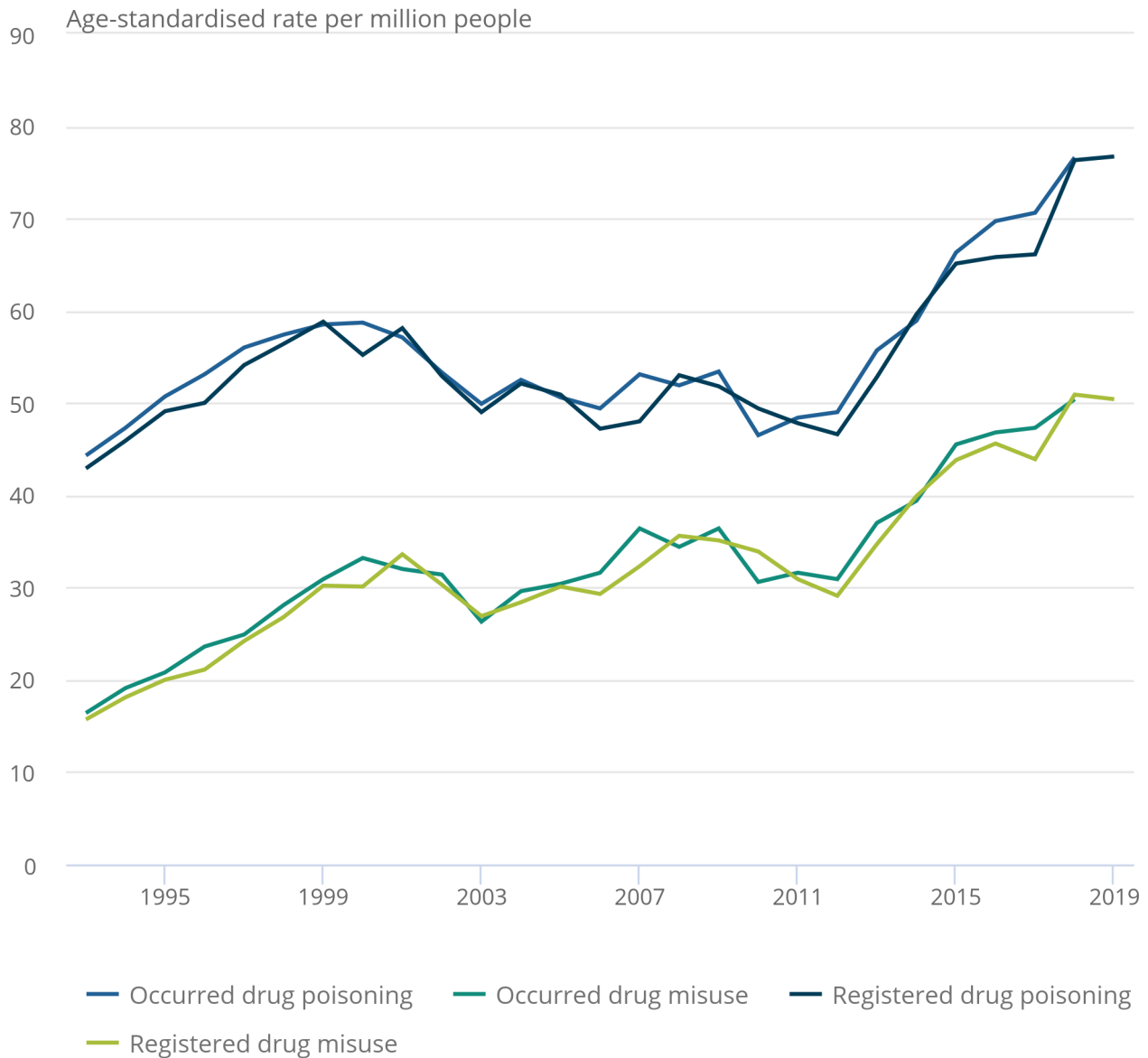
Despite registration delays, publication of drug-related deaths by registration year enables figures to be published in a timely manner and there is generally same pattern when comparing rates of drug poisoning and drug misuse based on year of registration and year of death (see Figure 1).

Figure 1: Trends in drug poisoning and drug misuse deaths are broadly similar at a national level when using date of death occurrence or registration

Age-standardised mortality rates for deaths related to drug poisoning and drug misuse, England and Wales, registered and occurred between 1993 to 2019

Figure 1: Trends in drug poisoning and drug misuse deaths are broadly similar at a national level when using date of death occurrence or registration

Age-standardised mortality rates for deaths related to drug poisoning and drug misuse, England and Wales, registered and occurred between 1993 to 2019

Age-standardised rate per million people

Legend:
- Occurred drug poisoning
- Occurred drug misuse
- Registered drug poisoning
- Registered drug misuse

Source: Office for National Statistics – Deaths registered in England and Wales

Notes:

1. Age-standardised mortality rates per million people, standardised to the 2013 European Standard Population.

2. Cause of death was defined using the International Classification of Diseases, Ninth Revision (ICD-9) for the years 1993 to 2000 and Tenth Revision (ICD-10) from 2001 onwards. More details can be found in the Quality and Methodology Information.

3. Figures are for deaths registered and deaths occurring in each calendar year.

4. Figures for England and Wales include deaths of non-residents.

Some users would prefer these statistics to be based on occurrences rather than registrations. To meet the user needs, we have provided drug poisoning data by occurrence year, see the reference table.

Coherence and comparability

(Coherence is the degree to which data that are derived from different sources or methods, but refer to the same topic, are similar. Comparability is the degree to which data can be compared over time and domain, for example, geographic level.)

A number of methodological changes, which may influence the comparability of figures over time, have been implemented in recent years. The nature of the changes and the effects on comparability are outlined in this section.

ESP 2013 implemented in 2014

Since the implementation of the European Standard Population (ESP) 2013, figures for age-standardised rates (ASRs) in this report have been calculated using the ESP 2013, with revisions provided back to 1993. With the change from ESP 1976 to ESP 2013, rates previously provided may not match. The previously used ESP 1976 and the ESP 2013 differ in two ways.

Firstly, the ESP 2013 gives the populations in older age groups greater weighting than the ESP 1976.

Secondly, the age distribution of the ESP 1976 has an upper limit of 85 years and over, while the ESP 2013 is further disaggregated to include age groups 85 to 89 years, 90 to 94 years and 95 years and over. But, due to the availability of population estimates of assured quality for the upper age band and the differences between the ASRs calculated using 90 years and over and 95 years and over upper limits were not significant (for either sex), we recommend that National Statistics outputs use the ESP 2013 aggregated to 90 years and over.

The impact of implementing the ESP 2013 is that drug-poisoning mortality rates have increased slightly for females over all years, with the largest increase in 1993 of 3.3 deaths per million population. For males the difference ranges from a decrease of 2.2 deaths per million population in 1998 to an increase of 0.9 deaths per million in 2011.

For drug misuse, again for females the rates have increased in every year, with the largest increase in 1993 of 1.1 deaths per million. For males it has decreased in every year, with the largest decrease in 2002 of 3.2. This is because the ESP 2013 gives a higher weight to those in the higher age groups. Males dying due to drug poisoning tend to be younger than females, which explains the different impact for the different sexes. When looking at the substances mentioned on death certificates, the female mortality rate with the largest change was for paracetamol in 2004, an increase of 1.4 deaths per million. For males the largest change was for heroin or morphine in 2001, a decrease of 2.4 deaths per million. Again, this will relate to the age groups most associated with these substances.

Drug misuse indicator definition revised in 2014

We have implemented a revision to the drugs misuse indicator for the 2013 data onwards. The definition of this indicator is:

- deaths where the underlying cause is drug abuse or drug dependence

- deaths where the underlying cause is drug poisoning and where any of the substances controlled under the Misuse of Drugs Act 1971 are involved

This definition has been adopted across the UK. To make sure the ONS drug misuse data include drugs that are newly controlled under the Misuse of Drugs Act, 20 newly-controlled drugs were added and this list is updated each year. Figures for all previous years (back to 1993) have been revised to allow for statistical comparison across the time series.

The revision caused the number of drug misuse deaths in England and Wales to increase, with the increase being greatest in the most recent years. For example, three additional deaths were classified as due to drug misuse in 1995 whilst there were 140 in 2012. The mortality rates increased over the years as there were more deaths related to these newly-classified drugs. The largest change in rate for regions was in Yorkshire and The Humber in 2012 (30.1 to 33.8 deaths per million population in 2012) and in the East Midlands (from 20.7 to 23.8 deaths per million population in 2012). Additionally, for both males and females, the largest increase in mortality rate occurred in the 40 to 49 age group.

IRIS software introduced in 2014 and updated to MUSE in 2020

Since ICD-10 was introduced in England and Wales in January 2001, the World Health Organisation (WHO) has authorised various amendments and we have updated our cause-coding software to incorporate these changes.

Between 2001 and 2010, we used software version 2001.2; between 2011 and 2013 version 2010 was used and in January 2014, the software was changed to a package called IRIS (version 2013). IRIS software version 2013 incorporates all official updates to ICD-10 approved by WHO, which were timetabled for implementation before 2014.

On 1 January 2020, we updated the software used to code causes of death and derive a single underlying cause. This is known as Multicausal and Unicausal Selection Engine (MUSE) (IRIS version 5.5). This will impact data for deaths registered in 2020 onwards.

To understand the impact of these changes on mortality statistics, we carried out bridge-coding studies in which a sample of deaths that had previously been coded using the old software were then independently recoded using the new version.

The [first of these bridge-coding studies](#), focusing on the move to version 2010 in 2011, found a large impact on the assignment of underlying cause of death for drug-related deaths, causing a large reduction in deaths with an underlying cause of a mental and behavioural disorder and a corresponding increase in deaths with an accidental underlying cause. It did not, however, affect the total number of drug-related deaths. More information about the impact of this coding change on drug-related deaths statistics can be found in the [2012 bulletin](#).

The [second study](#), analysing the move to IRIS (version 2013) software in 2014, expected to find a small decrease in the number of drug-related deaths, due to a change in the coding of deaths involving helium. Almost all of these deaths are suicides and until 2014 they would have been assigned an underlying cause of X64 or Y14 (poisoning by other and unspecified drugs, medicaments and biological substances). From 2014, deaths involving helium are assigned an underlying cause of X67 or Y17 (poisoning by other gases and vapours) and are no longer included in the range of codes used to select drug-related deaths. Consequently, the total number of drug-related deaths were approximately 2% lower in 2014 than they would have been had the coding change not been implemented.

In addition, analysis of the bridge-coded data suggested a small increase in deaths assigned an accidental poisoning underlying cause and a corresponding decrease in deaths assigned to mental and behavioural disorder due to drug use. The selection of one of these two causes is dependent on the precise wording on the death certificate and due to the small number of drug-related deaths in the bridge-coded data (around 200) it is possible these changes are simply random noise in the data.

This means figures for 2011 onwards by underlying cause will not be directly comparable with figures for 2001 to 2010.

The [third study](#), understanding the cause of death coding using the software IRIS 4.2.3 to the updated version MUSE 5.5, showed that 98% of deaths remained in the same [ICD chapter](#) with both software versions. It also showed that the statistical impact of the change from IRIS 4.2.3 to MUSE 5.5 is less than the last software change, which was the original move to the IRIS coding software from the Mortality Medical Data System (MMDS) in 2014, when 95% of deaths remained in the same chapter.

Alternative sources of data

There are several alternative sources of data on drug-poisoning deaths.

Drug misuse deaths counts and rates are presented in the [Public Health Outcomes Framework (PHOF)](#) at various geographic breakdowns including local authority, Public Health England (PHE) centres, deprivation deciles and combined authorities. These PHOF rates are presented per 100,000 population, whereas the ONS bulletin rates are reported per 1 million population. This allows the PHOF drug misuse indicator to be comparable with other indicators used in the framework, whereas the ONS rates are easier to interpret where numbers of drug deaths are relatively small.

The [Crime in England and Wales](#) bulletin is another ONS release that includes data on drugs. This publication combines data from the [Crime Survey for England and Wales (CSEW)](#) and police recorded crime statistics from the Home Office. The CSEW data includes experiences of anti-social behaviour broken down by type of offence including "people using or dealing drugs". The Home Office data includes numbers and rates of police recorded drug offences, split into "trafficking of drugs" and "possession of drugs". The Home Office also publishes a more detailed breakdown of [drug use statistics based on the CSEW (PDF, 1.1MB)](#). This includes trends in the frequency of drug use, type of substances used and attitudes towards drugs by various levels of demographic detail such as age, sex and lifestyle factors.

The European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) combines data from the England and Wales drug-poisoning database with data from Scotland and Northern Ireland to create figures for the UK, which allows international comparisons with other European countries. The [latest EMCDDA report (PDF, 6.4MB)](#) shows that the drug-related death rate in the UK was higher than most other European countries. However, the authors advise caution when making international comparisons, because of differences in definitions and the quality of reporting.

Accessibility and clarity

(Accessibility is the ease with which users are able to access the data, also reflecting the format in which the data are available and the availability of supporting information. Clarity refers to the quality and sufficiency of the release details, illustrations and accompanying advice.)

Our recommended format for accessible content is a combination of HTML web pages for narrative, charts and graphs, with data being provided in usable formats such as CSV and Excel. Our website also offers users the option to download the narrative in PDF format. In some instances other software may be used, or may be available on request. Available formats for content published on our website that we do not produce, or is referenced on our website but stored elsewhere, may vary. For further information please refer to the contact details at the beginning of this report.

For information regarding conditions of access to data please refer to:

- Terms and conditions (for data on the website)

- Copyright and reuse of published data

- Accessibility

Timeliness and punctuality

(Timeliness refers to the lapse of time between publication and the period to which the data refer. Punctuality refers to the gap between planned and actual publication dates.)

The provisional release date of the statistical bulletin on deaths related to drug poisoning is announced on the statistics page on GOV.UK up to a year in advance. The date is then finalised at least four weeks before publication.

The bulletin is published annually in August, approximately eight months after the end of the reference period. This delay is due to the large amount of quality-checking that must be performed on the underlying mortality data and the complex processing that is then carried out in order to update the drug-related deaths database.

Figures reported in this bulletin are for deaths registered in the reference period. However, around half of the drug-related deaths registered in the reference period have occurred in earlier years. Such delays are due the length of time it takes to hold an inquest and registerd a death, see the Accuracy and reliability section for more information on the registration delay.

For more details on related releases, the GOV.UK release calendar provides 12 months' advance notice of release dates. In the unlikely event of a change to the pre-announced release schedule, public attention will be drawn to the change and the reasons for the change will be explained fully at the same time, as set out in the Code of Practice for Statistics.

Concepts and definitions (including list of changes to definitions)

(Concepts and definitions describe the legislation governing the output and a description of the classifications used in the output.)

Source data and legislation

Mortality data are based on the information collected when a death is registered. The collection and dissemination of this data are governed by a range of legislation including the Births and Deaths Registration Act 1953 and the Population (Statistics) Acts 1938 and 1960. More details on this legislation and other relevant legislation can be found in the User guide to mortality statistics.

Underlying causes of death definition

Office for National Statistics (ONS) codes all of the causes of death mentioned on the death certificate using the International Statistical Classification of Diseases and Related Health Problems. From all of the causes mentioned on the death certificate, an underlying cause of death is selected using automated ICD coding rules. The underlying cause of death is defined by the World Health Organisation as:

- the disease or injury that initiated the train of events directly leading to death, or

- the circumstances of the accident or violence that produced the fatal injury (or poisoning)

More information on how the underlying cause of death is chosen can be found in section 9 of the User guide to mortality statistics.

Drug-related deaths definition

There is no internationally-agreed definition of what constitutes a drug-related death. Therefore, the figures reported in this statistical bulletin are based on the current National Statistics definition of deaths related to drug poisoning. This definition includes accidents, suicides and assaults involving drug poisoning, as well as deaths from drug abuse and drug dependence. It does not include other adverse effects of drugs (for example, anaphylactic shock, or transport accidents where the driver was under the influence of drugs). Also, a small number of deaths from assaults involving drugs are excluded because ONS does not have full information on the death. Here, because someone is being prosecuted in relation to the death, the coroner adjourns the inquest and registers the death using an "accelerated registration". ONS does not receive full information about the death until criminal proceedings are completed.

Drug-poisoning deaths involve a broad spectrum of substances, including legal and illegal drugs, prescription drugs (either prescribed to the deceased or obtained by other means) and over-the-counter medications. Some deaths may also be the result of complications of drug abuse (such as deep vein thrombosis or septicaemia resulting from intravenous drug use, or heart disease due to chronic cocaine use), rather than an acute drug overdose. Deaths involving these types of complications are generally coded as a mental and behavioural disorder due to drug use.

Deaths from 2001 onwards are included where one of the ICD-10 codes shown in Table 3 is the underlying cause of death. ICD-9 codes are also included, for the years 1993 to 2000.

Table 3: International Classification of Diseases, Ninth Revision (ICD-9) and Tenth Revision (ICD-10) codes used to define deaths related to drug poisoning

Description	ICD-9 Codes	ICD-10 Codes
Mental and behavioural disorders due to drug use (excluding alcohol and tobacco)	292, 304, 305.2–305.9	F11–F16, F18–F19
Accidental poisoning by drugs, medicaments and biological substances	E850–E858	X40–X44
Intentional self-poisoning by drugs, medicaments and biological substances	E950.0–E950.5	X60–X64
Assault by drugs, medicaments and biological substances	E962.0	X85
Poisoning by drugs, medicaments and biological substances, undetermined intent	E980.0–E980.5	Y10–Y14

Source: WHO

In addition, this definition includes only deaths related to poisonings by drugs, medicaments and biological substances - poisonings by other types of chemicals and noxious substances (such as carbon monoxide) are excluded. The number of deaths from poisoning by other chemicals and noxious substances can be found the Deaths registered in England and Wales publication.

Drug misuse deaths definition

As explained fully in the Coherence and compatibility section, from 2013 onwards the definition of the drug misuse indicator is:

- deaths where the underlying cause is drug abuse or drug dependence

- deaths where the underlying cause is drug poisoning and where any of the substances controlled under the Misuse of Drugs Act 1971 are involved

Geography (including list of changes to boundaries)

The deaths related to drug poisoning in England and Wales statistical bulletin covers:

- England and Wales, both combined and separately

- regions in England

- lower tier local authorities in England

- unitary authorities in Wales

Output quality

Deaths related to drug poisoning in England and Wales is published eight months after the reference period. The production of these statistics relies upon the availability of the annual death registrations data for England and Wales, as well as mid-year population estimates. Coding and quality assurance of death registration data is time-consuming. For it to be published earlier, provisional data would need to be used and would need to subsequently revised. Further information on key quality aspects related to drug poisoning can be found in the Accuracy and reliability section.

Why you can trust our data

The User guide to mortality statistics provides detailed information on the processing and quality of mortality data for England and Wales. Internal consistency checks are conducted to eliminate any errors made during the recording of deaths, and to ensure the annual dataset is complete. Any concerns relating to cause of death are referred to a medical advisor or medical epidemiologist.

In the compilation of these statistics, the ONS itself independently determines the focus, content, commentary, illustration and interpretation of these measures presented in bulletins. We provide early access for quality assurance to a small number of people working in other government bodies. This is for general expert comment on the plausibility of our findings.

6 . Methods used to produce the deaths related to drug poisoning in England and Wales data

How we collect the data, main data sources and accuracy

Deaths related to drug poisoning in England and Wales is compiled using information supplied when a death is registered. A record for each death registered in England and Wales is held on the Office for National Statistics (ONS) Death Registrations Database. Further details about the information held on the ONS Death Registrations Database, as well as the methods used to quality assure the data, can be found in the User guide to mortality statistics.

For more information on administrative sources of data that the ONS uses to produce statistics (including a list of administrative sources), or that are available for use in the production of statistics in the future, and information on statistical techniques for using administrative data, please see the Statement of Administrative Sources.

How we process the data

All ONS mortality data – including statistics on deaths related to drug poisoning – come from information collected when a death is certified and registered. ONS codes all of the causes mentioned on a death certificate using the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10). Deaths that are certified by a doctor are coded using the automated cause coding system (known as PC-ACCS). But most drug-related deaths are certified by a coroner and due to the extra information contained on the coroner's death certificate, the cause coding must be carried out manually.

Further details about how ONS mortality data are collected and coded can be found in the User guide to mortality statistics and the Mortality statistics in England and Wales Quality and Methodology Information.

How we analyse and interpret the data

Following extensive quality checks on these underlying cause of death data, all deaths with a drug-related underlying cause (ICD-10 codes used are shown in Table 3) are selected and a wide range of variables are extracted from the general mortality database including: sex, age, postcode of usual residence, the date the death occurred and the date it was registered, ICD-10 codes for all conditions mentioned on the death certificate and the text from the coroner's death certificate.

Once the extract is taken, the data are processed in a statistical package called R. Firstly, up to 11 variables are created showing which drugs are mentioned on the death certificate. Secondly, a variable is created showing whether alcohol was mentioned. This includes a wide variety of scenarios ranging from evidence of alcohol consumption around the time of death (for example, an empty vodka bottle found at the scene, mention of the deceased having been to the pub or alcohol found after toxicology tests) to long-term alcohol abuse and cirrhosis of the liver. The broad nature of this variable may limit its usefulness for some researchers. Thirdly, a variable is created showing whether a volatile substance was mentioned (for example, Butane or lighter fluid). The data are then formatted and output into Excel workbooks.

Every record is then manually checked by examining the text on the death certificate to ensure the R program has coded the data correctly. Once the manual checking is completed and corrections made (if needed), the dataset is expanded by deriving additional variables to show whether any of the following things were mentioned on the death certificate:

- common types of drug such as heroin or morphine, cocaine and anti-depressants

- only one drug

- no specific drugs (for example, the death certificate just said "drug overdose")

- drugs controlled under the Misuse of Drugs Act (1971)

- certain types of compound analgesics such as co-codamol (paracetamol and codeine)

Uniform formatting is then applied; for example, generic names (such as "fluoxetine") are used rather than brand names ("Prozac"). This standard formatting allows the database to be searched more easily. A final set of manual checks is completed to ensure the last stage of processing has been completed correctly and the latest year of data are then added to the drugs database.

Mortality rates are calculated using the number of deaths and mid-year England and Wales population estimates provided by the Population Estimates Unit at ONS. Further information about the methods used to calculate mid-year population estimates can be found in the Mid-year population estimates short methods guide (PDF, 114KB).

Age-standardised rates are calculated as follows:

$$Age - \text{standardised rate} = \sum (P_k m_k) / \sum P_k$$

where: Pk = Standard population in sex/age group k mk = Observed mortality rate (deaths per 1 million persons) in sex or age group k = age or sex group 0, 1 to 4, 5 to 9, ... , 80 to 84, 85 to 89, 90 years and over

Age-standardised rates are standardised to the European Standard Population (ESP). This is a hypothetical population and assumes that the age structure is the same in both sexes, therefore allowing comparisons to be made between the sexes as well as between geographical areas and over time. In 2014, we introduced a change to the ESP used for calculating age-standardised rates (for more information see the relevant section under Coherence and compatibility). Table 4 shows the ESP 2013.

Table 4: Distribution of the European Standard Population (ESP) 2013

Age	Population
Under 1	1,000
1 to 4	4,000
5 to 9	5,500
10 to 14	5,500
15 to 19	5,500
20 to 24	6,000
25 to 29	6,000
30 to 34	6,500
35 to 39	7,000
40 to 44	7,000
45 to 49	7,000
50 to 54	7,000
55 to 59	6,500
60 to 64	6,000
65 to 69	5,500
70 to 74	5,000
75 to 79	4,000
80 to 84	2,500
85 to 89	1,500
90 and over	1,000
Total	100,000

Source: Eurostat

These deaths data are not subject to sampling variation, as they are not drawn from a sample. Nevertheless, they may be affected by random variation, particularly where the number of deaths is small. To help assess the variability in the rates, lower and upper confidence limits form a confidence interval, which shows the range of uncertainty around the estimated figure. As a general rule, if the confidence intervals around two figures overlap, there is only a small probability that there is a genuine difference. The age-standardised mortality rates and accompanying confidence intervals can be used to:

- compare drug-related deaths in males and females

- examine trends over time

- measure differences between different geographic areas

In 2015, we started using a new method to calculate the confidence intervals where there are fewer than 100 deaths in a group. This is described in an Association of Public Health Observatories Technical Briefing (PDF, 570KB). We also revised the back series to reflect this.

Previously, the confidence intervals were calculated using a normal approximation method, on the assumption that the underlying deaths data are normally distributed. But, in some instances, for example, in young people, the number of drug-related deaths is relatively small (fewer than 100) and may be assumed to follow a Poisson probability distribution. In such cases, it is more appropriate to use the confidence limit factors from a Poisson probability distribution table to calculate the confidence intervals, instead of a normal approximation method. The previous normal approximation method is still used to calculate 95% confidence intervals where there are 100 or more deaths per group.

A benefit of the new method is that, because the Poisson probability distribution is asymmetric and has a lower bound of 0, the lower confidence interval can never fall below 0 (unlike the normal approximation).

These changes do not affect the death rate – only the confidence interval around the rate. The impact is generally small and affects groups where there are less than 100 deaths, for example: Wales; English regions; females; younger and older age groups and specific substances.

An Age-standardised mortality rate calculation template (XLS, 98KB) is available.

How we quality assure and validate the data

Quality assurance is carried out at all stages of production. Specific procedures include:

- independent extraction and analysis of data by two members of staff to ensure that the same results and conclusions have been reached

- checking of new estimates through cross-referencing with past publications and more widely what we know about the general trend in mortality

- identification of outliers in subnational estimates

How we disseminate the data

Main findings from the data are published as a bulletin and all data related to drug poisoning registered since 1993 are provided in the accompanying dataset. You may re-use the data in this publication (not including logos) free of charge in any format or medium, under the terms of the Open Government Licence.

How we review and maintain the data processes

We continuously review the drug data processing and communicate with our stakeholders (PHE, Home Office and NRS) when needed. A most recent improvement in our data processing was to use the text search power of R language to efficiently identify substances mentioned on the death certificate. This approach has markedly reduced the chances of spelling mistakes and resources spent on manual checks.

7 . Other information

Statistics on deaths related to drug poisoning can be accessed free of charge.

Provisional release dates are announced on the GOV.UK release calendar up to 12 months in advance and final dates at least four weeks in advance. This enables equal access to these statistics for all users and signposts the location of the statistics on our website.

It is not possible to publish the drug-poisoning database in its entirety, as it contains confidential data. National and regional level figures are available in the bulletin and variables such as age are grouped to protect confidentiality. More detailed tables, including figures for lower geographies, different age groups and substances not mentioned in the bulletin, are available on request (subject to legal frameworks, disclosure control, resources and agreement of costs, where appropriate). Information describing the limitations of data in these more detailed tables is provided with each individual request.

In addition, researchers can apply to access the individual record data contained on the drugs database, by becoming an approved researcher. For more information, please contact the mortality analysis team using the contact details at the beginning of this report.

Feedback from users is invited in the statistical bulletin with the inclusion of a standard statement within the background notes: 'We welcome feedback from users on the content, format and relevance of this release'. Regular attendance of ONS researchers at user group meetings and conferences also ensures feedback is received, as well as meetings with key stakeholders. To add, contact with users via ad-hoc requests provides steer on breakdowns and analysis that are not currently in the bulletin.

Useful links to Office for National Statistics (ONS) drug-related analysis

Deaths related to drug poisoning in England and Wales

Summary of existing suicide and drug poisoning user requested data

Deaths involving heroin up two thirds in two years

Deaths involving legal highs in England and Wales: between 2004 and 2013

Deaths related to volatile substances and helium in Great Britain

More than half of heroin/morphine misuse death hotspots in England and Wales are seaside

Drug-related deaths "deep dive" into coroners' records

Middle-aged generation most likely to die by suicide and drug poisoning

Drug-related deaths and suicide in prison custody in England and Wales: 2008 to 2016

Useful links to external drug-related analysis

Drug Related Deaths in Scotland

Drug Related Deaths in Northern Ireland

United Kingdom drug situation: Focal Point annual report

European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)

Useful links to other related publications

[Suicides in the UK](#)

[Quarterly suicide death registrations in England](#)

[Deaths of homeless people in England and Wales](#)

[Alcohol-specific deaths in the UK](#)

[Deaths registered in England and Wales](#)

Other

[Disclosure Control Policy for Birth and Death Statistics](#)