Public Health Scotland

The National Drug-Related Deaths Database (Scotland) Report

Analysis of Deaths occurring in 2017 and 2018

An Official Statistics release for Scotland

Publication date: 26 July 2022

Translations and other formats are available on request at:

phs.otherformats@phs.scot

0131 314 5300

Public Health Scotland is Scotland's national agency for improving and protecting the health and wellbeing of Scotland's people.

www.publichealthscotland.scot

This is an Official Statistics publication

Public Health Scotland has authority to produce official statistics on any matter in accordance with **The Official Statistics (Scotland) Order 2008**, **The Official Statistics (Scotland) Amendment Order 2019** and the **Statistics and Registration Service Act 2007**.

All official statistics should comply with the UK Statistics Authority's Code of Practice which promotes the production and dissemination of official statistics that inform decision making. They can be formally assessed by the UK Statistics Authority's regulatory arm for National Statistics status.

Find out more about the Code of Practice on the **UK Statistics Authority website**.

Find out more about Official Statistics on the **UK Statistics Authority website**.

Contents

Executive Summary

The National Drug-Related Deaths Database (NDRDD) was established to collect detailed information regarding the background and circumstances of people who had a Drug-Related Death (DRD) in Scotland. This is the eighth report and covers the calendar years 2017 and 2018 with trend data from 2009. This report analyses subsets of DRDs in Scotland on which National Statistics have already been published by National Records of Scotland (NRS) [1,2]. The NDRDD reports [3-9] analyse these deaths in further detail to help provide insights into the lives of those who died and highlight potential areas for intervention.

For varying reasons, discussed in greater detail within the report, collection of robust and high quality NDRDD data became increasingly difficult for the reporting period, resulting in a lower level of completeness for the data recorded for 2017 and 2018. Unlike in previous years, we have taken the additional step of varying how data are reported, depending on the issues with the data sources described.

Where there was evidence that the majority of questions reported in a section were affected by data quality and completeness issues we have reported figures for both 2017 and 2018 data, otherwise commentary focuses on deaths in 2018, and discussion of trends since 2009.

This report contains an account of the data collection and analysis of the NDRDD cohorts (**Methods**); a description of results from the 2017 and / or 2018 NDRDD cohort of unintentional and undetermined deaths (i.e. non-suicides) involving controlled substances that occurred in Scotland (including linked hospital admission and prescribing data) (**Results and Commentary**); and a section describing deaths by suicide involving controlled substances (**Deaths by Suicide**); together with overall **Conclusions**.

Main points

Demographic Profile

- In 2018, most DRDs continued to be among men (73%), the percentage of female deaths increased from 2009 (21%) to 2018 (27%).
- The mean age of people who had a DRD increased from 35 years in 2009 to 42 years in 2018.
- Over half (55%) of the people who died lived in the 20% most deprived neighbourhoods in Scotland.
- Most people who had a DRD lived in their own home (77%). Over half (58%) lived alone all of the time. The percentage of people in these categories increased over the time series (2009 to 2018).
- In 2018, 566 children were reported to have lost a parent or parental figure as a result of a DRD.

Substance Use History

- Most DRDs (87%) were among people previously known to use drugs. In 2018, 72% of those known to have used drugs had used them for eleven or more years and 57% were known to have injected drugs.
- In 2018 and across the time series combined (2009-2018), the percentage of females (83%) known to use drugs was lower than the percentage of males (89%), whereas females (65%) were more likely than males (62%) to inject drugs.
- In 2018, over one third of people who had a DRD (41%) were prescribed an OST drug (mainly methadone) at the time of death. The percentage of people who were prescribed an OST at the time of death has increased since 2009. Females were consistently more likely than males to be prescribed an OST at the time of death (45% compared to 41% in 2018).

- In 2018, around half of the people who had a DRD (49%) had previously experienced a near fatal overdose.

- In 2018, around one third of people who died (29%) experienced alcohol-related problems in the six months prior to death. The percentage experiencing alcohol-related problems in the six months prior to death decreased over the time series (2009: 43%).

Medical and Psychiatric History and Significant Life Events

- In 2017, 70% of people who had a DRD had a medical condition recorded in the six months before death, and in 2018 63% of DRDs had a medical condition recorded. Reported recent medical ill health among DRDs has increased since 2009 (46%).

- Respiratory illness (27% and 26%), blood borne viruses (19% and 15%) and epilepsy (both 7%) were the recent conditions most commonly recorded in 2017 and 2018 respectively.

- Respiratory and cardiac conditions were more common among people in the older age cohorts (35-44, over 45) at the time of death and the prevalence of these conditions increased over time, in line with increases in average age.

- In 2017 and 2018, 63% had a recent psychiatric condition recorded in the six months prior to death. The percentage of DRDs with recent psychiatric ill health has increased since 2009 (40%).

- Depression and anxiety were the most common psychiatric conditions recorded in the six months prior to death in both 2017 and 2018. Both conditions were more common among females and older people and increased over the time series (2009 to 2018).

- In 2017, 62% of people had experienced a significant event in the six months before death, this decreased to 55% in 2018 (most commonly, ill health or a recent diagnosis (medical or psychiatric)).

- 15% of people who had a DRD had experienced domestic violence prior to death in 2017, in 2018 this decreased to 11%. Sexual abuse at some point prior to death was recorded in 13% of DRDs in 2017, and 9% in 2018.

Contact with Services

- In 2017, three-quarters of people who had a DRD (76%) were in contact with drug treatment services, in 2018 63% of people were in contact. Drug treatment service contact increased over time from 2009 - 2017.

- In 2017, 42% of people who died were in recent contact with non-drug treatment services (e.g. social work, housing). In 2018 this decreased to 33%. Mental health service contact among DRDs increased over time from 2009 - 2017.

- Thirty percent of people who had a DRD in 2018 had been discharged from a general acute hospital in the six months prior to death (2017: 32%).

- In 2017, 26% of people who had a DRD had been in police custody in the six months prior to death. This decreased in 2018, where 19% had recently been in police custody.

- In 2018, 13% of people who had a DRD had been in prison in the six months prior to death (2017: 14%).

- In 2017, 76% of people (83% of those whose death was opioid-related) were in contact with a service with the potential to address their problematic drug use or deliver harm reduction interventions in the six months before death (2018: 67%, 73% opioid-related).

Circumstances of Death

- In 2018, the NHS Boards with the highest crude mortality rates for DRDs were Greater Glasgow & Clyde (34 deaths per 100,000 population), Tayside (25) and Ayrshire & Arran (24).

- In 2018, around two-thirds of people consumed the drugs in their own home (65%) and died in their own home (60%). The percentage of people in each of these categories has increased since 2009.

- Over half of DRDs (52%) occurred when others were present at the scene of the overdose. The percentage of deaths where others were present at the scene of overdose (and potentially able to intervene) was lower where people lived alone all of the time (34%) or were aged 45 or over (44%), than in relevant comparison groups.

- Where known, take-home naloxone (THN) supply has increased over time (29% of 2018 DRDs). Among people who had previously been supplied with THN, 59% had naloxone available at the scene of death.

Toxicology Data

- In 2018, almost all (95%) DRDs occurred after the consumption of multiple substances.

- Heroin/morphine (51%), methadone (51%) and etizolam (51%) were the most common substances found at post-mortem in 2018.

- Etizolam (49%), methadone (48%) and heroin/methadone (47%) were the substances most commonly implicated in deaths in 2018. The percentage of deaths where etizolam was implicated increased over time.

- Opioids (methadone, heroin, morphine or buprenorphine) were implicated in over three quarters (77%) of DRDs in 2018.

- Gabapentin and pregabalin implication increased over time, potentially due to their use to enhance the effects of opioids. In 2018, gabapentin or pregabalin were implicated in 401 deaths, 79% (317) of which were also related to the use of opioids.

- Diazepam presence at post-mortem has decreased sharply from 2015 (66%) to 36% in 2018, while presence of etizolam (a benzo-type NPS) has increased

sharply from 2015 (9%) to 2018 (51%). Etizolam was twice as likely as diazepam to be implicated in deaths where it was found present (97% vs. 49%).

- NPS-related deaths has continued to increase sharply from 2015 to 2018 due to the number of deaths involving benzo-type NPS (etizolam and diclazepam). In 2018, only one death involved the use of stimulant-type NPS (e.g. mephedrone).

Prescribing

- Among opioid-related deaths, the percentage of people prescribed an OST at the time of death increased from 21% in 2009 to 42% in 2017 and 41% in 2018.

- In 2017 and 2018, most OST prescribing at the time of death was well established (one year or more – 83% and 74% respectively), via supervised consumption (80% and 85% respectively) and within recommended therapeutic dose guidelines (65% and 59% respectively).

- In 2017 and 2018, 95% and 94% of people respectively prescribed methadone had methadone present in their body at post-mortem. This was higher than the percentage of people prescribed buprenorphine who had buprenorphine present in their body at post-mortem (2017: 93%; 2018: 78%).

- The percentage of people prescribed OST in 2017 (53%) and 2018 (49%) who had heroin/morphine present at death decreased from 2016 (62%; the highest recorded) and was similar to the percentage observed among people not on OST (2017: 58%; 2018: 53%).

- In 2017 and 2018, heroin/morphine was present at post-mortem in a higher percentage of people who were prescribed buprenorphine at the time of death (2017: 67%; 2018: 80%) than among people prescribed methadone at the time of death (2017: 53%; 2018: 46%).

- In 2017 and 2018 most people who were prescribed methadone and had it implicated in their death had been prescribed the drug for one or more years (86% and 77% respectively), received it under supervision (81% and 85% respectively) and were prescribed a dose within the recommended therapeutic range (66% and 61% respectively). In the vast majority of these cases, multiple drugs were implicated in death.

- Recent anti-depressant prescribing increased over time and was observed among 54% of the 2018 cohort. 63% of those prescribed an OST were also prescribed anti-depressants.

- Prescribing of gabapentin or pregabalin within 90 days of death increased from 5% of people in 2009 to 28% in 2018. Over the time series combined, gabapentin or pregabalin prescriptions were more common among those prescribed OST (27%) than those not prescribed OST (15%).

- Co-prescribing of methadone with either citalopram (an anti-depressant) or anti-psychotics (associated with a life threatening ventricular arrhythmia called torsades de pointes) occurred prior to death in 104 (9%) cases. Co-presence at death was evident in 91 cases in 2018, 55 (60%) of which were preceded by recent co-prescribing.

- Recent prescribing of strong opioid painkillers was very rare. Oxycodone or fentanyl were only prescribed to nineteen people who had a drug-related death in 2018.

Introduction

The National Drug-Related Deaths Database (NDRDD) was established to collect detailed information regarding the health and social circumstances of people who had a drug-related death (DRD) in Scotland.

The purpose of this publication series is to further analyse DRDs on which National Statistics have already been published by National Records of Scotland (NRS) [1,2] in order to provide insights into the lives of those who died and highlight potential areas for intervention.

This report contains an account of the data collection and analysis of the NDRDD cohorts (**Methods**); a description of results from the 2017 and / or 2018 NDRDD cohort of unintentional and undetermined deaths (i.e. non-suicides) involving controlled substances that occurred in Scotland (including linked hospital admission and prescribing data) (**Results and Commentary**); and a section describing deaths by suicide involving controlled substances (**Deaths by Suicide**); together with overall **Conclusions**.

Some of the issues described in this report in relation to data quality informed the decision to convene a Short Life Working Group (SLWG) on Drug Death Reporting. Further information on the output of the SLWG (and also information on data collection and NDRDD cohort analysis) can be found in the **Appendices**. Public Health Scotland (PHS) published a **summary** of the Short Life Working Group findings and recommendations in April 2022.

The data described in this report are collected by the local Data Collection Co-ordinators in each NHS Board area. The authors would like to thank Data Collection Co-ordinators for their hard work and dedication, without which this report could not be produced.

Methods

Drug-Related Deaths (DRDs) in Scotland are recorded and examined by Critical Incident Monitoring Groups who collaborate with the police and Procurator Fiscal to identify cases in their NHS Board area. On completion of the post-mortem examination, the Critical Incident Monitoring Group and local Data Collection Co-ordinator decide if the case matches the inclusion criteria for the National Drug-Related Deaths Database (NDRDD). If these criteria are met, a record is submitted to PHS.

Defining 'Drug-Related Deaths'

There are various definitions of what constitutes a DRD. Both the NDRDD and NRS reports use the 'baseline' definition for the UK Drugs Strategy (described in **Annex A** of the NRS report on 2018 deaths [2] and on the **NDRDD section** of the PHS website). The NRS obtains details of all deaths registered in Scotland and identifies DRDs based on a supplementary questionnaire (an ME4 form) that is completed by the forensic pathologist.

Prior to the report for calendar year 2012 [3-5], the NDRDD definition did not include deaths by suicide (defined as 'intentional self-poisoning'), which are included in the 'baseline' definition for the UK Drugs Strategy. To maintain consistency with previous publications, the main focus of the **Results and Commentary** is on unintentional and undetermined deaths and assault by drugs, while intentional self-poisonings (deaths by suicide) are described separately at the end of that section.

Data collection

The proforma used for NDRDD data collection was designed to collect a wide range of data on people's health and social circumstances and the circumstances of their death. Information is collected from a range of sources including the Scottish Prison Service, Scottish Ambulance Service, drug treatment services, GPs and hospitals. Information is recorded using a secure online database administered by PHS.

The individual records submitted to the NDRDD were linked with Information from general acute inpatient and day case admissions (SMR01) and psychiatric inpatient admissions (SMR04) datasets and Prescribing Information System (PIS)[1] held by PHS.

Analysis and presentation

Information is extracted, anonymised and analysed according to the following thematic sub sections;

Demographic Profile: Describes the demographic and social characteristics of the NDRDD cohort.

Substance Use History: Describes the extent and duration of substance use, associated treatments and known risk factors.

Medical and Psychiatric History and Significant Life Events: A description of recent medical and psychiatric conditions (and associated hospital admissions) and experience of significant life events including domestic or sexual abuse.

Contact with Services: A description of recent contact with services to provide insights into issues faced by people in the period immediately before death.

Circumstances of Death: A description of the circumstances of deaths.

Toxicology Data: Information about the drugs present in the body at post-mortem and those thought by pathologists to have been implicated in death.

Prescribing: A description of deaths among people receiving Opioid Substitution Therapies and the prescription of other drugs among the NDRDD cohort.

[1] These data are available from 2009 onwards, when patient identifiable Community Health Index numbers were first included in Prescribing Information System.

The data tables which are available on the **publication page** include findings from the seven previous yearly cohorts from 2009 onwards, allowing comparisons to be made.

Data Quality

The quality and completeness of information contained within the NDRDD report is reliant on the contribution of local Data Collection Co-ordinators for the collection of information. The Data Collection Co-ordinators are in turn reliant on local partners for information to be made available.

- The increasing number of people who have died was not matched with an increase in resource to process and record information, thereby resulting in delays and incomplete information submitted.
- Data collection occurred during the COVID-19 pandemic. During this period, health and social care staff time was re-prioritised resulting in difficulties obtaining routine requests for information or accessing care records to complete the NDRDD data proforma.
- Information Sharing between NHS Boards and local partner organisation may often be based on informal arrangements leading to a lack of resilience when people or systems change.
- Changes in the scope of some data sources has meant that some information cannot be obtained.

The factors outlined above resulted in higher numbers of missing or ‘unknown’ responses recorded during 2017 and 2018 for some NDRDD proforma questions compared to previous years.

For a particular question, if the percentage of ‘unknowns’ was above 10% of the annual cohort size the details are provided in text footnotes and presented in the data tables. Additionally, the number of cases where information was unknown have been excluded from the total cohort size (denominator). This has been done to reduce the

impact data quality may have on any findings and to ensure that comparisons can be made across the years reported.

In order to maximise the available data presented as well as taking into account variation in data quality, the **Results and Commentary** sections describe information in different ways. Where there were no data quality issues affecting the most recent year, 2018 findings are emphasised in the narrative. Where data quality issues affected 2018, an equal emphasis is placed on findings from 2017 and 2018. Table 1 details which years are presented in each section.

Table 1: NDRDD Reporting Approach by Topic Area

Topic Area	Issue	NHS Boards Affected[1]	Reporting Year
Demographic Profile	Minor issue related to living with children / parent and parental figure.	Borders, Fife, Forth Valley, Highland, Lanarkshire, Lothian, Tayside	2018
Substance Use History	Issues related to a limited number of NDRDD variables, including length of drug use and drug detoxification.	Fife, Forth Valley, Greater Glasgow and Clyde, Highland, Lanarkshire, Lothian, Tayside	2018
Medical and Psychiatric History and Significant Life Events	Issues related to majority of NDRDD variables.	All	2017 and 2018
Contact with Services	Issues related to majority of NDRDD variables.	All	2017 and 2018
Circumstances of Death	Minor issue related to known use and provision of naloxone.	Borders, Dumfries, Fife, Forth Valley, Highland, Lanarkshire, Lothian, Tayside	2018
Toxicology Data	No issues identified.	-	2018
Prescribing	Issues related to majority of NDRDD variables[2].	Dumfries, Fife, Lanarkshire, Lothian	2017 and 2018

Topic Area	Issue	NHS Boards Affected[1]	Reporting Year
Deaths by Suicide	Similar sections, as above	-	2018

1 'unknowns' for one or more questions in 2018 above 10% of the annual cohort size. Excludes Orkney, Shetland and Western Isles due to issues with small numbers.

2 No reporting issues associated with 2018 data from PHS Prescribing Information System - sections using this data will focus on 2018 only.

Further information on methods is available in **Appendix 1**.

The National Drug-Related Deaths Database Cohort

Defining the 2018 NDRDD Cohort:

The total cohort size during 2018 was 1,209 people. Of the 1,209, 1,154 people were included as 'non-intentional deaths' and reported in the main NDRDD report. The remaining 55 people were classified as intentional deaths and are reported in further detail in **Deaths by Suicide**[2].

National Records of Scotland reported a total of 1,187 confirmed drug related deaths in Scotland during 2018. Territorial health boards submitted a total of 1,267 records. Of these 1,181 records corresponded with the NRS record, a further 86 records were from people whose deaths had involved drugs but did not meet the criteria for inclusion in the NRS figures.

---

[2] To bring the NDRDD cohort more in line with the volume of cases reported by NRS, deaths categorised as 'intentional self-poisoning' were included in NDRDD for the first time in 2012, but are excluded from the main NDRDD cohort in order to ensure that it remains consistent in scope, and therefore comparable, over time.

Of 1,267 records submitted by the territorial health boards 58 were excluded, the reason for exclusion was that the final recorded cause of death was not drug related (**Appendix 2**).

Defining the 2017 NDRDD Cohort:

The total cohort size in 2017 was 956 people. Of the 956, 899 people were included as 'non-intentional deaths' and reported as part of the main cohort. The remaining 57 people were classified as intentional deaths and reported in further detail in **Deaths by Suicide**.

National Records of Scotland reported a total of 934 confirmed drug related deaths in Scotland during 2017. Territorial health boards submitted a total of 1,014 records. These comprised of 934 records which corresponded with the NRS record and a further 80 records were from people whose deaths had involved drugs but did not meet the criteria for inclusion in the NRS figures.

Of 1,014 records submitted by the territorial health boards 58 were excluded, the main reason for exclusion was that the final recorded cause of death was not drug related. (**Appendix 2**).

Results and commentary

This section presents the findings from the 1,154 non-intentional drug-related deaths (DRDs) in the 2018 National Drug-Related Deaths Database (NDRDD) cohort, important findings from the 2017 cohort (899 non-intentional DRDs) and discussion of trends since 2009. Results are organised into thematic subsections, each concluding with a description of key findings.

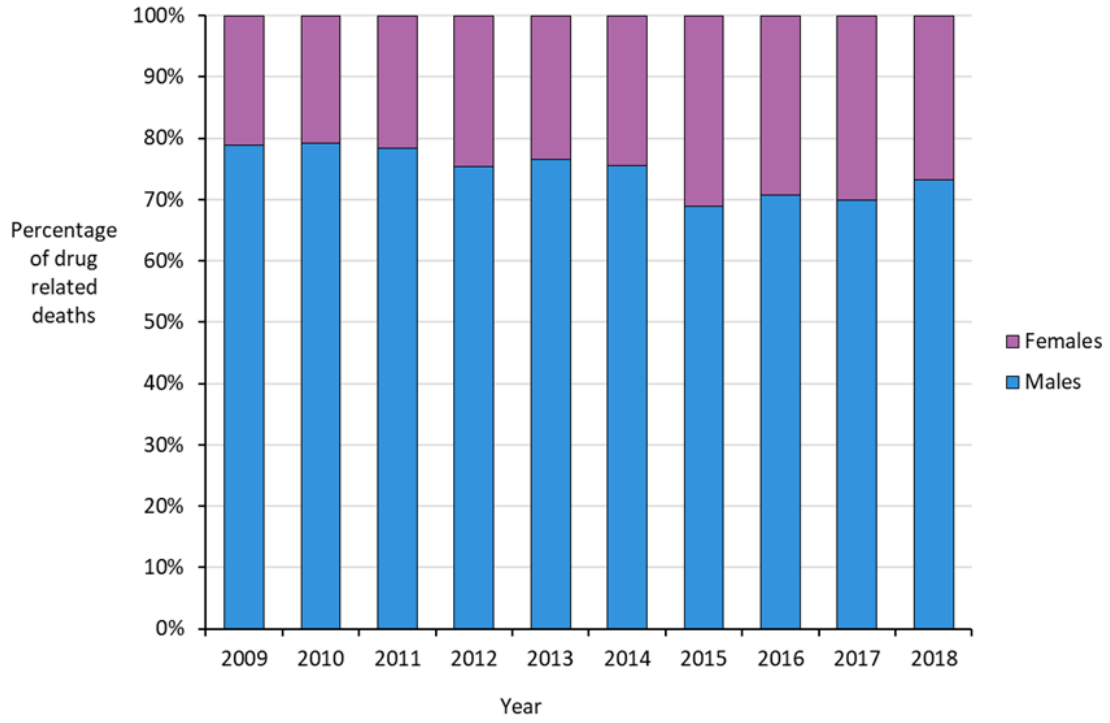
Demographic Profile

This section presents 2018 data.

Age and Sex

In 2018, around seven in ten drug-related deaths (DRDs) were among males (844; 73%). Over the time series, the percentage of DRDs among females increased from 21% in 2009 to 27% in 2018 (Figure 1).

Figure 1: Percentage of Drug-Related Deaths by Sex (NDRDD: 2009-2018)

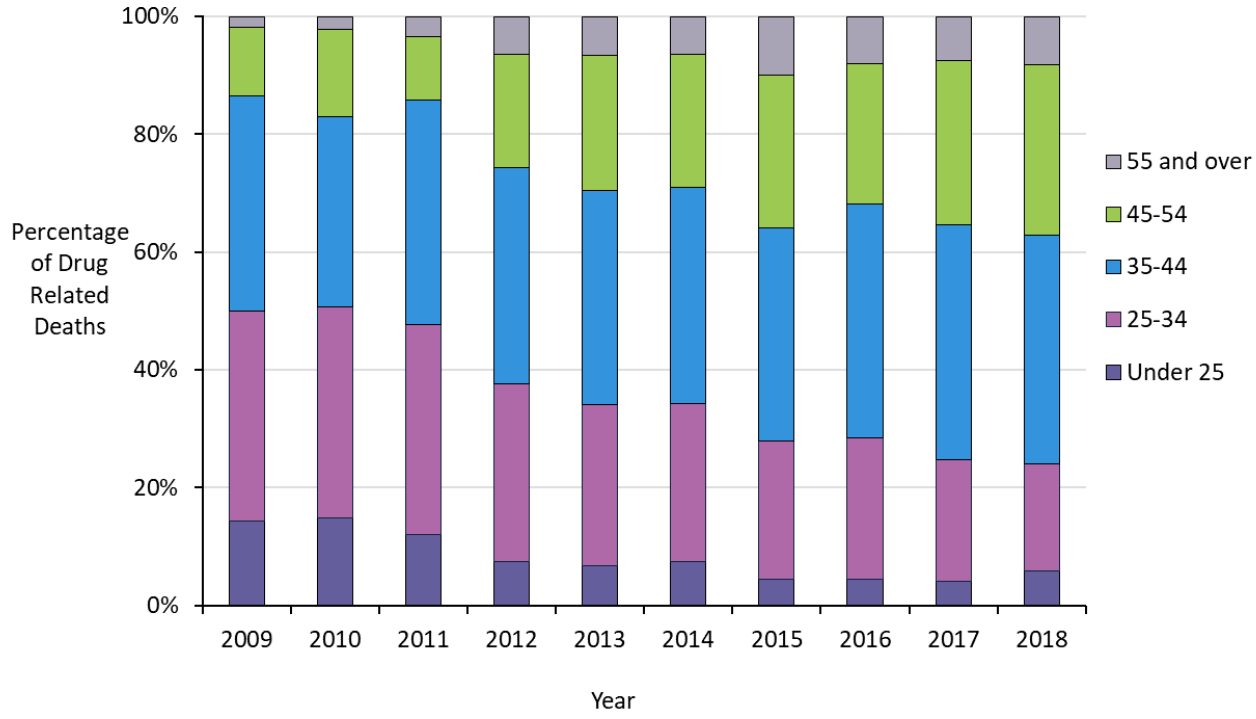


The age profile of DRDs was similar across both sexes, with the highest percentage of DRDs in 2018 among people aged 35-44 (448; 39%) (Table 1 and Figure 2).

The mean age of people who had a DRD increased from 34.9 years in 2009 to 41.7 years in 2018.

The percentage of DRDs among those aged 35 and over increased from 50% (216) in 2009 to 76% (879) in 2018. In particular, the percentage of DRDs among those aged 45 and over more than doubled from 13% (58) in 2009 to 37% (428) in 2018, whereas those aged 35 and under accounted for 50% (216) of the 2009 cohort decreasing to 25% (278) in 2018 (Figure 2).

Figure 2: Percentage of Drug-Related Deaths by Age Group (NDRDD: 2009-2018)



Deprivation

In 2018, over half of people who had a DRD (637, 55%) lived in the most deprived neighbourhoods (Deprivation quintile 1) in Scotland, while only 2% of people (28)

lived in the least deprived areas (Deprivation quintile 5). The deprivation profile has changed very little since 2009 (Deprivation quintile 1: 222, 52%) (Table 2).

Living Arrangements[3]

In 2018, almost four out of five people who had a DRD (836, 77%) were reported to be living in their own home prior to death while 4% (46) lived in a hostel, were of no fixed abode or sleeping rough prior[4] to death (Table 3)[5]. The percentage of people living in their own home prior to death increased from 61% (260) in 2009, while the percentage living hostels or with no fixed abode or rough sleeping decreased from 11% (46) in 2009.

In 2018, 63% (675) of people were recorded as living alone for part of the time, 58% of people (618) were recorded as living alone all of the time. Of those people who lived with other people, 19% (197) lived with a spouse or partner and 9% (99) lived with relatives (Table 4). The percentage who lived alone all of the time increased from 41% (173) in 2009.

Older people were more likely to both live in their own home, and to live alone than those in younger age groups in 2018[6] (data not shown in tables).

---

[3] Living arrangements at the time of death were recorded as unknown in over 10% of records in 2018 (14%).

[4] Recognised to be among the most vulnerable in terms of a range of risks including DRD [12].

[5] People could have been reported as living in more than one place, therefore totals may exceed 100%.

[6] Living in own home (Under 25: 37%, 25-34: 63%, 35-44: 74%, 45 and over: 81%). Living alone only (Under 25: 24%, 25-34: 45%, 35-44: 53%, 45 and over: 60%).

Around a third of women who died in 2018 were recorded as living with a spouse or partner at the time of death. Women were twice as likely to be living with a spouse or partner at the time of death compared to men (data not shown in tables).

Parenthood and Living with Children[7]

In 2018, 35% (342) of people who had a DRD were reported to be a parent or parental figure to one or more children aged under 16. 5% of people (61) were reported to be living in the same household as the child at the time of their death.

In 2018, 566 children lost a parent (Table 5). Of these 566 children, 18% (100) were reported to be living in the same household as the deceased parent at the time of death (Table 6).

Summary

- In 2018, most DRDs continued to be among men (73%), the percentage of female deaths increased from 2009 (21%) to 2018 (27%).
- The mean age of people who had a DRD increased from 35 years in 2009 to 42 years in 2018.
- Over half (55%) of the people who died in 2018 lived in the 20% most deprived neighbourhoods in Scotland.
- Most people who had a DRD lived in their own home (77%). Over half (58%) lived alone all of the time. The percentage of people in these categories increased over the time series (2009 to 2018).
- In 2018, 566 children were reported to have lost a parent or parental figure as a result of a DRD.

---

[7] Parent/parental figure of a child (under 16 years) at the time of death were recorded as unknown in 14% of records in 2018.

Substance Use History

As previously described in the **Methods** section, this section presents 2018 data.

Drug Use and Injecting Status Prior to Death[8]

In the 2018 cohort, 87% (986) of people who had a DRD 'were known'[9] to have used drugs prior to death (Table 7). This figure was broadly consistent with previous years. In 2018 and across the time series combined, the percentage of female DRDs who were known to use drugs prior to death was lower than for males (2018: 82% compared to 89%, 2009-2018: 83% compared to 89% - Table 7).

A key change in the DRD cohort over time has been the increasing percentage of people who were known to have used drugs over a longer period of time. Where the length of drug use is known, people who have used drugs for 20 or more years increased from 17% in 2009 (55) to 41% in 2018 (275). Increasing long-term drug use among the NDRDD cohort was associated with the increasing average age of people who had a DRD.

In 2018, 57% (497) of people who had a DRD and were known to have used drugs prior to death were also known to have injected (Table 8)[10]. Although no clear trend was evident across the time series (2009 to 2018), reported injecting prevalence ranged from approximately 57% to 71% of each cohort. Among those known to inject

---

[8] Data on the length of known drug use were recorded as unknown in over 10% of records in 2017 (14%) and 2018 (33%). Data on the length of injecting drug use were also recorded as unknown in over 10% of records in 2017 (18%) and 2018 (24%).

[9] This information has been recorded by data collection co-ordinators using evidence gathered from a variety of sources (e.g. health, social care or other partner agencies).

[10] This includes those injecting intravenously, intramuscularly (‘muscle popping’), or subcutaneously.

drugs and where the length of drug use is known, the percentage who injected drugs over a period of 20 years or more increased from 14% (23) in 2009 to 33% (113) in 2018.

In 2009, recorded injecting drug use was highest amongst 25-44 year olds (73%), 63% in people 45 and over, and lowest in those under 25 (55%). In 2018, recorded injecting was highest amongst 45 and over age groups (61%), 57% in 25-44 year olds, and lowest in those under 25 (26%) (Table 8). Although there was considerable variation between yearly cohorts, recorded injecting was higher among females (65%) than males (62%) across the entire time period combined (Table 8).

Drug Detoxification[11]

In 2018, where known, only 9% of people who had a DRD (66) were known to have undertaken a drug detoxification in the year prior to death. This percentage has decreased since 2009 (14%, 51). In 2018, where the length of time since last drug detox is known, 23% of those who had a drug detoxification in the year prior to death (14 people) died within one month of this treatment (Table 9).

Substitute Prescribing

In 2018, 58% of people (667) in the NDRDD cohort were prescribed an Opioid Substitution Therapy (OST) drug at some time since 2009[12]. Of these people, 94% (628) had been prescribed methadone. In 2017, the comparable figures were 61%

---

[11] Data on drug detoxification (within the 12 months prior to death) were recorded as unknown in 23% of records in 2018.

[12] Due to issues with capturing Community Health Index numbers from prescriptions [13-14], there is a risk that the figures presented may underestimate OST prescribing since 2009. Inter-year comparisons were not included in this report due to the restricted look back period available for analysis.

(548) who had been prescribed an OST, of which 95% (522) had been prescribed methadone (data not shown in tables).

In 2018, 41% of people (478) were prescribed an OST drug at the time of death. Of these, 91% (437) were prescribed methadone, with the remainder receiving buprenorphine and naloxone (21) or buprenorphine (20) (Table 10). The percentage of the cohort prescribed an OST drug at the time of death increased over the time series (2009: 21%).

In 2018, the percentage of females who were prescribed an OST at the time of death was 45% (139), compared to 41% (339) among males. In each year, the percentage of females prescribed an OST at the time of death was higher than for males. For both sexes, the percentage prescribed an OST at the time of death increased across the time series (2009: 32% for females and 18% for males) (Table 10).

In 2018, the percentage of people prescribed an OST at the time of death was higher among the older age groups (35-44: 50%, over 45: 48%) than among the younger people (under 25: 5%, 25-34: 25%). In most years (apart from 2011 and 2014) and across the entire time series combined, the percentage of people prescribed OST at the time of death was highest among people aged 35-44 years (Table 10).

For information on the dosage, supervision and efficacy of OST prescribing, see **OST section**.

Previous Near Fatal Drug-related Overdoses[13]

In 2018, 49% (477) of people had a record of a near fatal overdose. Of those, 18% had experienced five or more incidents over their lifetime (Table 11).

[13] Data related to the length of time since previous overdose were recorded as unknown in 11% of records in 2018. Where information was unavailable (i.e. blank cases), these have been omitted from the denominator.

In 2018, of those who had experienced a previous overdose and the length of time since the previous overdose is known, 32% (132) had overdosed within six months of death (19% (80) had overdosed in the three months prior to death) (Table 12).

Alcohol-Related Problems[14]

Around one third (29%, 335) of people who had a DRD in 2018 had received treatment for their alcohol use, been in contact with alcohol services, or had medical or psychiatric notes about alcohol-related problems recorded in the six months prior to death. The percentage of people with recent alcohol-related problems has decreased over the time series (2009: 43%) (Table 13).

In 2018 and across the entire time series combined, the percentage of female DRDs with recent alcohol-related problems recorded was lower than among males. In 2018, 24% of females (77) and 31% of males (258) had alcohol problems recorded in the six months prior to death (data not shown in tables).

---

[14] Decreases in the percentage of people who had a DRD with 'problem alcohol use' recorded as a recent medical condition (from 37% in 2009 to 6% in 2014) and the inconsistency between these findings, alcohol statistics [15] and clinical experience, led to the formulation (since 2013) of an alternative alcohol category, incorporating a broader range of NDRDD data items. People are categorised as having recent alcohol-related problems if any of the following were recorded in the six months prior to death: Alcohol–related medical condition; Alcohol–related psychiatric condition; problematic alcohol use noted in mental health history; contact with alcohol services; or, treatment for alcohol dependence. As the scope of this category extends beyond medical conditions, it is not reported in the **Medical and Psychiatric Conditions Section**.

Summary

- Most DRDs (87%) were among people previously known to use drugs. In 2018, 72% of those known to have used drugs had used them for eleven or more years and 57% were known to have injected drugs.

- In 2018 and across the time series combined (2009-2018), the percentage of females (83%) known to use drugs was lower than the percentage of males (89%), whereas females (65%) were more likely than males (62%) to inject drugs.

- In 2018, over one third of people who had a DRD (41%) were prescribed an OST drug (mainly methadone) at the time of death. The percentage of people who were prescribed an OST at the time of death has increased since 2009. Females were consistently more likely than males to be prescribed an OST at the time of death (45% compared to 41% in 2018).

- In 2018, around half of the people who had a DRD (49%) had ever previously experienced a near fatal overdose.

- In 2018, around one third of people who died (29%) experienced alcohol-related problems in the six months prior to death. The percentage experiencing alcohol-related problems in the six months prior to death decreased over the time series (2009: 43%).

Medical and Psychiatric History and Significant Life Events[15]

Information from medical records (e.g. GP notes) and other data sources is recorded by NDRDD Data Collection Co-ordinators. The accuracy of these data is dependent upon access to relevant data sources and the comprehensiveness of the information they contain.

The decrease in the percentage of DRDs with a recent medical or psychiatric condition observed in 2018 (2017: 70%, 2018: 63%)[16] may be related to the challenges faced by some Data Collection Co-ordinators in collecting comprehensive medical and social care information, indicating that findings for 2018 may be less reliable than in other years.

Difficulties accessing sources and the sharing of information may also be related to the unexpected decrease in DRDs where significant events or being victims of domestic violence was recorded, potentially also indicating that these data are not as reliable as in previous years.

Consequently, this section presents findings from both 2017 and 2018 data.

---

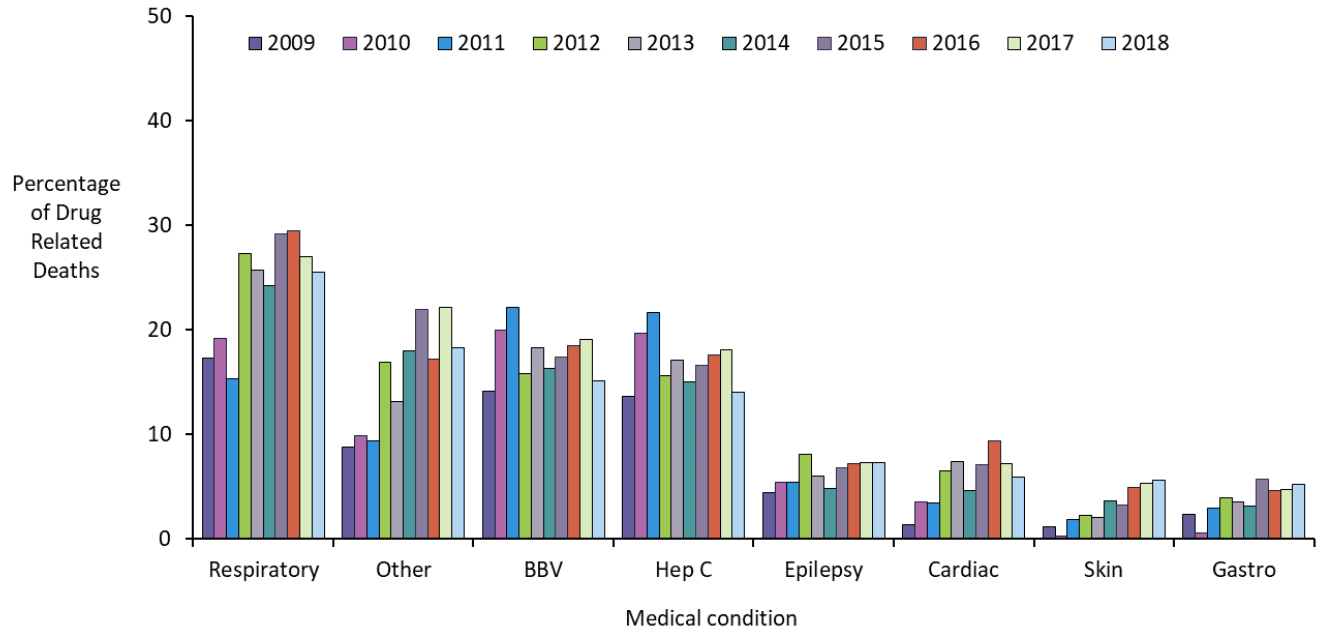
[15] People may have more than one medical or psychiatric condition recorded. For psychiatric conditions, bipolar disorder and schizophrenia are mutually exclusive diagnoses at any one time although people may have both in their lifetime, with revision over time. 'Drug addiction' and 'problem alcohol use' were removed from recorded conditions. Medical conditions wrongly recorded in the 'psychiatric conditions' variables (and vice versa) were transferred to the appropriate variables.

[16] Where information was available: includes those recorded as having no recent medical condition, blank cases are omitted from the denominator.

Recent Medical Conditions

One or more medical condition was recorded in the six months prior to death (hereafter referred to as 'recent') for 70% of people in the 2017 NDRDD cohort (630) (Table 14 and Figure 3). The percentage with a medical condition recently recorded increased over time from 2009 to 2017 (2009: 46%). Although the percentage of DRDs with a medical condition decreased in 2018 (63%, 687), this result should be considered with caution due to data quality issues.

Figure 3: Medical Conditions Recorded in the Six Months Prior to Death (NDRDD: 2009-2018)[1 2]



1. Medical conditions which are present in 5% or more cases in 2018 have been displayed in the chart.

2. The category 'Other' encompasses the following diagnoses: Eating Disorder; Learning Disability; Migraine; Pancreatitis (not alcohol-related); and cases recorded as 'Other medical condition' (e.g. fracture, cancers).

In 2017 and 2018, the most common recent medical conditions amongst people who had a DRD were;

- respiratory conditions (2017: 27%, 243; 2018: 26%, 278),
- ‘other’ medical conditions[17] (2017: 22%, 199; 2018: 18%, 199),
- Blood Borne Viruses[18] (BBV) (i.e. hepatitis B, hepatitis C or HIV) (2017: 19% 172; 2018: 15%, 165),
- epilepsy (2017: 7%, 66; 2018: 7%, 80),
- and cardiac conditions (2017: 7%, 65; 2018: 6%, 64) (Table 14).

Recording of respiratory disease and cardiac illness as medical conditions in the six months prior to death increased across the time series from 17% (75) in 2009 to 27% (243) in 2017 and 26% (278) in 2018 and from 1% (6) in 2009 to 7% (65) in 2017 and 6% (64) in 2018 respectively (Table 14). Across the time series, both types of condition were more prevalent with age[19]. Females (38%) were also more likely than males (21%) to have a recent respiratory condition recorded (data not shown in tables). Changes in the age and sex composition of the NDRDD cohort (increasing average age, increasing percentage of females) are likely to explain increasing prevalence of respiratory and cardiac conditions over time.

[17] The category 'Other medical conditions' includes the following diagnoses: Eating Disorder; Learning Disability; Migraine; Pancreatitis (not alcohol-related); and cases recorded as ‘Other medical condition’ (e.g. fracture, cancers).

[18] While they are grouped together in Figure 3, the specific BBV infections are listed separately in Table 14. Hepatitis C would be 4th most common medical condition (2017: 18.1%, 163; 2018: 14.1%, 153) in descending order, occurring after the grouped BBV category.

[19] Respiratory disease: under 25s; 17%, 25-34; 16%, 35-44; 23%, 45 and over; 37%. Cardiac illness: under 25; 2%, 25-34; 3%, 35-44; 5%, 45 and over; 12%.

There was no discernible trend over time in the prevalence of recent BBV recording, however it was strongly associated with injecting drug use[20]. In each year and over the time series combined, recent BBV conditions were more likely to be recorded for people who injected drugs (2009-2018: 31%) than for DRDs among those not known to inject drugs (2009-2018: 3%). Recent BBV recording was also more prevalent among females (20% compared to 17% of males) and among older people[21] - these differences are likely to be due to higher injecting prevalence among females and older people who had a DRD (data not shown in tables).

The prevalence of chronic pain showed a proportionally greater increase over time than for other conditions (e.g. respiratory). In years 2009 (<1%) to 2014 (2%), few recent chronic pain cases were observed among people who had a DRD. The percentage of cases with chronic pain peaked in 2016 (11%, 90), decreasing in more recent years (2017: 6%, 55; 2018: 5%, 51) (Table 14). Across the time series, recent chronic pain was more often recorded for females (6%) than for males (4%) and for older people[22] (data not shown in tables).

The prevalence of a subset of six medical conditions[23] identified in the NDRDD dataset and in hospital admission records (using the International Classification of Diseases Version 10 (ICD10) diagnosis coding scheme [10]) was used to examine multiple morbidity. On average, people who had a DRD in 2017 had 0.72 and in 2018 0.60 (of six) medical conditions recorded in the six months prior to death, significantly

---

[20] This is consistent with 2016 BBV data published by Health Protection Scotland, stating that hepatitis C was the most prevalent BBV in Scotland and 90% of infected people had acquired the virus because of injecting drug use [16].

[21] Recent BBV; Under 25: 3%, 25-34: 12%, 35-44: 21%, over 45: 22%.

[22] Recent chronic pain: Under 25: <1%, 25-34: 3%, 35-44: 4%, over 45: 7%.

[23] The six key medical conditions examined were respiratory disease, liver disease, epilepsy, cardiac problems, stomach problems and Blood Borne Viruses (Hepatitis B, Hepatitis C, HIV).

higher than in 2009 (0.45), indicating increasing recent multiple morbidity over the time series (Table 15). In 2017 and 2018, females had a higher average number of recent conditions recorded (2017: 0.85, 2018: 0.76) than males (2017: 0.67, 2018: 0.54). Older people (35-44; over 45) had a higher average number of recent conditions than younger people (Under 25; 25-34) (Table 15).

Using SMR01 records, in the ten years before death, the average number of key medical conditions associated with hospital admission for people who had a DRD in 2018 was 0.84, in 2017 this figure was 0.77. In 2017 and 2018, the average number of medical conditions associated with hospital admission was significantly higher than in 2009 (0.51). While there was no significant difference by sex in 2018, the average number of medical conditions increased significantly with age[24]. There was no significant difference by sex or age in 2017.

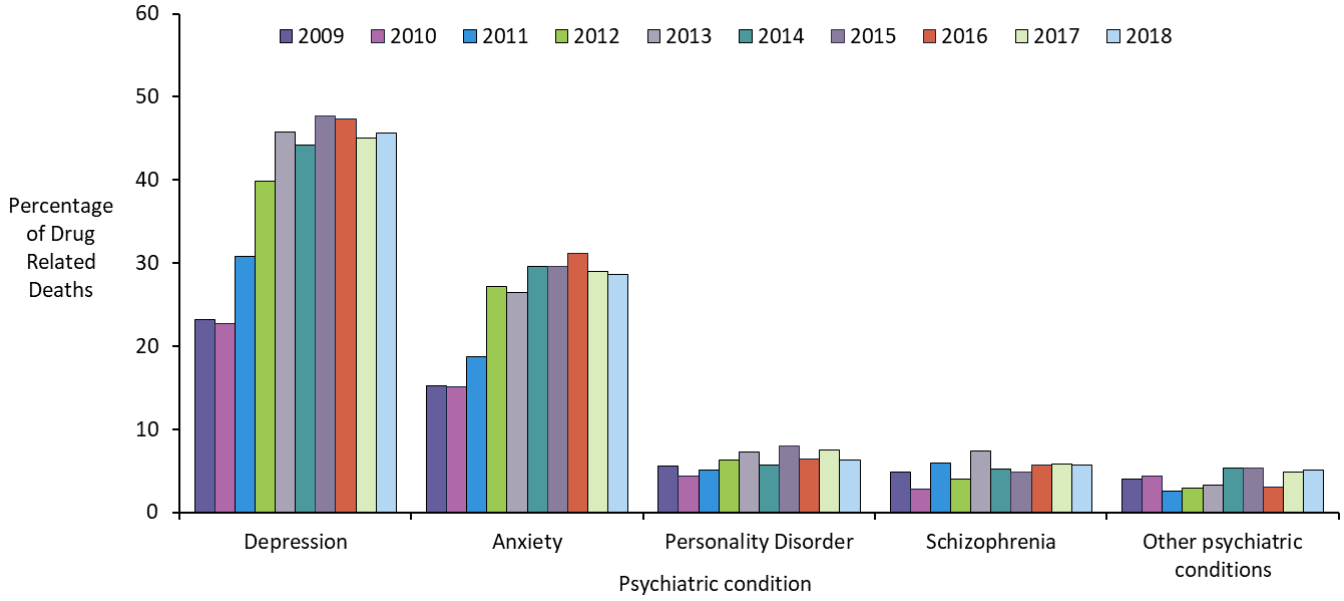
Recent Psychiatric Conditions

In 2017 and 2018, 63% of people who had a DRD had a specific psychiatric condition recorded in the six months prior to death (2017: 567; 2018: 665) (Table 16). Prior to this, the percentage steadily increased between 2009 (40%) and 2016 (65%). This result should be considered with caution due to the data quality issues described above.

In 2017, 45% (405) were recorded as recently suffering from depression, 29% (261) from anxiety, 8% (67) from personality disorders and 6% (52) from schizophrenia. In 2018, 46% (481) were recorded as recently suffering from depression, 29% (302) from anxiety, 6% (66) from personality disorders and 6% (60) from schizophrenia. The prevalence of recent psychiatric conditions over time is shown in Figure 4.

[24] Average number of medical conditions: Under 25: 0.38, 25-34: 0.55, 35-44: 0.80, over 45: 1.09.

Figure 4: Psychiatric Conditions Recorded in the Six Months Prior to Death (NDRDD: 2009-2018)[1 2]



1. Psychiatric conditions which are present in 5% or more cases in 2018 have been displayed in the chart.

2. The category 'Other psychiatric conditions' encompasses the following diagnoses: Agoraphobia; Autism/Aspergers; Self Harm; and cases recorded as "Other psychiatric condition".

Recording of depression and anxiety as recent psychiatric conditions increased across the time series from 23% (100) in 2009 to 45% (405) in 2017 and 46% (481) in 2018, and from 15% (66) in 2009 to 29% (261) in 2017 and 29% (302) in 2018 respectively (Table 16). Across the time series, both conditions were more prevalent among females (Depression: 55%, Anxiety: 34%) than males (Depression: 37%, Anxiety: 24%). Depression was more prevalent among older people than younger people[25]. Anxiety was recorded in the lowest percentage of people aged under 25

[25] Recent depression: Under 25: 25%, 25-34: 38%, 35-44: 43%, over 45: 46%.

(19%) but had similar prevalence across other age groups[26] (data not shown in tables). Therefore, increases in the recording of recent depression and anxiety among people who had a DRD may be partly attributable to changes in the demography of the NDRDD cohort.

The prevalence of a subset of seven psychiatric conditions[27] identified in the NDRDD dataset and in hospital admission records (using ICD10) was used to examine multiple psychiatric morbidity. On average, people who had a DRD in 2017 had 0.96 and in 2018 had 0.85 (of seven) psychiatric conditions recorded in the past six months (Table 17). The average number of recent psychiatric conditions in 2017 and 2018 was significantly higher than in 2009 (0.53). In 2017 and 2018, females had a higher average number of recent psychiatric conditions recorded (2017: 1.10, 2018: 1.03) than males (2017: 0.89, 2018: 0.78). There were no statistically significant differences in the mean number of psychiatric conditions recorded by age group.

Admission to a psychiatric hospital in the ten years prior to death was much less common than recent recording of a psychiatric diagnosis. People in the 2017 cohort had psychiatric inpatient stays in relation to an average of 0.17 of the seven conditions examined (2018: 0.16) (Table 17). The prevalence of psychiatric admissions associated with these conditions has remained relatively constant over time, between 0.15 and 0.20 conditions. Across the time series combined, females who had a DRD (0.24) had been admitted to hospital in relation to a higher number of psychiatric conditions than males (0.16) (data not shown in tables).

[26] Recent anxiety: 25-34: 28%, 35-44: 26%, over 45: 27%.

[27] The seven psychiatric conditions examined were depression, anxiety, personality disorder, schizophrenia, psychotic episode, post traumatic stress disorder and bipolar disorder.

Recent Significant Events

In 2017, 62% (561) and in 2018, 55% of people (550) were recorded as experiencing a significant event in the six months prior to death (Table 18)[28]. In 2017, 26% (229) were recorded as suffering ill health or a recent diagnosis (medical or psychiatric), 9% experienced either the breakdown of a significant relationship (82), 8% were recently released from prison (66), 7% experienced a bereavement (85), and 12% had recent homelessness or housing problems (71) in the past six months (2018; ill health/recent diagnosis: 19% (194), breakdown of significant relationship, recent prison release, bereavement or recent homelessness/housing problems: 7% (73, 73, 65, 65 respectively). Validating findings in relation to recent medical or psychiatric diagnoses, the percentage reporting recent ill health/diagnosis increased over time from 2009: 19% to 2017: 26% and 2018: 19%.

Domestic and Sexual Abuse

In 2017, 15% (134) of people who had a DRD (82% of whom were female) were reported to have been a victim of domestic violence at some point prior to death (Table 19). In 2018, 11% (126) of people (82% female) were reported to have been a victim of domestic violence.

Sexual abuse at some point prior to death was reported for 13% (113) of people who had a DRD in 2017 (of whom 65% were female) (Table 20). In 2018, 9% (108) of people who had a DRD reported sexual abuse (60% female). This is a decrease from 16% (128) in 2016. Although overall prevalence decreased, this result should be considered with caution as there is a possibility that the high percentage of 2018 cases with 'no known incidence' recorded (91%) (2017; 87%, 2016; 84%) could include cases where it was not possible to comprehensively check the records of the deceased.

[28] People may have had more than one significant event recorded.

Summary

- In 2017, 70% of people who had a DRD had a medical condition recorded in the six months before death, and in 2018 63% of DRDs had a medical condition recorded. Reported recent medical ill health among DRDs has increased since 2009 (46%).

- Respiratory illness (27% and 26%), blood borne viruses (19% and 15%) and epilepsy (both 7%) were the recent conditions most commonly recorded in 2017 and 2018 respectively.

- Respiratory and cardiac conditions were more common among people in the older age cohorts (35-44, over 45) at the time of death and the prevalence of these conditions increased over time, in line with increases in average age.

- In 2017 and 2018, 63% had a recent psychiatric condition recorded in the six months prior to death. The percentage of DRDs with recent psychiatric ill health has increased since 2009 (40%).

- Depression and anxiety were the most common psychiatric conditions recorded in the six months prior to death in both 2017 and 2018. Both conditions were more common among females and older people and increased over the time series (2009 to 2018).

- In 2017, 62% of people had experienced a significant event in the six months before death, this decreased to 55% in 2018 (most commonly, ill health or a recent diagnosis (medical or psychiatric)).

- 15% of people who had a DRD had experienced domestic violence prior to death in 2017, in 2018 this decreased to 11%. Sexual abuse at some point prior to death was recorded in 13% of DRDs in 2017, and 9% in 2018.

Contact with Services[29]

This section presents both 2017 and 2018 data.

Drug Treatment Services

In the 2017 cohort, three quarters of people who had a DRD (76%, 682) had been in contact with a drug treatment service at some point in their lives. Over half of these (59%, 527) were in contact with drug treatment services in the six months prior to death (hereafter referred to as 'recent') (Table 21). In 2018, 63% (722) had been in contact with a drug treatment service at some point, with around half, 48% (555) in the last six months. Both the percentage of people in contact with drug treatment services at some point (2009: 62%) and in contact within the previous six months (2009: 34%) has generally increased over the time series, until 2018 where an unexpected decrease has occurred which could be related to unreliable data collection issues.

In 2017 and 2018 and across the time series combined, the percentage of people aged 35 or over who had been in contact with a drug treatment service in the six months prior to death was higher than among those aged under 35[30]. Similar significant differences were observed between age groups in relation to contact with drug treatment services at any time prior to death (Table 21).

---

[29] Although the NDRDD collects information on contact within different time periods, this section emphasises contact within six months of death in order to illustrate which services might have had an impact in terms of preventing DRD.

[30] Contact with drug treatment service in 6 months prior to death:
Under 35's: 2017: 97, 44%; 2018: 84, 30%; 2009-2018: 814, 39%.
35 and over: 2017: 430, 64%; 2018: 471, 54%; 2009-2018: 2,273, 54%.

Over the time series combined, the percentage of females in contact with a drug treatment service in the six months prior to death was higher (2009-2018: 887, 54%) than for males (2009-2018: 2,200, 47%) (data not shown in tables). In 2017 and 2018, the differences by sex in the percentage 'ever' or 'recently' in contact were not significant.

In 2017, 37% of people who had a DRD (331) attended a specialist drug treatment service, in 2018 this decreased to 27% (310) of people (Table 22). The percentage of people who had recently attended a specialist drug treatment service increased from 2009 to 2018 (2009: 27%). In 2017, 15% (135) and in 2018, 11% (132) had seen their GP for the purpose of drug treatment. The percentage of people consulting their GP has decreased over the time series (2009; 22%), with 2018 recording the lowest percentage so far.

In 2017, 47% (417) and in 2018, 44% (466) of people who had a DRD were being treated for their problematic drug use at the time of death – this percentage increased over the time series (2009: 32%). In both 2017 and 2018, people aged 35-44 and 45 and over were more likely than younger people to have been in contact with a drug treatment service at the time of death[31]. Over the time series combined, those aged 35-44 were the most likely to be in contact with a drug treatment service at the time of death (2009-2018; 1,081; 47%). Females were more likely than males to be in contact with a drug treatment service at the time of death[32] (Table 23).

---

[31] In contact with drug treatment service at time of death:
Under 25: 2017: 4, 11%; 2018: 9, 15%.
25-34: 2017: 59, 32%; 2018: 62, 32%.
35-44: 2017: 195, 55%; 2018: 205, 49%.
45 and over: 2017: 159, 50%; 2018: 190, 49%.

[32] In contact with drug treatment service at time of death:
Female: 2017: 134, 50%; 2018: 137, 47%; 2009-2018: 754, 47%.
Male: 2017: 283, 45%; 2018: 329, 43%; 2009-2018: 1,683, 37%.

In 2017 and 2018, in cases where the date of last contact with drug treatment services was recorded, nearly one third (2017: 112, 29%; 2018: 98, 28%) of people who were being treated for their problematic drug use had been seen within one week of death. 84% (321) in 2017 and 83% (289) in 2018 were seen within one month of death (data not shown in tables).

Non-Drug Treatment Services

Among the 2017 cohort, 71% (639) had been in contact with services for reasons other than management of a drug misuse problem at some point in their lives (an increasing trend since 2012 (66%), when these data were first available). This increasing trend did not continue into 2018, where 56% (641) had been in contact with services, this result should be considered with caution due to data quality issues.

In 2017, recent (within six months) contact with non-drug treatment services (377, 42%) was similar to most previous years (ranging from 42% to 48%, excluding 2014). In 2018, this figure decreased to 33% (386).

In 2017, 22% (197) (2018; 16%, 181) had recently been in contact with mental health services and 9% (82) (2018; 9%, 103) had been in contact with social work (Table 24).

In 2017, among people who had been discharged from a psychiatric hospital in the six months prior to death, 63% (26/41) had also been in contact with mental health services in the six months prior to death. In 2018, 53% (24/45) of people discharged in the six months prior to death had also been in contact with mental health services in the six months prior to death. These were both higher than the percentages in recent contact with mental health services among those not recently discharged from a psychiatric hospital (2017: 171/858, 20%; 2018 157/1109, 14%) (data not shown in tables).

Hospital Stays[33]

General Acute Hospital Stays

In 2017, 32% (288) had been discharged within six months of death (2018: 30%, 345) and 85% (767) of people who had a DRD had been discharged from a general acute hospital in the ten years before death (2018: 85%, 981) (Table 26). The percentage of people with 'long-term' or 'recent' hospital discharges was stable over time.

Across the time series combined, there were clear differences in admission to general acute hospitals. Females (88%) and older people (35-44; 85%, over 45; 88%) were more likely to have had a general acute hospital stay in the past ten years than males (83%) and younger people (under 25; 76%, 25-34; 81%). Similarly, recent general acute stays were more common among females (32%), and older people (35-44; 29%, over 45; 34%) than among males (28%) and younger people (under 25; 17%, 25-34; 26%) (data not shown in tables).

Among people hospitalised in the ten years before death, the median number of inpatient stays increased from seven in 2009 to nine in 2018 (the highest number observed). Across the time series combined, a higher median number of stays was observed among females (9) than males (8), and in older people (under 25; 4, 25-34; 7, 35-44; 8, over 45; 11) (data not shown in tables).

---

[33] NDRDD data was linked to PHS's acute (SMR01) and psychiatric (SMR04) hospital inpatient databases in order to examine the number of medical and psychiatric admissions, and time before death. Admissions to Scottish NHS hospitals in the ten years before death were included. Information on the time between last hospital discharge (general acute or psychiatric) and death is shown in Table 25.

Psychiatric Hospital Stays

A quarter of people who had a DRD in 2017 and 2018 had been discharged from a psychiatric hospital within ten years (2017: 26%, 229; 2018: 25%, 294), with 5% (41) in 2017 having been discharged in the six months before death (2018: 4%, 45). The percentage of people with a 'long-term' or 'recent' psychiatric hospital discharge was similar across the time series (Table 27).

Across the time series, females (29%) and older people (35-44 and over 45; 77% each) were each more likely to have had a psychiatric hospital inpatient stay in the past ten years than their respective comparison groups (males (25%); younger people (under 25; 12%, 25-34; 25%)) (data not shown in tables). There were no differences between groups in relation to the prevalence of psychiatric stays in the six months prior to death.

Among people hospitalised in the ten years before death, the median number of psychiatric hospital stays observed in the 2017 and 2018 NDRDD cohort was two (there was no clear trend over time). Across the time series combined, a higher median number of psychiatric stays were observed among females (3) than males (2) and among people aged 45 and over (3) compared to those aged under 45 (2) (data not shown in tables).

Criminal Justice System

Police Custody[34]

Where known, 26% (189) of people who had a DRD in 2017 and 19% (187) of people who had a DRD in 2018 had been in police custody in the six months prior to

[34] Continuing issues accessing police custody records meant that data related to the length of time between police custody release and death were recorded as unknown in over 10% of records in 2017 (19%) and 2018 (14%).

death (Table 28). Previous police custody in the six months prior to death was unknown in 19% (167) of cases in 2017, and 14% (166) in 2018 (Table 28).

In 2017, where the length of time between police custody release and death is known, 5% of DRDs (43) occurred within four weeks of a release from police custody. The equivalent number for 2018 was 4% (47). Further detailed information on the time between police custody and death is shown in Table 29.

Prison Custody[35]

Where known, slightly over half of the 2017 cohort (373, 53%) had ever been in prison (2018: 471, 52%) and 14% (96) had spent time in prison in the six months prior to death (2018: 13%, 118) (Table 30). There was no clear trend in experience of prison custody at any time. However, there was a decrease over time in experience of a prison custody release within six months of death (2009: 20%). Further information on the time between prison custody and death is shown in Table 31. Information on the number and percentage of opioid-related deaths occurring within four or 12 weeks of release from prison custody (based on NRS's National Statistics) is also provided in PHS's **National Naloxone Monitoring Report** [17].

Over the entire time series, differences between groups were evident in relation to experience of prison custody. Experience of prison at any time prior to DRD was more common among males than females (52% compared to 28%) and among people who are known to inject drugs for 10 or more years (PWID>10) (68%) than among groups with less severe/prolonged drug use (person not known to use drugs (NK-PWUD): 15%, person known to use drugs (PWUD): 42%, person known to inject drugs for less than 10 years (PWID<10): 60%). The age cohorts most likely to have experienced prison custody were 25-34 year olds (41%) and 35-44 (47%) (Under 25; 32%, 45 and over; 35%). Experience of recent prison custody was also higher among males (15% compared to 6% of females), among people aged 25-34 (21% compared

[35] Data related to the length of time between prison release and death were recorded as unknown in over 10% of records in 2017 (22%) and 2018 (21%).

to 20% of people aged 25 and under, 14% of 35-44, and 6% of 45 and over) and highest among People who Injected Drugs for less than 10 years (PWID<10: 21%, compared to NK-PWUD: 4%, PWUD: 11%, PWID10+: 15%) (data not shown in tables).

Contact with Services Providing Specialist Drug Interventions

While drug treatment episodes and hospital admissions may directly address people's substance use, specialist interventions are also provided in prison and police custody. These non-drug treatment services also provide opportunities to detect/address problematic drug use, promote overdose awareness and deliver harm reduction interventions (e.g. providing Take Home Naloxone).

In 2017, 76% (679) of people who had a DRD had been in drug treatment, in prison or police custody or discharged from hospital in the six months prior to their death. The percentage of people in contact with these services in the six months prior to death increased over the time series (2009: 70%, 2010: 67%, 2011: 71%, 2012: 75%, 2013: 69%, 2014: 71%, 2015: 74%, 2016: 77%) (Table 32). In 2018, the percentage of people in contact with services providing specialist drug interventions decreased to 67% (770), and should be considered with caution due to potential data quality issues.

The percentage of people who had an opioid-related death who were in contact with these services in the six months prior to death was even higher (2017: 83% (583/702)) and has increased over the time series (2009: 72%) (Table 32). Although this figure decreased to 73% (654/891) in 2018, this result should also be considered with caution due to data quality issues.

Summary

- In 2017, three-quarters of people who had a DRD (76%) were in contact with drug treatment services, in 2018 63% of people were in contact. Drug treatment service contact increased over time from 2009 - 2017.

- In 2017, 42% of people who died were in recent contact with non-drug treatment services (e.g. social work, housing). In 2018 this decreased to 33%. Mental health service contact among DRDs increased over time from 2009 - 2017.

- In 2018, 30% of people who had a DRD had been discharged from a general acute hospital in the six months prior to death (2017: 32%).

- In 2017, 26% of people who had a DRD had been in police custody in the six months prior to death. This decreased in 2018, where 19% had recently been in police custody.

- In 2018, 13% of people who had a DRD had been in prison in the six months prior to death (2017: 14%).

- In 2017, 76% of people (83% of those whose death was opioid-related) were in contact with a service with the potential to address their problematic drug use or deliver harm reduction interventions in the six months before death (2018: 67%, 73% opioid-related).

Circumstances of Death

As previously described in the **Methods** section, this section presents 2018 data.

Time and Location[36]

Information on the distribution of Drug-Related Deaths (DRDs) by day and month is available in Tables 33 and 34. Across the time series combined, the highest percentage of deaths occurred on a Sunday (16%) and in December (10%). However, differences were not significant - neither the day of death nor the month of death were unequally distributed.

In 2018, the NHS Boards where the highest number of DRDs occurred were Greater Glasgow & Clyde (390), Lothian (151) and Lanarkshire (124) (Table 35).

Based on the normal place of residence of people who had a DRD, the NHS Boards with the highest crude mortality rates in 2018 were Greater Glasgow & Clyde (34 deaths per 100,000 population), Tayside (25) and Ayrshire & Arran (24) (Table 36)[37].

Place of Drug Use and Place of Death

Where known, 65% (714) of people who had a DRD in 2018 consumed the drugs present at death in their own home, while 22% (242) consumed them in another

---

[36] NRS examines the geographical distribution of DRDs and provides rates per head of population and rates per estimated number of 'problem drug users' in their National Statistics [1,2]. However, as the main NDRDD cohort is restricted to non-intentional deaths and is based upon calendar year rather than the year in which death was registered, similar analyses are also included in this report.

[37] Due to small numbers of DRDs, figures for island NHS Boards should be interpreted with caution.

person's home (Table 37). The percentage of people who consumed drugs at home increased across the time series (2009: 54%).

Where known, 60% of people who had a DRD in 2018 (676) died in their own home and 20% (225) died in another person's home. 8% of people (94) died in hospital (Table 38). The percentage of people who died in their own home has increased over time (2009: 51%).

Scene of Overdose

Where known, another person was present at the scene of the fatal overdose in 52% (566) of DRDs in 2018. The percentage of DRDs where another person was present decreased over the time series (2009: 64%). In 2018, presence of another person in the same room was recorded in 24% (255) of DRDs, broadly similar to previous years (Table 40).

Across the time series, presence of another person at the scene of fatal overdose was much lower among people who lived alone all of the time (34%) than among those who did not (74%). Similarly, fatal overdoses were less likely to be witnessed where the person was living in their own home (48%) than where they were not (66%) (data not shown in tables). As discussed in Section **Living Arrangements**, the percentage living in one's own home and living alone all of the time increased with age. Age was also related to the percentage of fatal overdoses which were witnessed by another person (72% among people aged under 25, 62% for 25-34 year olds, 53% for 35-44 year olds, and 44% of those aged 45 and over) (Table 39). Within the population of people who use drugs, ageing appears to be associated with an increase in the number of people for whom there is a reduced probability of effective intervention in the event of a drug poisoning or overdose.

Also (with reference to Section **Living Arrangements**) women were more likely to be living with a partner/spouse (30%) compared to men (15%). Females also had a higher percentage of fatal overdoses witnessed by another person (57%) than males (50%) (Table 39). Across the time series combined, the group most likely to have someone present at the scene of a fatal overdose were younger females (under 25) who were living with a partner/spouse (data not shown in tables).

In 2018, an ambulance attended the scene of 86% (970) of DRDs; a similar percentage to previous years (the lowest percentage was recorded in 2015 (77%, 494)). Among the 165 (15%) cases where an ambulance did not attend, there were 47 deaths (4%) when an ambulance was not required as the person was beyond medical intervention (Table 41).

Where known, an attempt was made to resuscitate the individual in 42% (464) of cases (Table 42). In 60% (277) of these cases, resuscitation was attempted by ambulance staff (Table 43)[38].

Naloxone Availability and Use[39]

Naloxone is a medication which is used to reverse the effects of an overdose with drugs such as heroin [17]. Opioids (including heroin) were implicated in 77% of all drug-related deaths in 2018. Take-home naloxone (THN) is supplied nationally by the **National Naloxone Programme**.

In 2018, opioids (methadone, heroin/morphine or buprenorphine) were implicated in 891 of the 1,153 DRDs with known toxicology (77%). Whether there was a THN kit available was known in 50% (447) of opioid deaths. Where known, THN was

---

[38] Multiple people (in differing roles) may have attempted to resuscitate the same individual.

[39] In 2010, questions were added to the NDRDD form to collect data on the availability of 'take-home' naloxone. However, an examination of 2010 and 2011 NDRDD data suggested that these questions were not solely measuring 'take-home' naloxone (as had been intended) but administration by a range of people including relatives, paramedics and hospital staff. The naloxone questions in the 2012 proforma were refined to specify administration of 'take home' naloxone provided directly to people at risk of an opioid overdose. Due to this change, naloxone availability and use from 2012 is not comparable to previous years.

reported to be available at the scene of overdose in 35 of these deaths (8%) and was administered on 26 occasions (79% of cases where available) (Table 44).

Previous THN supply was known in 78% (902) of cases in the 2018 cohort. THN supply was unknown in 22% of cases. Where known, 29% (263) of the 2018 cohort had been supplied with THN before death. THN supply before death increased over time among the cohort (rising from 3% in 2012). In 2018, for cases where it had been supplied, naloxone was available at the scene of overdose in 59% (24) of DRDs. Naloxone availability was unknown in 84% (222) of cases. Where available, THN was used in 77% (17) of deaths[40]. Apart from one death in 2015, and three in 2017, in all other cases where naloxone was available but not used, either no other persons were present at the scene of overdose or they were not in the same room (data not shown in tables).

Summary

- In 2018, the NHS Boards with the highest crude mortality rates for DRDs were Greater Glasgow & Clyde (34 deaths per 100,000 population), Tayside (25) and Ayrshire & Arran (24).
- In 2018, around two-thirds of people consumed the drugs in (65%) and died in (60%) their own home. The percentage of people in each of these categories has increased since 2009.
- Over half of DRDs (52%) occurred when others were present at the scene of the overdose. The percentage of deaths where others were present at the scene of overdose (and potentially able to intervene) was lower where people lived alone all of the time (34%) or were aged 45 or over (44%), than in relevant comparison groups.

[40] Naloxone availability at DRDs in a home environment (own home, other's home, hostel, B&B/temporary accommodation) was 54% (19/35) in cases where availability was known.

- Where known, take-home naloxone (THN) supply has increased over time (29% of 2018 DRDs). Among people who had previously been supplied with THN, 59% had naloxone available at the scene of death.

Toxicology Data

Information on the presence of drugs tested at post-mortem is collected as part of the NDRDD dataset. PHS also receives pathology information from National Records of Scotland (NRS) about whether substances were (i) implicated in the death and (ii) not implicated in the death. For the first time in this report, pathology data for 2009 and 2010 are also included in the information presented below.

The determination as to whether substances were implicated in, or potentially contributed to, death is complex and lies with the pathologist who will consider toxicology data in combination with pathological and circumstantial evidence before reaching their conclusion. The relationship between presence and implication is not straightforward. Some drugs are more potent than others and there is significant risk to life even at so-called 'therapeutic' levels, particularly when ingested with other drugs or alcohol. Conversely, other drugs are considered to pose less risk to life, even when an excess of the drug is ingested. See **Appendix 1** for further information about these data.

As previously described in the **Methods** section, this section presents 2018 data.

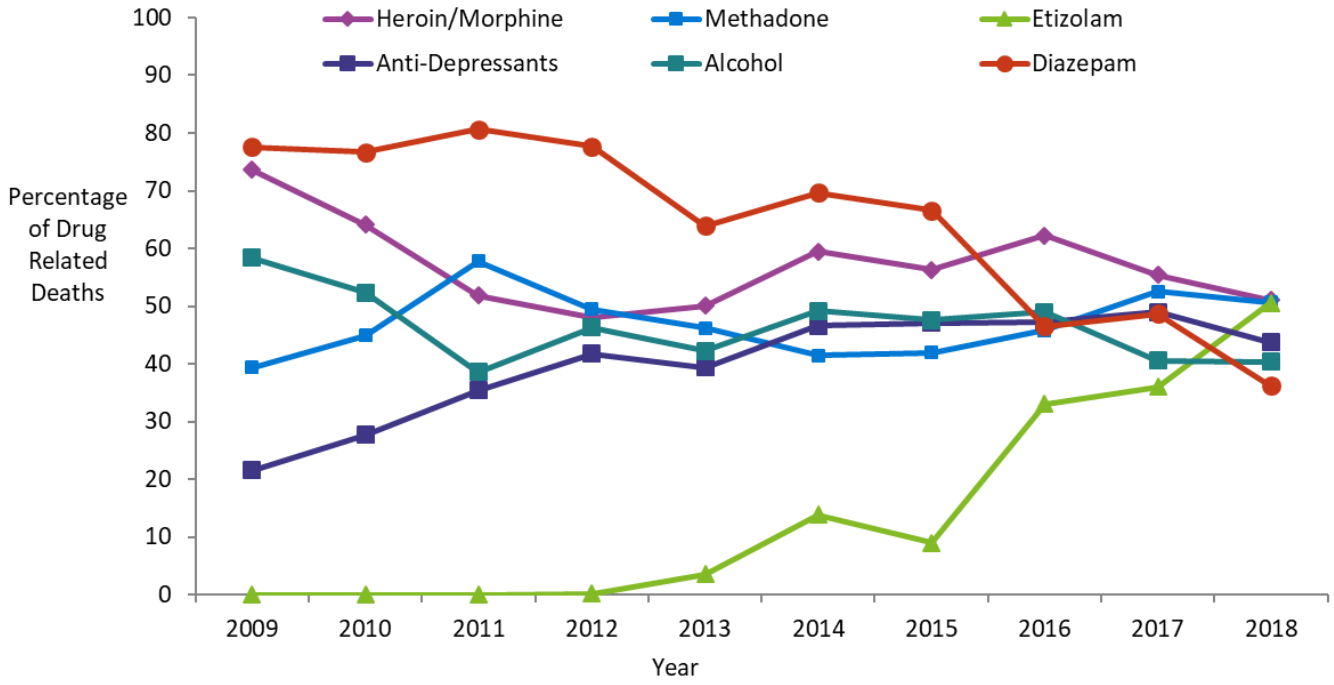
Drugs Present at Time of Death

NDRDD toxicology results showing the drugs present in the body at the time of death (but not necessarily contributing to the death) indicated that the vast majority of DRDs (95%, 1,100) had multiple drugs present at the time of death. This was similar to previous cohorts where, apart from in 2013 (92%), multiple drugs were present in more than 95% of deaths (Table 46).

In 2018, heroin/morphine was the drug most commonly found at post-mortem (51%, 589). Following a decrease from 2009 to 2012, a trend of increasing heroin/morphine presence has been in evidence since 2012 (48%), reaching its peak in 2016 (62%, 509) (Table 46 and Figure 5).

Methadone was the second most common drug found at post-mortem in 2018 - present in approximately half of DRDs (51%, 585). The percentage of deaths with methadone present increased over the time series (2009: 39%).

Figure 5: Most Common Drugs Present at Post-mortem (NDRDD: 2009-2018)



Etizolam presence in deaths at post-mortem has increased markedly since 2009, from zero cases occurring between 2009 and 2011 to presence in half of DRDs in 2018 (51%, 583).

In 2018, the next most common drugs found present at post-mortem were anti-depressants (44%, 505) and alcohol (40%, 466). The percentage of deaths with anti-depressants present has increased over the time series (2009: 22%). Alcohol presence increased from 2011 (39%) to 2016 (49%) but has decreased in recent years (2017: 41%).

Between 2009 and 2015, diazepam was the drug most commonly found present at post-mortem in each NDRDD year cohort. In 2016, diazepam prevalence decreased significantly to 47% (380) and has continued to decrease significantly to 36% (418) in 2018. Diazepam was the sixth most common drug found present at post-mortem in

2018. This reduction was part of a general decreasing trend over the time series (2009: 78%). Growth in the illicit market for benzodiazepine-type 'Novel' Psychoactive Substances (hereafter called 'benzo-type NPS') such as etizolam is highly likely to be associated with the reduction in diazepam use in recent NDRDD cohorts.

The next most common drugs found present at post-mortem were pregabalin (30%, 351), cocaine (30%, 343), cannabis (27%, 315) and codeine[41] (27%, 310). The percentage of DRDs with pregabalin, cocaine, cannabis and codeine present all increased over the time series (2009: pregabalin 0%; cocaine 14%; cannabis 12%; codeine 21%).

In 2018, several emerging drugs were increasingly evident in post-mortem toxicology data. Alprazolam (13%, 155) (a benzodiazepine also known by the brand name 'Xanax') and buprenorphine (9%, 103) were present at post-mortem among significantly more DRDs than in any other year cohort (excluding 2014 for buprenorphine). Strong opioids such as oxycodone (2%, 18) and fentanyl (2%, 17) have increased in prevalence over the time series.

Drug presence by sex

Drugs present at post-mortem by sex in 2018 are described below and shown in Table 47.

For females:

- Anti-depressants (59%, 182) were the substances most commonly found at post-mortem, followed by methadone (58%, 180) and etizolam (49%, 153).

[41] It is important to note that codeine may be present in post-mortem toxicology as a result of acetylcodeine being a naturally occurring impurity in illicit heroin rather than because of use as a prescribed or 'over the counter' medication.

- Anti-depressants (59%), methadone (58%), diazepam (37%), pregabalin (36%) and gabapentin (28%) presence was higher among females than males

For males:

- Heroin/morphine (53%, 451), etizolam (51%, 430) and methadone (48%, 405) were the substances most commonly found present at post-mortem.
- Heroin/morphine (53%), etizolam (51%), alcohol (41%), cocaine (32%) or cannabis (29%) were all more likely to be found present at post-mortem among males than among females.

Drug presence by age

Drugs present at post-mortem by age group in 2018 are described below and shown in Table 48.

Among people aged under 25 years:

- Alcohol (49%, 33), cocaine (46%, 31) and etizolam (41%, 28) were the substances most commonly found at post-mortem.
- The presence of alcohol (49%), cocaine (46%), cannabis (40%), ecstasy (22%), buprenorphine (19%) and tramadol (12%) was higher than in any other age group.

In people aged 25-34:

- Heroin/morphine (56%, 117), etizolam (50%, 104) and alcohol (42%, 88) were the substances most commonly found present at post-mortem.
- Heroin/morphine (56%), codeine (35%) and alprazolam (18%) presence was higher than any other age group.

In people aged 35-44:

- Methadone (58%, 259), heroin/morphine (54%, 243) and etizolam (53%, 239) were the substances most commonly found present at post-mortem.

- Methadone (58%), etizolam (53%), diazepam (39%), pregabalin (35%), gabapentin (27%) and anti-psychotics (13%) presence was higher than any other age group.

In people aged 45 and over:

- Methadone (55%, 234), etizolam (50%, 212) and anti-depressants (49%, 211) were the substances most commonly found present at post-mortem.
- Anti-depressants (49%), dihydrocodeine (18%) and paracetamol (16%) presence was higher than any other age group.

Combinations of Drugs Present at Time of Death

In 2018, opioids (heroin/morphine, methadone or buprenorphine) and benzodiazepines (e.g. diazepam, etizolam, diclazepam) was the most common combination of drugs found at post-mortem (69%, 795) (Table 49). The main combinations within this group were methadone and benzodiazepines (45%, 521), followed by heroin and benzodiazepines (43%, 495). Benzodiazepines and alcohol were present in 30% of DRDs (346).

The combination of opioids (heroin/morphine, methadone or buprenorphine) and cocaine became more prevalent over the time series, increasing from 16% (52) in 2009, to 34% (270) in 2018. The same was also true for the combination of heroin and gabapentin or pregabalin, increasing from 0% (0) in 2009 to 23% (269) of DRDs in 2018.

Certain drugs are known to prolong the heart's QT interval[42], potentially leading to a life threatening ventricular arrhythmia called 'torsades de pointes'. Drugs known to be associated with QT prolongation should not be co-prescribed. A small percentage of the cohort had a combination of drugs known to prolong the QT interval (methadone

[42] The time between the start of the Q wave and the end of the T wave in the heart's electrical cycle, representing depolarization and repolarization of the ventricles.

and anti-psychotics or citalopram) present at post-mortem (2018: 8%, 91). There was no overall trend in the percentage of deaths where this combination of drugs was found present [43].

In 2018, examining combinations of drugs present by sex, combinations involving heroin/morphine were more likely to be observed among males than females (e.g. heroin/morphine and alcohol (Males: 20%, 167; Females: 15%, 46). Conversely, the combination of methadone and benzodiazepines was more prevalent among females than males (Males: 42%, 357; Females: 53%, 164), as was the combination of anti-depressants and dihydrocodeine (Males: 6%, 52; Females: 13%, 40) (data not shown in tables).

Drug combinations involving methadone were more likely to be observed among the older age cohorts (25-34, 35-44 and 45+) at the time of death than among younger people (under 25), potentially reflecting the higher percentage of older people in treatment (data not shown in tables).

- Methadone and benzodiazepines (under 25: 7, 10%; 25-34: 76, 36%; 35-44: 231, 52%; 45+: 207, 48%)
- Methadone and heroin/morphine (under 25: 5, 7%; 25-34: 43, 21%; 35-44: 123, 28%; 45+: 103, 22%)
- Methadone and alcohol (under 25: 3, 4%; 25-34: 31, 15%; 35-44: 89, 20%; 45+: 68, 16%)

Drugs Implicated in Death

Additional information on drugs implicated in, or potentially contributing to, death was supplied by NRS and was available for 100% (899) of NDRDD non-intentional deaths in 2017 and for 99% (1,153) of deaths in 2018.

---

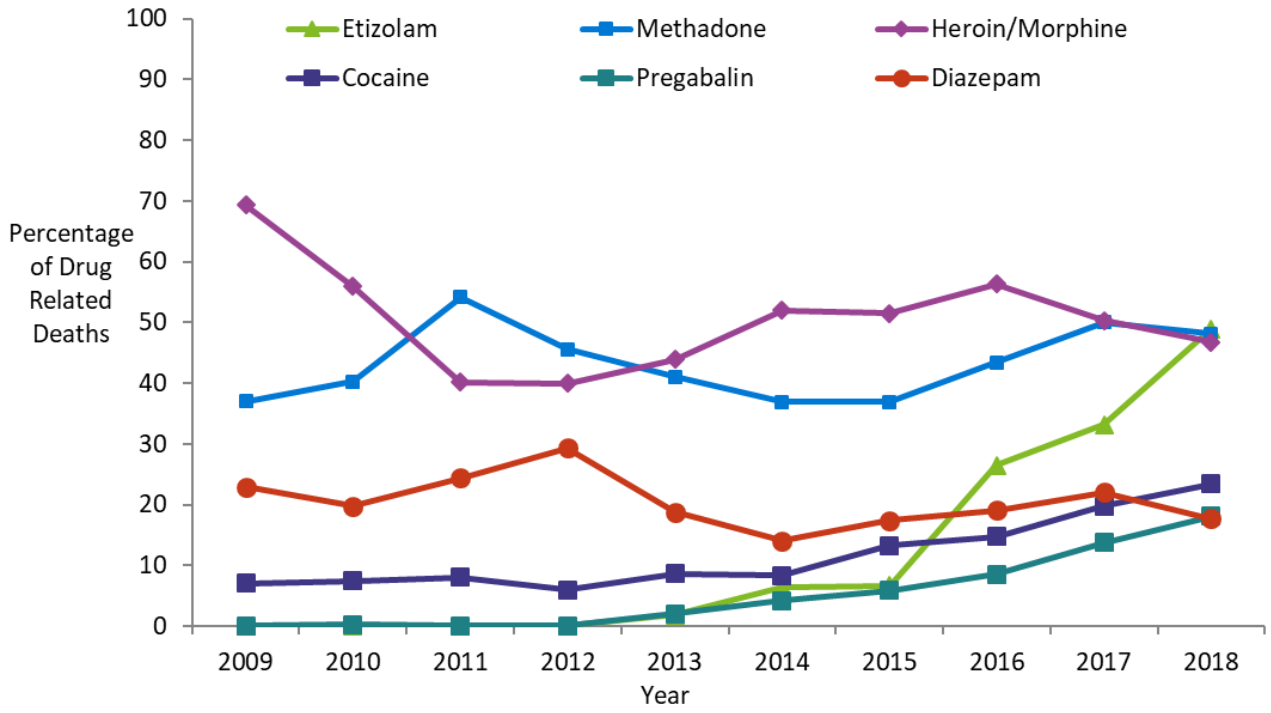
[43] 2009: 7%, 2010: 7%, 2011: 10%, 2012: 2%, 2013: 7%, 2014: 8%, 2015: 8%, 2016: 8%, 2017: 9%.

Where data were available, multiple drugs were implicated in 85% (764) of 2017 NDRDD deaths and 87% (1,004) of 2018 NDRDD deaths. Multiple drug implication has increased over time and was significantly higher in 2018 than in any previous year (excluding 2017) (Table 50).

In 2018, opioids (methadone, heroin, morphine or buprenorphine) were implicated in 891 DRDs with NRS toxicology information. This was the highest number of opioid implicated deaths recorded. In percentage terms, opioids were implicated in 77% of DRDs with NRS toxicology information in 2018 (Table 50).

In 2018, etizolam was the drug most frequently implicated in deaths (49%, 564), followed by methadone (48%, 555), heroin/morphine (47%, 539), cocaine (23%, 270), pregabalin (18%, 208) and diazepam (18%, 204) (Table 50 and Figure 6).

Figure 6: Most Common Drugs Implicated in Death (NDRDD/NRS: 2009-2018)



The main changes in drug implication over the time series have been:

- The sudden increases in benzo-type NPS implication. Etizolam implication was slowly increasing across the time series, reaching 7% of DRDs (with implication data) in 2015, before sharply increasing to almost half of DRDs (49%) in 2018. It is now the most commonly implicated drug. Among a smaller number of DRDs, an even sharper increase in diclazepam implication was observed between 2015 (1%) and 2016 (11%). This has since decreased to 4% in 2017, and 5% in 2018.

- Heroin/morphine implication decreased sharply between 2009 (69%) and 2011 (40%), before gradually increasing up to 2016 (56%). Since then, there has been a reduction in the percentage of DRDs where heroin/morphine have been implicated (2017: 50%, 2018: 47%).

- Recent increases in the percentage of DRDs where cocaine was implicated. Implication was fairly static up to 2014, ranging between 6% and 9% of deaths, but has increased since, to 20% in 2017, and 23% in 2018.

- There have been gradual increases in gabapentin and pregabalin implication over time. Gabapentin and pregabalin are prescription drugs used to treat epilepsy and chronic pain. However, there is a significant illicit market for these controlled drugs, which are known to 'potentiate' or enhance the effects of opioids, [30]. In 2018, gabapentin or pregabalin were implicated in 401 deaths (35% of cases with implication data). Opioids (heroin/morphine, methadone or buprenorphine) were also implicated in 87% (317) of these gabapentin or pregabalin deaths (data not shown in tables).

- Alcohol as an implicated substance in drug-related deaths over the time series decreased from 32% in 2009 to 13% in 2018.

Drug implication by sex

Drugs implicated in death by sex in 2018 are described below and shown in Table 51.

For females:

- Methadone (56%, 172), etizolam (48%, 149) and heroin/morphine (39%, 121) were most commonly implicated in DRDs.
- Methadone (55%), gabapentin (21%), pregabalin (19%), anti-depressants (18%), dihydrocodeine (15%), tramadol (8%) and codeine (5%) implication were all higher among females rather than male DRDs

For males:

- Heroin/morphine (50%, 418) was most commonly implicated in death, followed by etizolam (49%, 415) and methadone (45%, 383).
- Heroin/morphine (50%), cocaine (25%) and diazepam (19%) implication were each more prevalent among male rather than female DRDs.

Drug implication by age

Drugs implicated in death by age in 2018 are described below and shown in Table 52. The most commonly implicated substances differ between age groups.

Among people aged under 25:

- Etizolam (42%), cocaine (34%) and heroin/morphine (27%) were the most commonly implicated substances.
- Buprenorphine (19%), ecstasy (19%), tramadol (10%) and oxycodone (5%) were implicated in a higher percentage of deaths in under 25s than older persons.
- Cocaine (34%) and alcohol (16%) were implicated in a higher percentage of deaths than those aged over 35.

For those aged between 25 and 34:

- Heroin/morphine (51%), etizolam (48%) and methadone (38%) were the most commonly implicated substances.

- Diazepam was highest in those aged 25-34 (24%) compared to other age groups.
- Cocaine (35%) and alcohol (16%) were implicated in a higher percentage of deaths than those aged over 35.

For those aged between 35 and 44:

- Methadone (55%), etizolam (52%) and heroin/morphine (50%) were the most commonly implicated substances.
- Pregabalin (22%) and fentanyl (3%) were highest in those aged 35-44 than any other age group.
- Methadone (55%) and anti-depressants (12%) were implicated in a higher percentage of deaths than those aged under 35.

Among people aged 45 and over:

- Methadone (52%), etizolam (48%) and heroin/morphine (44%) were the most commonly implicated substances.
- Zopiclone was highest in person aged 45 and over (3%) compared to other age groups.
- Methadone (52%) and anti-depressants (11%) were implicated in a higher percentage of deaths than those aged under 35.

Relative drug implication[44]

Among drugs more commonly seen in DRDs, etizolam was implicated in 97% (564/589) of DRDs where present, followed by methadone (95%: 555/585) and

[44] To calculate drugs implicated as a percentage of drugs present, 1 case with no NRS data was removed, resulting in toxicology data for drugs present and drugs implicated being available for 1153 people in 2018.

heroin/morphine (93%: 539/589). Despite only present in a small number of cases in 2018, phenazepam (2%, 25) and ecstasy (3%, 37) were implicated in over 90% of DRDs where they were present at post-mortem (Table 53).

In contrast, although diazepam, alcohol and anti-depressants were among the drugs most commonly found at post-mortem, they were implicated in less than half of deaths where present (diazepam: 49% (204/418): alcohol; 33% (154/465); anti-depressants: 24% (121/505)).

'Novel' Psychoactive Substances[45]

The Psychoactive Substances Act [18] came into force across the United Kingdom, prohibiting (since 26 May 2016) the production, sale and supply of psychoactive[46] substances (other than those specifically exempted by the Act). This legislation was a direct response to increasing diversity within global drug markets[47] and challenges in restricting the availability of 'Novel' Psychoactive Substances (NPS) via the Misuse of Drugs Act 1971 [20,21].

Recent NRS [1,2] and NDRDD [6-9] reports have included sections on NPS.

---

[45] The term 'NPS' has been used in NDRDD reports in preference to 'Legal Highs' because the latter term failed to recognise a) changes in the controls applied to relevant substances and b) the differential effects of those substances. However, it should be noted that in this report 'NPS' is coterminous with 'Legal Highs', 'synthetic substances' and other terms applied to this group of substances.

[46] Defined by the Act [18] as anything which 'by stimulating or depressing the person's central nervous system ... affects the person's mental functioning or emotional state'.

[47] By the end of 2016, the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) had been notified of 628 NPS via its EU Early Warning System, including 164 substances reported in 2015 and 2016 [19].

In 2017, NRS counted 363 DRDs (including deaths by suicide) where NPS were either present or implicated in death, two of which were excluded from the overall DRD total (these were outwith the NRS definition, mainly due to uncontrolled NPS being the only substance present).

In 2018, NRS counted 588 DRDs where NPS were either present or implicated in death, of which three were not included in the overall total of DRDs.[48]

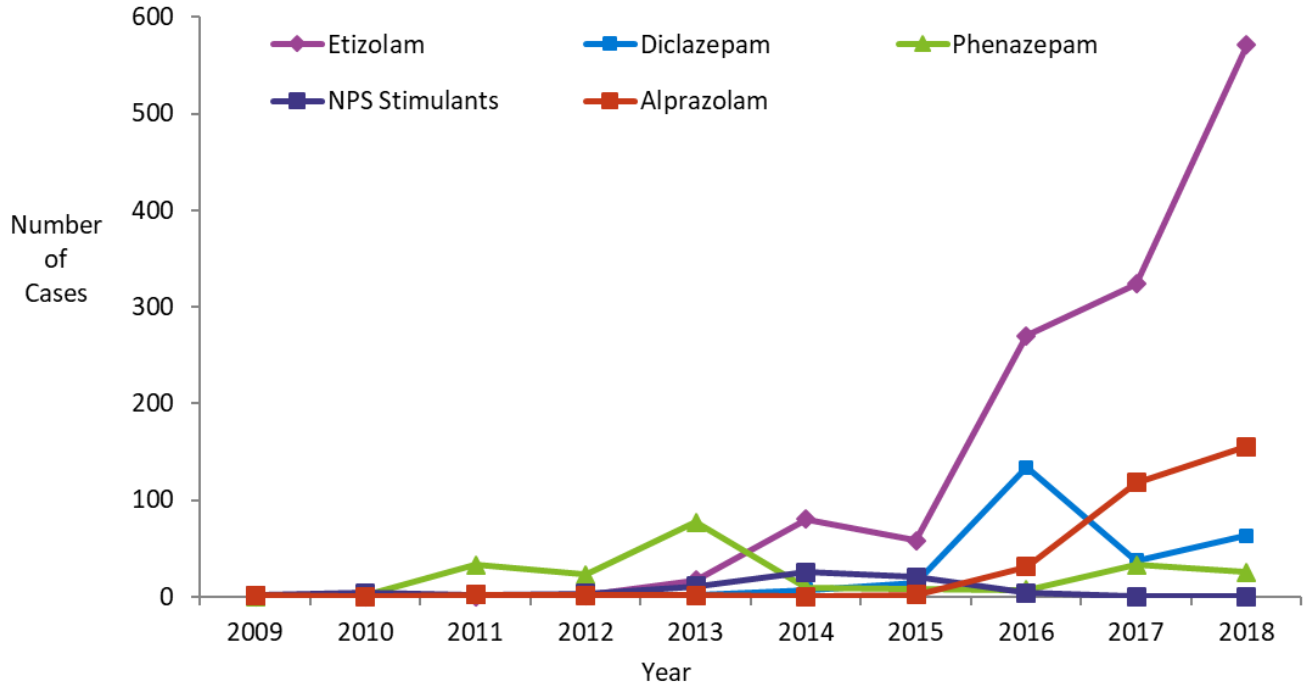
As the NDRDD cohort is based on the NRS definition, cases where only uncontrolled NPS were involved are also excluded from this analysis. 'NPS-related' deaths includes cases where NPS were present or implicated. NDRDD NPS-related death figures are based on year of death rather than year of registration (used by NRS) and are a subset of the non-intentional deaths analysed in this report.

The number of NPS-related DRDs in 2018 was 617 (53%). This was significantly higher than the number and percentage of deaths in the preceding three years (2015: 103, 16%, 2016: 363, 44%, 2017: 370, 41%) (Table 54).

Nearly all NPS-related DRDs in 2017 (99.7%) and 2018 (98.7%) involved consumption of multiple substances. The percentage of NPS-related deaths with benzo-type NPS drugs recorded within toxicology increased from 81% (83) in 2015 to 99% (612) in 2018.

[48] It is important to note that, in both 2017 and 2018, the NPS-related deaths reported by NRS were largely a subset of the DRDs on which National Statistics were published [1,2]. Details of the NPS definition and inclusion criteria used by NRS are available in **Annex A** of the NRS report on 2018 deaths and on the **NDRDD pages** of the PHS website.

Figure 7: NPS Recorded Within DRD Toxicology (NDRDD: 2009-2018)[1]



1. Due to small numbers, stimulant-type NPS have been grouped together in Figure 7.

In 2018, one DRD involved stimulant-type NPS which included opioids and benzodiazepines, either illicit or prescribed. In 2017, no DRDs involved stimulant-type NPS.

Among the 612 DRDs in 2018 which involved benzo-type NPS, the drugs most commonly found present were; etizolam (583), methadone (367), heroin (344), anti-depressants (275), and alcohol (216). The drugs most commonly implicated were; etizolam (564), methadone (358), heroin (325), pregabalin (120), and cocaine (117).

Among the 368 DRDs in 2017 which involved benzo-type NPS, the drugs most commonly found present were; etizolam (324), methadone (234), heroin (216), anti-depressants (181) and diazepam (144). The drugs most commonly implicated were; etizolam (298), methadone (228), heroin (206), gabapentin (69) and cocaine (64).

Summary

- In 2018, almost all (95%) DRDs occurred after the consumption of multiple substances.
- Heroin/morphine (51%), methadone (51%) and etizolam (51%) were the most common substances found at post-mortem in 2018.
- Etizolam (49%), methadone (48%) and heroin/methadone (47%) were the substances most commonly implicated in deaths in 2018. The percentage of deaths where etizolam was implicated increased over time.
- Opioids (methadone, heroin, morphine or buprenorphine) were implicated in over three quarters (77%) of DRDs in 2018.
- Gabapentin and pregabalin implication increased over time, potentially due to their use to enhance the effects of opioids. In 2018, gabapentin or pregabalin were implicated in 401 deaths, 79% (317) of which were also related to the use of opioids.
- Diazepam presence at post-mortem has decreased sharply from 2015 (66%) to 36% in 2018, while presence of etizolam (a benzo-type NPS) has increased sharply from 2015 (9%) to 2018 (51%). Etizolam was twice as likely as diazepam to be implicated in deaths where it was found present (97% vs. 49%).
- NPS-related deaths has continued to increase sharply from 2015 to 2018 due to the number of deaths involving benzo-type NPS (etizolam and diclazepam). In 2018, only one death involved the use of stimulant-type NPS (e.g. mephedrone).

Prescribing[49]

People who use drugs have higher rates of morbidity and mortality than the rest of the population [11]. As a result, rates of prescribing for medical and psychiatric conditions are likely to be higher than in the general population. The prescribing burden for this group is additionally increased by Opioid Substitution Therapy (OST) prescribing – the dominant form of treatment for opioid dependence.

In the toxicology findings (**Toxicology Data**), prescribed drugs (e.g. methadone, buprenorphine, diazepam, gabapentin, pregabalin, anti-depressants) were often present and/or implicated in deaths. Use of illicit substances alongside prescribed medications can increase drug toxicity and the risk of adverse health-related outcomes (particularly for people prescribed OST, where higher risks of overdose and blood borne virus infection have been documented [22]).

This section describes the extent of prescribing among people who had a DRD and includes comparisons with the presence of prescribed drugs at post-mortem, highlighting potential issues associated with compliance and/or diversion of prescribed drugs. Deaths among people prescribed OST are described in detail, to determine the extent of concurrent prescribing and/or illicit drug use.

As previously described in the **Methods** section, this section presents both 2017 and 2018 for NDRDD collected data and 2018 for PIS data.

OST prescribing

More than half of all DRDs in the entire NDRDD cohort occurred when people had not been in recent contact with specialist drug treatment services (53%, 4,265/6,290).

---

[49] Difficulties with NDRDD data collection of prescribed OST information (i.e. supervision status, length of time in receipt) resulted in high levels of unknowns (above 10%) for 2017 and 2018 data. The percentage of unknowns have been listed in the data tables.

However, among people whose death was opioid-related[50], both the percentage in contact with drug treatment services at the time of death (2009: 35%, 2017: 54%, 2018: 52%) (data not shown in tables) and the percentage prescribed an OST at the time of death (2009: 21%, 2017: 42%, 2018: 41%) (Table 10) increased over the time series.

As discussed in Sections **Substitute Prescribing** and **Drug Treatment Services**, OST prescription and drug treatment contact at the time of death were both more common among females and people in older age cohorts (35-44 and 45+). Therefore, demographic changes over time may partly explain the increasing number of deaths 'in treatment'.

However, the clear increase in specialist drug treatment contact immediately prior to death also raises questions about the role of treatment interventions in protecting against adverse health outcomes. Aspects of treatment such as OST dosing and adherence are explored here, along with the potential impact of non-compliance with treatment.

OST dosage and supervision

In 2017, 64% (228) of those receiving methadone or buprenorphine (with or without naloxone) were prescribed a normal daily therapeutic dose (methadone: 60-120mg, buprenorphine: 12-16mg) as recommended by the 'Orange Guidelines' [22]. In 2018, 59% (257) were receiving a recommended dose. A third in 2017 (33%, 116) were prescribed a lower than recommended dose and 3% (14) were prescribed a higher than recommended dose. In 2018, 38% (163) were receiving a lower than recommended dose, and 3% (14) were receiving a higher than recommended dose (Table 55). While the percentage prescribed a normal daily therapeutic OST dose

---

[50] Since 2011, NRS has supplied data on drugs implicated in death. Opioid-related deaths are those where heroin, morphine, methadone or buprenorphine were implicated, or potentially contributed to death. For years before 2011, presence of those drugs in the body at post-mortem is used as a proxy indicator.

has fluctuated over the time series, it has not been lower than 50% of relevant cases in any year.

In 2017, the mean methadone dose was 68.7mg daily. In 2018, the mean methadone dose was 67.2mg daily – this was slightly lower than the average range over the time series (between 69mg and 75mg). In 2017, the mean buprenorphine dose was 12.8mg daily, and in 2018 this was 11.4mg daily – the mean buprenorphine dose varied considerably over the time series due to the low number of cases observed each year (Table 55).

Mean daily methadone dosages were analysed by sex and age group. Across the entire time series combined, the average daily methadone dose prescribed to males (2009-2018: 68.7ml) was lower than that for females (2009-2018: 70.9ml). This difference was not significant in 2017 (males: 68.6ml, females 68.9ml), or in 2018 (males: 66.7ml; females: 68.4ml). Likewise, the average daily methadone dose of people from different age groups was not significantly different (across the time series or in 2017 or 2018) than that observed among other age groups[51] (data not shown in tables).

Since 2010, approximately three quarters of OST prescriptions among people who had a DRD have been supervised[52]. In 2017, where supervision status is known, 80% (256) of OST prescriptions were supervised, in 2018 85% (317) of OST prescriptions were supervised (Table 56).

---

[51] Average daily methadone dose;
2009-2018; **under 25**: 54.6ml, **25-34**: 67.2ml, **35-44**: 70.6ml, **45 and over**: 69.5ml.
2017; **under 25**: 50.0ml, **25-34**: 63.0ml, **35-44**: 68.7ml, **45 and over**: 70.5ml.
2018; **under 25**: 40.0ml, **25-34**: 61.6ml, **35-44**: 70.5ml, **45 and over**: 65.3ml

[52] 'Supervision' may cover a wide range of scenarios from daily (7 day) supervised consumption to supervised consumption once per week on the day of collection only. Recording of OST supervision in NDRDD is based on the last dose dispensed prior to death.

Where the length of time prescribed OST was known, 83% (264) of people who had a DRD in 2017 and were prescribed OST had received their medication for one year or more and 28% (90) had received it for over ten years. In 2018, 74% (255) of people received their medication for one year or more, and 24% (82) received it for over ten years. The percentage of people prescribed an OST drug for less than one year decreased over the time series (2009: 22, 29%, 2017: 53, 17%, 2018: 88, 16%) (Table 57).

OST compliance and effectiveness

In 2018, 94% (409) of those prescribed methadone had methadone present in their body at post-mortem, compared to 23% (155/663) of those not prescribed methadone. While it is not possible to ascertain if people had consumed illicit methadone in addition to their prescribed methadone, presence among prescribees was lower in 2018 (94%) than in 2017 (95%) .

Methadone presence among those not prescribed it is likely to vary according to the availability of illicit opiates. Therefore while 44% of non-prescribees had methadone present at post-mortem in 2011 (during the heroin drought [23-26]) a decreasing trend was evident between 2012 and 2016[53] before an increase again in 2017 and 2018 (Table 58 and Figure 5).

In 2017, buprenorphine presence was recorded at post-mortem in 93% (14/15) of people prescribed this drug at the time of death and in 5% (84/1,042) of non-prescribees. In 2018, buprenorphine presence was 78% (32/41) in prescribees, and 6% (71/1,113) of non-prescribees. Over the entire time series (2009-2018), 66% of prescribees and 4% of non-prescribees had buprenorphine present at post-mortem (data not shown in tables). Because of the small number of people prescribed this relatively new OST treatment, there was considerable variation between years in the percentage of deaths with the drug present at post-mortem. However, both in 2018 (78%) and across the time series (66%), the percentage of buprenorphine

[53] 2012: 33%, 2013: 26%, 2014: 24%, 2015: 18%, 2016: 19% 2017: 24%, 2018: 23%

prescribees with buprenorphine present at post-mortem was significantly lower than the equivalent percentages among methadone prescribees (both 96%).This difference was not significant in 2017 (buprenorphine: 93%, methadone: 96%).

In 2017, 53% (197) of those in receipt of an OST had heroin/morphine present, compared to 58% (299) not prescribed OST. In 2018, among people who had a DRD and were in receipt of an OST, 49% (236) had heroin/morphine present at post-mortem, compared to 53% (348) of people not prescribed an OST. (Table 58).

In 2017 and 2018, heroin/morphine was present at post-mortem in a higher percentage of people who were prescribed buprenorphine at the time of death (2017: 10/15, 67%; 2018: 33/41, 80%) than among people prescribed methadone at the time of death (2017: 188/358, 53%; 2018: 203/437, 46%). Similarly, heroin/morphine presence was higher among buprenorphine prescribees across the time series (buprenorphine: 116/144, 81%; methadone: 941/1,937, 49%) (data not shown in tables).

Methadone-Related Deaths

While it is not possible to ascertain if people had consumed additional methadone ‘on top’ of the amount they were prescribed, methadone-implicated deaths among people prescribed methadone provide a potential basis for examining the extent to which dosing regimens may have potentially contributed to death or whether DRDs occurred in spite of safe prescribing practices.

In 2017, almost three quarters of people for whom methadone was implicated in death (73%, 328/450) were in receipt of a methadone prescription prior to death, and in 2018 this figure was 72% of people (397/554) (Table 59). These people were generally on long-term, supervised prescribing regimens within recommended dose guidelines:

- In 2017, where supervision status was known, 81% (236) received their prescription on a supervised basis. In 2018, 85% (270) were supervised (Table 60);

- In 2017, where the length of time of a prescription was known, 86% (244) had been prescribed methadone for one year or more. In 2018, 77% (217) were prescribed methadone for one year or more (Table 61); and,

- In 2017, where the dosage was known, 66% (210) were prescribed a normal daily therapeutic dose (60-120mg) [22]. In 2018, 61% (222) were on a normal dose. Around a third (31%, 100) in 2017 were prescribed less than the recommended dose, and 36% (130) in 2018, but it is not possible to determine if these people were in the process of having their dose increased to a recommended therapeutic dose (Table 62).

In methadone-implicated deaths among people prescribed methadone, there have only been eight cases across the time series where no other drugs were found present at post-mortem. Of the 328 cases observed in 2017, 326 had other drugs present at post-mortem, and in 2017 of the 397 cases observed, 391 had other drugs present. The most common drugs found present in 2017 and 2018 being etizolam, anti-depressants pregabalin, heroin/morphine and diazepam[54]. In 2018, the percentage of methadone-implicated deaths with etizolam present was higher than in any other year[55] while the percentage with diazepam present was lower than in any other year[56] (data not shown in tables).

---

[54] etizolam (2017: 166, 51%; 2018: 256, 65%),
anti-depressants (2017: 186, 57%; 2018: 214, 55%),
pregabalin (2017: 116, 36%; 2018: 198, 51%),
heroin/morphine (2017: 172, 53%; 2018: 184, 47%),
diazepam (2017: 189, 58%; 2018: 170, 43%).

[55] Percentage of methadone implicated deaths with etizolam present: 2009-2012: 0%, 2013: 7%, 2014: 20%, 2015: 18%, 2016: 47%, 2017: 51%.

[56] Percentage of methadone implicated deaths with diazepam present: 2009: 86%, 2010: 83%, 2011: 88%, 2012: 87%, 2013: 75%, 2014: 83%, 2015: 76%, 2016: 52%, 2017: 58%.

Since 2009, there have been 149 (9%) deaths among methadone prescribees where methadone was the only substance implicated in death. The percentage of methadone-implicated deaths attributed solely to methadone has decreased over time since 2013 (21%). In 2018, methadone was the sole substance implicated in 2% (7) of methadone-implicated deaths (2017: 3%, 9). Of the remaining 390 methadone-implicated deaths, etizolam was implicated in 66% (257), heroin/morphine was implicated in 43% (167), pregabalin in 32% (123), gabapentin in 23% (90) and diazepam in 21% (79). The percentage of methadone-implicated deaths where these other drugs were also implicated in death increased over the time series (etizolam: 0% - 66%, heroin/morphine: 7% - 43%, pregabalin: 0% - 32% and gabapentin: 0% - 23% respectively). In 2018, the percentage with etizolam present was higher than in any other year[57] (data not shown in tables). An increasing trend in cocaine implication was also evident between 2009 (0%) and 2018 (19%). In the 319 methadone-implicated deaths in 2017 involving another substance, etizolam was implicated in 50% (159), heroin/morphine in 50% (158), diazepam in 30% (95), gabapentin in 23% (74), and pregabalin in 23% (73).

Presence of Other Prescribed Medications[58]

Most deaths among people prescribed OST involved consumption of other substances. Some of the substances implicated in death (e.g. diazepam, gabapentin)

---

[57] Percentage of methadone-implicated deaths with etizolam present: 2009: 0%, 2010: 0%, 2011: 0%, 2012: 0%, 2013: 1%, 2014: 3%, 2015: 6%, 2016: 27%, 2017: 41%, 2018: 66%

[58] It should be noted that, in some cases, exact dispensing dates are not provided in the Prescribing Information System, which instead defaults to the last day of the month, when the prescription was paid. Therefore, although some cases are included in which it appears that the drug was dispensed after death, this provides a fairly robust estimation of people prescribed specific drugs. Although CHI completeness is more problematic in relation to OST drugs, information on other types of prescriptions may also be influenced by this issue.

may have been legitimately prescribed. Using data from PHS's Prescribing Information System (PIS), it is possible to identify recent (within 90 days of death) dispensing activity in relation to specific prescription drugs[59]. Comparing this information with drugs present in the body at post-mortem provides some information on whether people had taken prescribed medication and the extent to which drugs may have been diverted to the illicit market.

Anti-depressants

In 2018, anti-depressant prescribing was observed in the three months prior to death in 54% of DRDs (621). There has been an overall increasing trend in recent anti-depressant prescribing from 2009 (28%) onwards, which reached a high in 2017 (58%) (Table 63 and Figure 8).

Around two-thirds (415/621, 67%) of those recently prescribed anti-depressants had them present at post-mortem (Table 64). Anti-depressants were also found at post-mortem in 16% (85/533) of people not recently prescribed them. Anti-depressant presence at post-mortem increased over the time series among both groups (2009: 56% and 8% respectively).

In 2018, recent anti-depressant prescribing was observed among 63% (302) of those prescribed an OST (methadone or buprenorphine (with or without naloxone)) at the time of death and 37% (176) of those who were not. The percentages for both groups fluctuated over time with no overall trend evident. Over the entire time series combined, recent anti-depressant prescriptions were more common among those prescribed OST (53%) than those not prescribed OST (38%) (data not shown in tables).

[59] Previous reports categorised 'recent' prescriptions as those within 30 days of death, however, this has been changed to 90 days following advice from prescribing colleagues on the use of dates from PIS.

The type of anti-depressants prescribed to people who had a DRD has changed over time (Table 65 and Figure 9). In 2018, among people prescribed an anti-depressant in the 90 days before death, mirtazapine (40%, 248) was the most commonly prescribed drug, followed by amitriptyline (16%, 99), sertraline (16%, 97), and fluoxetine (7%, 45). The increasing trend in recent mirtazapine prescribing continued, rising from 18% in 2009. Sertraline prescribing increased over the time series from 2% of DRDs in 2009. There was a decreasing trend in citalopram prescribing from 33% in 2009 to 5% in 2018. For other anti-depressant drugs there was no clear trend over time. It should be noted that the amitriptyline trend may include instances where the drug was prescribed for chronic pain relief (it was not possible to exclude these cases).

The reduction in citalopram prescribing is likely to be associated with warnings regarding co-prescribing of drugs known to prolong the QT interval [27-29]. In 2018, citalopram had recently been prescribed to 3% (29) of people who had a DRD. Among these people, methadone and citalopram (both of which are known to prolong the QT interval) were recently co-prescribed in seven (24%) cases. Of five deaths where both drugs were found present at post-mortem, recent co-prescribing had occurred in two (40%) cases. Over the time series, a total of 58 (1%) people who had a DRD were prescribed both methadone and citalopram within 90 days of death. In 127 instances of co-presence, 30 (24%) people had recently been co-prescribed these drugs (data not shown in tables).

Figure 8: Prescriptions within 90 days of Death (NDRDD/PIS: 2009-2018)

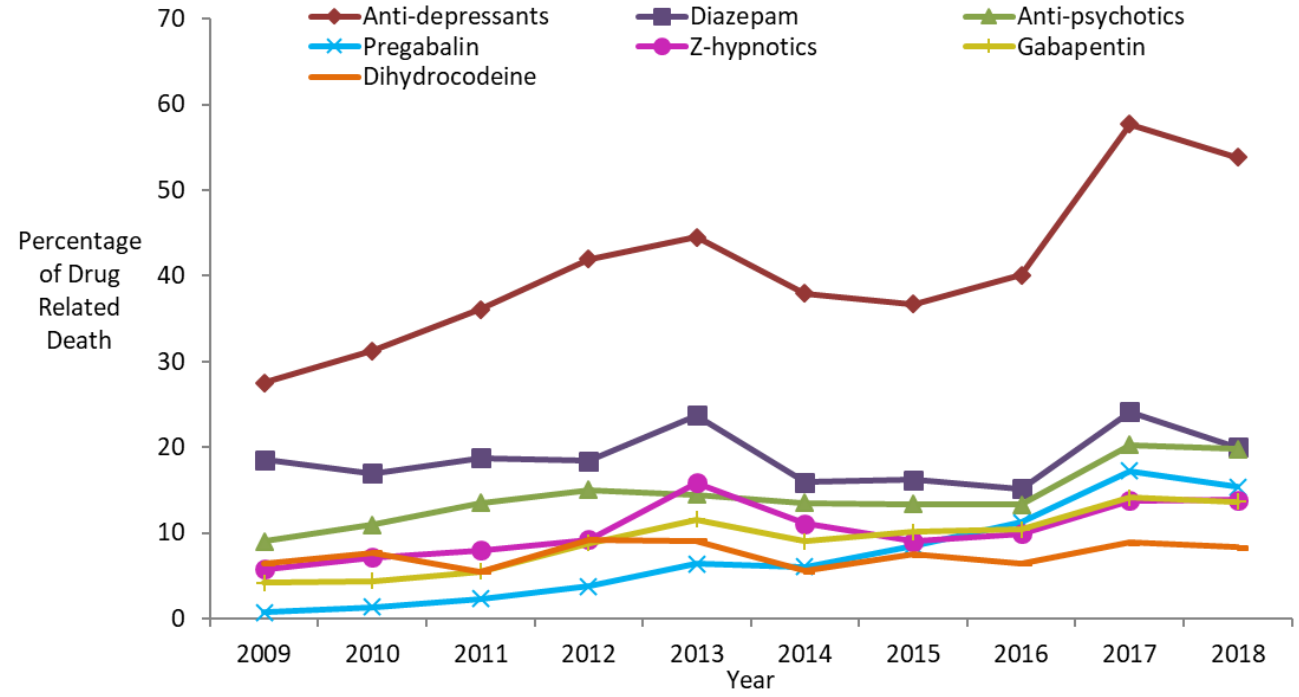
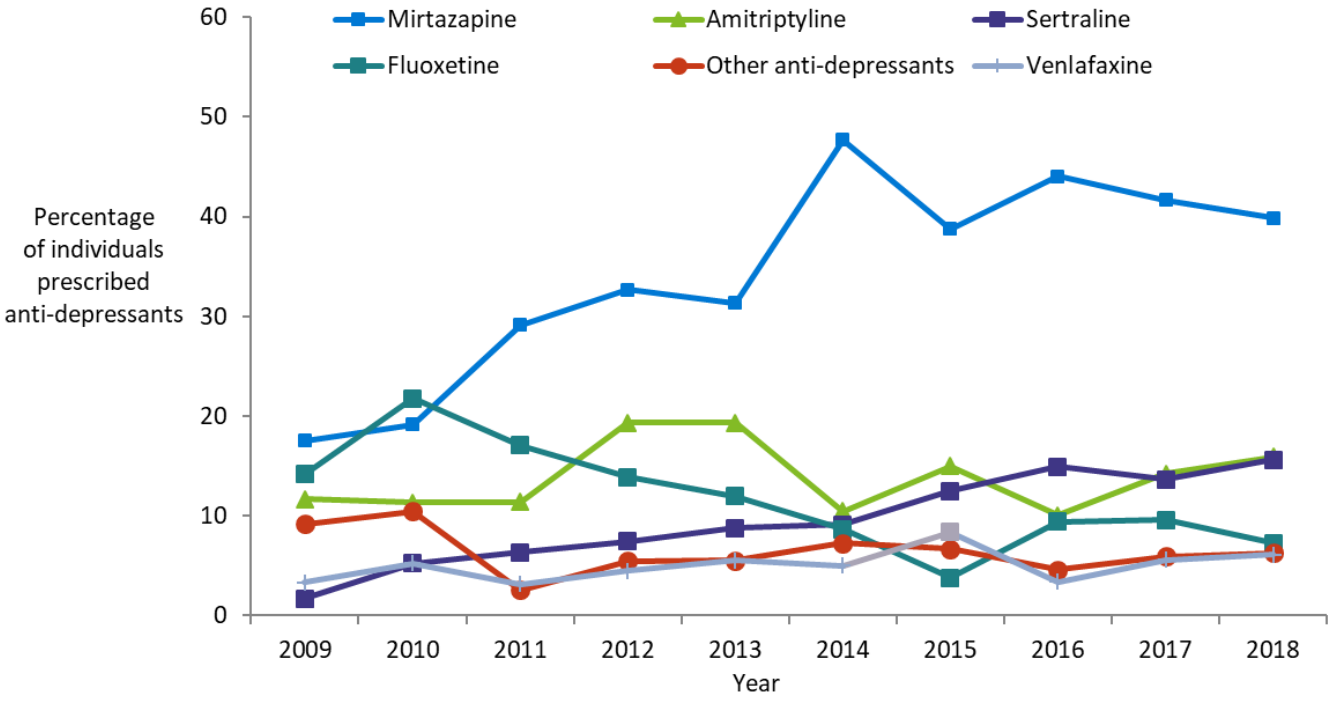


Figure 9: Anti-Depressant Most Recently Prescribed by Year (NDRDD/PIS: 2009-2018)



Gabapentinoids

Gabapentin and pregabalin are prescribed medications for epilepsy and chronic pain, but at high doses these drugs have been reported to enhance or 'potentiate' the subjective effects of opioids [30]. Recent (within three months) prescribing of these drugs (collectively referred to as gabapentinoids) was observed in 28% (327) of DRDs in 2018 (2017: 30%, 271). The percentage of people recently prescribed gabapentinoids increased over time (from 5% in 2009).

In cases where gabapentinoids had recently been prescribed, presence of these drugs at post-mortem was 76% (248/327) in 2018. Where not prescribed, these drugs were found in 35% of DRDs (289/827). In 2018, among people recently prescribed these drugs, gabapentin or pregabalin were implicated in 155 deaths (47% of recently prescribed cases). Opioids (heroin/morphine, methadone or buprenorphine) were also implicated in 132 (85%) of these deaths (data not shown in tables).

In 2018, prescribing of gabapentinoids in the three months prior to death was observed among 37% (178/478) of those prescribed an OST (methadone or buprenorphine (with or without naloxone)) at the time of death and 22% (149/676) of those who were not. Both percentages increased over time from 2009 (OST: 11%, non-OST: 3%). Over the time series combined, gabapentinoid prescriptions were more common among those prescribed OST (27%) than those not prescribed OST (15%) (data not shown in tables).

Diazepam

In 2018, diazepam was prescribed in the 90 days prior to death to 20% (231) of the NDRDD cohort. There was no evidence of a changing trend in diazepam prescribing over the study time period.

In 2018, diazepam was found present at post-mortem in 65% (151/231) of people to whom it was recently prescribed. Presence among those not recently prescribed diazepam was significantly lower than in any other year; 27% (253/923) of relevant people, decreasing over the time series from 75% in 2009 to 37% in 2017. This

reduction is likely to have been associated with the emergence of street benzodiazepines such as etizolam.

Recent diazepam prescribing was observed among 21% (102/478) of those prescribed an OST at the time of death and 19% (129/676) of people who were not. Recent diazepam prescribing decreased over the time series among people prescribed OST (2009: 27%), while there was no clear trend among the non-OST group. Over the time series, those prescribed OST were more likely to be prescribed diazepam (23%) than those who were not (17%) (data not shown in tables).

Anti-psychotics

Anti-psychotics such as quetiapine are primarily used to manage psychosis (including delusions, hallucinations, paranoia or disordered thought) in schizophrenia and bipolar disorder. Prescribing of anti-psychotics in the three months prior to death was observed in 18% (228) of DRDs in 2018. The percentage of people recently prescribed anti-psychotics has increased over the time series (2009: 9%).

In 2018, where anti-psychotics had recently been prescribed, presence at post-mortem was 48% (107/228). Where not prescribed, they were found in 3% of DRDs (32/926).

Rather than examining co-prescribing of anti-psychotics with all OSTs, focusing on co-prescribing of methadone and anti-psychotics is more worthwhile, as both are specifically associated with risk of QT interval prolongation [28, 29]. In 2018, 97 (8%) people had recently been co-prescribed methadone and anti-psychotics. Of the 87 people who had a DRD and who had anti-psychotics and methadone present at post-mortem, 56 (64%) had recently been co-prescribed these drugs. Over the time series combined, a total of 380 (6%) people were prescribed this combination of drugs within 90 days of death and, of the 363 people with methadone and anti-psychotics present at post-mortem, 181 (50%) had recently been prescribed these drugs (data not shown in tables).

Collectively, 9% (104) of people who had a DRD in 2018 had been prescribed methadone and either citalopram or an anti-psychotic drug within 90 days of death (a

total of 425 (7%) over the time series). Comparing prescription of these drugs with presence at post-mortem, in 2018, 55 of the 91 people (60%) with this drug combination found at post-mortem were prescribed these drugs within 90 days of death (5% of all 2018 DRDs and 200 DRDs (3%) over the time series combined) (data not shown in tables).

Z-hypnotics

Z-hypnotic drugs (principally zopiclone and zolpidem) are used to treat insomnia (a common condition among people who use drugs) and have similar effects (and side-effects) to benzodiazepines. In 2018, z-hypnotics were prescribed within 90 days of death to 14% (160) of the NDRDD cohort. Statistically, there was an increasing trend in z-hypnotic prescription across the time series from 2009 (6%) though this may be associated with the high percentage of prescribees observed in 2013 (16%).

In 2018, z-hypnotics were found present at post-mortem in 27% (43/160) of DRDs where the person was recently prescribed these drugs. Presence of z-hypnotics at post-mortem among prescribees increased over the time series (2009: 8%). Presence of z-hypnotics among those not recently prescribed these drugs was 1%.

In 2018, recent z-hypnotic prescribing was observed among 14% (68/478) of those prescribed an OST at the time of death and 14% (92/676) of those who were not. Over time, both groups had similar levels of prescribing with no clear patterns of change (data not shown in tables).

Weak opioid analgesics

Dihydrocodeine prescribing in the 90 days prior to death was relatively infrequent (96, 8% of DRDs in 2018) and was fairly static between year cohorts. Where recently prescribed, dihydrocodeine was found at post-mortem in 67% (64/96) of deaths and where not prescribed, in 10% (103/1058) of deaths – both percentages were fairly consistent over the time series. It is not appropriate to analyse dihydrocodeine prescription by OST group, as dihydrocodeine is often prescribed in order to manage withdrawal symptoms during opioid detoxification.

Recent tramadol prescribing was evident for a small percentage of people who had a DRD in 2018 (56, 5%) and varied little over the time series (2009-2018). Tramadol was found present in 55% of recently prescribed people (31/56) in 2018. Tramadol presence among those not recently prescribed was 4% (44/1098) and has been relatively consistent over time. There were no differences in recent tramadol prescribing on the basis of OST prescription (2018: 4% (17/478) for OST prescribees, 6% (39/676) for non-OST prescribees) (data not shown in tables).

Strong opioid analgesics

Reflecting recent concerns about deaths related to the prescribing and/or misuse of high-strength opioid painkillers, recent oxycodone [31] and fentanyl [32,33] prescribing was examined.

In 2018, 15 people who had a DRD (1%) were prescribed oxycodone (including the extended-release formulation oxycontin) in the 90 days before death. Recent oxycodone prescribing was rare, with only 59 cases observed across the time series (0.9% of 6,290 DRDs). In 2018, oxycodone was present in 53% of cases where it had been prescribed. There were a further 9 deaths where oxycodone was found present among non-prescribees (<1%). Across the time series, there were 4 cases where recent oxycodone prescription was made alongside an OST treatment (data not shown in tables).

Fentanyl prescribing among people who had a DRD was extremely rare. Over the time series, a total of 26 people (0.4% of 6,290 DRDs) had recently been prescribed fentanyl. In 2018, fentanyl was found present at post-mortem in 17 people (most of whom had not recently been prescribed the drug). Across the time series, there were only two deaths where fentanyl and an OST treatment were recently co-prescribed (data not shown in tables).

Summary

- Among opioid-related deaths, the percentage of people prescribed an OST at the time of death increased from 21% in 2009 to 42% in 2017 and 41% in 2018.

- In 2017 and 2018, most OST prescribing at the time of death was well established (one year or more – 83% and 74% respectively), via supervised consumption (80% and 85% respectively) and within recommended therapeutic dose guidelines (65% and 59% respectively).

- In 2017 and 2018, 95% and 94% of people respectively prescribed methadone had methadone present in their body at post-mortem. This was higher than the percentage of people prescribed buprenorphine who had buprenorphine present in their body at post-mortem (2017: 93%; 2018: 78%).

- The percentage of people prescribed OST in 2017 (53%) and 2018 (49%) who had heroin/morphine present at death decreased from 2016 (62%; the highest recorded) and was similar to the percentage observed among people not on OST (2017: 58%; 2018: 53%).

- In 2017 and 2018, heroin/morphine was present at post-mortem in a higher percentage of people who were prescribed buprenorphine at the time of death (2017: 67%; 2018: 80%) than among people prescribed methadone at the time of death (2017: 53%; 2018: 46%).

- In 2017 and 2018 most people who were prescribed methadone and had it implicated in their death had been prescribed the drug for one or more years (86% and 77% respectively), received it under supervision (81% and 85% respectively) and were prescribed a dose within the recommended therapeutic range (66% and 61% respectively). In the vast majority of these cases, multiple drugs were implicated in death.

- Recent anti-depressant prescribing increased over time and was observed among 54% of the 2018 cohort. 63% of those prescribed an OST were also prescribed anti-depressants.

- Prescribing of gabapentin or pregabalin within 90 days of death increased from 5% of people in 2009 to 28% in 2018. Over the time series combined, gabapentin or pregabalin prescriptions were more common among those prescribed OST (27%) than those not prescribed OST (15%).

- Co-prescribing of methadone with either citalopram (an anti-depressant) or anti-psychotics (associated with a life threatening ventricular arrhythmia called torsades de pointes) occurred prior to death in 104 (9%) cases. Co-presence at death was evident in 91 cases in 2018, 55 (60%) of which were preceded by recent co-prescribing.

- Recent prescribing of strong opioid painkillers was very rare. Oxycodone or fentanyl were only prescribed to nineteen people who had a drug-related death in 2018.

Deaths by Suicide in the 2017 and 2018 NDRDD Cohorts

As previously described in the **Methods** section, this section presents 2018 data.

Introduction

Known risk factors for death by suicide in the general population are wide ranging and can include: depression, previous suicide attempts, incidents of self-harm, other mental health problems, unemployment, alcohol and/or substance use, tragic life events, violence and sexual abuse [37-39]. Research (and this report) has shown that people with problematic drug use, particularly in the Scottish context, exhibit such risks [6-9, 36, 40-42]. In addition, studies of people in drug and alcohol treatment have shown previous suicide attempts and current suicidal thoughts are common [43]. The risk of death by suicide is greater when several risk factors occur concurrently.

The Scottish Suicide Information Database (ScotSID) is led by PHS and provides comprehensive data on all deaths by suicide. The 2018 ScotSID report, based on 2009-2017 data, highlighted the strong link between death by suicide and deprivation and, for a minority (11%), participation in specialist drug treatment six months prior to death [44]. This Section provides further detail on deaths by suicide using controlled drugs (referred to below as 'intentional' deaths or DRDs), contrasting these deaths with findings from the 'non-intentional' deaths[60] described in **Results and Commentary**. Data for this section are not shown in the tables that accompany the report.

Result and Commentary

National Drug-Related Deaths Database (NDRDD) forms are submitted to PHS in respect of deaths by suicide which involved consumption of controlled drugs. In

[60] 'Non-intentional' deaths includes accidental poisonings, those of 'undetermined intent' and deaths where the cause was described as 'drug abuse'.

2018, 55 intentional self-poisoning deaths were reported to NDRDD (57 in 2017). It is important to note that these deaths are largely a subset of the 1,187 DRDs and 784 probable deaths by suicide registered in 2018 on which National Records of Scotland (NRS) published National Statistics [2,45].

Taking into account the different time periods for case inclusion and delays in determining cause of death, the NDRDD could potentially have received forms for 1143 deaths occurring in and registered in 2018 (55 of which were 'intentional' self-poisonings). Of these, a total of 1137 NDRDD forms were returned (4 of the 6 potential NDRDD forms not completed were non-intentional deaths). Therefore, for the intentional death cohort in 2018, 2 of a potential 55 NDRDD forms was not completed (4%) compared to 4 (<1%) of a potential 1088 NDRDD forms for non-intentional deaths. The percentages not completed in 2017 were 0% of eligible intentional death forms and <1% of non-intentional death forms.

Demographic Profile

Age and Sex

In 2018, the mean age of intentional DRDs (50.9 years) was higher than the mean age of non-intentional DRDs (41.7 years).

In 2018, as in previous years, there was a higher percentage of males (844, 73%) than females (310, 27%) among non-intentional DRDs. Among intentional DRDs, men (29, 52%) outnumbered women (26, 47%) to a lesser extent. Intentional DRDs accounted for a higher percentage of all DRDs among females (26/310, 8%) than males (29/844, 3%). This was similar to previous NDRDD year cohorts.

Living Arrangements and Relationships

In 2018, living arrangements among people who had an intentional DRD were similar to those among non-intentional DRDs. Where known, 80% (44/55) of intentional DRDs lived in their own home at the time of death compared to 78% (836/1,154) of non-intentional DRDs. The percentage of people living with parents at the time of

death was lower among intentional (1/55, 2%) than non-intentional DRDs (119/1,066, 11%).

Differences in relationships at the time of death were observed between intentional and non-intentional DRDs. A higher percentage of people whose death was intentional (32/40, 80%) were childless at the time of death compared with non-intentional DRDs (650/992, 66%). In terms of marital status, a lower percentage of people from the intentional DRD group were single at the time of death (19/49, 39%) than in the non-intentional DRD group (674/1,049, 64%).

Employment Status

Where known, 42% (19/45) people whose death was intentional were categorised as ‘unemployed’ - lower than the 80% (781/973) recorded among non-intentional DRDs. The percentage of intentional DRDs where the person was categorised as ‘long-term sick/disabled’ (16/45, 36%) was significantly higher than among non-intentional DRDs (168/973, 17%).

Substance Use History

Drug Use and Injecting Status Prior to Death

In 2018, known drug use in the intentional DRD cohort (14/54, 26%) was lower than among non-intentional DRDs (986/1,134, 87%).

Similar to the non-intentional DRDs, the majority of the 14 intentional DRDs who were known to have used drugs prior to death were male (8, 57%). Of those for whom duration of drug use was known, 38% (3/8) had used drugs for 20 years or more. Among the 14 intentional DRDs who were known to have used drugs prior to death, 21% (3) were known to have injected drugs; this was lower than the equivalent percentage in the non-intentional DRD cohort (44%).

Previous Overdoses

In 2018, 38% (21/55) of people in the intentional DRD cohort had previously experienced at least one overdose, compared with 49% (477/973) of people in the non-intentional DRD cohort.

Medical and Psychiatric History & Recent Significant Events

Recent Medical History

Among people whose death was intentional (38/55, 69%) and non-intentional (687/1088, 63%), similar percentages experienced a medical condition in the six months prior to death. A higher percentage of people in the non-intentional DRD cohort had hepatitis C recorded in the six months prior to death (153/1,088, 14%) than in the intentional DRD cohort (0/55, 0%).

Recent Psychiatric History

In the six months prior to death, 39 of the 55 (71%) people whose death was intentional were recorded as experiencing a psychiatric condition; the percentage of people experiencing such conditions in the non-intentional DRD cohort was 63% (665/1,055). The prevalence of most psychiatric conditions was similar in both cohorts.

Recent Significant Events

Fifty-six percent (31/55) of people whose death was intentional had experienced at least one adverse event in the six months prior to death, the most common being recent ill health (12, 22%) or a bereavement (7, 13%). There were no significant differences in the percentage of the non-intentional DRD cohort recently experiencing any significant event and recent ill health (55% and 19% respectively). A significantly higher percentage of people in the intentional DRD cohort had a bereavement recorded than the non-intentional cohort (7%).

Previous Suicide Attempts

In 2018, a higher percentage of people (40% of known cases) in the intentional DRD cohort had made a previous suicide attempt compared with those in the non-intentional DRD cohort (18%).

Circumstances of Death

Place of Death

A higher percentage of people whose death was intentional were pronounced dead in their own home than those whose death was non-intentional (39/51, 76% compared to 676/1,126, 60%).

Persons Present at Scene of Overdose

Where known, people whose death was intentional were more likely to be on their own at the time of death (33/45, 73%) than people in the non-intentional DRD cohort (516/1,082, 48%). For the remaining intentional DRDs when at least one individual was present at the location, 33% (4/12) of deaths occurred when another person was in the same room. This compared to 46% (255/551) of the non-intentional DRD cohort.

Toxicology data

Drugs Present at Time of Death

Among people whose death was intentional, the drugs most commonly found present at post-mortem were: anti-depressants (32/55, 58%), alcohol and paracetamol (both 22/55, 40%), diazepam (18/55, 33%), dihydrocodeine (15/55, 27%), codeine and tramadol (both 13/55, 24%), and heroin (12/55, 22%).

Certain drugs were found present at post-mortem in a lower percentage of intentional DRDs compared with non-intentional DRDs; etizolam (4% and 51%), methadone (7%

and 51%), heroin (22% and 51%), cocaine (4% and 30%) and cannabis (4% and 27%).

Other drugs were found present in a higher percentage of intentional DRDs compared with non-intentional DRDs; paracetamol (40% and 13%), tramadol (24% and 7%), anti-depressants (58% and 44%), zopiclone (18% and 4%) and dihydrocodeine (27% and 15%).

Drugs Implicated in Death

Among people whose death was intentional, the drugs most frequently implicated in death were: anti-depressants (17/55, 31%), dihydrocodeine (14/55, 25%), tramadol (11/55, 20%), heroin/morphine and alcohol (both 10/55, 18%), codeine and paracetamol (8/55, 15%), zopiclone (7/55, 13%), and methadone, pregabalin and oxycodone (each 5/55, 9%).

Different patterns of drug implication were observed between intentional and non-intentional deaths. Drugs which were implicated in a higher percentage of intentional DRDs than non-intentional DRDs were anti-depressants (31% and 11%), tramadol (20% and 4%), dihydrocodeine (26% and 10%), paracetamol (15% and 1%) and zopiclone (13% and 1%). Drugs which were implicated in a lower percentage of intentional DRDs than non-intentional DRDs were etizolam (4% and 49%), methadone (9% and 48%), heroin/morphine (18% and 47%), cocaine (6% and 23%) and alprazolam (0% and 12%).

Summary

- On average, people who had an intentional DRD were older (50.9 years) than those who had a non-intentional DRD (41.7 years).
- Intentional deaths accounted for a higher percentage of DRDs among females (8%) than males (3%) in 2018.
- Known drug use was lower among the intentional DRD cohort (26%) than the non-intentional DRD cohort (87%).

- A higher percentage of people (40% of known cases) in the intentional DRD cohort had made a previous suicide attempt compared with those in the non-intentional DRD cohort (18%).

- A lower percentage of intentional DRDs had etizolam (4%), methadone (9%), heroin/morphine (18%), cocaine (6%) and alprazolam (0%) implicated in death compared with the non-intentional DRD cohort (49%, 48%, 47%, 23% and 12% respectively).

- A higher percentage of intentional DRDs had anti-depressants (31%), tradamdol (20%), dihydrocodeine (26%), paracetamol (15%) and zopiclone (13%) implicated in death compared with the non-intentional DRD cohort (11%, 4%, 10%, 1% and 1% respectively).

Conclusion

Data from the National Drug-Related Death Database (NDRDD) provides detailed information on Drug-Related Deaths (DRDs) in Scotland, describing the background and circumstances of those who died and highlighting potential areas for intervention.

As discussed earlier, National Records of Scotland's National Statistics on DRDs show that, in each year since 2014, numbers of both drug-related and opioid-related deaths were at their highest recorded levels in Scotland. Scotland's DRD rate is estimated to be the highest in Europe and recent research has further emphasised the high population prevalence of problematic drug use [34] and the impact of DRDs in Scotland in terms of premature mortality [35]. Further, the trajectory of Scotland's DRD rate suggests that deaths will remain at a high level in future years.

The explanation for these high and increasing numbers of DRDs is complex. NDRDD data highlights some key points and themes:

Demographics:

- Scotland has a cohort of people with a drug problem who have multiple complex health and social care needs. Many people who had a DRD shared similar characteristics: they were male, aged over 35, socially deprived, lived alone and had a history of long term and / or injecting opioid use and near fatal overdose. In 2018, over half (55%) of the people who died lived in the 20% most deprived neighbourhoods in Scotland (Deprivation quintile 1).

- Most people who had a DRD in 2018 lived in their own home (77%). Over half (58%) lived alone all of the time. The percentage of people in these categories increased over the time series (2009 to 2018).

Contact / Interaction with Services:

- Nearly half of people in 2018 were in contact with drug treatment services in the six months before death. Across the time series combined, this percentage was higher among those aged 35 or over, and was higher for females than for males.

- Over one third of people in 2018 who had a DRD were prescribed an Opioid Substitution Therapy (OST) drug (mainly methadone) at the time of death. This percentage has increased since 2009, with females consistently more likely than males to be prescribed an OST at the time of death.

- Thirty percent of people who had a DRD in 2018 had been discharged from a general acute hospital in the six months prior to death.

Prescribing / Toxicology:

- The most common substances found implicated in deaths in 2018 were etizolam (49%), methadone (48%) and heroin/methadone (47%).

- Opioids (heroin/morphine, methadone or buprenorphine) were implicated in 77% of deaths. An increasing percentage of those who died from opioid-related death were in specialist drug treatment and prescribed an OST drug at the time of death (41% in 2018).

- The percentage of deaths where etizolam (a benzodiazepine-type 'Novel' Psychoactive Substance or 'Street benzo') was implicated increased markedly over the time series. Etizolam was twice as likely as diazepam to be implicated in deaths where it was found present (97% vs. 49%).

- The percentage of deaths where cocaine was implicated has been relatively stable up to 2014 (ranging between 6% and 9% of deaths) but has increased to 23% in 2018.

- Gabapentin and pregabalin implication increased over time, potentially due to their use to enhance the effects of opioids, [30], and were implicated in 401 deaths, 79% of which were also related to the use of opioids. Across the time series, prescribing of gabapentin or pregabalin within 90 days of death increased (from 5% of people in 2009 to 28% in 2018).

PHS hope to deliver the next report in this statistical series (on deaths in 2019 and 2020) with a shorter delay than was the case for this report. This will be part of PHS's work towards achieving the objective of publishing detailed information on DRDs

within one year of death. In the meantime, PHS will also aim to publish supplementary commentary to this report, which will discuss some of its key findings in greater depth.

References

[1] National Records of Scotland (2017) Drug-Related Deaths in Scotland in 2017 [online]. Available at: **https://webarchive.nrscotland.gov.uk/20210317072845/https://www.nrscotland.gov.uk/files//statistics/drug-related-deaths/17/drug-related-deaths-17-pub.pdf**

[2] National Records of Scotland (2018) Drug-Related Deaths in Scotland in 2018 [online]. Available at: **https://webarchive.nrscotland.gov.uk/20210317072711/https://www.nrscotland.gov.uk/files//statistics/drug-related-deaths/2018/drug-related-deaths-18-pub.pdf**

[3] Graham, L., et al., Information Services Division (2010) The National Drug-Related Deaths Database (Scotland) Report 2009 [online]. Available at: **https://www.isdscotland.org/Health-Topics/Drugs-and-Alcohol-Misuse/Drugs-Misuse/Historic-Publications/_docs/NDRDD_2009.pdf**

[4] Graham, L., et al., Information Services Division (2012) The National Drug-Related Deaths Database (Scotland) Report 2010 [online]. Available at: **http://www.isdscotland.org/Health-Topics/Drugs-and-Alcohol-Misuse/Publications/2012-02-28/2012-02-28-NationalDrugRelatedDeathsDatabase2010-Report.pdf?**

[5] Hoolachan, J., et al., Information Services Division (2013) The National Drug-Related Deaths Database (Scotland) Report 2011 [online]. Available at: **http://www.isdscotland.org/Health-Topics/Drugs-and-Alcohol-Misuse/Publications/2013-04-30/2013-04-30-NDRDD-Report.pdf?**

[6] Hecht, G., et al., Information Services Division (2014) The National Drug-Related Deaths Database (Scotland) Report 2012 [online]. Available at: **http://www.isdscotland.org/Health-Topics/Drugs-and-Alcohol-Misuse/Publications/2014-03-25/2014-03-25-NDRDD-Report.pdf?**

[7] Barnsdale, L., et al., Information Services Division (2015) The National Drug-Related Deaths Database (Scotland) Report 2013 [online]. Available at:

https://www.isdscotland.org/Health-Topics/Drugs-and-Alcohol-Misuse/Publications/2015-04-28/2015-04-28-NDRDD-Report.pdf?29418581725

[8] Barnsdale, L., et al., Information Services Division (2016) The National Drug-Related Deaths Database (Scotland) Report 2014 [online]. Available at: **http://www.isdscotland.org/Health-Topics/Drugs-and-Alcohol-Misuse/Publications/2016-03-22/2016-03-22-NDRDD-Report.pdf**

[9] Barnsdale, L., et al., Information Services Division (2018) The National Drug-Related Deaths Database (Scotland) Report 2015 and 2016 [online]. Available at: **https://www.isdscotland.org/Health-Topics/Drugs-and-Alcohol-Misuse/Publications/2018-06-12/2018-06-12-NDRDD-Report.pdf**

[10] World Health Organization (2016) International Statistical Classification of Diseases and Related Health Problems – 10th revision, Fifth edition. Geneva: WHO.

[11] Scottish Drugs Forum (2016) Older People with Drug Problems in Scotland: Addressing the Needs of an Ageing Population [online]. Available at: **http://sdf.org.uk/wp-content/uploads/2017/06/Working-group-report-OPDPs-in-2017.pdf**

[12] Neale, J. (2008) 'Homelessness, drug use and Hepatitis C: a complex problem explored within the context of social exclusion', in International Journal of Drug Policy, 19, 429–435.

[13] Information Services Division (2017) Opioid Replacement Therapy (ORT) Prescribing Scotland 2016/17 [online]. Available at: **http://www.scotpho.org.uk/behaviour/drugs/data/treatment-for-drug-misuse/**

[14] Information Services Division (2017) Methadone patient analysis for 2012/13 - 2016/17 [online]. Available at: **http://www.scotpho.org.uk/media/1516/methadone-patient-estimates-2016-17.xlsx**

[15] Information Services Division (2017) Alcohol-related Hospital Statistics Scotland 2016/17 [online]. Available at: **https://www.isdscotland.org/Health-Topics/Drugs-and-Alcohol-Misuse/Publications/2017-11-21/2017-11-21-ARHS-Report.pdf**

[16] Health Protection Scotland and Glasgow Caledonian University (2017). Blood borne viruses and sexually transmitted infections: Scotland 2017 [online]. Available at: **http://www.hps.scot.nhs.uk/resourcedocument.aspx?id=6305**

[17] Public Health Scotland (2022) National Naloxone Programme Scotland – Monitoring Report 2018/19 [online]. Available at: **https://publichealthscotland.scot/publications/national-naloxone-programme-scotland-annual/national-naloxone-programme-scotland-monitoring-report-201819**

[18] HM Government (2016) Psychoactive Substances Act 2016 [online]. Available at: **http://www.legislation.gov.uk/ukpga/2016/2/pdfs/ukpga_20160002_en.pdf**.

[19] EMCDDA/Europol (2017) EMCDDA–Europol 2016 Annual Report on the implementation of Council Decision 2005/387/JHA [online]. Available at: **http://www.emcdda.europa.eu/system/files/publications/4724/TDAN17001ENN_PDFWEB.pdf**

[20] UNODC (2017) World Drug Report 2017 [online]. Available at: **https://www.unodc.org/documents/wdr2015/World_Drug_Report_2015.pdf**

[21] EMCDDA (2016) EU Drug Markets Report: In-depth Analysis [online]. Available at:

http://www.emcdda.europa.eu/system/files/publications/2373/TD0216072ENN.PDF

[22] Department of Health (England) and the devolved administrations (2017) Drug Misuse and Dependence: UK Guidelines on Clinical Management [online]. Available at: **https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/673978/clinical_guidelines_2017.pdf**

[23] UNODC (2011) World Drug Report 2011 [online]. Available at: **http://www.unodc.org/unodc/en/data-and-analysis/WDR-2011.html**

[24] EMCDDA (2011) Annual Report 2011: The State of the Drugs Problem in Europe [online]. Available at: **http://www.emcdda.europa.eu/attachements.cfm/att_143743_EN_EMCDDA_AR2011_EN.pdf**

[25] Harris, M., et al. (2015) '"It's Russian roulette": Adulteration, adverse effects and drug use transitions during the 2010/2011 United Kingdom heroin shortage', in International Journal of Drug Policy, 26 (1), 51–58.

[26] Longo, M. C., et al. (2004) 'Impact of the heroin 'drought' on patterns of drug use and drug-related harms', in Drug and Alcohol Review, 23(2), 143-150.

[27] Medicines and Healthcare products Regulatory Agency (2011) Citalopram and escitalopram: QT interval prolongation [online]. Available at: **https://www.gov.uk/drug-safety-update/citalopram-and-escitalopram-qt-interval-prolongation**

[28] Stringer, J., Welsh, C., & Tommasello, A. (2009) 'Methadone-associated Q-T Interval Prolongation and Torsades de Pointes', in American Journal of Health-System Pharmacy, 66(9), 825-833.

[29] NHS Greater Glasgow and Clyde Medicines Information Service (2012) 'Drug Induced QT Prolongation', in PostScriptExtra [online]. Available at: **http://www.ggcprescribing.org.uk/media/uploads/ps_extra/pse_21.pdf**

[30] Lyndon, A., et al. (2017) 'Risk to heroin users of polydrug use of pregabalin or gabapentin', in Addiction [online]. Available at : **https://onlinelibrary.wiley.com/doi/full/10.1111/add.13843**

[31] Centre for Social Justice (2015) Prescriptions of drug linked to heroin addiction in US soars in England, CSJ warns [online]. Available at: **https://www.centreforsocialjustice.org.uk/core/wp-content/uploads/2016/08/oxycodone.pdf**.

[32] Torjesen, I. (2018) 'Fentanyl misuse in the UK: will we see a surge in deaths?' in British Medical Journal [online]. Available at: **https://www.bmj.com/content/361/bmj.k1564**

[33] Hikin, L., et al. (2018) 'Multiple fatalities in the North of England associated with synthetic fentanyl analogue exposure: Detection and quantitation a case series from early 2017', in Forensic Science International [online]. Available at:

https://www.sciencedirect.com/science/article/pii/S0379073817304942?via%3Dihub

[34] EMCDDA (2017) Technical Report: EMCDDA assessment of drug-induced death data and contextual information in selected countries [online]. Available at: **http://www.emcdda.europa.eu/system/files/publications/4667/Assessment%20of%20drug-induced%20death%20data.pdf**.

[35] ScotPHO (2017) Scottish Burden of Disease, Injuries and Risk Factors 2015 [online]. Available at: **http://www.scotpho.org.uk/media/1452/sbod2015-cause-25.xlsx**

[36] Merrall, E. L. C., et al. (2010) 'Meta-analysis of Drug-Related Deaths soon after Release from Prison', in Addiction, 105, 1545–1554.

[37] The Scottish Government (2008) Risk and Protective Factors for Suicide and Suicidal Behaviour: A Literature Review [online]. Available at: **http://www.scotland.gov.uk/Publications/2008/11/28141444/0**

[38] Choose Life (2014) High Risk Groups [online]. Available at: **http://www.chooselife.net/whatwedo.aspx#clstrategyobjectives**

[39] Bergen H., et al. (2012) 'Shared characteristics of suicides and other unnatural deaths following non-fatal self-harm? A multicentre study of risk factors', in Psychological Medicine, 42, 727–741.

[40] Kimber, J., et al. (2010) 'Survival and cessation in injecting opiate users, a prospective observational study of outcomes and the effect of opiate substitute treatment', in British Medical Journal, 340:c3172. doi:10.1136/bmj.c3172.

[41] Copeland, L., et al. (2012) 'Premature mortality in Scottish injecting drug users: a life history approach', in Scottish Medical Journal, 57, 38–42. doi: 10.1258/smj.2011.011289.

[42] Macleod J., et al. (2013) ‘Early life influences on the risk of injecting drug use: case control study based on the Edinburgh Addiction Cohort’, in Addiction, 108(4), 743-50. doi: 10.1111/add.12056.

[43] Wilcox H. C., et al. (2004) ‘Association of alcohol and drug use disorders and completed suicide: an empirical review of cohort studies’, in Drug and Alcohol Dependence, 76 (suppl):S11-S19.

[44] Information Services Division (2018) A profile of deaths by suicides in Scotland 2011-2017: A report from the Scottish Suicide Information Database (ScotSID) [online]. Available at: **https://www.isdscotland.org/Health-Topics/Public-Health/Publications/2018-12-04/2018-12-04-ScotSID-Report.pdf**.

[45] National Records of Scotland (2017) Probable Suicides: Deaths which are the Result of Intentional Self-harm or Events of Undetermined Intent [online]. Available at: **http://www.nrscotland.gov.uk/statistics-and-data/statistics/statistics-by-theme/vital-events/deaths/suicides/main-points** [Accessed 30/05/18].

Glossary

Benzodiazepine-type NPS

These drugs are part of the wider benzodiazepine class of drugs which induce sedation by reducing irritability or excitement. At low doses, they reduce anxiety and produce a peaceful effect. Higher doses may result in slurred speech, staggering gait, poor judgement, and slow, uncertain reflexes. Higher doses may also be used as a hypnotic to induce sleep. In the event of an overdose or if combined with another sedative (including opioids), many of these drugs can cause unconsciousness and even death. Benzodiazepine-type NPS (such as etizolam and diclazepam) produce similar effects to prescribed benzodiazepines (such as diazepam and alprazolam). Benzodiazepine-type NPS are, by definition, not licensed for medical use or legally controlled at the point they become available in a specific country's illicit drug market. Individual benzodiazepine-type NPS may not be licensed for use in specific countries because they have proven to be less efficacious in treatment or because they are regarded as unsafe due to other characteristics such as potency, bioavailability or biological half-life.

Cannabinoid-type NPS

These drugs mimic cannabis, but they bear no relation to the cannabis plant except that the chemicals which are blended into the base plant matter act on the brain in a similar way to cannabis. They are traded under names such as Clockwork Orange, Black Mamba, Spice and Exodus Damnation. The effects of these are similar to cannabis intoxication: relaxation, altered consciousness, disinhibition, a state of being energised and euphoria.

Concomitant

Concurrent

DRD

Drug-Related Death

EMCDDA

European Monitoring Centre for Drugs and Drug Addiction

ICD

International Classification of Diseases

ISD

Information Services Division

NDRDD

National Drug-Related Deaths Database

NJ-PWUD

People Not Known as a Person who Used Drugs

NPS

Novel Psychoactive Substances. Drugs which affect the central nervous system and which are not licensed for medical use or legally controlled at the point they become available an illicit drug market.

NRS

National Records of Scotland

PHS

Public Health Scotland

PIS

Public Health Scotland's Prescribing Information System

PWID<10

People who Injected Drugs for less than 10 years

PWID10+

People who Injected Drugs for 10 years or more

PWUD

People who Used Drugs (but were not known to inject)

OST

Opioid Substitution Therapy

QT Interval

The time between the start of the Q wave and the end of the T wave in the heart's electrical cycle, representing depolarization and repolarization of the ventricles. Certain drugs are known to prolong the heart's QT interval, potentially leading to a life threatening ventricular arrhythmia called 'torsades de pointes'.

Regimen

A prescribed course of medical treatment, diet, or exercise for the promotion or restoration of health.

SIMD

Scottish Index of Multiple Deprivation

Stimulant-type NPS

These drugs mimic substances such as amphetamines, cocaine, or ecstasy and include BZP, mephedrone, MPDV, NRG-1, Benzo Fury, MDAI, ethylphenidate etc. People who take these drugs can feel energised, physically active, fast-thinking, very chatty and euphoric.

Contact

Gordon Hunt, Principal Information Analyst
Drugs Team
07767008931
Gordon.Hunt@phs.scot

Morven Millar, Information Analyst
Drugs Team
0141 282 2359
Morven.Millar3@phs.scot

For all media enquiries please email **phs.comms@phs.scot** or call 0131 275 6105.

Further information

Further information and data for this publication are available from the **publication page** on our website.

The next release of this publication will be winter 2023/24.

Rate this publication

Let us know what you think about this publication via. the link at the bottom of this **publication page** on the PHS website.

Appendix 1 – Data Collection

Appendix 1.1 – Data Collection Development

National Drug-Related Death Database Governance

The National Forum on Drug-Related Deaths (NFDRD) Research and Data Monitoring Subgroup (formerly known as the Data Collection Subgroup) established the National Drug-Related Death Database (NDRDD), oversaw the process of data collection and steered the delivery of this report until 2015.

In 2016, oversight of the NDRDD was transferred to the new Partnership for Action on Drugs in Scotland (PADS) Harms Subgroup. Whilst the NDRDD is led by PHS, both oversight groups have been comprised of people from a range of organisations and professional backgrounds. Further details on **PADS** are available at the Scottish Government website.

The National Drug-Related Death Database Data Collection Form

The proforma used for NDRDD data collection was developed by the NFDRD Data Collection Subgroup. It was designed to collect data on a wide range of details concerning people's social circumstances and health prior to death. These variables include socio-demographic information, drug use history, medical history, circumstances surrounding the death, details of substitute prescriptions and drugs detected in the person's body through toxicological and pathological examination. In addition, data are collected regarding the individual's contact with services (e.g. health, social care and criminal justice) prior to death. Although the dataset has been reviewed each year since its inception, the core data items collected remain unchanged.

Appendix 1.2 – Data Collection Process

Case Identification

In the event of an unexpected death, the police complete a Sudden Death Report which is passed to the Procurator Fiscal. The Procurator Fiscal then calls for a full pathological and toxicological post-mortem examination to be conducted to determine the cause of death. On completion of the post-mortem examination, the Local Critical Incident Monitoring Group and local Data Collection Co-ordinator decide if the case matches the inclusion criteria for the NDRDD (i.e. if it is a Drug-Related Death (DRD) as per the NDRDD definition). If these criteria are met, a case record is submitted to PHS.

Local Area Drug-Related Death Surveillance

DRDs in Scotland are recorded and examined by Local Critical Incident Monitoring Groups who often collaborate with the police and Procurator Fiscal to identify such cases in their local area. Each area has a Data Collection Co-ordinator who works closely with the Local Critical Incident Monitoring Group and other key partners to collate the information on each DRD.

Data Sources and Data Collection

In addition to the Sudden Death Report completed by the police and the pathology report, information surrounding the circumstances of death and information on the person who died is collected from a wide range of sources. These sources include the Scottish Prison Service and Scottish Ambulance Service as well as notes from drug treatment services, GPs, psychiatrists, hospitals and pharmacies. For most NDRDD data items, the main information sources were identical for all NHS Boards in Scotland. However for some items there was variance in their recording depending on local practice (e.g. for Greater Glasgow & Clyde, data on naloxone provision prior to death is requested from PHS, rather than from the NHS Board naloxone lead).

Information Support, Data Entry and Data Transfer

Prior to the collection of data on 2014 deaths, PHS implemented a secure online database enabling direct entry of DRD information by Data Collection Co-ordinators. Information was recorded and validated using the secure online Oracle database administered by PHS. These data were then anonymised and added to the composite NDRDD dataset.

Incorporation of 'Drugs Implicated' Data from National Records of Scotland

The NDRDD dataset provides information about the drugs present in the body at post-mortem. National Record of Scotland (NRS) provides additional information about whether substances were (i) implicated in the death and (ii) not implicated in the death. Pathologists provide NRS with additional information about most DRDs. However, when information is not received, NRS assumes all drugs mentioned on the death certificate were implicated in the death.

Presence of a drug in the body at post-mortem does not necessarily mean that the drug contributed to death and interpretation of post-mortem toxicology is complex. The determination as to whether a drug has caused or contributed to death lies with the pathologist who will consider toxicological findings in combination with pathological and circumstantial evidence before coming to a conclusion.

This report incorporates this information, which was supplied to PHS by NRS with the relevant permissions and subsequently matched to the NDRDD dataset. The supplementary NRS information allows for a more meaningful analysis of the circumstances of individual drug deaths, taking into account the substances that have contributed towards deaths.

Appendix 1.3 – Data Quality Assurance

Within the electronic spreadsheet and Oracle database, data were automatically checked at the point of data entry and subsequently cross-matched with records obtained from the NRS Vital Events database which contains the records of all those who die in Scotland. ICD-10 diagnosis codes were then extracted and compared with

the relevant codes within the NDRDD. This quality assurance process makes it possible to thoroughly investigate any differences between the NDRDD and NRS data. Details regarding the outcomes of this matching process can be found in **Appendix 2**.

As a result of ongoing quality improvements some figures differ from previous reports [3-8]. Specifically:

- Following a data validation exercise, four cases were excluded from the 2009 cohort (reducing the total 2009 cohort to 428) and nine cases were excluded from the 2012 cohort (reducing the total 2012 cohort to 522).
- Due to late data submission, two additional deaths are reported for 2014 (increasing the total 2014 cohort to 624).

Appendix 1.4 – Statistical Testing

Data were analysed descriptively using SPSS.

Comparisons of proportions where samples were expected to be similar in nature (e.g. single year NDRDD cohorts) were tested using a T-test. A chi-square test was used where groups were thought to be different in nature (e.g. males and females). Where comparisons involved small numbers of cases (e.g. inter-year comparison of Stimulant-type 'Novel' Psychoactive Substance (NPS) deaths), Fisher's exact test was used. While the T-test was used where individual years appeared to be outliers (e.g. higher percentage in 2018 than in other cohorts), a chi-square test for trend was used where there was evidence of linear change over time.

Differences in means were tested using an Independent Samples T-test. Medians were tested using Mood's Median Test.

Data Confidentiality and Information Governance

The data collected for the NDRDD are not directly covered by the Data Protection Act 2018, which relates only to living people. However, Public Health Scotland maintains a duty of confidence to protect data relating to deceased people after their death.

Person-identifying details regarding each individual are entered into the NDRDD as this information is necessary for linkage to other datasets. All measures are taken to protect the confidentiality of these data and the NDRDD project adheres to the seven Caldicott Guardian Principles.

Appendix 2 – Construction of the 2017 and 2018 NDRDD Cohorts[61]

Drug-Related Deaths for 2017 and 2018 Reported by Different Agencies

The National Drug-Related Deaths Database (NDRDD) reports on a subset of 1,209 of the DRDs in Scotland in 2018 (956 in 2017) and is therefore not a National Statistics output for Scotland but a descriptive account of a cohort of deaths where further information was available. The National Statistics output for the number of DRDs registered annually in Scotland is published by National Records of Scotland (NRS) in its annual DRD report [1]. The number of DRDs registered in 2018 and reported by NRS was 1,187 (934 in 2017).

Year	NDRDD	NRS
2017	956	934
2018	1,209	1,187

Matching National Drug-Related Death Database Records to National Records of Scotland Death Records

As in previous NDRDD reports [2-4], data were quality assured by matching records in this database to those held by NRS. NRS review the death certificates for all

[61] Police Scotland figures (and associated comparisons) are not included in this year's report. After the creation of Police Scotland, a new Police Scotland DRD Database was implemented in order to facilitate consistent national recording and to provide a mechanism for the early indication of trends reported by local policing divisions. Police Scotland share intelligence from this database with local drug trend monitoring groups and with national partner agencies via the Partnership for Action on Drugs in Scotland and NPS Centre for Excellence advisory structures.

deaths registered in a given calendar year before determining whether or not they were drug-related. Each year, some deaths are also reviewed jointly by NRS and senior clinicians at PHS. The 2018 NRS figure of 1,187 (934 in 2017) was therefore derived from this comprehensive process.

A total of 1,267 records were returned to PHS for inclusion in the NDRDD for 2018 and these were matched to death database held by PHS which includes the 1,187 DRDs registered in Scotland in 2018 (1,014 including 934 DRDs in 2017). Fifty-eight (out of 1,267) of the NDRDD records did not meet the NDRDD definition of a DRD (58 out of 1,014 in 2017). Therefore the final 2018 NDRDD cohort (analysed for this report) contained 1,209 records (956 in 2017). The reasons for the removal of records are shown below.

	Number of cases excluded 2017	Number of cases excluded 2018
Deaths coded to something unrelated to the use of a controlled substance e.g. chronic ischaemic heart disease (ICD10 code I25), other chronic obstructive pulmonary disease (J44)	57	58
Unable to identify whether the death was drug-related due to missing data	1	0
Duplicates	0	0
Total	58	58

Reasons why National Records of Scotland DRDs were not Captured by the National Drug-Related Death Database Data Collection

1. The pathologist (or the Local Critical Incident Monitoring Group informed by the pathologist) decided that the death was a suicide whereas NRS had counted the death as an ‘event of undetermined intent’ because NRS had not been told that the death was believed to be a suicide by the date on which

NRS ‘froze’ its statistical data records for that year (N.B. a death certificate will not state whether a death was a suicide. NRS relies on Procurators Fiscal to inform it whether a traumatic or suspicious death was believed to be the result of an accident, assault, or intentional self-harm). In this scenario a NDRDD record was not completed and returned to PHS for the death, but the death was probably counted by NRS as an ‘event of undetermined intent’ DRD, or possibly an ‘accidental’ DRD.

2. The pathologist (or the Local Critical Monitoring Group) decided that the Cause of Death was ‘unascertained’ and that the death should therefore not be classed as a DRD whereas the information that NRS received had indicated that the death was a DRD.

3. The NRS decided that the death was a DRD because an illicit drug was present in the toxicology, but the pathologist (or the Local Critical Incident Monitoring Group) considered that:

    a. either the level of the illicit drug was so small that the death could not be considered as being a DRD, or

    b. the only illicit drug(s) listed in the toxicology were being prescribed to the deceased at the time of death and therefore these drugs should not be considered as being illicit

    NRS is not informed about the levels of drugs found, or whether the drugs had been prescribed to the deceased. In any case, the ‘UK Drug Strategy’ DRD definition (which NRS applies) does not exclude deaths because there was a low level of drug found or because they had been prescribed to the deceased (see Paragraph A2.2 in **Annex A** of the NRS report on 2018 deaths).

4. Where the pathologist’s Cause of Death consisted of several elements, only one of which was related to illicit drug intoxication, and where the pathologist (or the Local Critical Incident Monitoring Group) decided that the non-illicit drug element was the main cause of death whereas the NRS decided that the death was in fact drug-related (it should be noted that in the majority of cases where

the Cause of Death consists of several elements the NRS reach the same conclusion as the pathologist as to what the single main Cause of Death is).

5. The Data Collection Co-ordinator was not informed about a DRD. For example, when there is no evidence at the time of death to suggest a potential DRD, the Police Sudden Death report would not show the death as being a suspected DRD. Occasionally, via post-mortem and toxicology testing, the Procurator Fiscal will later find that such a death was a DRD. In some areas the Procurator Fiscal may not inform the police and the Local Critical Incident Monitoring Group about such a DRD and consequently PHS will not be sent a NDRDD record. The NRS will normally know about these DRDs as they receive toxicology and cause of death information directly from the pathologist. Note that this scenario will not arise in areas where the pathologist has direct links with the Local Critical Incident Monitoring Group and the Data Collection Co-ordinator.

6. There is an ongoing criminal investigation surrounding a DRD and the Procurator Fiscal has not given permission for certain information relating to a death to be released to the Data Collection Co-ordinator and the Co-ordinator has consequently been unable to complete a NDRDD record for the death. However, the NRS may have enough available information to define the death as a DRD.

7. For the NDRDD, the place where someone dies determines what area the death is assigned to. However, NRS's figures for DRDs in Scotland are normally registered by the geographical area of the usual place of residence of the deceased. If the place of residence is outside Scotland, then the location of death within Scotland is assigned. In the case of someone who had recently moved residence within Scotland, NRS is likely to count the death by the former area of residence (provided that he/she had been resident there for at least 12 months). This could lead to small discrepancies in the number of DRDs that NRS and NDRDD assign to a particular area of Scotland.

Appendix 3 – NDRDD Drug Death Reporting Short Life Working Group

Some of the issues described in this report in relation to data quality informed the decision by Information Services Division (ISD) Scotland (now part of Public Health Scotland) and the Scottish Government to jointly convene a Short Life Working Group (SLWG) on Drug Death Reporting.

Taking particular account of the increasing volume of DRDs and the difficulties experienced in gathering information about them, it was felt that the role of the NDRDD in the context of drug death reporting in Scotland needed to be formally evaluated. Having started this process in 2019, Public Health Scotland (PHS) and the Scottish Government originally intended to host a series of meetings during 2020. However, the COVID-19 pandemic necessitated a delay and meetings were instead held in the first half of 2021.

In the course of four meetings, a representative multi-agency SLWG concluded that the NDRDD data collection was valuable, but was not realising its potential in helping to prevent DRDs due to reporting delays and the limited accessibility of its findings. PHS published a **summary** of the Short Life Working Group findings and recommendations in April 2022.

At the beginning of 2022, PHS received funding from the Scottish Government to implement these recommendations. While further action is required in order to fully address the issues identified, PHS has already implemented the following changes:

- Allocated additional data management, analytical and communication resources to NDRDD reporting.
- Appointed a National DRD Data Co-ordinator.
- Will be providing alternative outputs and visualisations in order to enhance the accessibility of information for different audiences.

A programme of work to modernise the NDRDD and to improve the timeliness and impact of reporting has now commenced. This will include a full review of the NDRDD dataset and engagement with partners to make better use of data linkage.

The next report in this series will see the implementation of the following SLWG recommendations:

- Change to reporting by registration of death (rather than year of death) as in the NRS reports.
- Incorporation of deaths by suicide in the main findings of the NDRDD report.
- Further work to improve the accessibility of NDRDD findings.

PHS hope to deliver the next report in this statistical series (on deaths in 2019 and 2020) with a shorter delay than was the case for this report. This will be part of PHS's work towards achieving the objective of publishing detailed information on DRDs within one year of death.

Appendix 4 – Publication metadata

Publication title

The National Drug-Related Deaths Database (Scotland) Report: Analysis of Deaths occurring in 2017 and 2018

Description

A detailed examination of a subset of the Drug-Related Deaths that occurred in Scotland in 2017 and 2018 (including trend data from 2009 where available).

Theme

Health and Social Care

Topic

Drug Related Mortality

Format

PDF with Excel Tables

Data source(s)

Data from the National Drug-Related Deaths Database (NDRDD) held by PHS. Data are collected at a local level by data co-ordinators. For each record they access a variety of sources including drug treatment services, GPs, prisons, police etc. Data from the National Records of Scotland (NRS) for drug-related deaths in 2017 and 2018. This was supplied to PHS by the NRS for this report.

Date that data are acquired

June 2021

Release date

26 July 2022

Frequency

Biennial

Timeframe of data and timeliness

All drug-related deaths that occurred in calendar years 2017 and 2018 are considered relevant.

Continuity of data

This is the eighth NDRDD report. In 2012 the definition of a 'drug related death' used by NDRDD was expanded to include deaths by suicide involving controlled drugs (or 'intentional' deaths or DRDs). However, these intentional DRDs are reported separately in Deaths by Suicide section of the report, to ensure the continued comparability of findings from the main cohort of non-intentional deaths. Other definitions have remained consistent over time.

Revisions statement

No planned revisions

Revisions relevant to this publication

As a result of ongoing quality improvements, figures may be revised over time.

The numbers of deaths reported in 2009, 2012 and 2014 are different from those in previous reports for the following reasons: Following a data validation exercise, four cases were excluded from the 2009 cohort (reducing the total 2009 cohort to 428) and nine cases were excluded from the 2012 cohort (reducing the total 2012 cohort to 522); Due to late data submission, two additional deaths are reported for 2014 (increasing the total 2014 cohort to 624).

Concepts and definitions

Detailed information of the deaths relevant to this report is shown in **Annex A** of the NRS report and on the **NDRDD section** of the PHS (formerly Information Services Division) website.

Relevance and key uses of the statistics

Planning; epidemiology; research; provision of services and access to services; improved understanding of topic area.

Accuracy

All records are validated when entered into the PHS database. Any issues identified

within the record are highlighted to the data provider and corrected before analysis begins.

For varying reasons, discussed in greater detail within the report, collection of robust and high quality NDRDD data became increasingly difficult for this reporting period, resulting in a lower level of completeness for the data recorded for 2017 and 2018. These have been discussed and highlighted in the report where appropriate.

Completeness

Detailed breakdowns of completeness are available in the data tables.

Comparability

The data captured can be used for year-on-year comparisons.

Accessibility

It is the policy of Public Health Scotland to make its web sites and products accessible according to published guidelines. More information on accessibility can be found on the **PHS website**.

Coherence and clarity

The report is available as a PDF file with tables clearly linked for ease of use.

Value type and unit of measurement

Counts, numbers and percentages

Disclosure

The PHS protocol on Statistical Disclosure Protocol was followed.

Official Statistics designation

Official Statistics

UK Statistics Authority Assessment

N/A

Last published

12 June 2018

Next published

Winter 2023/24

Date of first publication

25 January 2011

Help email

phs.drugsteam@phs.scot

Date form completed

12 July 2022

Appendix 5 – Early access details

Pre-Release Access

Under terms of the "Pre-Release Access to Official Statistics (Scotland) Order 2008", PHS is obliged to publish information on those receiving Pre-Release Access ("Pre-Release Access" refers to statistics in their final form prior to publication). The standard maximum Pre-Release Access is five working days. Shown below are details of those receiving standard Pre-Release Access.

Standard Pre-Release Access:

Scottish Government Health Department

NHS Board Chief Executives

NHS Board Communication leads

Appendix 6 – PHS and Official Statistics

About Public Health Scotland (PHS)

PHS is a knowledge-based and intelligence driven organisation with a critical reliance on data and information to enable it to be an independent voice for the public's health, leading collaboratively and effectively across the Scottish public health system, accountable at local and national levels, and providing leadership and focus for achieving better health and wellbeing outcomes for the population. Our statistics comply with the **Code of Practice for Statistics** in terms of trustworthiness, high quality and public value. This also means that we keep data secure at all stages, through collection, processing, analysis and output production, and adhere to the '**five safes**'.