

Publication Report



The National Drug-Related Deaths Database (Scotland) Report: Analysis of Deaths occurring in 2013

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Executive Summary

This is the fifth report from the National Drug-Related Deaths Database (NDRDD) for Scotland which presents data for the calendar year 2013 and trend data back to 2009. The NDRDD was established to collect detailed information regarding the nature, health and social circumstances of individuals who have died a drug-related death. This report analyses a specific cohort of drug-related deaths in Scotland on which National Statistics have already been published by National Records of Scotland (NRS) [1]. Information on methods and definitions is included in [Section 2](#).

The main body of this report ([Section 3](#)) focuses on 448 unintentional and undetermined deaths involving controlled substances that occurred in Scotland in 2013. These were largely a subset of the 526 drug-related deaths reported by NRS.

As in 2012, this report also contains a section ([Section 4](#)) outlining the characteristics of NPS deaths in comparison to the rest of the NDRDD cohort and highlighting differences in deaths involving specific types of NPS. The 108 NPS-related deaths reported in 2013 are also included in the analysis of 448 non-intentional deaths forming the main body of this report.

Intentional self-poisonings (deaths by suicide: n=37) are described separately in [Section 5](#).

Key Findings

Profile of Individuals

- As in previous years, over three quarters (76%) of those who died were male and half (50%) lived in the most deprived areas of Scotland.
- The mean age of individuals suffering a drug-related death increased from 34.4 in 2009 to 39.1 in 2013.
- The percentage of deaths among individuals aged 35 and over has increased from half of deaths (50%) in 2009 to two-thirds (66%) of deaths in 2013.
- More than half of the cohort lived on their own all of the time (232, 53%) – a known risk factor for drug-related death.
- Nine out of ten (88%) of individuals were known to be using drugs prior to death and, of these, almost two-thirds (64%) also had a history of intravenous (IV) drug use.
- In 2013, almost one third (31%) were prescribed an Opioid Replacement Therapy (ORT) drug at the time of death (an increase since 2009 (21%)), while over half (51%) had been prescribed an ORT at some point since 2009.
- Over one third of the 2013 cohort (37%) had been prescribed an anti-depressant in the 30 days before death (the most commonly prescribed substance being mirtazapine). Diazepam was recently prescribed to one-fifth (21%) and gabapentin to one-tenth (10%) of the cohort. Anti-depressant and gabapentin prescriptions have both increased since NDRDD started in 2009.
- Almost three quarters (72%) had a medical condition recorded in the six months prior to death, while almost two thirds (63%) had a psychiatric condition recorded (higher than in any previous cohort).

- The average number of medical conditions in relation to which individuals were admitted to an acute hospital increased from 1.0 in 2009 to 1.4 in 2013, suggesting that multiple morbidity in the cohort may be increasing over time.
- Over a third of those who died (36%), were a parent or parental figure. 273 Children lost a parent or parental figure to a drug-related death in 2013.

Contact with Services

- Over half of individuals (53%) had been in contact with a drug treatment service in the six months before death. Half of individuals (50%) were in contact with services for reasons other than management of a drug misuse problem in the six months before death.
- Ten per cent had been discharged from an acute or psychiatric hospital within four weeks of death, rising to 28% discharged within the past six months.
- The percentage of the cohort with experience of an acute or psychiatric inpatient stay (93%) increased over time (2009: 86%).
- Around one third (31%) had been in police custody and around one in ten (13%) had been in prison in the six months prior to death.
- Collectively, seven in ten individuals (71%) who died a drug-related death in 2013 had been in contact with a service (drug treatment, hospital, police or prison) which may have identified them as being at risk of drug-related death.

Drugs Present and Implicated in Death

- As in previous years, in almost all cases (97%) there was more than one drug *present* in the body at death and in 68% of cases more than one drug was *implicated* in death, indicating the presence of polydrug use amongst this cohort.
- The drug most frequently found to be *present* in the body at death was diazepam (66%), followed by heroin/morphine (50%), methadone (47%), alcohol (42%) and anti-depressants (39%). Opioids (methadone, heroin, morphine or buprenorphine) were *present* in 82% of cases.
- The percentage of deaths with diazepam *present* declined from 77% in 2009 to 66% in 2013. The decrease in diazepam presence among females was particularly marked (from 80% in 2012 to 61% in 2013). For the first time, diazepam was not the substance most likely to be found present in female drug-related deaths (anti-depressants were found in 62% of female deaths).
- The percentage of deaths with heroin-morphine *present* was similar to the past two years, while the percentage with methadone *present* decreased from a peak of 56% in 2011 to 47% in 2013.
- The drug most frequently found to be *implicated* in death in 2013 was heroin/morphine (44%), followed by methadone (42%), diazepam (19%) and alcohol (18%). Opioids (methadone, heroin, morphine or buprenorphine) were *implicated* in 76% of cases.

Novel Psychoactive Substances

- Between 2009 and 2013, there were 203 cases with a 'Novel' Psychoactive Substance (NPS) *present* in the body at time of death. 2013 Had the highest

number of cases to date (108), an increase of 129% from the previous high of 47 in 2011.

- Deaths with NPS present in the body at time of death could be broadly categorised into two types: mainly those featuring Benzodiazepine-type NPS (e.g. Phenazepam, Etizolam) and to a lesser extent Stimulant-type NPS (e.g. PMA/PMMA, BZP, Mephedrone).
- Almost all deaths with NPS present in the body at time of death had co-presence of other drugs; typically combinations of NPS, opioids, alcohol and benzodiazepines.

Deaths by Suicide

- In addition to the 448 non-intentional deaths in the 2013 NDRDD, 37 deaths by suicide were recorded. Again, these were largely a subset of the 526 drug-related deaths (including suicide statistics) already published by National Records Scotland (NRS) in August 2014.
- Almost two-thirds (65%) of deaths by suicide recorded by NDRDD were among males. The mean age of deaths by suicide (45.3) was six years higher than the main NDRDD cohort (39.1).

Conclusions

Reflecting changes in the wider population of people with problematic drug use, victims of drug-related death were increasingly from older age groups. This demographic change was reflected in the increase in long-term intravenous drug users, increases in the percentage living alone and in their own home and is likely to be driving increases in contact with drug treatment, ORT prescribing, increasing medical and psychiatric morbidity and hospital admission.

Seven in ten individuals who died a drug-related death had recent experience of drug treatment, hospital, prison or police custody. Evidence on increased overdose risk after release from custody or following treatment suggests it is vitally important that services work together to promote retention in treatment, continuity of care and awareness of overdose risk.

Opiate use continues to be the key factor in most drug-related deaths. Heroin and methadone were the substances most often implicated in deaths. Nearly all drug-related death victims had used multiple drugs prior to death. Diazepam presence decreased markedly among 2013 deaths, but the presence of other legally available benzodiazepines increased.

These findings further underline that the major issues are opiate-related toxicity, injecting drug use, poly substance misuse and the complex needs and risks associated with an ageing population. Further study on older drug users and the role of benzodiazepines in drug-related death is due to take place in the near future. Insights into these new areas of study will be made possible by continuing to capture detailed data on drug-related deaths and actively utilising this resource to generate public health intelligence with the potential to save lives.

1: Introduction

1.1: Overview

This is the fifth report from the National Drug-Related Deaths Database (NDRDD) for Scotland which presents data for the calendar year 2013 and trend data back to 2009. The NDRDD was established to collect detailed information regarding the nature, health and social circumstances of individuals who have died a drug-related death. This report analyses a specific cohort of drug-related deaths in Scotland on which National Statistics have already been published by National Records of Scotland (NRS).

The NRS and NDRDD gather information separately but since both sets of data concern drug-related deaths in Scotland, there is a great deal of overlap and therefore it is useful to draw comparisons. The NRS have identified an overall upward trend in drug-related deaths in Scotland since 1997 [1]; the NDRDD reports have sought to contextualise these deaths in relation to the health and social circumstances of the deceased. Dissemination of NDRDD findings informs policymakers and practitioners as to the potential for harm reduction and therapeutic interventions to reduce drug-related deaths in Scotland.

1.2: Defining ‘Drug-Related Deaths’

It is important to highlight that different organisations and authors adopt various definitions of what constitutes a drug-related death. For the purposes of this report, the two most salient definitions come from the NRS [1] and previous NDRDD reports [2-5]. The NRS obtains details of all deaths that are registered in Scotland and identifies drug-related deaths based on a supplementary questionnaire (an ME4 form) that is completed by the forensic pathologist. The NRS definition of a drug-related death, including the specific diagnosis codes used, can be found in [Appendix A1](#).

The definition of a drug-related death used by the NDRDD for years 2009-2011 [2-4] matched that of the NRS with the exception that it did not include confirmed deaths by suicide (defined as ‘intentional self-poisoning’). However, from 2012 onwards, the definition used matched that of the NRS, with deaths by suicide included. The reason for this change was to bring the NDRDD cohort more in line with the volume of cases reported by NRS. The inclusion of deaths by suicide accounts for much of the observed increase in the NDRDD cohort since 2012 and 2013 compared to 2011. To maintain consistency with previous publications the main body of this report focuses on unintentional and undetermined deaths and assault by drugs (n=448), while intentional self-poisonings (deaths by suicide: n=37) are described separately in [Section 5](#).

It is important to note that the 37 deaths by suicide reported in [Section 5](#) are largely a subset of the 526 drug-related deaths (including suicide statistics) on which National Statistics have already been published by NRS in August 2014 [1].

1.3: NRS Report on Drug-Related Deaths 2013

In its most recent publication [1], NRS reported that 526 drug-related deaths were registered in Scotland in 2013. This was 9% lower than the number reported in 2012 (581). The 2013 figure was the fifth highest number of drug-related deaths recorded by NRS, 209 (66%) more than in 2003. Although there is an overall upward trend in drug-related deaths since 1996, the updated 3-year and 5-year moving averages suggest that the annual number of deaths may be ‘levelling off’. On this basis, the large annual increases and

decreases observed since 2008 may be year-to-year fluctuations around a fairly steady annual level. A detailed summary of the NRS report is included in [Appendix A2](#).

1.4: 'Novel' Psychoactive Substances

In recognition of the international evidence that global drug markets and drug trends are changing [6-7], the 2012 and 2013 NRS reports [8,1] included a section on 'Novel' Psychoactive Substances (NPS). As in 2012 [5], this report also contains a section ([Section 4](#)) outlining the context and use of NPS, describing the characteristics of NPS deaths in comparison to the rest of the NDRDD cohort and highlighting differences in the characteristics of deaths involving different types of NPS. In 2013, this section also includes some trend analysis of all 203 NPS-related deaths occurring between 2009 and 2013.

Again, it is important to note that the 108 NPS-related deaths reported in 2013 are largely a subset of the 526 drug-related deaths¹ on which National Statistics have already been published by NRS in August 2014 [1]. However, unlike deaths by suicide, NPS-related deaths are also included in the analysis of 448 non-intentional deaths forming the main body of this report.

1.5: Report Outline

This report focuses on the **nature, health and social circumstances of drug-related deaths occurring in Scotland in 2013**. This provides us with insights into the lives of these individuals before their death and highlights potential areas for interventions. It contains:

- an account of the data collection and analysis of the 2013 NDRDD cohort;
- a full description of results from the 2013 NDRDD cohort and comparison with results from previous NDRDD cohorts to identify changes and trends over time;
- a description of the medical and psychiatric co-morbidities and hospital admissions experienced by those who died a drug-related death;
- a description of the prescribing of opioid substitutes and other drugs to those who died a drug-related death;
- a description of the role of methadone and 'Novel' Psychoactive Substances in drug-related deaths;
- an account of the differences between deaths classified as intentional (suicides) and those classified as not intentional;
- consideration of the results within the wider policy and health protection context.

¹ Two of the 108 NRS-related deaths occurring in 2013 were not included in the NRS publication, as these deaths were not registered until 2014.

2: Methods

The National Forum on Drug-Related Deaths (NFD RD) Data Collection Sub-Group oversees the process of data collection and steers the delivery of this report. Whilst the National Drug-Related Deaths Database is led by ISD, the NFD RD Data Collection Sub-Group comprises of individuals from a wide range of organisations and professional backgrounds ([Appendix A5](#)).

Drug-related deaths in Scotland are recorded and examined by Local Critical Incident Monitoring Groups who collaborate with the police and Procurator Fiscal to identify such cases in their local area. 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 as per the NDRDD definition)². If these criteria are met, a case record is submitted to ISD.

The proforma used for NDRDD data collection was designed to collect data on a wide range of details concerning the individuals' health and social circumstances and circumstances of death. Although the dataset has been refined each year since its inception, the core data items collected remain unchanged. Information on the circumstances of the deceased was collected from a range of sources including the Scottish Prison Service and Scottish Ambulance Service as well as notes from drug treatment services, GPs, hospitals etc. Information was recorded using an electronic spreadsheet and submitted to a restricted mailbox at ISD via the Government Secure Internet email network. These data were then entered into a secure database at ISD, anonymised and analysed descriptively using SPSS v21.

In 2014-15, work was undertaken to create a composite NDRDD dataset encompassing all cohorts from 2009 to 2013 (annual datasets had previously been stored individually). The objective of this project was to enhance the NDRDD as a resource for examining drug-related deaths and to facilitate easier analysis of trends over time. To ensure consistency of all datasets and data quality, some recoding was undertaken. As a result of this work, some of the analyses described include revised figures which may differ from previous reports.

In order to provide an alternative perspective on medical and psychiatric co-morbidities, information from ISD's general acute inpatient and day case admissions (SMR01) and psychiatric inpatient admissions (SMR04) datasets were linked to the NDRDD cohort. Analysis of these data among drug-related deaths is included for the first time in this report. These analyses provide measures of hospital admission since 1997 (numbers of stays, time period between discharge and death – see Sections [3.4.3](#), [4.2.5](#) and [5.2.4](#)) and a description of stays in relation to specific conditions and related multi-morbidity (see Sections [3.3.1](#) and [3.3.2](#)).

In addition, data from ISD's Prescribing Information System has been used to supplement the NDRDD dataset, providing further detail about prescribing from 2009 onwards. Prescribing Information System data is restricted to 2009 onwards, as this is when Community Health Index numbers were first included (it is therefore, only individually identifiable from 2009 onwards). These data are reported in Sections [3.2.3](#) (substitute prescribing) and [3.7.3](#) (other prescriptions). In respect of both linkages, all relevant

² In addition to the NRS and NDRDD reports, NHS Health Boards may also report independently on drug-related deaths within their area or host websites providing relevant information to the public (e.g. <http://www.drdothian.org.uk/>).

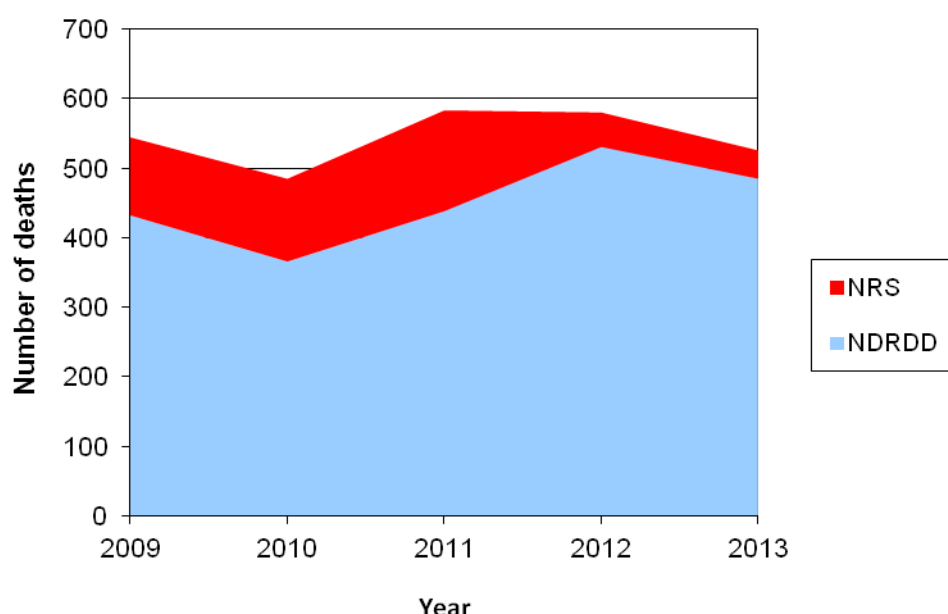
permissions for use and reporting of data were obtained in accordance with ISD's Information Governance processes.

Further information on methods is available in [Appendix A3](#).

2.1: The 2013 National Drug-Related Deaths Database Cohort

In 2013, a total of **485** records were identified as eligible for inclusion in the NDRDD cohort. This was a decrease in comparison to the number of cases reported in 2012 (531), reflecting the annual decrease recorded by NRS. Figure 1 shows the increasing convergence in terms of cohort size between the two datasets over time.

Figure 1: Number of Drug-Related Deaths in NRS and NDRDD Cohorts (2009-2013)



In 2013, a total of 508 records were submitted to ISD for the NDRDD but 23 (4.5%) did not meet the criteria for inclusion. The reasons for excluding these 23 cases are detailed in [Appendix A7](#). The percentage of cases that were excluded from the 2013 NDRDD cohort was lower than for 2012 (5.2%).

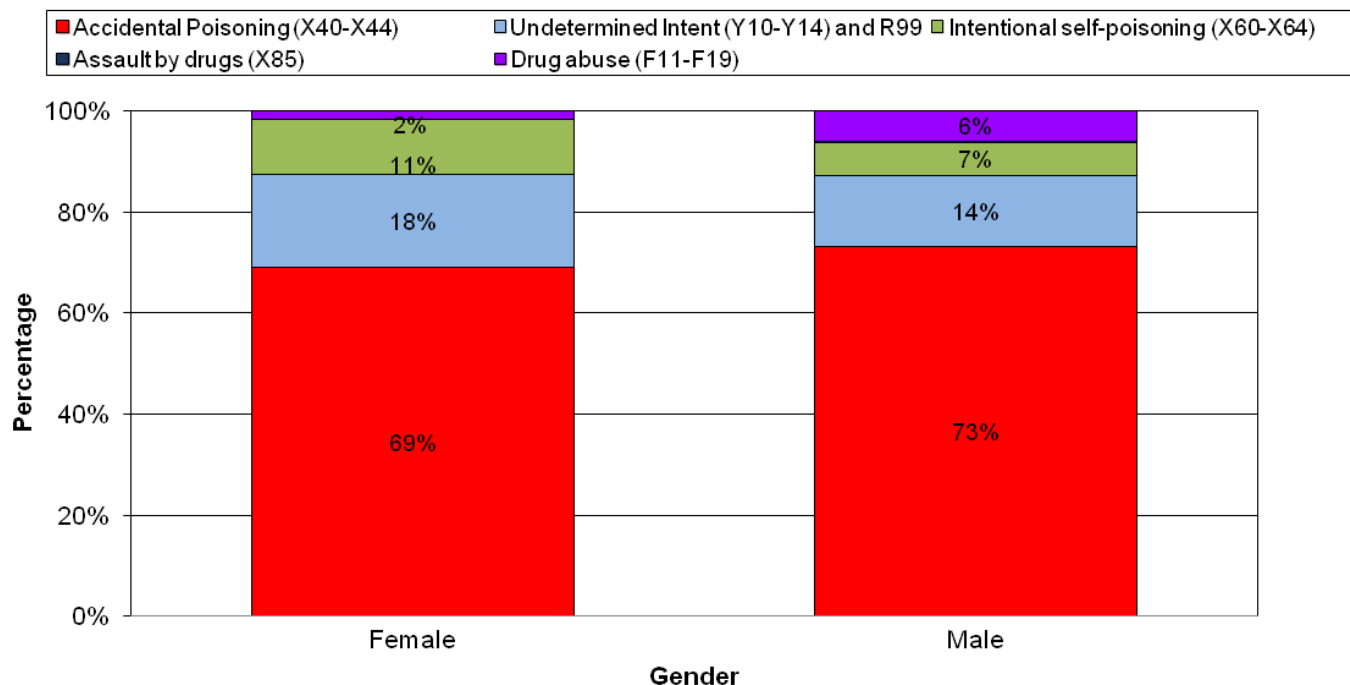
After matching to NRS data on drug-related deaths, it was possible to identify a total of 57 records that should have been returned to ISD for the NDRDD but for which records were not received. Full details of these missing records are provided in [Appendix A7](#). In 2013, the percentage of missing records was 10.5% ($57/485+57=542$) which was higher than for 2012, 7.2% ($41/531+41=572$).

Of the **485** records which were identified as eligible for inclusion in the NDRDD cohort, 37 (7.6%) cases were classed as deaths by suicide ('intentional self-poisoning' in Figure 2: reported in further detail in [Section 5](#))³. Therefore, a total of **448** records were identified as eligible for inclusion in the main NDRDD cohort in 2013 (hereafter referred to as 'the NDRDD cohort' or as 'non-intentional deaths').

³ Deaths categorised as 'intentional self-poisoning' were included in the NDRDD cohort 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.

Figure 2 shows the percentage of causes of death (as classified by ICD10 code) by gender. While the number of deaths by suicide ('intentional self-poisoning') was higher among males (24 compared to 13 among females), deaths by suicide accounted for a higher percentage of deaths among females (11%) than males (7%).

Figure 2: Cause of Drug-Related Deaths by Gender (NDRDD, 2013)



2.1.1: 'Novel' Psychoactive Substances (NPS)-Related Deaths

The NDRDD adopts the same definition as used by NRS [1] when including NPS within the dataset:

"The term 'New [or 'Novel'] Psychoactive Substances' (NPSs) is meant to cover the kinds of substances that people have, in recent years, begun to use for intoxicating purposes. NPSs include so-called 'legal highs' (by which is meant substances which were legally available at the time of the death, whether or not they have since become controlled). In general, when an NPS first became available, it would not have been a controlled substance under the Misuse of Drugs Act 1971. Some NPSs may still not be controlled under the Act. The definition of NPSs therefore includes current so-called 'legal highs', and also substances which used to be described as 'legal highs' but are now controlled." [1]

NDRDD Criteria for Counting NPS-Related Deaths

Inclusion and exclusion criteria for counting statistics on NPS-related deaths in a given year can be categorised in three ways:

- NPSs which were already controlled substances at the start of the time period of analysis;
- NPSs which became controlled substances during the time period of analysis (i.e. whose classification changed during the period covered by these figures for deaths involving NPS); and
- NPSs which were not controlled substances at the end of the time period (some of which have since become controlled substances).

NRS Criteria for Counting NPS-Related Deaths

A death due solely to one of these drugs would be counted in the NRS National Statistics on Drug-Related Deaths [1] if the person died on or after the specified date that the drug became controlled. A death due solely to an NPS drug would not be counted by NRS if it involved a drug that was not controlled at the time at the time of death.

3: Results and Commentary

This section presents the findings from the 448 non-intentional drug-related deaths in the 2013 NDRDD cohort, along with comparisons to previous years. Findings are organised by theme, with each subsection containing a short discussion. Unlike last year's report, the NPS and suicide sections are included in the main report, rather than as appendices.

The [data tables](#) include findings from the four previous cohorts from 2009, allowing comparisons to be made. While percentages in 2013 are described throughout, direct inter-group or inter-year comparisons included in the analysis are restricted to those where a significant difference ($p < 0.05$ based on a comparison of proportions or chi-square test where groups were thought to be different in nature) was identified. Except where individual cohorts have been identified as outliers, inter-year differences are generally based on comparison of 2009 and 2013.

Due to improvements in data completeness, the numbers of cases where information was known is not routinely reported (this information is available in the tables). The number of cases where information was known is only reported when completion was lower than 90%.

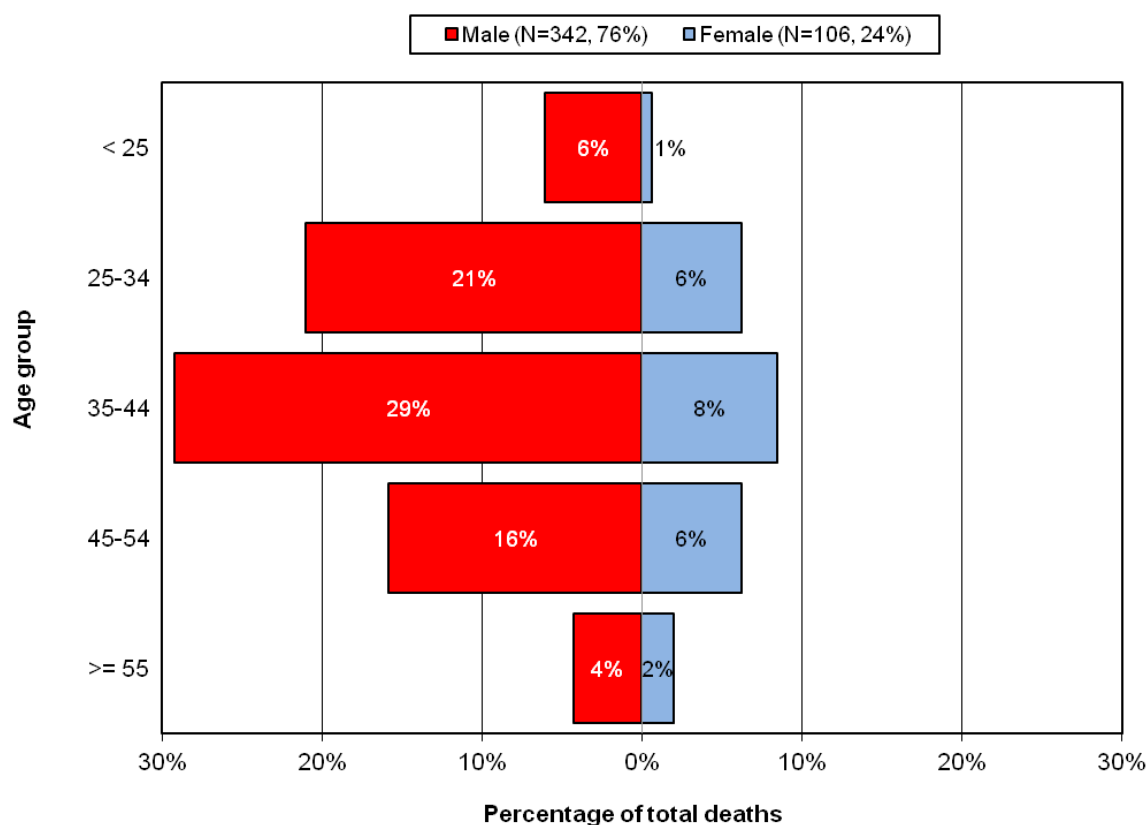
3.1: Socio-Demographics

This section examines the demographic and social characteristics of those who died a drug-related death in Scotland in 2013. Data on the age and sex composition, social and living situation of this group provide useful insights into the wider population of problem drug users and in particular, those who may be at highest risk of drug-related mortality.

3.1.1: Age and Gender

As in previous cohorts, around three quarters of those who died a drug-related death in 2013 were male (342, 76%). Across both sexes, the highest percentage of deaths was observed among those aged between 35 and 44 (169, 38%) (Table 1 and Figure 3).

Figure 3: Percentage of Drug-Related Deaths by Age Group and Gender (NDRDD: 2013)¹



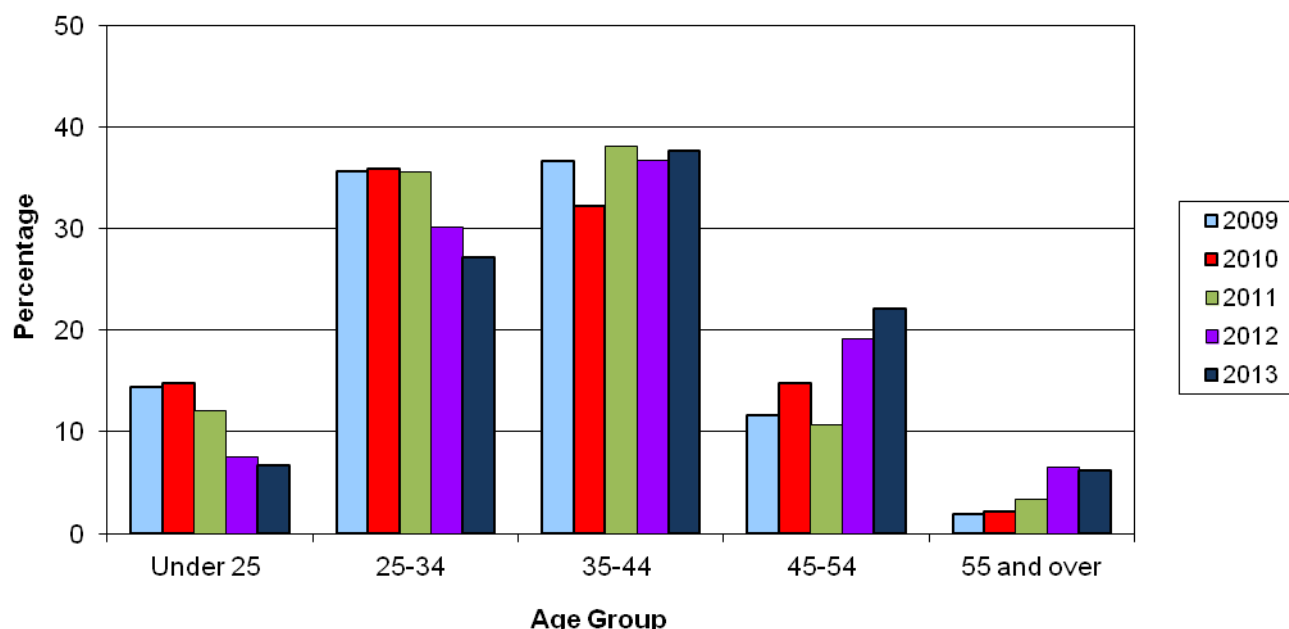
Note:

1. Due to rounding, totals in this chart do not equal 100%.

The mean age of individuals suffering a drug-related death increased from 34.4 in 2009 to 39.1 in 2013. The age distribution of drug-related deaths has also changed since the establishment of the NDRDD in 2009 (Figure 4). In 2013, the percentage of drug-related deaths in those aged under 25 (30, 7%) continued to decrease and was lower than in 2009 (2009: 14%, 2010: 15%, 2011: 12%, 2012: 8%). However, the most notable change has been in relation to older drug users. In 2013, two thirds (296, 66%) of deaths were among those aged 35 and over; higher when compared to half of drug-related deaths (216; 50%)

in 2009. In particular, the percentage of deaths among those aged 45 and over was higher in 2013 (28%) than in 2009 (14%).

Figure 4: Percentage of Drug-Related Deaths by Age Group (NDRDD: 2009-2013)



The increased presence of those in older age groups among drug-related deaths was apparent in both genders, although more marked among females (Table 1). Individuals aged 35 and over accounted for 52% of deaths among males in 2009 compared with 65% in 2013. However, among females, this percentage increased from 44% of deaths in 2009 to 71% in 2013.

3.1.2: Deprivation

The Scottish Index of Multiple Deprivation (SIMD) classifies postcode areas by deprivation on a scale of one to five, with one being the most deprived. Half those who died (212, 50%) had lived in the most deprived neighbourhoods (SIMD quintile 1) in Scotland. Only fifteen individuals (4%) who died a drug-related death lived in the least deprived areas (SIMD quintile 5). The percentage of deaths among those who lived in the most deprived neighbourhoods in Scotland was at its lowest overall level since the start of the NDRDD and was significantly lower than in 2012 (57%) (Table 2).

3.1.3: Living Arrangements

Seven in ten of those who died were reported to be living in their own home prior to death (318, 71%) and around one fifth (84, 19%) were living in a relative's home (Table 3)⁴. Four per cent were each reported to have lived in a friend's home, in supported accommodation or to be of no fixed abode or sleeping rough. Viewed as a single group, the percentage of individuals living in the most vulnerable circumstances (in a hostel or no fixed

⁴ It is important to note that individuals could have been reported as living at more than one place of residence at the time of death.

abode/sleeping rough) prior to death (28, 6%) was at its lowest since the start of the NDRDD (lower than in 2009: 11%).

More than half of the cohort lived on their own at least part of the time ((251, 57% - other responses were also provided) or all of the time (232, 53% - no other responses were provided) prior to death. Eighty-eight (20%) individuals were reported to live with their spouse or partner. Sixty-eight individuals (15%) were reported to have lived with their parents, 37 (8%) lived with other relatives and 24 (5%) with friends (Table 4).

3.1.4: Parenthood and Living with Children

Over a third of individuals suffering a drug-related death in 2013 (159, 36%) were a parent or parental figure to a child or children aged under 16 (similar to percentages in most previous cohorts). The total number of children who lost a parent/parental figure due to a drug-related death in 2013 was 273 (the third highest total seen in NDRDD cohorts (the highest total (331) was observed in 2011)) (Table 5).

Twenty-nine individuals (7%) who died a drug-related death were living with a child when they died (similar to previous years (2009: 9%, 2010: 9%, 2011: 10%, 2012: 8%)). Of the 273 children who lost a parent/parental figure due to drug-related death in 2013, 42 (15%) were living with them at the time of death. This figure was the lowest recorded since the start of the NDRDD (Table 6).

Almost half of females (49, 47%) who died a drug-related death in 2013 had children aged under 16, compared with around a third of males (110, 32%). Among parents, the average number of children was the same for both sexes (1.7). Female parents (16, 37%) were more likely to be living with their children at the time of death than male parents (13, 12%) (data not shown in tables).

Of those who lived with children at the time of their death, ten (34%) were known to use drugs intravenously. A total of 14 children lived alongside those known to use drugs intravenously prior to their death (data not shown in tables).

3.1.5: Discussion

The gender composition of the NDRDD cohort continues to be predominantly male (76%) and therefore broadly reflects the most recent estimates of the prevalence of problem drug use in Scotland (71% male) [9] and the population in specialist drug treatment (69% male) [10]⁵. Similarly, the finding that half of the cohort lived in the most deprived areas of Scotland indicates the continuation of an existing trend and supports the association between deprivation and health inequalities [12].

The increased prevalence of deaths among individuals (both males and females) from older age groups, first observed in 2012, continued to be evident. In this respect, 2012 and 2013 cohorts appeared quite similar in term of age structure, and somewhat different from 2009-2011 cohorts. Continuation of this pattern among 2014 deaths would provide a suitable rationale for examining this demographic change and its potential impacts in greater detail. Further commentary on demographic changes over a longer time period (comparing averages for 1999-2003 and 2009-2013) is available in the NRS report [1].

While the NDRDD age groupings were not used in the most recent report on the prevalence of problem drug use [9], those estimates confirmed that the population of problem drug users aged under 35 is decreasing, while the population aged 35 and over is

⁵ For comparable English figures [11].

increasing (from 0.9% of population in 2006, to 1.3% of population in 2012/13). While the definition of problem drug use for these estimates is restricted to routine and prolonged use of illicit/prescribed opiates and illicit benzodiazepines, the demographic composition and associated changes among this wider population of problem drug users bears some resemblance to drug-related deaths. Further work to refine prevalence estimates in order to provide further contextual detail about older drug users may be possible in the future.

Comparison with the 2013 Scottish population [13] showed differences in the age distributions, with drug-related deaths over-represented for those aged 25-34 (27% of 2013 NDRDD vs. 13% of Scottish population), 35-44 (38% vs. 13%) and 45-54 (22% vs. 15%).

There is widespread recognition that the population of problem drug users is ageing. Older drug users are becoming increasingly prevalent [1,9,14-16] and evidence from other ISD statistics [17] also indicates that an increasing percentage of people from older age groups are being treated for drug-related morbidities. Study on older drug users is currently being undertaken by a Working Group led by the Scottish Drugs Forum, with the support of the Scottish Government and ISD. This Working Group has defined older drug users as individuals aged 35 and over (providing the rationale for this report also to make specific reference to this age group). The ageing population of problem drug users presents a number of challenges for health and social care services (e.g. engagement and retention in treatment, risk awareness, targeting interventions, impact of co-morbidities, growing service provision costs and their impact on resource planning) which are currently being investigated by the Working Group and will be discussed at other points within this report.

Changes in living circumstances are also likely to be linked to changes in the age structure. The percentage of individuals living alone all or part of the time were both higher than the 34% of adults estimated to live alone among the general Scottish population in 2013 [18]. Compared to previous cohorts, both the 2012 and 2013 cohorts had higher percentages of individuals living alone all or part of the time and at home (more common among older age groups and both acknowledged as risk factors for drug-related death [19]). However, the percentage of individuals living in a hostel or no fixed abode/sleeping rough (recognised to be among the most vulnerable in terms of a range of risks including drug-related death [20]) was at its lowest since NDRDD started.

In 2013, fewer children were affected by the loss of a parent (273) or were living with parents known to use drugs (42) at the time of their death than in 2012. This is likely to be related to the size of the cohort. In 2013, around half of females who died had children aged under 16.

In 'Hidden Harm' [21], the then Scottish Executive outlined the harms caused to children of living with a parent with problematic drug use. These risks are likely to be highest among those children living with individuals known to use drugs intravenously. A total of 14 children lived with ten parents known to use drugs intravenously prior to death. That this figure was so low relative to the number of parents known to use drugs intravenously (148), suggests that child protection practice may be minimising risks for such children. However, the impacts upon children losing a parent to a drug-related death and risks of drug-related death among those living apart from their children are both worthwhile avenues for further research.

3.2: Substance Use History

Information associated with substance use (whether individuals were known to use drugs or injected drugs intravenously, had overdosed, undertaken a drug detoxification or suffered from problem alcohol use) contributes to our understanding of the extent and duration of substance use and associated risks among the NDRDD cohort.

Substitute prescribing data allows us examine a subgroup of opiate users receiving controlled drugs in a treatment setting, so that their deaths might also be understood in context. Data on substitute prescribing in 2009 and 2010 are presented for the first time (Tables 10 to 13). In addition, data from ISD's Prescribing Information System has been used to provide further detail about substitute prescribing from 2009 onwards.

3.2.1: Drug Use and Injecting Status Prior to Death

Nine out of ten individuals (395, 88%) were known to be using drugs prior to death (Table 7). This figure was broadly consistent with previous years. Of these, 321 (88%) were known to have used drugs for six years or more and around four in ten (144, 39%) had used drugs for 20 or more years. In 2013, the percentage known to have used drugs for 20 years or more was higher than that observed in previous years (2009: 17%, 2010: 22%, 2011: 20%, 2012: 28%).

Of those known to use drugs, 253 (64%) individuals were also known to inject drugs intravenously (IV). No clear trend in the prevalence of intravenous drug use was evident when compared across the time series. Data on the length of IV drug use was available for 225 (89%) people (Table 8). In 2013, the percentage known to use drugs intravenously for 20 years or more (60, 27%) was significantly higher than that observed in previous years (2009: 14%, 2010: 15%, 2011: 14%, 2012: 18%).

3.2.2: Drug Detoxification

Fewer than one in ten individuals suffering a drug-related death in 2013 (37, 9%) were known to have undertaken a drug detoxification in the year prior to death. Of these, nine had undertaken drug detoxification in the month before death (24%) while over two-thirds (25, 68%) had done so in the six months before death (Table 9).

3.2.3: Substitute Prescribing

Using data from ISD's Prescribing Information System, over half of the 2013 NDRDD cohort (229, 51%) had been prescribed an Opioid Replacement Therapy (ORT) drug at some point since 2009⁶. Of those ever prescribed an ORT drug, 96% (219) had been prescribed methadone at some point since 2009 (data not shown in tables).

Almost one third of the 2013 NDRDD cohort (138, 31%) were prescribed an ORT drug at the time of death. This percentage has steadily increased each year and was higher than in 2009 (21%). As in 2012, females (44, 42%) were more likely to have been receiving an ORT than males (94, 27%) (data not shown in tables). The vast majority of those on ORT received methadone (133, 96%), with the remainder (5) receiving suboxone. The percentage of individuals prescribed methadone was the same as in 2012. Unlike in

⁶, Due to issues with capturing Community Health Index numbers from hospital prescriptions, there is a risk that the figures presented may underestimate opioid substitute prescribing since 2009. Inter-year comparisons were not included in this report due to the restricted look back period available for analysis.

previous years, no individuals were prescribed buprenorphine at the time of death (Table 10).

Around three quarters of all ORT prescriptions were supervised (95, 74%) (Table 11). Two-thirds of those receiving methadone (85, 67%) were prescribed 31-90mg daily, 13% (16) were each prescribed up to 30mg daily or 91-120mg daily and 7% (9) were prescribed over 120mg. The median methadone dose was 70.0mg daily – this has remained the same since 2011 ((2009: 67.5mg, 2010: 65.0mg) data not shown in tables).

Information on the length of time individuals had been prescribed an ORT indicated that more than four-fifths (104, 81%) of these had received ORT for one year or more and two thirds (83, 65%) received ORT for four years or more. Although there was no change since 2012, the percentage receiving an ORT drug for four years or more was significantly higher than in 2009 (39%) (Table 12). Given the dominance of methadone among ORT prescribing, duration of prescription was largely similar (83% (103) having received methadone for more than one year) (Table 13).

3.2.4: Previous Overdoses

Around half of individuals in the 2013 cohort had previously experienced a non-fatal overdose (227, 51%), a similar percentage to previous years (2009: 47%, 2010: 46%, 2011: 53%, 2012: 53%). Among those who had previously overdosed, around two-fifths (81, 36%) had one known occurrence, while 36 (16%) were known to have overdosed at least five times prior to their death (Table 14). Where known, the median number of previous overdoses was two – this has remained the same since 2011 ((2009: 1, 2010: 3) data not shown in tables).

Of these who had suffered a previous overdose, 39 individuals (18%) had overdosed within the three months prior to death and 23 individuals (11%) had experienced their most recent overdose between three and six months prior to death. There appeared to be no overall pattern between NDRDD cohort in the percentage experiencing an overdose within three months of death (2009: 22%, 2010: 21%, 2011: 13%, 2012: 13%) (Table 15).

3.2.5: Alcohol-Related Problems

Having been identified as a recent medical condition which was unexpectedly decreasing over the 2009-2012 time series, variables related to alcohol problems were examined extensively prior to production of this report. An alternative category, taking into account a broader range of indicators⁷ was calculated and reveals a different pattern (2009: 43%, 2010: 45%, 2011: 39%, 2012: 42%, 2013: 43%), where prevalence of recent alcohol-related problems has remained stable among drug-related death victims over time (data not shown in tables). As the scope of information used in this category extends beyond recent medical conditions, it is not reported in [Section 3.3.1](#).

3.2.6: Discussion

The overall pattern of drug and alcohol use among the NDRDD cohorts has remained relatively unchanged over time – the overwhelming majority were known to have used

⁷ Individuals are categorised as having suffered recent alcohol-related problems if any of the following had been recorded in the six months prior to death: Alcohol-related medical condition; Alcohol-related psychiatric condition; problem alcohol use noted in mental health history; contact with alcohol services; and, treatment for alcohol dependence.

drugs, more than one half were known to have used drugs intravenously and around half had previously overdosed prior to death.

A new analysis indicated that prevalence of recent alcohol-related problems has remained stable across NDRDD cohorts (40-45%). The multi-faceted definition used for this broader category is potentially more useful in determining the extent of alcohol-related service contact/conditions among the cohort than the narrow definition of problem alcohol use on the basis of a recent medical condition used in previous reports.

Although many of the key indicators of substance use varied little over time, three substantial changes were apparent:

- The prevalence within the cohort of individuals known to have used illicit drugs (and to have used them intravenously) for 20 years or more was higher than in previous cohorts;
- the percentage of individuals receiving an ORT drug at the time of death increased between 2009 and 2013; and,
- the percentage of individuals receiving an ORT drug for four years or more at the time of death increased between 2009 and 2013.

The increasing presence among the NDRDD cohort of older, long-term drug users (many of whom are likely to have experienced the wide availability of heroin in the UK in the 1980s and early 1990s and have engaged in injecting drug use since that time [15]) may be linked to increases in the percentage prescribed ORT and the percentage of long-term ORT prescriptions. The ageing cohort of problem drug users may also bring about other challenges in terms of previous experiences and attitudes towards treatment, engagement, provision of appropriate services and therefore retention.

3.3: Medical and Psychiatric History and Significant Life Events

Information from medical records (e.g. GP notes) and other data sources is collected and recorded by NDRDD Data Collection Co-ordinators in order to examine the clinical histories and life events of individuals suffering a drug-related death. This information is generally collected on the basis of occurrence at any time prior to death, within six months of death and at time of death. Aside from domestic or sexual abuse, when reporting findings from the NDRDD, the period within six months of death is reported throughout the section below in order to provide a comprehensive account of recent diagnoses or problems.

While the information below is helpful in further contextualising the lives of those suffering a drug-related death, it is important to caveat these findings accordingly. Collection of these data is wholly dependent upon the comprehensiveness of source information (e.g. GP notes) and conditions or events are only recorded as occurring within a specific time period if noted as such in records. For example, lifetime occurrence of a condition does not entail that it will be recorded as occurring in the past six months, potentially leading to underestimates of some co-morbidities. Likewise, many conditions or events may not be recorded in medical or psychiatric notes etc. – they may be unknown to the individual, undiagnosed, or not reported to others by choice or because an individual was not in contact with services. The robustness of figures presented in this section may also be influenced by the lack of definitional rigour associated with some diagnoses or events, subjective differences in assignment of psychiatric diagnoses and the interpretation of those who record such information for the NDRDD.

As described in [Section 2](#), information from ISD's general acute inpatient and day case admissions (SMR01) and psychiatric inpatient admissions (SMR04) datasets has been linked to the NDRDD cohort. Related analysis is included below in order to provide an alternative perspective on medical and psychiatric co-morbidities.

3.3.1: Medical History

***Recent Medical Conditions*^{8,9}**

There were 322 cases in the 2013 NDRDD cohort (72%) where a medical condition had been recorded in the six months prior to death (Table 16). This figure was the second highest recorded by the NDRDD (2009: 64%, 2010: 64%, 2011: 68%, 2012: 75%) and was significantly higher than in 2009. In 2013, 121 individuals (27%) were recorded as having a recent respiratory condition, 82 (18%) had Hepatitis C, 74 (17%) suffered from an 'other condition'¹⁰ and 13% each suffered problem alcohol use (60) or liver disease (57).

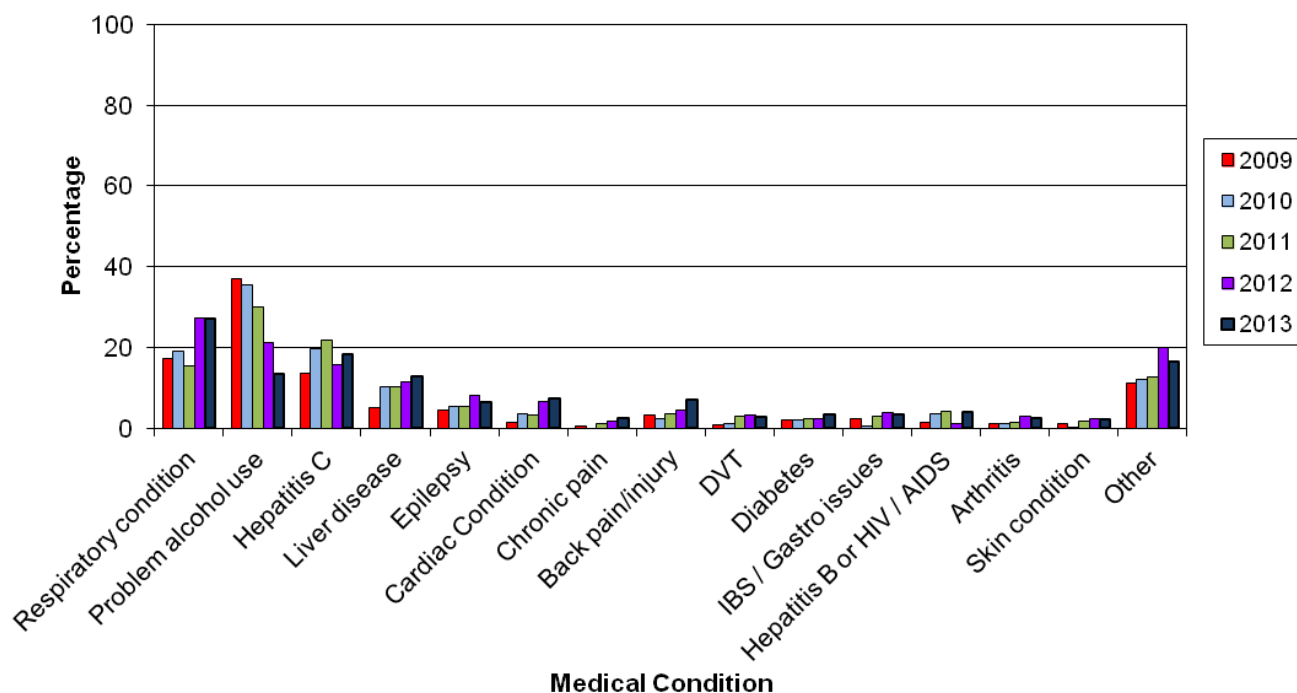
Over time (Table 16 and Figure 5), it can be seen that the percentage of cases with a cardiac condition (7%) or back pain/injury (7%) was higher in 2013 than in 2009 (1% and 3% respectively). In contrast, the percentage with problem alcohol use recorded as a medical condition (13%) was significantly lower than in any other year (2009: 37%, 2010: 36%, 2011: 30%, 2012: 21%).

⁸ It is important to note that, unlike in previous reports, psychiatric conditions have been excluded from inclusion within the medical conditions section – this change was applied to all cohorts. These conditions are now reported in Section 3.3.2.

⁹ It is important to note that individuals could have more than one condition recorded.

¹⁰ The category 'Other medical conditions' encompasses the following diagnoses: Obesity; Eating Disorder; Learning Disability; Sensory Impairment; Migraine; Kidney Disease; Pancreatitis (not alcohol-related); and cases recorded as 'Other medical condition' (e.g. fracture, cancers).

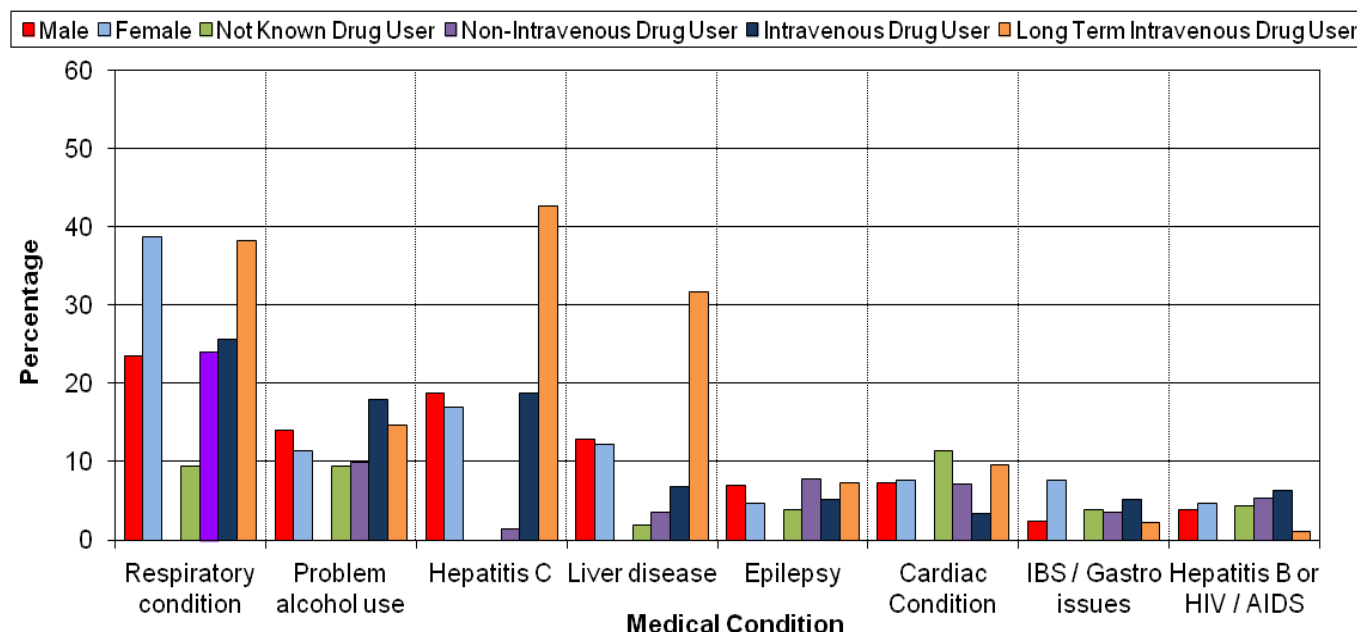
Figure 5: Medical Conditions Recorded in the Six Months Prior to Death (NDRDD: 2009-2013)



Additional analysis was conducted to investigate any differences in the prevalence of eight key medical conditions on the basis of gender and known drug use (Figure 6). In 2013, females had a higher prevalence of recent respiratory (39%) and GI conditions (8%) recorded than males (23% and 2% respectively). Long-Term Intravenous Drug Users (LT-IVDU: defined as individuals known to have used drugs intravenously for more than ten years) were more likely than other drug use groups in the cohort (individuals Not Known to be Drug Users (NKDU), Non-Intravenous Drug Users (N-IVDU) and Intravenous Drug Users (IVDU)) to have respiratory conditions, Hepatitis C and liver disease recorded in the past six months.

Analysis of recent multiple morbidity showed that individuals had a mean average of 1.0 of the eight specific medical conditions examined (Table 17). Averages for males (0.9) and females (1.0) were similar. Individuals aged 35 and over had a higher average (1.1) than those under 35 (0.6), as did LT-IVDU (1.5) when compared with other drug use groups. The average number of recorded recent medical conditions was consistent over time, ranging from 0.9 in 2009 to 1.0 in 2013.

Figure 6: Percentage of Individuals with Key Medical Conditions Recorded in the Six Months Prior to Death by Gender and Known Drug Use (NDRDD: 2013)

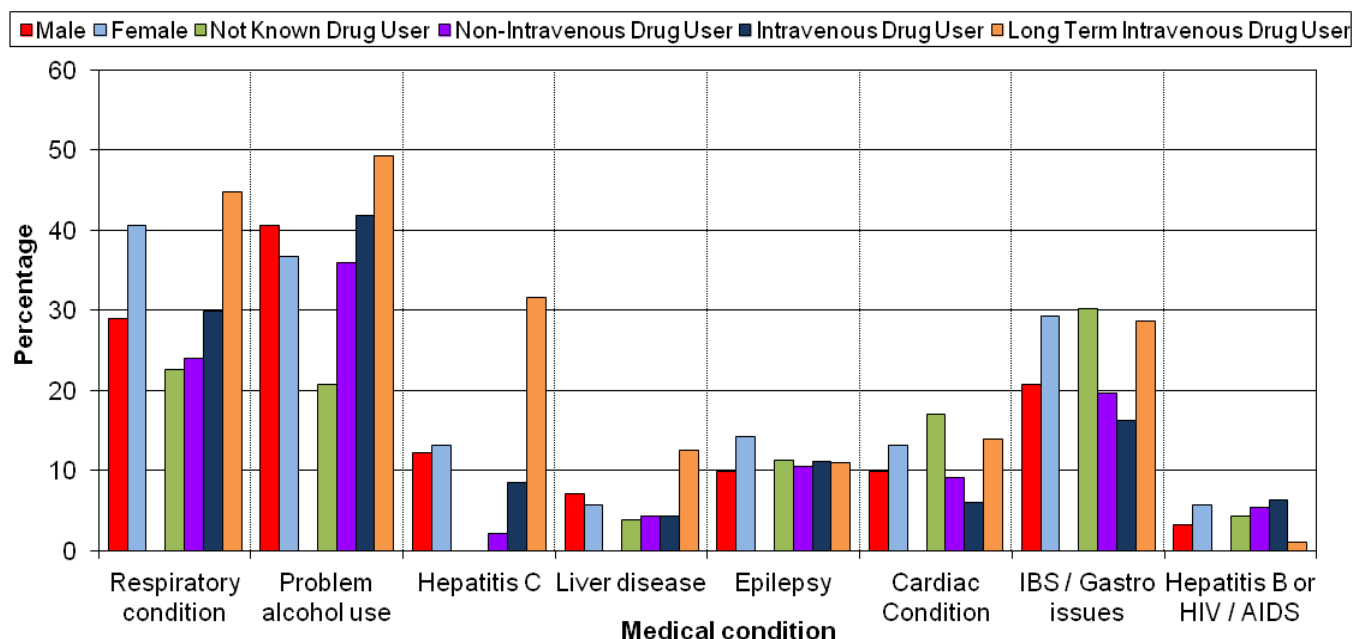


Diagnoses Related to Acute/General Inpatient Stays

General hospital admission since 1997 for the eight key medical conditions described above was also examined among individuals in the 2013 NDRDD cohort (Figure 7). Females had a higher prevalence of respiratory (41%) and GI (29%) admissions than males (29% and 21% respectively). A higher percentage of LT-IVDU had been admitted as an inpatient in relation to respiratory conditions, liver disease or Hepatitis C than other drug use groups in the cohort. All groups with drug use identified within the NDRDD (N-IVDU, IVDU and LT-IVDU) were more likely than those who did not (NKDU) to have been admitted to hospital in relation to problem alcohol use. In contrast, the profile of epilepsy admissions was the same irrespective of known drug use.

Analysis of multiple morbidity showed that, since 1997, individuals in the 2013 cohort had experienced general inpatient stays in relation to an average of 1.4 of the eight key medical conditions examined (Table 17). Individuals aged 35 and over had a higher mean (1.6) than those under 35 (0.9), as did LT-IVDU (2.0) when compared with other drug use groups. Determining a meaningful trend over time is not straightforward due to changes in time at risk for each successive cohort. However, the change from an average of 1.0 (2009) to 1.4 (2013) key medical conditions suggests that multiple morbidity in the NDRDD cohort may be increasing over time.

Figure 7: Percentage of Individuals with General Inpatient Stays related to Key Medical Conditions since 1997 by Gender and Known Drug Use (SMR01: 2013)



3.3.2: Psychiatric History

Recent Psychiatric Conditions^{11,12}

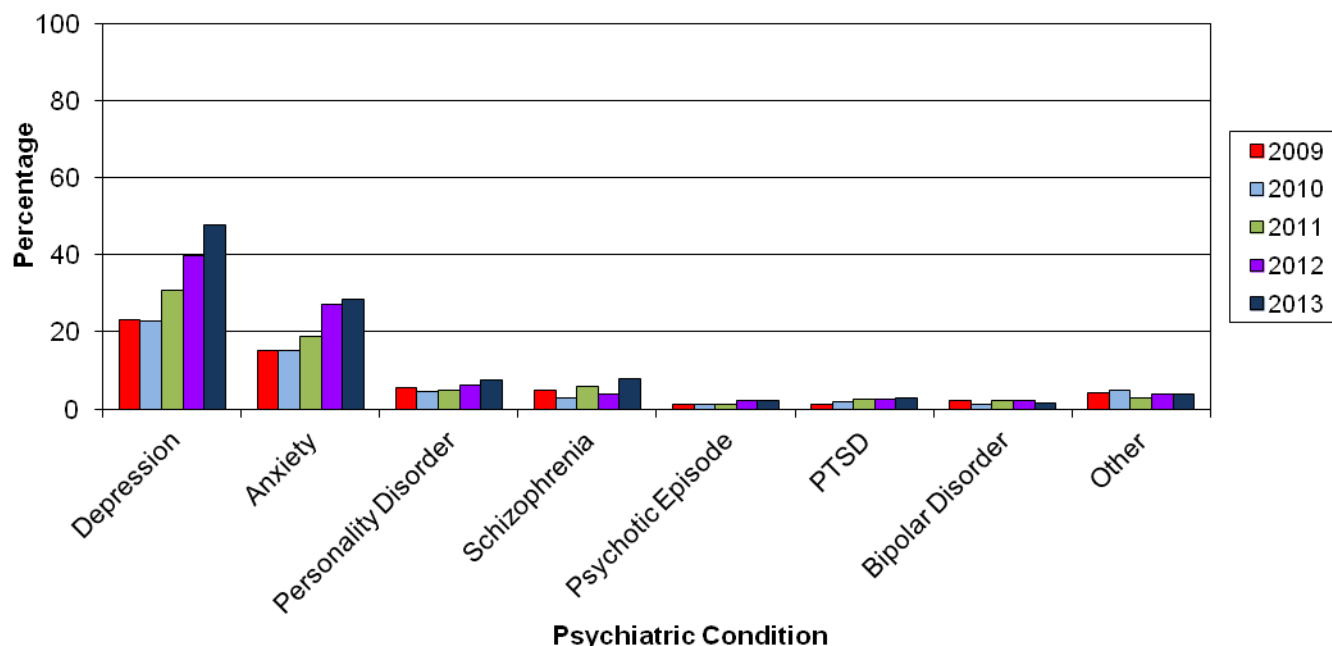
There were 280 cases in the cohort (63%) where a specific psychiatric condition had been recorded in the six months prior to death (Table 18). This figure was higher than that observed in other NDRDD cohorts (2009: 40%, 2010: 40%, 2011: 47%, 2012: 56%). In 2013, almost half (214, 48%) were recorded as suffering from depression, three in ten from anxiety (127, 28%) and 8% from either schizophrenia (35) or personality disorder (34).

Over time (Figure 8), increases in the percentage with depression recorded in the six months prior to death were observed when compared with data from previous years (2009: 23%, 2010: 23%, 2011: 31%, 2012: 40%, 2013: 48%).

¹¹ It is important to note that, unlike in previous reports, 'psychiatric condition' was removed from the medical condition analyses and relevant detail transferred to the psychiatric condition section. Therefore, relevant counts in all years are more robust than those previously reported.

¹² It is important to note that individuals could have more than one condition recorded.

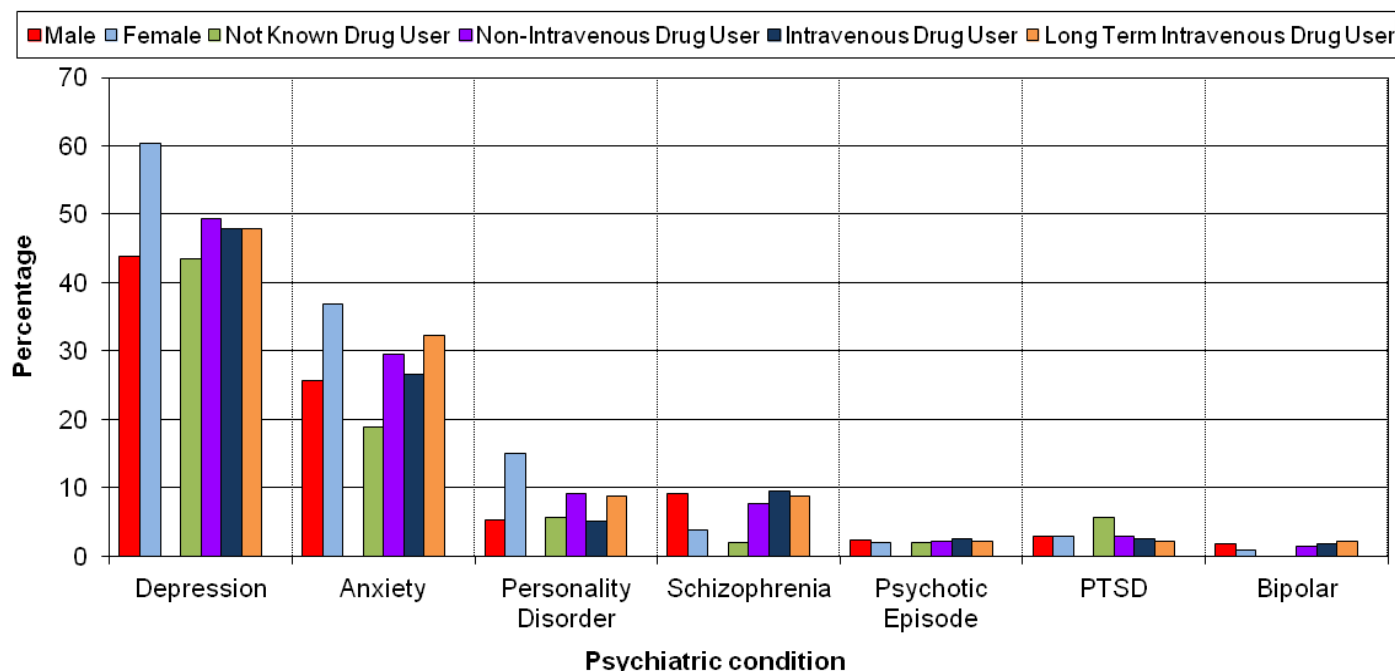
Figure 8: Psychiatric Conditions Recorded in the Six Months Prior to Death (NDRDD: 2009-2013)



Additional analysis was conducted to investigate any differences in the prevalence of seven specific psychiatric conditions on the basis of gender and known drug use (Figure 9). In 2013, a higher percentage of females were recorded as suffering from depression (60% compared to 44% of males), anxiety (37% compared to 26%) and personality disorders (15% compared to 5%), while males were more likely to have schizophrenia (9% compared to 4% of females) recorded. A higher percentage of individuals categorised as LT-IVDU (44, 32%) had anxiety recorded as a recent psychiatric condition than those categorised as NKDU (10, 19%).

Analysis of recent multiple morbidity showed that, in 2013, individuals had a mean average of 1.0 of these seven psychiatric conditions recorded recently (Table 19). The average number of conditions was higher among women (1.2) than men (0.9) and higher among those aged 35 and over (1.1) than among those under 35 (0.8). The increase in the average number of recorded recent psychiatric conditions from 2009 (0.5) to 2013 (1.0) was highly significant.

Figure 9: Percentage of Individuals with Key Psychiatric Conditions Recorded in the Six Months Prior to Death by Gender and Known Drug Use (NDRDD: 2013)

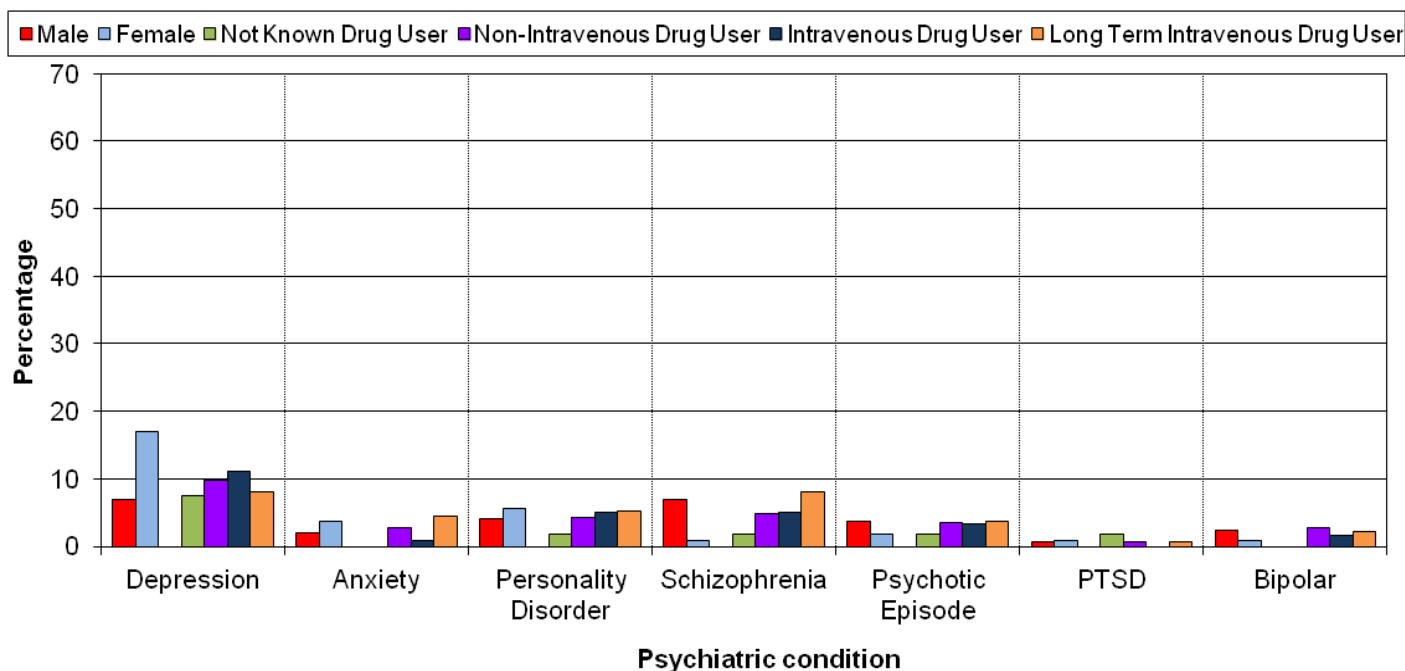


Diagnoses Related to Psychiatric Inpatient Stays

Psychiatric hospital admission since 1997 for the same psychiatric conditions was examined among individuals in the 2013 NDRDD cohort (Figure 10). Despite the longer time period examined, it was apparent that inpatient admission to a psychiatric hospital was considerably less common than recent recording of psychiatric diagnoses. Depression was the most prevalent recent psychiatric condition in NDRDD (214, 48%) and the diagnosis most often related to a psychiatric inpatient stay (42, 9%), yet only one fifth of those suffering depression were hospitalised. Females were more likely to have been hospitalised in relation to depression (17% compared to 7% of males) while males were more likely to have been hospitalised with schizophrenia (7% compared to 1% of females).

Analysis of multiple morbidity showed that, since 1997, individuals in the 2013 cohort had experienced psychiatric inpatient stays in relation to an average of 0.3 of the seven conditions examined (Table 19). Males and females both had an average of 0.3 conditions. Those aged 35 and over had an average of 0.3 and those under 35 had an average of 0.2 conditions. No discernable trend over time was evident in relation to multiple morbidity related to psychiatric hospital admission.

Figure 10: Percentage of Individuals with Key Psychiatric Inpatient Stays related to Psychiatric Conditions since 1997 by Gender and Known Drug Use (SMR04: 2013)



3.3.3: Recent Significant Events

In 2013, 277 individuals (62%) were recorded as having experienced a significant event in the six months prior to death (Table 20)¹³. This percentage was the highest observed by the NDRDD and was higher than in 2009 (2009: 54%, 2010: 60%, 2011: 56%, 2012: 58%).

In 2013, one quarter of individuals (114, 25%) were recorded as suffering ill health or a recent diagnosis – higher than in any other cohort (2009: 19%, 2010: 18%, 2011: 14%, 2012: 19%). Forty-six individuals (10%) each experienced a relapse or bereavement in the past six months. Thirty-nine individuals (9%) suffered a relationship breakdown and 37 (8%) were released from prison. In 2013, the percentage recently experiencing homelessness or housing problems was (10, 2%); the lowest observed since the start of the NDRDD.

3.3.4: Domestic and Sexual Abuse

In the 2013 cohort, 59 (13%) individuals were reported to have been a victim of domestic violence at some point prior to death (Table 21). Over four-fifths of those who suffered domestic violence were female (48, 81%). Thus, almost half of females (48/106, 45%) who died a drug-related death in 2013 had experienced domestic abuse at some point in their lives. The comparable figure for men was 3% (11/342).

Seventy-one individuals (16%) who died a drug-related death had experienced sexual abuse at some point prior to death (Table 22). Over half (39, 55%) of those suffering sexual abuse were female. Again, females (39/106, 37%) were more likely to have experienced this form of abuse than were males (32/342, 9%).

¹³ It is important to note that individuals could have more than one significant event recorded.

3.3.5: Discussion

Previous sections of this report have firmly established that the demographic profile of drug-related deaths in Scotland is changing. The increasing prevalence of older drug users and individuals with long-term drug using careers (often engaging in intravenous drug use) is clearly evident and is likely to be associated with changes in the prevalence of medical and psychiatric co-morbidities. While older age has been identified as a specific risk factor for drug-related death (EMCDDA [22]), length of time using drugs and other characteristics require evaluation as factors which may influence co-morbidity and increase the likelihood of drug-related death.

The cohort had high levels of medical conditions recorded in the six months prior to death. Specific conditions were related to gender and long-term intravenous drug use and analysis of multiple morbidity showed that age and long-term intravenous drug use were related to a higher average number of recorded medical conditions. It is likely that the increasing prevalence of older, long-term intravenous drug users is the principal reason for increasing morbidity in the cohort over time.

Analysis of inpatient and day-case acute hospital admissions related to key medical conditions largely confirmed the findings of the analysis of recent conditions in respect of prevalence among specific groups and multiple morbidity in general. As expected, prevalence of conditions was higher due to the longer timeframe (admissions since 1997 were analysed). This was particularly evident in relation to GI problems and problem alcohol use. Higher prevalence of GI admissions may be related to liver disease, drug/alcohol use or other lifestyle factors. Interestingly, the percentage admitted in relation to problem alcohol use was similar to the percentage identified as having recent alcohol-related problems using the new broader definition (see [Section 3.2.5](#)).

Prevalence of recent psychiatric conditions was at its highest level since NDRDD began, largely driven by an increase in the percentage recorded as recently suffering from depression. Analysis of multiple morbidity among the cohort provided strong evidence of increased psychiatric ill health over time. Again, this was likely to be due to the increasing prevalence of older drug users within the cohort. As expected, hospitalisation in relation to psychiatric conditions was much less common than recent recording of such conditions within medical notes. This is likely to be due to hospitalisation only occurring in the most severe cases.

The majority of the cohort had experienced a significant event in the six months prior to death. The increased prevalence of ill health or a recent diagnosis as a recent significant event in 2013 confirms, to some extent, the findings of the analyses of medical and psychiatric conditions. Again, a high percentage of female drug-related death victims had suffered domestic or sexual abuse at some point in their lives [23].

Individuals who have died a drug-related death often experienced a wide range of medical and psychiatric co-morbidities and significant life events in the period leading up to their death and it is possible that some of these events/conditions may have acted as triggers for the drug use that contributed to death. The changing demographic profile of the drug using population, and hence the NDRDD cohort, appears to be the main driver for the increasing prevalence of such risks. Although these findings require further examination, the inclusion of hospital inpatient data provides an important additional perspective in relation to co-morbidities and risks among this population.

3.4: Contact with Services

Information on recent contact with services can provide insights into the issues faced by individuals in the period immediately before death. Contact with a drug treatment service generally indicates that people were seeking help for problem drug use. Recent contact with non-drug treatment services are examined to ascertain the range of services individuals were known to and the types of support they sought. Recent hospital stays indicate the existence of a medical or psychiatric condition. Recent experience of police or prison custody indicates potential criminal activity, which may also have been linked to the use of drugs.

Although the NDRDD collects information on contact within different time periods (ever, within six months and at the time of death), this section generally emphasises on contact within six months of death in order to illustrate which services might have had an impact in terms of preventing drug-related death. Prison custody and combined acute and psychiatric hospital discharges are exceptions; both are also examined using timescales of four and twelve weeks before death, due to the use of comparable indicators in ISD's naloxone report [25].

3.4.1: Drug Treatment Services

Where known, around seven in ten individuals (311, 69%) suffering a drug-related death in 2013 had been in contact with a drug treatment service at some point in their lives. This finding was roughly the same as 2012 (70%) but higher than earlier years (2009: 61%, 2010: 59%, 2011: 59%) (Table 23). Fifty-three per cent (239) had been in contact with drug treatment services in the six months prior to death. Similarly, this was comparable to 2012 (54%) but higher than in earlier cohorts (2009: 33%, 2010: 33%, 2011: 31%). At the time of death, over one third of individuals (160, 36%) were actively being treated for their problem drug use (data not shown in tables).

Over one third (157, 35%) were in contact with an addiction service and one quarter in contact with their GP (109, 24%) in the six months prior to death (Table 24). Three per cent (15) had been in contact with psychiatric services, 3% (13) with an Accident & Emergency department and 2% (9) with social work services. The percentage in recent contact with addiction services was the same as 2012 (35%) and both years were higher than previous cohorts (2009: 27%, 2010: 27%, 2011: 25%). Interestingly, recent contact with a GP for drug treatment was observed in a higher percentage of the cohort in 2012 (37%) than in any other year, including 2013 (2009: 22%, 2010: 24% 2011: 22%, 2013: 24%).

Among individuals who had opiates (heroin/morphine, methadone or buprenorphine) present at death and were in contact with a drug treatment service in the six months prior to death, six in ten (132/227, 58%) were in receipt of an ORT prescription at the time of death (data not shown in tables). No overall pattern was evident in comparison with previous cohorts (2009: 49%; 2010: 65%, 2011: 72%, 2012: 49%).

3.4.2: Non-Drug Treatment Services

Although contact with non-drug treatment services within six months of death has been captured throughout the NDRDD, questions examining contact outwith six months of death were first introduced in 2012. In 2013, three-quarters of individuals (341, 76%) had been in contact with services for reasons other than management of a drug misuse problem at some point in their lives (an increase since 2012 (315, 66%)) (Table 25).

Focusing on the six months before death, half of the cohort (225, 50%) were in contact with non-drug treatment services. Recent contact was higher than in all other NDRDD cohorts before 2012 (2009: 43%, 2010: 42%, 2011: 44%, 2012: 48%). The percentage of females (56/106, 53%) and males (169/342, 49%) in contact with such services during this period was roughly similar. Where known, almost one quarter of the cohort (104, 23%) had been in contact with mental health services in the six months before death. Fifteen per cent (67) had been in recent contact with social work, one tenth (48, 11%) had attended alcohol services, and 7% had each attended housing (31) or homeless services (30). In 2013, recent social work contact among the cohort was at its highest level since 2009 (16%), while contact with housing services was at its lowest level since the NDRDD began.

Among those who had been admitted to a psychiatric hospital in the six months before death, 57% (13/23) had been in recent contact with mental health services. This was higher than the percentage in recent contact among those not recently admitted to a psychiatric hospital (91/425, 21%) (data not shown in tables).

3.4.3: Hospital Stays¹⁴

One in ten (43, 10%) of the 2013 NDRDD cohort had been discharged from an acute or psychiatric hospital following an inpatient or day case episode within four weeks of death. Cumulatively, one in five (84, 19%) had been discharged within twelve weeks. The percentage of the cohort with experience of previous hospital admission increased over time (2009: 86%, 2010: 87%, 2011: 90%, 2012: 88%, 2013: 93%).

Females were more likely to have been discharged from hospital within the past four weeks (16, 15%) compared to males (27, 8%). As expected, a higher percentage of individuals aged 35 and over (34, 11%) had been discharged from hospital within the past four weeks compared to those under 35 (9, 6%). A higher percentage of individuals categorised as LT-IVDU (23, 17%) than N-IVDU (9, 6%) or IVDU (6, 5%) had been discharged from hospital within the past four weeks (Table 26).

Acute/General Hospital Stays

As acute/general hospital inpatient stays were far more common than psychiatric inpatient stays, likelihood of admission among the whole cohort was similar to patterns observed when counting both types of stay (above – [Section 3.4.3](#)). Nine in ten of the cohort (407, 91%) had ever been admitted, while one quarter (115, 26%) had experienced a general hospital admission within six months of death. In 2013, the percentage of the cohort with experience of general hospital admission was higher than in 2009 (2009: 84%, 2010: 85%, 2011: 89%, 2012: 87%, 2013: 91%) (Table 27).

Females were more likely to have experienced a general inpatient admission ever, or in the past six months (respectively 95% and 32%) than males (89% and 24%). Similarly, individuals aged 35 and over were more likely to have experienced a general inpatient admission ever, or in the past six months (respectively 94% and 28%) than those under 35 (86% and 20%).

Known drug use by individuals influenced the likelihood of general hospital admission. The percentage with experience of previous admission was lower (45, 85%) among NKDU compared with LT-IVDU (129, 95%). Recent general hospital admission was higher among LT-IVDU (50, 37%) than among other groups (NKDU: 19%, N-IVDU: 22%, IVDU: 21%).

¹⁴ NDRDD data was linked to ISD's acute (SMR01) and psychiatric (SMR04) hospital inpatient databases in order to examine the number and nature of medical and psychiatric admissions and how recently before death they had occurred. Admissions to Scottish hospitals since 1997 were included within this analysis.

Among individuals who had been admitted to a general hospital in Scotland since 1997, the median number of inpatient stays since was seven - roughly the same as in previous years. In 2013, a higher median number of stays was observed among females (9), compared to males (6) and among those aged 35 and over (8) compared to those under 35 (5). On average, individuals categorised as LT-IVDU had twice the number of general inpatient stays (10) as those categorised as NKDU (5).

Psychiatric Hospital Stays

Examining psychiatric inpatient episodes (SMR04) among the cohort, one third (148, 33%) had experience of a previous psychiatric inpatient stay while 5% (22) had been discharged in the six months before death (Table 28). No differences were evident in relation to gender, but those aged 35 and over (109, 37%) were more likely to have had at least one previous psychiatric stay compared to those under 35 (39, 26%).

Known drug use by individuals influenced the likelihood of psychiatric hospital admission. Although the percentage experiencing recent psychiatric admission was similar among groups (NKDU: 4%, N-IVDU: 4%, IVDU: 5%, LT-IVDU: 6%), the percentage with at least one previous psychiatric stay was higher among LT-IVDU (56, 41%) than among most other groups (NKDU: 17%, N-IVDU: 31%).

The median number of psychiatric stays observed in the 2013 NDRDD cohort was two. No differences were evident between the groups examined.

3.4.4: Criminal Justice System

Around one third of the cohort (96, 31%) had been in police custody at some point in the six months prior to death. However, it should be noted that due to problems accessing police custody records in Glasgow, a large amount of data (143, 32%) for 2013 was missing, which may introduce bias into any comparison of trends (Table 29). In 2013, 42 individuals were reported to have been in police custody in the four weeks prior to death, while 69 were reported to have been in police custody in the twelve weeks prior to death (Table 30). Given the amount of missing data, 2013 figures are likely to underestimate the actual level of police custody contact among the cohort.

Around half of the cohort (213, 51%) had been in prison at some point in their lives prior to death. Over one in ten (55, 13%) had spent time in prison in the six months prior to death, as in 2012 (59, 13%). Males (50, 16%) were more likely than females (5, 5%) to have been in prison in the six months prior to death (Table 31). Among the 2013 NDRDD cohort, 19 individuals were released from prison in the four weeks prior to death and 32 were released in the twelve weeks prior to death. In 2012, the comparable numbers were 24 and 42 respectively. Taking into account cohort size, the percentage released from prison within four and twelve weeks of deaths was lower in 2013 (4% and 7% respectively) than in 2009 (10% and 14% respectively) (Table 32).

In 2013, experience of having been in prison was strongly correlated with drug use. Where prison custody experience was known, only 7% (3/47) of NKDU had been in prison, compared to 36% (47/130) of N-IVDU, 65% (73/112) of IVDU and 70% (90/129) of LT-IVDU (data not shown in tables).

3.4.5: Discussion

The majority of the cohort had been in contact with drug treatment services at some point in their lives and also within the six months before death (a similar pattern to that observed in 2012). Most were treated by a specialist addiction service or in a primary care setting and

the extent of recent contact indicates that the majority of the cohort were actively addressing their problem drug use shortly before, or at, the time of death.

Half of the cohort had been in recent contact with non-drug treatment services (e.g. mental health, social work) – similar again to 2012. These findings demonstrate that individuals suffering a drug-related death had complex and multi-faceted needs and often accessed a range of services prior to death. Viewed in the context of the amalgamation of health and social care services, it is apparent that there are opportunities for drug and non-drug services to work collaboratively to reduce the risks of drug-related death.

The NDRDD cohort had an increasing prevalence of hospital admission over time. The percentage with experience of an inpatient stay increased between 2009 and 2013. In 2013, one in ten were discharged from hospital in the four weeks before death. This measure relates to a risk factor for opioid-related death (due to a reduction of opioid tolerance or withdrawal during an inpatient stay [24]) and features as an indicator within ISD's most recent naloxone report [25]¹⁵. As observed in that report, hospital discharge in the four weeks before death was related to age (this can be explained by length of time at risk of admission) and gender. This report shows that it was also related to the nature and length of known drug use.

Due to the high prevalence of acute inpatient admissions among all hospital admissions, largely the same patterns were evident in terms of experience of, and length of time since most recent discharge. An increased number of general acute inpatient stays were evident among older individuals and LT-IVDU. Older individuals and LT-IVDU also had a higher prevalence of psychiatric inpatient stays, though only age was related to a higher number of stays.

It is well evidenced that the period immediately following release from prison (particularly in the first two weeks post-release) is a time of heightened risk of drug-related death [26-28]. Periods of imprisonment can result in reduced drug tolerance (due to abstinence or changes in the quantity or quality of illicit drugs), increasing the risk of overdose for individuals who return to drug use after their release. When liberated from prison, disruptions in substitute prescriptions and/or the increased availability of illicit drugs may also elevate risk of drug-related death. As in 2012, the time periods used by NDRDD for reporting previous experience of police and prison custody (4 and 12 weeks before death) were aligned to the timeframes used in ISD's report on take-home naloxone [25]¹⁶.

For the first time in this report, with the incorporation of data on hospital stays, it is possible to provide a complete account of services that individuals may have come into recent contact with as a result of problem drug use. In each NDRDD cohort, over two-thirds of individuals have been in drug treatment, in prison or police custody or discharged from hospital in the six months prior to their death (2009: 70%, 2010: 66%, 2011: 70%, 2012: 73%, 2013: 71%). Of these individuals, 90% (285/316) had opioids present at the time of death (data not shown in tables).

If those patterns of drug use been identified during service contact there may have been the potential to reduce the number of drug-related deaths by undertaking targeted harm

¹⁵ The percentages of the 2013 NDRDD cohort discharged from hospital 4 and 12 weeks before death were 10% and 19% respectively. The equivalent figures from the naloxone report were also 10% and 19% respectively. These figures correspond well, but as the naloxone indicators are based on opioid-related deaths from NRS statistics, equivalence was not anticipated.

¹⁶ The percentages of the 2013 NDRDD cohort released from prison 4 and 12 weeks before death were 4% and 7% respectively. The equivalent figures from the naloxone report were 5% and 9% respectively. These figures correspond relatively well - as the naloxone indicators are based on opioid-related deaths from NRS statistics, equivalence was not anticipated.

reduction measures (e.g. take-home naloxone distribution). The National Naloxone Programme supplies 'take-home' naloxone kits for opioid users at risk of overdose. This programme was introduced in Scottish prisons and drug treatment services in February 2011 and was taken up by all Scottish prisons by June 2011 [25]¹⁷. As part of the programme, a total of 13,808 'take home' kits were issued in Scotland between 2011/12 and 2013/14. Drug treatment services provide an ideal setting to identify individual's drug treatment needs, identify risks and intervene to reduce associated harms. Hospital settings, particularly when admission is identified as being associated with problem drug use, provide similar opportunities for intervention.

Custodial settings also provide opportunities to detect and respond to individuals who are thought to be at risk of overdose after their release. While distribution of take home naloxone to individuals liberated from prison is well established, the feasibility of distribution from police custody suites is currently being discussed at a national level. Although there is a lack of academic literature on the link between police custody and drug-related death, evidence of the experience of recent police custody among this cohort suggests this could be a significant opportunity for intervention.

¹⁷ The responsibility and accountability for the provision of health care services to prisoners transferred from the SPS to the National Health Service on 1 November 2011. These services are now provided within Scottish Prisons by respective local Health Boards.

3.5: Circumstances of Death

While previous sections of the report have focused on the profiles of those who died a drug-related death, the NDRDD also collected a range of information on the circumstances of their death. Ranging from the time and place of death to attempts to save individual's lives, these data help form a picture of how the death occurred, what situational factors may have contributed to it and interventions that may have helped prevent loss of life.

3.5.1: Temporal Distribution

Drug-related deaths were distributed relatively uniformly across days of the week (Table 33) and months of the year (Table 34). There appeared to be no evidence for a consistent pattern when compared to previous years.

3.5.2: Geographical Distribution¹⁸

NRS examines the geographical distribution of drug-related deaths in their National Statistics [1]. 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.

The council areas with the highest crude mortality rates were Dundee City (0.18 deaths per 1,000 population), followed by City of Glasgow (0.16 deaths per 1,000 population) and Clackmannanshire (0.12 deaths per 1,000 population). In East Dunbartonshire and Western Isles council areas, zero mortality rates were recorded (Table 35).

The NHS Health Boards with the highest crude mortality rates were NHS Greater Glasgow and Clyde (0.11 deaths per 1,000 population) followed by NHS Ayrshire & Arran, NHS Lothian, NHS Lanarkshire and NHS Tayside (all 0.09 deaths per 1,000 population). Western Isles was the only NHS Board where a zero mortality rate was recorded (Table 36). The crude rates observed by NDRDD were generally consistent with the relative ranking of council and health board areas on the basis of numerical estimates of problem drug users, included in the most recent drug prevalence study published by ISD [9].

3.5.3: Place of Drug Use and Place of Death

Where known, the majority of those suffering a drug-related death (263, 65%) consumed the drugs present at death in their own home (an increase compared to 2009 (55%)), while 118 (29%) consumed the drugs in another person's home. In 2013, a further 34 individuals (8%) had consumed the drugs in either a hostel, outdoors, in supported accommodation, in a hotel/temporary accommodation or in a public place indoors. Two individuals (0.5%) had consumed the drugs in prison (Table 37).

Where known, three-fifths of individuals (269, 60%) died within their own home (similar to 2012 (62%)) but an increase from previous years (2009: 51%, 2010: 53%, 2011: 53%)) and over a fifth (93, 21%) died in the homes of other people. Fifty seven individuals (13%) died in hospital, having been admitted following symptoms of overdose. One in twenty individuals (25, 6%) died in either a hostel, outdoors, in supported accommodation or in temporary accommodation (similar to 2012 (5%)) but a decrease compared to previous years (2009: 12%, 2010: 8%, 2011: 10%)) (Table 38).

¹⁸ These findings should be interpreted with caution given the small numbers observed in island council/NHS Health Board areas.

3.5.4: Persons Present at Scene of Overdose

Where known, another person was present at the scene of the fatal overdose in over half (249, 58%) of drug-related deaths in 2013; with 110 (25%) in the same room (Table 39). The percentage of deaths where persons were present in the same room was similar to previous years (2009: 25%, 2010: 23%, 2011: 28%, 2012: 23%).

3.5.5: Ambulance Attendance and Attempted Resuscitation

In the majority of cases (363, 81%) an ambulance attended the scene of death, while in 68 cases (15%) it did not. Among the cases where an ambulance did not attend, there were 17 deaths (4%) when an ambulance was not required because it was clear that the deceased was beyond medical intervention. The percentage of cases where an ambulance attended the scene was similar to previous years (2009: 83%, 2010: 84%, 2011: 86%, 2012: 82%) (Table 40).

Where known, in almost half of cases (196, 45%) an attempt was made to resuscitate the individual. This percentage was similar to previous NDRDD cohorts (2009: 44%, 2010: 47%, 2011: 43%, 2012: 39%) (Table 41).

In around two-thirds of cases where resuscitation was attempted, this was done by ambulance staff (123, 63%). Resuscitation was also attempted in a smaller number of cases by a friend (50, 26%), a witness (33, 17%), a spouse or partner (26, 13%) or a relative (22, 11%) (Table 42)¹⁹.

3.5.6: Naloxone Availability and Use²⁰

Naloxone is an opioid antagonist which is used to reverse the effects of an overdose. Opioids (methadone, heroin/morphine or buprenorphine) were present in the body at post mortem in 331 of the 442 drug-related deaths with known toxicology (75%). Whether or not there was a 'take-home' naloxone kit available was known in 242 (73%) of the opioid deaths. Naloxone was reported to be available in only seven of these deaths (3%) and was administered in only one instance (0.4%, 17% of cases where available)²¹ (Table 43).

3.5.7: Discussion

Drug consumption and death in the home of the individual occurred in around six in ten cases (similar to patterns observed in 2012) and was aligned closely with changes in living circumstances (more individuals living alone). Again, this is likely to be associated with the increased prevalence of older drug users.

¹⁹ It should be noted that different people (in differing roles) may have attempted resuscitation on the same individual.

²⁰ The intention of the Data Collection Sub-Group was to collect information about the availability of 'take-home' naloxone in the NDRDD as opposed to naloxone available through paramedics and medical staff. However, an examination of the naloxone data in the 2010 and 2011 NDRDD revealed that, in the cases where naloxone was administered, this was done by a range of people including relatives, paramedics and hospital staff. Therefore, it appears that the questions in the data collection form were not solely measuring 'take-home' naloxone as had been intended. As a result, the naloxone questions in the 2012 proforma were refined to specify administration of 'take home' naloxone provided directly to individuals at risk of an opioid overdose. Due to this change, naloxone availability and use in 2012 is not comparable to previous years.

²¹ In this instance it was not known who administered naloxone.

However, in spite of this, other persons were present at more than half of overdoses. Opportunities for intervention occurred frequently and were often taken by individuals present or arriving at the scene. However, the length of time between the overdose and potential life saving measures being employed (attempting resuscitation and calling an ambulance) was not known. Factors that may have inhibited a timely response to the overdose are that many of those present when the person died were not in the same room and that those present may, particularly when also taking drugs, not have had sufficient capacity to intervene.

Take-home naloxone was reported to be available in only seven cases where opioids (methadone, heroin/morphine or buprenorphine) were present in toxicology results but was administered in only one of these cases. It may be difficult to prevent opioid-related deaths that occur when no others are present at the scene or where those present do not have capacity to intervene. However, increasing the supply and availability of 'take-home' naloxone and providing associated overdose awareness/naloxone administration training enhances the overall potential for life saving interventions to be delivered and there is some evidence that opioid-related deaths within four weeks of prison release have reduced following implementation of the National Naloxone Programme [25].

3.6: Toxicology Data

The NDRDD dataset provides information about the drugs *present* in the body at post mortem. National Records 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 drug-related deaths. However, when information is not received, NRS assumes all drugs mentioned on the death certificate were implicated in the death.

The *presence* of a drug (NDRDD data) does not necessarily mean that the drug contributed to the death and interpretation of post mortem toxicology is complex. It is important to note that 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 and take into account their own expertise before coming to a conclusion. Some drugs are generally considered to be 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, some abused drugs are considered to pose less risk to life, even when an excess of the drug is ingested. The extent of agreement between pathologists from specific locations in relation to implication of specific substances has recently been examined by the NDRDD Pathologists Sub-Group and found to be generally good, although it was agreed this should be monitored on an ongoing basis.

3.6.1: Drugs Present at Time of Death

Toxicology results showing the drugs *present* in the body at the time of death (but not necessarily contributing to the death) showed that diazepam was the drug most commonly found at post mortem (295, 66%) (Table 44 and Figure 11). The percentage with diazepam present was lower than in any other cohort (2009: 77%, 2010: 76%, 2011, 79%, 2012: 77%). The presence of diazepam was lower in 2013 among females (61%) and males (67%) than in 2012 (80% and 76% respectively). The decrease among females was particularly marked; for the first time, it was not the substance most likely to be found present in female drug-related deaths (anti-depressants were found in 62% of female deaths: Table 45).

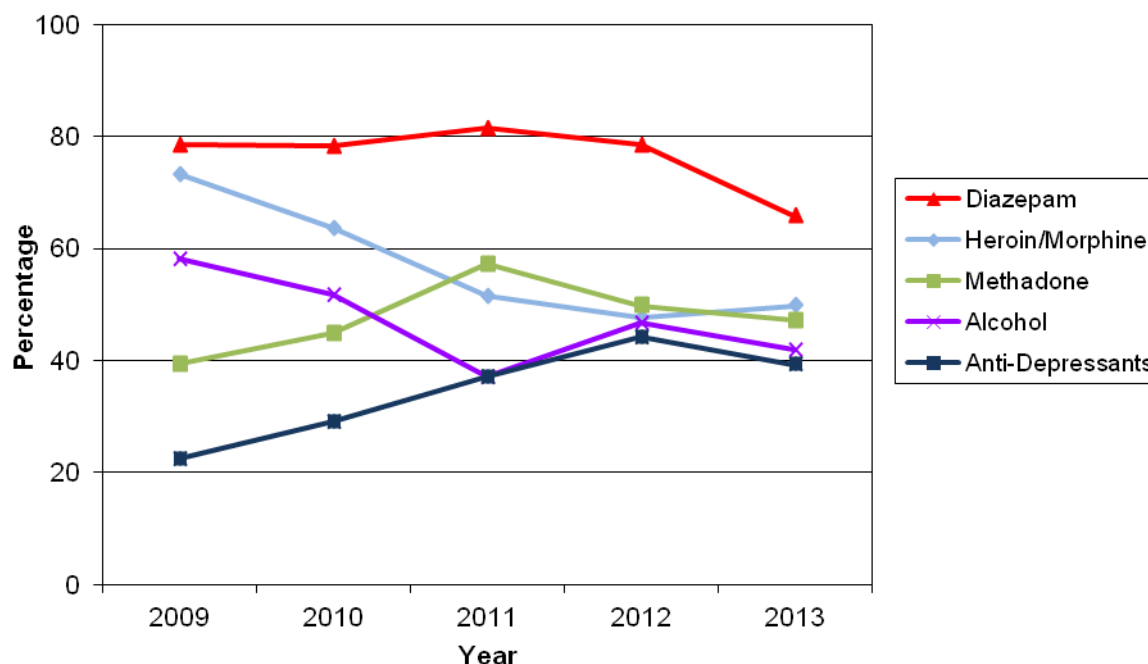
In 2013, heroin/morphine was present in half of deaths (223, 50%); a similar level to 2011 (51%), although lower than in 2009 (72%) or 2010 (63%). Heroin/morphine was present at post mortem in around half of males (177, 52%) and over four in ten females (46, 43%). The percentage of males with heroin/morphine present remained the same as 2011 and 2012 (both 52%), but was lower than in 2009 (75%). The percentage of females with heroin/morphine present increased since 2012 (33%) but has fluctuated across the time series.

In 2013, the third most common drug found at post mortem was methadone (211, 47%). Methadone prevalence continues to decrease and was lower than the highest level observed (2011: 56%). In 2013, females (61%) were more likely to have methadone present at the time of death than males (43%) – a similar difference was observed in all previous NDRDD cohorts with the exception of 2012 (50% and 48% respectively).

Alcohol was present at post mortem in 188 cases (42%) in 2013, which was similar to 2012 (45%) but lower than in 2009 (58%). Alcohol prevalence was lower among females (36, 34%) than males (152, 44%). Examining previous cohorts, alcohol prevalence among males has fluctuated considerably (2009: 61%, 2010: 53%, 2011: 38%, 2012: 46%) while prevalence among females has changed less over time.

Anti-depressants were present in 176 cases (39%) in 2013, a similar finding to 2012 (42%), although still higher than in 2009 (22%). Anti-depressants were the most prevalent drugs found at post mortem among females (66, 62%) and were found in almost twice the percentage of cases than among males (101, 32%). A pattern of increasing presence over time was evident for both genders (2009: 33% and 18% for females and males respectively).

Figure 11: Most Common Drugs Present at Post Mortem (NDRDD: 2009-2013)



The next most common drugs found present at post mortem were cannabis (84, 19%), codeine (76, 17%), phenazepam (72, 16%) and dihydrocodeine (95, 15%). The prevalence of phenazepam at post mortem was higher than in 2012 (5%). Gabapentin prevalence also continued to increase and was higher in 2013 (64, 14%) than in 2011 (4%).

3.6.2: Combinations of Drugs Present at Time of Death

Of the 442 drug-related deaths with known toxicology in 2013, the vast majority (429, 97%) had multiple drugs present at the time of death (data not shown in tables). This was similar to previous cohorts (2010: 98%, 2011: 97%, 2012: 98%). Given this evidence of widespread poly drug use among drug-related death victims, it is important to examine combinations of illicit drugs found present (Table 46).

Heroin-diazepam was the most common combination of drugs found at post mortem (161, 36%), used by 38% of males (130) and 29% of females (31). Co-presence of these drugs decreased throughout the NDRDD and was at its lowest level since NDRDD started (lower than 2009: 57%).

The second most common drug combination in 2013 was methadone-diazepam (154, 34%). Co-presence of methadone-diazepam has been higher among females than males throughout the NDRDD and this continued to be observed in 2013 (47, 44% and 107, 31% respectively). Having peaked in 2011 (48%), prevalence was lower in 2013.

Diazepam-alcohol was the next most commonly present drug combination in 2013 (126, 28%), with prevalence similar to 2011 (29%) but lower than in 2009 (44%). A lower percentage of females (18, 17%) than males (108, 32%) had both of these drugs present in

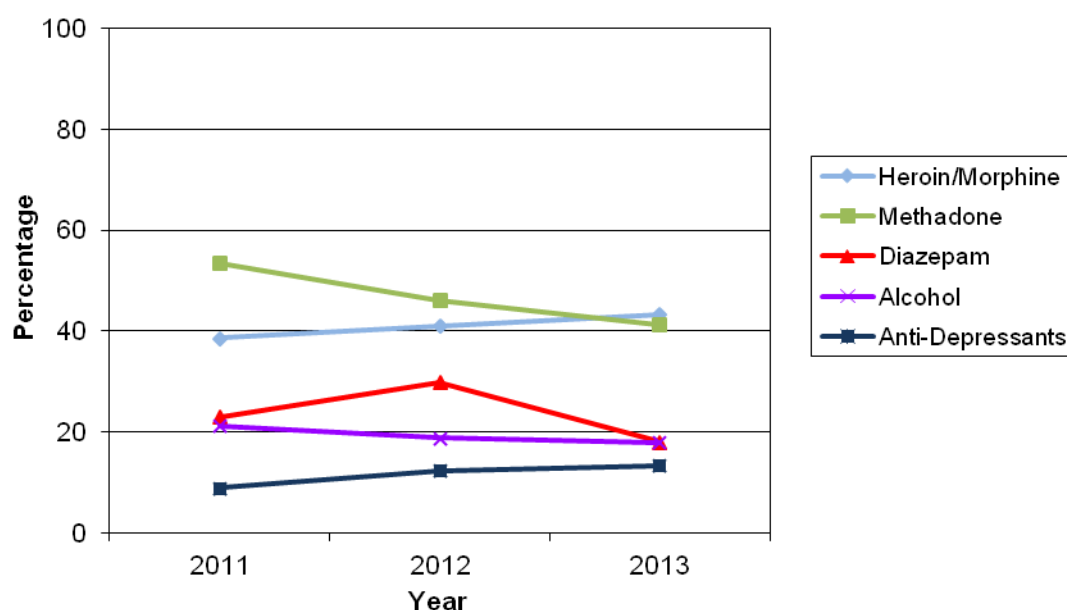
2013 (in previous years, the percentage from each gender was very similar). The fourth most common drug combination present was heroin-alcohol (104, 23%). Prevalence of this combination has been roughly the same since 2011, but was lower than the percentages observed in 2009 (44%) and 2010 (32%).

3.6.3: Drugs Implicated in Death

Toxicology information has been supplied by NRS since 2011 and was available for 437 (98%) NDRDD deaths in 2013. However, in eighteen cases (4%) none of the drugs present were regarded as being implicated in the death. Therefore, data on the potential contribution to death of specific drugs was available in 419 (94%) deaths in 2013. Among cases where NRS data were available, multiple drugs were implicated in 68% (297/437) of 2013 NDRDD deaths (the same percentage seen in 2012).

Heroin/morphine was the drug most frequently implicated in deaths (194, 44%), followed by methadone (185, 42%), diazepam (81, 19%), alcohol (80, 18%), anti-depressants (58, 13%) and dihydcodeine (55, 13%) (Table 47 and Figure 12). Methadone was implicated in a lower percentage of deaths than in 2011 (54%) but a similar percentage to 2012 (45%). Diazepam was implicated in a lower percentage of deaths than in 2012 (29%). Other drugs were roughly similar in terms of implication from 2011 to 2013. Opioids (methadone, heroin, morphine or buprenorphine) were *implicated* in three quarters (331, 76%) of deaths.

Figure 12: Most Common Drugs Implicated in Death (NDRDD/NRS: 2011-2013)



Gender differences in drugs implicated were also analysed but were found to reflect the differences observed in drugs present (see [Section 3.6.1](#)). For example, anti-depressants were more likely to be implicated in deaths among females than males (31% and 7% respectively).

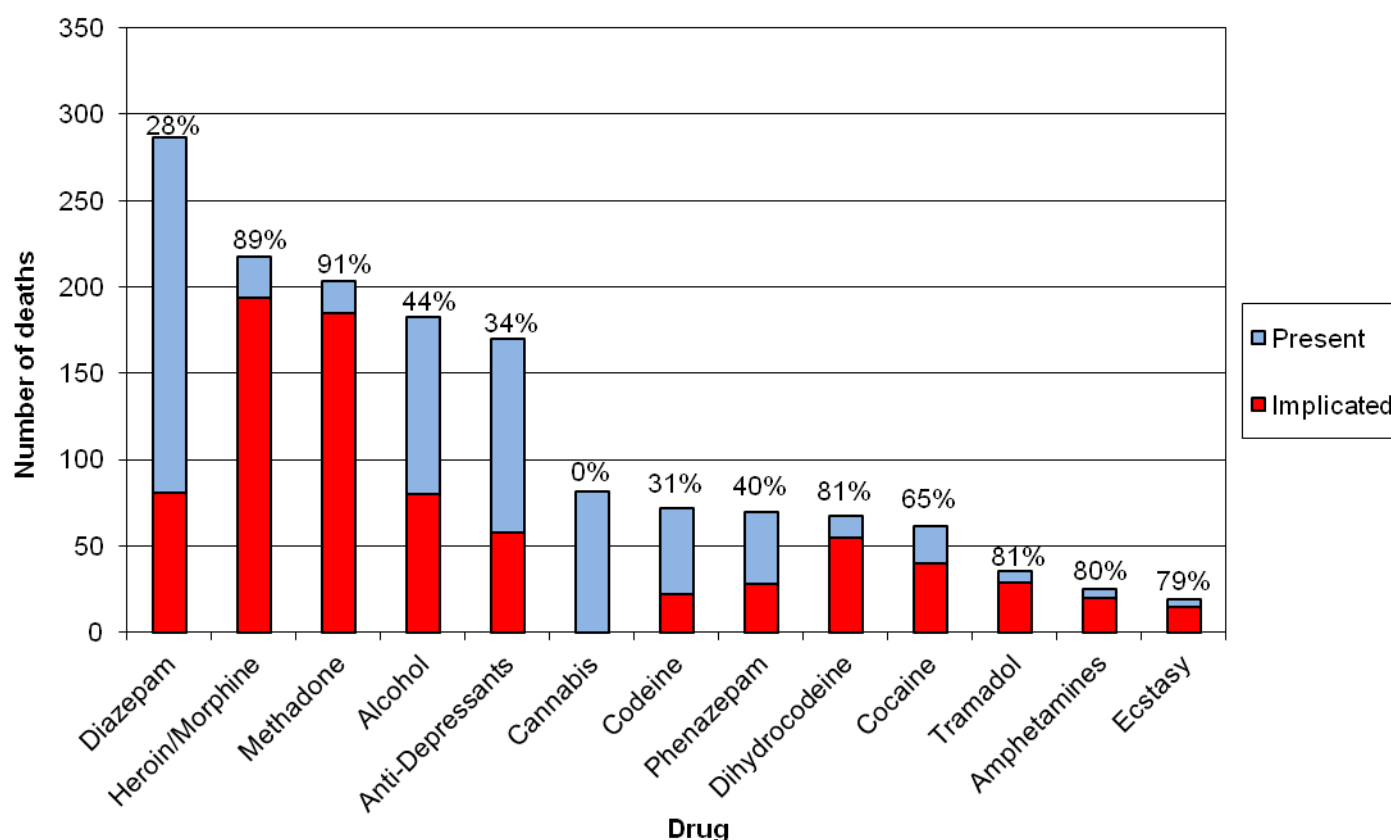
In order to calculate drugs implicated as a percentage of drugs present, the data for the 11 cases with no NRS data were removed from the 2013 NDRDD dataset. This resulted in toxicology data for drugs present and drugs implicated being available for 437 individuals (Table 48 and Figure 13).

Where methadone was present, it was implicated in 91% of deaths (185/204). The drug with the next highest proportion of implicated to present was heroin/morphine (89%),

194/218). Dihydrocodeine (81%, 55/68), tramadol (81%, 29/36), amphetamines (80%, 20/25) and ecstasy (79%, 15/19) also had high implicated/present ratios, although some were based on a small number of deaths. In contrast, although alcohol, anti-depressants and diazepam were among the most common drugs found present at post mortem, they were implicated in less than half of deaths where present (alcohol: 80/183, 44%; anti-depressants: 58/170, 34%; diazepam: 81/287, 28%) (Table 48).

In 2013, the percentage of cases where heroin/morphine was present and implicated continued to increase and was higher than in 2011 (2011: 79%, 2012: 84%). Anti-depressants and dihydrocodeine were both present and implicated in a higher percentage of deaths than in 2012 (24% and 71% respectively). The percentage of cases where diazepam was present and implicated was lower than in 2012 (38%) – returning to a similar percentage to 2011 (30%).

Figure 13: Number and Percentage of Deaths where Drugs Present and Implicated (NDRDD/NRS: 2013)



3.6.4: Discussion

Despite a reduction in prevalence (thought to be caused by the impact of legally available benzodiazepines (i.e. phenazepam)), diazepam continued to be the substance most commonly found in toxicology results after a drug-related death (present in two-thirds of deaths). Heroin/morphine was the second most commonly found substance at post mortem, followed by methadone, alcohol and anti-depressants (each present in 40-50% of deaths) in 2013. Poly drug use was evident in the overwhelming majority of the cohort.

Data supplied by the NRS on substances implicated in drug-related deaths were incorporated into the NDRDD dataset. Using these data, it was seen that heroin/morphine

was the drug most frequently implicated in deaths, followed by methadone, diazepam, alcohol, anti-depressants and dihydrocodeine. Despite their overall prevalence in toxicology results, substances varied widely in the percentage of deaths in which they were implicated; methadone was implicated in over 90% of deaths where present, while diazepam was implicated in less than one third.

The percentage of deaths with heroin/morphine present appears to have stabilised during the period from 2011 to 2013. In contrast, the percentage of deaths with methadone present continued to fall from its peak in 2011. Viewed alongside the high percentage of individuals in recent contact with drug treatment services observed from 2012 onwards, this provides further evidence of a heroin drought in 2010 and 2011²², where individuals may have sought alternatives such as methadone (either from drug treatment services or illicit sources). The decreasing percentage of deaths with methadone present supports this explanation. However, the absence of a corresponding subsequent increase in heroin/morphine deaths suggests that patterns of drug use are changing, rather than reverting to the patterns observed prior to the heroin drought. In 2013, increases in the presence of phenazepam and gabapentin at time of death were especially noteworthy. [Section 4](#) on NPS describes some aspects of changing patterns of drug consumption in greater detail.

The number of methadone prescriptions in Scotland rose from 15.2 defined daily doses per 1,000 population per day in 2009/10, to 15.9 in 2010/11 and has since fallen to 15.1 in 2011/12, 14.0 in 2012/13 and 13.1 in 2013/14 [31]. While methadone prescription among the NDRDD cohort did not reflect these changes and continued to increase, overall methadone presence in toxicology results decreased in 2013. Despite being regarded as a safer drug than heroin [32], the proportion of deaths with methadone implicated was roughly the same as heroin/morphine (and only slightly higher than other opioids) in 2013.

Despite a decrease in the presence of anti-depressants in 2013, their implication in drug-related deaths increased. These changes are likely to be linked to the increasing percentage of cases where depression was recorded as a recent psychiatric condition and possibly the tendency for such drugs to be prescribed alongside ORTs. The role of anti-depressants in drug-related death warrants further investigation, particularly in females who were more likely than males to have these drugs present at the time of death.

Despite it being the most common drug present in toxicology, there is limited academic research on the influence of benzodiazepines (e.g. diazepam, phenazepam) in drug-related death. Further research on the cultural and toxicological role of diazepam in drug-related death in Scotland is currently being undertaken by members of the National Forum on Drug-Related Death and will enhance understanding of this issue. Recent prescribing of both diazepam and anti-depressants among the NDRDD cohort are described alongside an account of ORT prescribing in [Section 3.7](#).

²² During this period, the purity of the heroin available in the UK was unusually low [29-30]

3.7: Prescribing

Individuals who consume illicit drugs in addition to prescribed ORT drugs are at higher risk of overdose than those complying with a treatment programme tailored specifically to their needs. 'Topping up' suggests individuals are receiving an insufficient dose (possibly as part of titration process) [33] of their prescribed ORT drug, may be insufficiently motivated to comply with treatment and/or may be diverting/selling some or all of these drugs. Consumption of illicit drugs in addition to prescribed substitutes also exposes individuals to the potential dangers of combining certain drugs and unanticipated changes in street drug potency or quality over time, both of which increase the risk of overdose.

While 'topping up' is a problem specifically associated with ORT drugs, diversion of prescriptions relates to a wider range of substances with abuse potential. Diversion may be indicated by the absence of specific drugs in the toxicology results of those in receipt of a prescription, or by their presence in the toxicology results of those without prescriptions. While the former measure suggests non-consumption or possible diversion, the latter measure is indicative of illicit supply.

The 2011 and 2012 NDRDD reports examined methadone-related deaths in detail after a rise in the number of deaths in which it was found present at post mortem (39% in 2009, 44% in 2010 and 56% in 2011). Since then, the percentage of cases with methadone found present at post mortem decreased to 49% in 2012 and 47% in 2013. Despite this decrease, methadone has a very high rate of implication (91% where present) in drug-related death and there continues to be considerable public concern about its use as an ORT. These concerns were addressed by the Scottish Drug Strategy Delivery Commission's Expert Review of Opioid Replacement Therapies in Scotland [34] in 2013. This concluded that, despite concerns about its safety, there was a strong evidence base for the continued use of methadone in Scotland within recovery-oriented systems of care.

As discussed in last year's report, supplementing the NDRDD dataset with prescribing information held by LSD, facilitates more extensive analysis of a wider range of prescribed drugs. Therefore, in addition to maintaining some focus on ORTs, this section now includes information on other widely abused prescription drugs. Key themes examined as part of this analysis of drug-related death and prescribing are:

- individuals consuming illicit drugs in addition to prescribed medication (in the context of ORT prescribing: 'topping up');
- deaths where methadone was implicated; and,
- prescription (and possible diversion) of other medication.

3.7.1: Drugs Present by Substitute Prescription

In order to examine adherence to ORT prescriptions and potential diversion of such drugs it is necessary to examine drugs present in the body at post mortem (Figure 14 and Table 49). Over nine-tenths (127/138, 92%) of those receiving an ORT (or 94% (125/133) of those receiving methadone²³) had methadone present in their body at post mortem compared to 27% (84/310) of those who were not receiving an ORT. While the percentage of those on a methadone prescription with methadone present remained the same (2009: 90%, 2010: 96%, 2011: 97%, 2012: 94%), the percentage of those not receiving an ORT

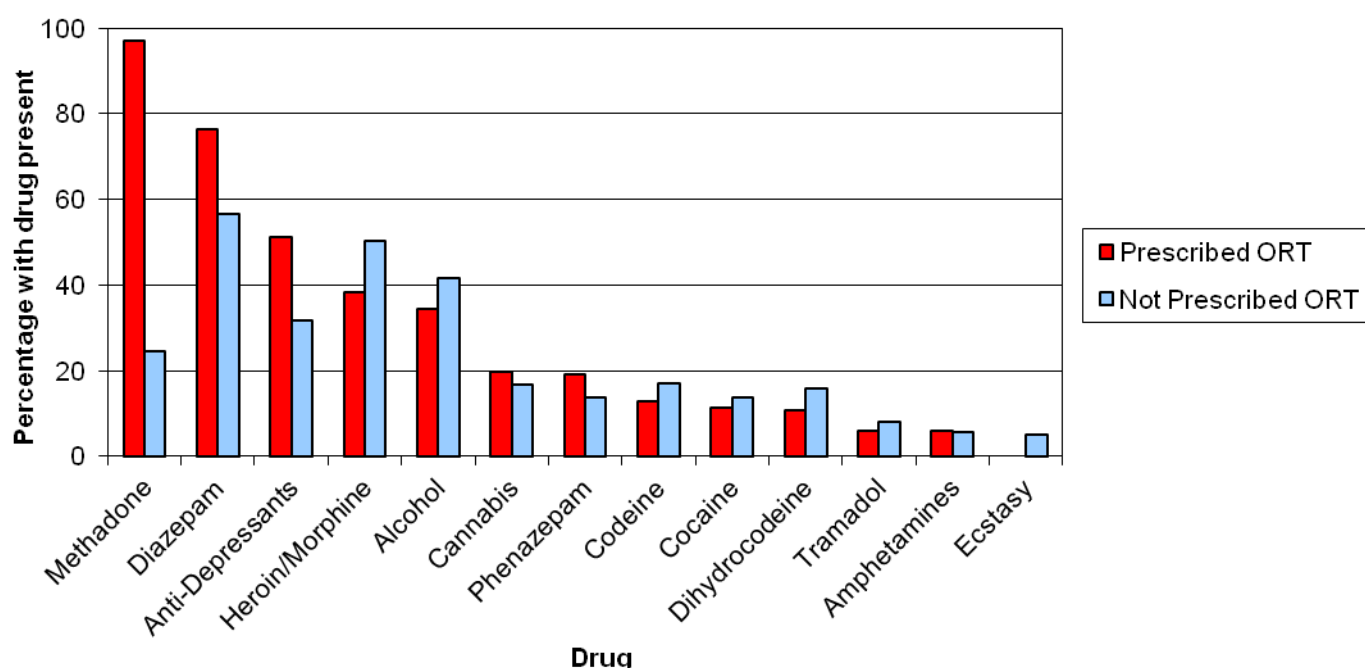
²³ Of the eight individuals with a methadone prescription who did not have methadone present in their body at post mortem, three received their methadone in a supervised setting (in two cases, supervision was unknown).

who had methadone present in toxicology (27%) was lower than in 2012 (33%) or 2011 (46%) (comparable with the 2009 (28%) and 2010 (31%) cohorts) (Table 49).

Seventy-three per cent (100/138) of those receiving an ORT had diazepam present compared with 63% (195/310) who were not receiving an ORT. In line with the wider decrease in diazepam presence, both percentages were lower than in 2012 (83% and 75% respectively). Around half (67/138, 49%) of those in receipt of an ORT had anti-depressants present at post mortem compared to 35% (109/310) of individuals not receiving an ORT.

Over one third (50/138, 36%) of those in receipt of an ORT had heroin/morphine present in their body at post mortem, compared to over half (173/310, 56%) of those not in receipt of an ORT. In line with the wider decrease in heroin presence, both the percentage of those with and without an ORT who had heroin/morphine present at the time of death has decreased steadily over time and was lower than in 2009 (55% and 77% respectively).

Figure 14: Percentage with Drugs Present at Post Mortem by Substitute Prescription (NDRDD: 2013)



3.7.2: Methadone-Related deaths

Methadone was the second most frequently implicated drug in 2013 deaths (185, 42%), having decreased since 2011 (54%) when data on substances implicated was first available. In 2013, over half of these individuals (108, 58%) were in receipt of a methadone prescription prior to death; a higher percentage than that observed in 2011 (39%), but similar to 2012 (52%) (Table 50). Therefore, of the 133 individuals in the cohort who were in receipt of a methadone prescription, 108 (81%) had methadone implicated in their death.

In 2013, there were thirty-nine deaths (9% of total, or 21% (39/185) of methadone-implicated deaths) where methadone was the only implicated substance (compared to 27% (64/234) in 2011 and 24% (50/209) in 2012). In 59% (23) of these deaths, the individual was in receipt of methadone at the time of death (data not shown in tables).

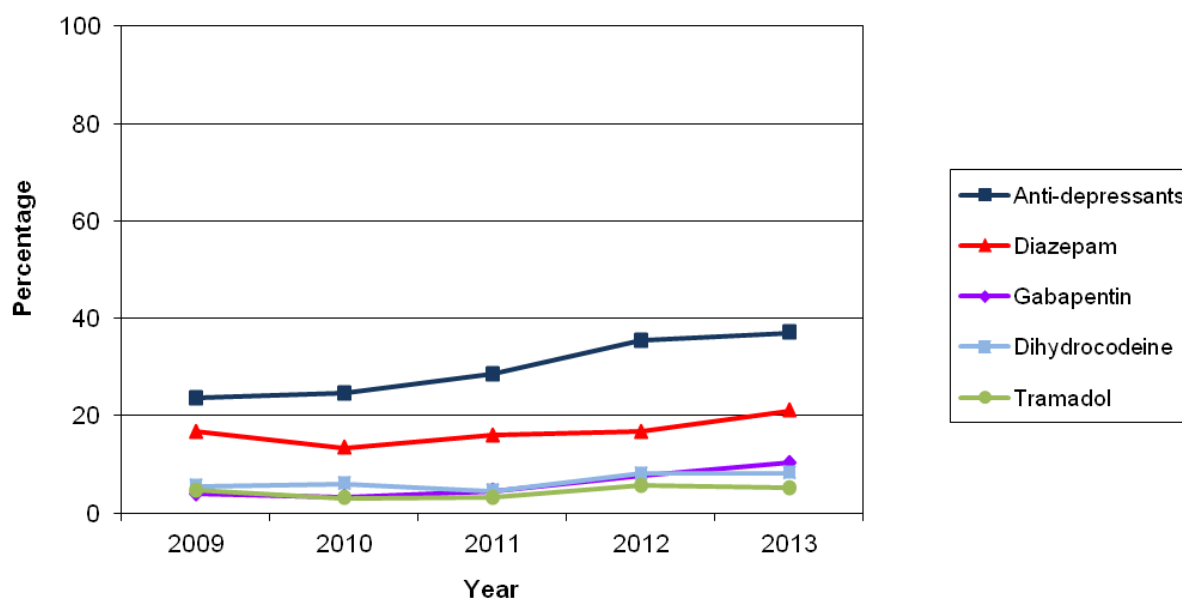
Three quarters of individuals (78, 76%) who received methadone and whose death was methadone-implicated received their prescription on a supervised basis (Table 51). Among the cases where methadone was prescribed but not implicated in the death and supervision status was known (21/25: 84%), 13 (62%) were supervised.

The majority of those prescribed methadone (103, 83%) had been prescribed the drug for more than one year before they died, while 20 had started their prescription within the year. Duration of methadone prescription among methadone-related deaths was almost identical; 84% (87) having been prescribed the drug for one year or more (Table 52). Individuals prescribed a range of methadone doses were considered to have methadone implicated in their death. Irrespective of dose, greater than three quarters of those prescribed methadone were thought to have methadone implicated in their death (including all of those receiving over 120ml per day (9/9)) (Table 53).

3.7.3: Presence of Other Prescribed Medications

Using data from ISD's Prescribing Information System, it is possible to identify recent dispensing activity (within 30 days of death) in relation to specific prescription drugs ((Table 54 and Figure 15). Comparing this information with drugs present in the body at post mortem, facilitates examination of adherence (presence of recently prescribed drug at time of death) to prescribed medication and potential diversion of drugs²⁴.

Figure 15: Percentage of Deaths where Individuals Received Recent Prescription for Specified Drugs (PIS: 2009-2013)



In 2013, diazepam was recently prescribed to one fifth of the cohort (94, 21%). This was higher than the percentage prescribed diazepam in all previous cohorts from 2010 onwards (2010: 13%, 2011: 16%, 2012: 17%). Among those recently prescribed diazepam, the drug was present at post mortem in 88% (83/94) of cases in 2013. This was lower than the

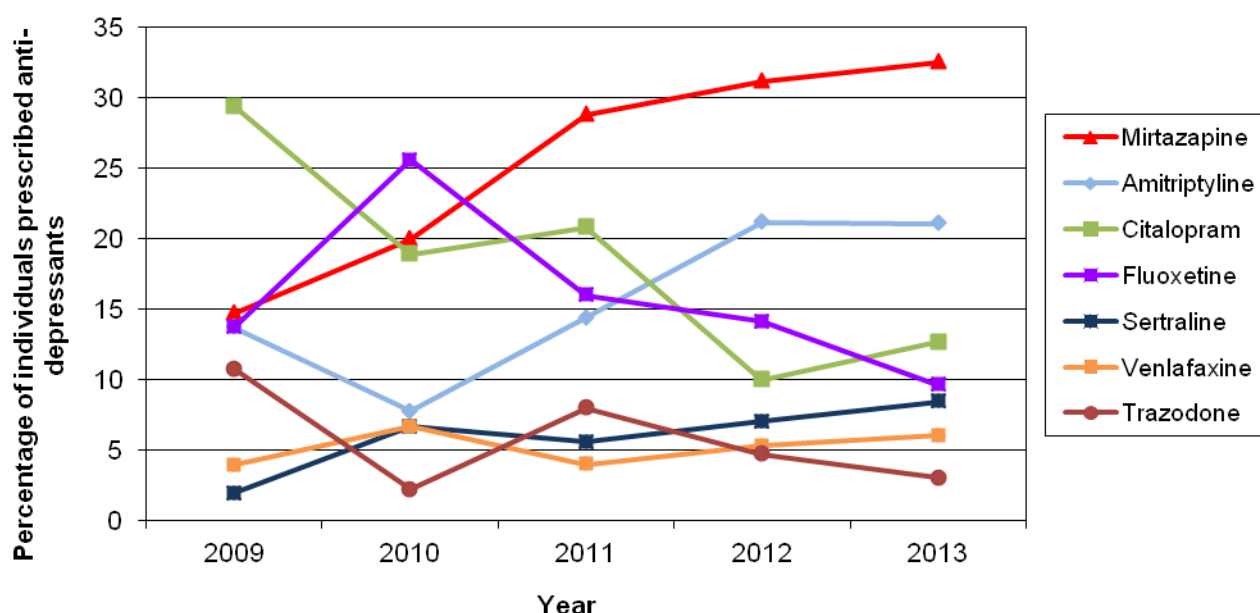
²⁴ It should be noted that, in some cases, exact dispensing dates are not provided in the Prescribing Information System, which instead defaults to the last day of the month, when the prescription was paid. Therefore, although some cases are included in which it appears that the drug was dispensed after death, this provides a fairly robust estimation of individuals prescribed specific drugs.

percentage observed in 2011, when 96% of those prescribed diazepam had the drug present at the time of death. Usage among those not recently prescribed diazepam was high: it was found present in 60% (212/354) of such deaths in 2013. Presence among those not recently prescribed diazepam was lower than in other NDRDD cohorts (2009: 75%, 2010: 75%, 2011: 76%, 2012: 74%).

Recent anti-depressant (e.g. citalopram, fluoxetine) prescribing was observed in almost four in ten deaths in 2013 (166, 37%) and increased across the time series. The increase in recent prescribing between 2009 (24%) and 2013 (37%) was highly significant. Almost three-quarters (123/166, 74%) of those recently prescribed anti-depressants also had anti-depressants in their body at post mortem. This percentage has increased gradually over time and was higher than the percentage observed in 2009 (59%). Anti-depressants were found at post mortem in 19% (53/282) of individuals who were not recently prescribed them, similar to recent years, although an increase since 2009 (10%).

Recent anti-depressant prescribing among drug-related deaths appears to have changed over time (Table 55 and Figure 16). In 2013, among those prescribed an anti-depressant in the 30 days before death, mirtazapine (54, 33%) was most frequently observed as the last prescribed anti-depressant, followed by amitriptyline (35, 21%), citalopram (21, 13%) and fluoxetine (16, 10%). Recent mirtazapine prescribing among drug-related deaths increased across the time series and was higher than in 2009 and 2010 (2009: 15%, 2010: 20%, 2011: 29%, 2012: 31%, 2013: 33%). Conversely, citalopram prescribing was lower than in 2009 (29%), but similar to 2012 (10%).

Figure 16: Anti-Depressant Most Recently Prescribed by Year (PIS: 2009-2013)



Recent tramadol prescribing was found among only a small number of deaths in 2013 (23, 5%) and has shown little change between cohorts. While tramadol was found present in two-thirds of deaths (15/23, 65%) where recently prescribed in 2013, this percentage has fluctuated considerably each year. However, presence among those not recently prescribed tramadol has been relatively consistent between years (2009: 3%, 2010: 5%, 2011: 2%, 2012: 5%, 2013: 5%).

Likewise, recent dihydrocodeine prescribing was found among only a small number of deaths (37, 8% in 2013) and prevalence was relatively consistent between cohorts. Where

recently prescribed, the percentage where dihydrocodeine was found at post mortem was also quite consistent at between one half and three quarters of such deaths (25/37, 68% in 2013). Presence among those not recently prescribed dihydrocodeine also changed little between years (2009: 14%, 2010: 12%, 2011: 15%, 2012: 14%, 2013: 11%).

Gabapentin presence at death increased considerably from 2012 onwards, having been observed in only one case before 2011. Recent gabapentin prescribing was evident in one in ten deaths in 2013 (46, 10%). While small annual increases were evident, the percentage prescribed in 2013 was higher than in 2009 (2009: 4%, 2010: 3%, 2011: 5%, 2012: 8%). In cases where gabapentin had recently been prescribed, presence at post mortem was lower than two-thirds in 2013 (29/46, 63%) and 2012 (62%). Gabapentin was found present at post mortem in less than one in ten cases where it had not recently been prescribed (35/402, 9%), roughly the same percentage observed in 2012 (8%).

3.7.4: Discussion

By examining the associations between substances and prescribing patterns it was evident that almost all those receiving an ORT had methadone present in their body at the time of death and were also more likely to have consumed diazepam and anti-depressants than those not prescribed an ORT. As these drugs are often prescribed together, this is unsurprising.

The percentage of those prescribed an ORT who also had heroin/morphine present continued to decrease and was at its lowest since NDRDD began. Co-presence of alcohol and dihydrocodeine also continued to decrease. These percentages were lower than those observed among individuals without an ORT prescription, providing some evidence of treatment effectiveness. However, compliance with treatment and the context of consumption was largely unknown and is likely to be key to understanding these deaths. Continuing poly drug use among the cohort and changes in the patterns of illicit drug use suggest that the variety of substances used alongside ORTs requires further elaboration.

There was strong evidence of diversion of ORT prescriptions among the cohort. Methadone was present at post mortem in around a quarter of those cases where an individual was not receiving an ORT (a substantial decrease from almost half in 2011). Although it may indicate temporary non-compliance, a small number of individuals with a methadone prescription did not have methadone present in their body at post mortem.

Although methadone is regarded as an effective treatment [35] which is safer than heroin [32], where present it was implicated in a high percentage of deaths (91%). Therefore, it is unsurprising that nearly all those in receipt of a methadone prescription had methadone present in their toxicology results and died a methadone-implicated death. Why such deaths occur in individuals on maintenance treatment is poorly understood. They may result from 'topping up' with illicit methadone, polysubstance misuse despite treatment, vulnerability due to other co-morbidities or a combination of these factors. It is also possible that high rates of methadone implication are a consequence of pathology reporting practice. These factors are clearly beyond the scope of this report. Due to difficulties gathering personal identifiers from ORT prescriptions, the extent, nature and duration of ORT prescribing remains relatively unexplored. Evidence on the efficacy of ORT prescribing in Scotland can be generated by improving the quality and completeness of information from prescribers and should therefore be a key priority in relation to developing information about illicit drug use and recovery in Scotland.

Information on other prescriptions dispensed recently to those who died a drug-related death was reported for the first time. Among the 2013 cohort, anti-depressant prescribing was most common (37%), followed by diazepam (21%), gabapentin (10%), dihydrocodeine

(8%) and tramadol (5%). While dihydrocodeine and tramadol prescribing was consistent between cohorts, anti-depressant and gabapentin prescribing had increased considerably over time and diazepam prescribing was higher in 2013 than most other NDRDD cohorts.

Adherence (presence of recently prescribed drug at time of death) to diazepam prescriptions was high (88%) but had decreased since 2011 (96%). The latter figure may have been indicative of increased adherence to prescriptions during the heroin drought. Among the other drugs examined, adherence in the 2013 cohort ranged from 74% (anti-depressants) to 62% in relation to gabapentin, indicating a relatively high level of potential diversion of the latter drug, which is reported to be used to enhance the effects of opiates.

Despite a general decrease in presence at post mortem in 2013 (likely to be due to an increase in the use of NPS benzodiazepines ([Section 4](#))), diazepam was present in six in ten deaths where not prescribed. Anti-depressant presence among those without recent prescriptions was also fairly common (19%), while around one in ten of those not prescribed each drug had dihydrocodeine or gabapentin present. Inclusion of these prescribing data represents a significant development in the analytical capacity of NDRDD, but a range of issues in relation to ORT prescribing still remain unexplored.

4: ‘Novel’ Psychoactive Substances (NPS)

4.1: Introduction

The use and misuse of Novel Psychoactive Substances (NPS) is now established as a key public health issue. Although not a new phenomenon, over the past five years there has been an extraordinary rise in the number, type and availability of NPS in Europe. In 2014, over 100 new substances were reported to the EU Early Warning System, taking the total number of NPS being monitored by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) to more than 450 with more than half of these being reported in the last three years alone [36].

Lack of information on drug effects and harms related to NPS, as well as the speed at which they appear on the market, continue to present major challenges to understanding fully the public health impact of increased availability, type and consumption. The most reliable data on NPS-related harm, to date, remains within fatal poisoning datasets. Indeed, the fourth annual National Drug-Related Death Database (NDRDD) report [5] produced one of the first comprehensive analyses of a population-based NPS-related mortality cohort which identified the characteristics of the individuals involved and the circumstances surrounding their deaths. These data identified a number of areas which merited further investigation, most notably the apparent dichotomy of cases with either Benzodiazepine-type or Stimulant-type NPS recorded within toxicology. A subsequent journal paper looked more in-depth at the cases where the reporting pathologist had deemed NPS to be directly implicated in the cause of the death [37]. It concluded that individuals whose death involved Benzodiazepine-type NPS shared many similar characteristics to the mainly opioid-based Drug-Related Death (DRD) cohorts in Scotland and elsewhere that have been documented in recent years. The Stimulant-type cases, however, were more closely aligned to the recent reported increases in recreational use of Stimulant-type NPS by younger people.

This new analysis attempts to substantiate the initial findings from the fourth annual NDRDD report [5] by analysing a larger NPS-related death dataset. As before, this largely involves an NPS-related subset of the drug-related deaths reported by National Records of Scotland (NRS).

4.1.1: Methods

For information on methods and definitions, please refer to [Section 2.1.1](#).

4.2: Results and Commentary

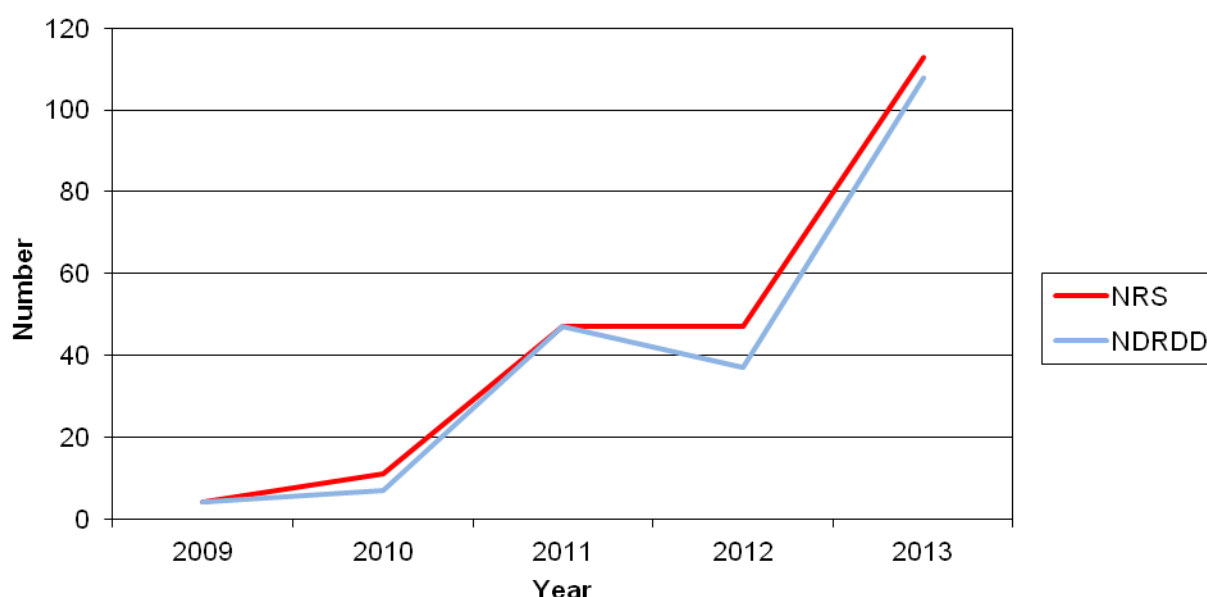
The following analysis provides a descriptive account of the data available on all DRDs recorded by the NDRDD between 2009 and 2013 where NPS was recorded within toxicology (henceforth known as ‘NPS-related deaths’). Findings are presented alongside comparable data from the overall NDRDD cohort, and any notable differences reported between these cohorts are indicated where appropriate ($p < 0.05$ using Fisher’s exact tests/chi-square when comparing groups). Trend analysis is also presented where relevant, although the small numbers of cases in 2009 (4) and 2010 (7) limits interpretation to mainly three-year trends. Similar to the fourth annual NDRDD report, the analysis also includes consideration of NPS-related DRDs in two subsets; deaths involving Benzodiazepine-type NPS (henceforth referred to as ‘Benzo-type’) and those featuring Stimulant-type NPS.

4.2.1: Overall

Between 2009 and 2013 there were 203 NPS-related deaths recorded on the NDRDD. The number of deaths per annum with NPS recorded within toxicology increased substantially from 4 in 2009 to 108 in 2013, with the latest year having the largest number ever recorded by a considerable margin (Figure N1). These figures relate to NPS recorded within toxicology in 9% of all DRDs within the 2009-2013 time series, increasing from 1% of all DRDs in 2009 to 24% in 2013.

Almost all (200, 99%) of the NPS-related deaths recorded between 2009 and 2013 involved polydrug consumption; typically combinations of NPS, opioids, alcohol and benzodiazepines (Table N1). Only three cases across the total NPS-related death cohort involved consumption of NPS alone.

Figure N1: Total Number of NPS-Related Deaths: NRS/NDRDD Data Comparison (2009-2013)



The majority of deaths had Benzo-type NPS drugs recorded within toxicology (143, 70%) with fewer featuring Stimulant-type NPS drugs (61, 30%). The numbers were greater than the overall total of 203 because one case had *both* Benzo-type and Stimulant-type NPS drugs present at time of death.

4.2.2: Socio-Demographics

Age, Gender, Ethnicity

Deaths with NPS recorded within toxicology predominantly involved white males and were evident across all age groups, with half (104, 51%) of all NPS-related deaths in those aged 35 years and over. The gender and ethnicity profile of those affected has remained largely stable across the 2009-2013 time series.

Like the overall NDRDD cohort, the percentage of cases aged 35 years and over appears to be increasing, from 45% (21) in 2011 to 56% (60) in 2013. Deaths where Benzo-type NPS were recorded in toxicology were more likely to be older than deaths where Stimulant-type NPS were recorded with a mean age of 37.8 years and 63% (90) were aged 35 years

and over. In comparison the Stimulant-type NPS deaths had a mean age of 28.5 years and only 23% (14) were aged 35 years and over.

Location

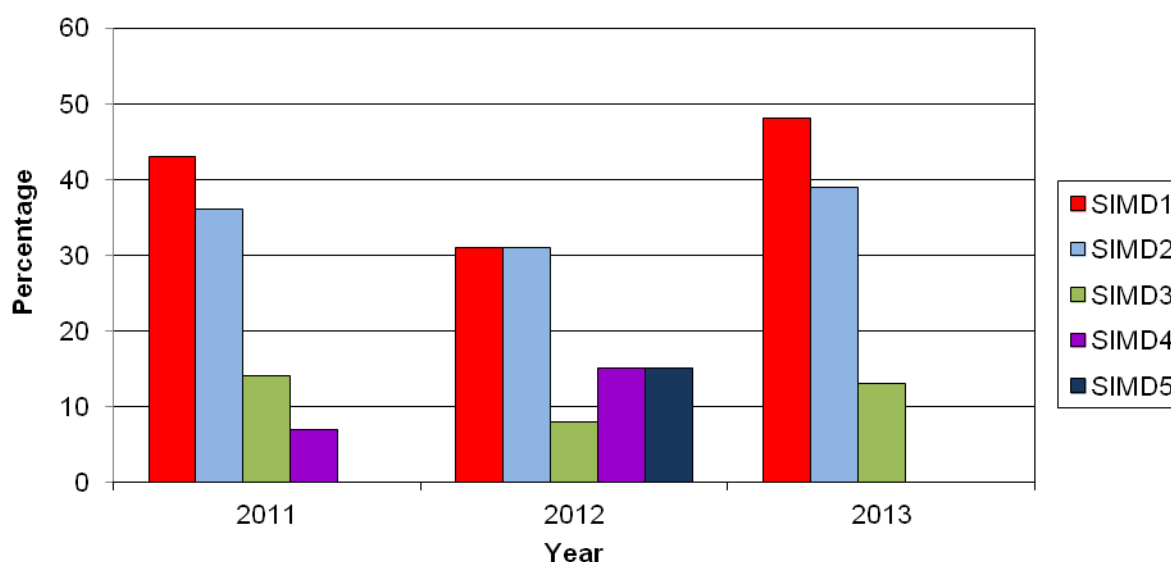
The majority of the 203 NPS-related deaths were from the Greater Glasgow & Clyde (60), Lanarkshire (36), Tayside (25) and Lothian (24) NHS Health Board areas. The island boards (Orkney, Western Isles and Shetland) had no recorded NPS-related deaths within the time series.

The NHS Health Boards with the highest crude mortality rates were NHS Lanarkshire and NHS Tayside (0.06 deaths per 1,000 population respectively) followed by NHS Greater Glasgow and Clyde (0.05 deaths per 1,000 population). All other health board areas reporting NPS-related deaths had rates at or below the national rate of 0.04 deaths per 1,000 population. Most health board areas had increasing trends of NPS-related deaths, although case numbers outwith the main four health boards identified above were very small (<10).

Deprivation

The breakdown of the NPS-related deaths by deprivation was similar to that of individuals in the overall NDRDD cohort. The majority of deaths were among those living in areas classified by Scottish Index of Multiple Deprivation (SIMD) as among the most deprived (SIMD quintile 1 (109, 55%) and quintile 2 (48, 24%)). There has been little change in these deprivation trends across the 2011-2013 time series (Figure N2). This pattern was also evident for the Benzo-type NPS deaths where 62% (85) and 19% (26) of all deaths across the time series were individuals from quintiles 1 and 2 respectively and the Stimulant-type NPS group at 42% (25) (quintile 1) and 37% (quintile 2) (22).

Figure N2: Percentage of NPS-Related Deaths by SIMD Deprivation Quintile (NDRDD: 2011-2013)



Living Arrangements

Again, similar to the overall NDRDD cohort, where known, around half of NPS-related deaths occurred where individuals were living on their own at least part of the time (100, 49%). In addition, around a fifth reported living with either their parents (43, 21%) or with a

spouse/partner (39, 19%). Deaths where individuals had Benzo-type NPS recorded within toxicology were more likely to be living on their own (81, 57%) than those where Stimulant-type NPS featured (20, 33%). In contrast, deaths within Stimulant-type NPS group were more likely to be living with their parents (20, 33%) than the Benzo-type NPS group (23, 16%).

Parenthood and Living with Children

Over a third of the individuals within the total NPS-related death cohort had parental responsibility (78, 39%), however, less than a quarter (18, 23%) had their children living with them at the time of death. Although the percentage who were parents was similar to the overall NDRDD cohort, the percentage with children living at home was higher within the total NPS-related death cohort despite falling consistently since 2011 from one third (6, 33%) to one in six (7, 16%).

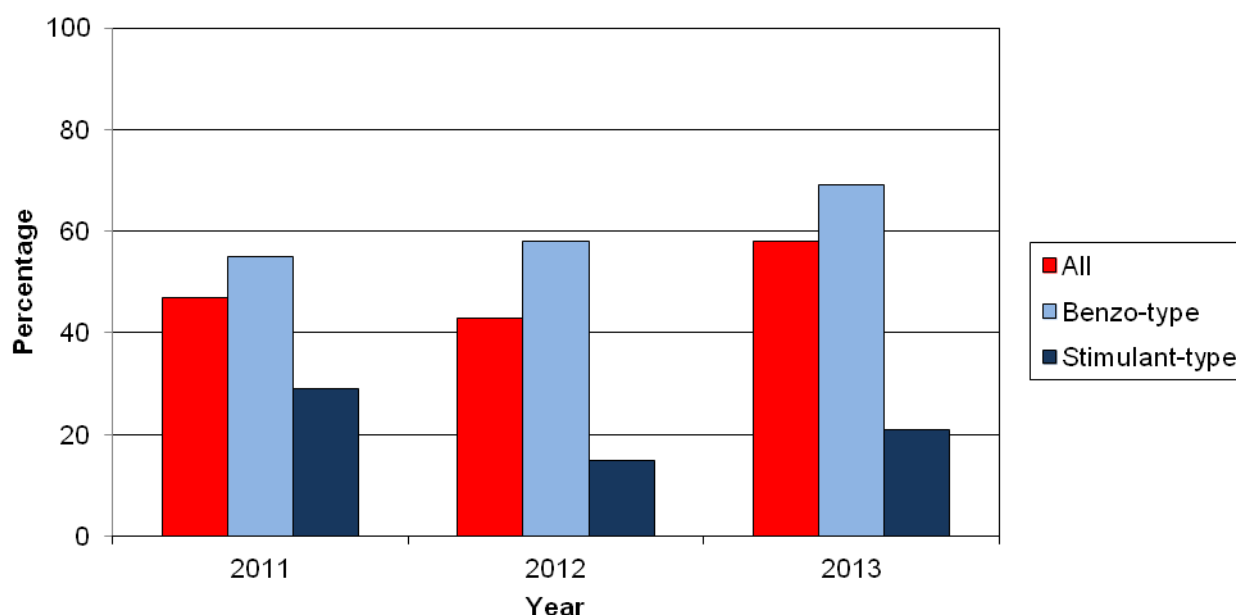
4.2.3: Substance Use History

Drug Use and Injecting Status Prior to Death

As in the overall NDRDD cohort, the vast majority of NPS-related DRDs (181, 89%) were among individuals known to have used drugs at some point prior to their death with over half (104, 57%) known to have used for a long period of time (i.e. 11 years or more). Although prevalence of known drug use was high across this cohort, there were proportionately more known drug users in the older group (i.e. aged 35 years and over: 100, 96%) compared to the younger age groups (81, 82%). The older group were also much more likely to be long-term drug users (79, 79%) than those aged under 35 years (25, 31%). NPS-related deaths involving Benzo-type drugs were also more likely to involve known drug users (137, 96%) than those featuring Stimulant-type drugs (45, 74%).

Similar to the overall NDRDD cohort, over half of all NPS-related cases who were known to have used drugs previously were also known to inject drugs intravenously (103, 57%) with a peak of known injectors in 2013 (63, 58%). Moreover, over half (57, 55%) of those with an injecting history were known to have injected over a long period of time (i.e. 11 years or more). Again, the older drug users (i.e. aged 35 years and over) were more likely to be known injectors (64, 62%) and to have a much higher prevalence of long-term injecting (43, 67%) in comparison to the younger age group (39 (39%) and 14 (36%) respectively). Deaths with Benzo-type NPS recorded within toxicology were more likely (92 64%) to feature among cases involving injectors than deaths with Stimulant-type NPS recorded (12, 20%), in particular long-term injectors, and in an increasing proportion of deaths among known injectors between 2011 and 2013 (Figure N3).

Figure N3: Percentage of NPS-Related Deaths among Known Injectors (NDRDD: 2011-2013)



Drug Detoxification

Despite the majority of NPS-related deaths involving individuals known to have previously used drugs, few were known to have undertaken a drug detoxification in the past year (16, 8%), mirroring the overall NDRDD cohort where only 9% of 2013 cases had undergone a detoxification in the past year. Until 2013, when three such cases were reported, no NPS-related deaths had undergone a detoxification in the last month. Despite these low percentages, the trend in the total NPS-related death cohort undertaking drug detoxification in the past year has increased consistently across the time series, from 0% in 2009 to 10% (11) in 2013. Almost all of the cases (one exception) with a known history of drug detoxification were from the Benzo-type NPS group.

Substitute Prescribing

Just over a quarter of the total NPS-related death cohort (57, 28%) were known to be on an Opioid Replacement Therapy (ORT) prescription at the time of death, with those aged 35 years or above more likely (40, 38%) to be on a prescription than younger cases (17, 17%). The vast majority of those on ORT prescriptions at time of death were on methadone (55, 96%), mainly via supervised consumption (50, 88%). These figures remained relatively stable over the 2011-2013 time series and were comparable to the 2013 NDRDD cohort, where 31% were on an ORT drug at the time of death, 73% of whom were supervised.

Where known, the vast majority of NPS-related deaths among those receiving ORT had been prescribed the drug for more than one year (48, 87%), although one case in 2013 had died within a month of commencing their treatment. The percentage of NPS-related deaths among those on ORT for more than a year dropped consistently between 2011 and 2013 (from 93% (13) to 84% (27)).

The vast majority (91%) of NPS-related DRDs on ORT prescriptions at time of death were from the Benzo-type NPS group, where over a third (52, 36%) were on a prescription; deaths where Stimulant-type NPS was recorded in toxicology were less likely (5, 8%) to be on ORT at the time of death.

Alcohol-Related Problems

Just over a third (75, 37%) of the total NPS-related death cohort had alcohol-related problems recently documented²⁵, similar to the overall NDRDD cohort between 2009 and 2013 (39-43%). There were no notable differences in the prevalence of recent alcohol-related problems between subgroups or in the trend over time.

Previous Overdoses

Overdose experience was fairly common in the total NPS-related DRD cohort with just under half (96, 47%) known to have overdosed previously, similar to the percentages within the overall NDRDD cohort (between 2009 and 2013 (46-53%)). Those aged 35 and over were more likely to have previously overdosed (57, 55%) than younger cases (39, 39%).

The majority of those in the total NPS-related DRD cohort who had previously experienced a non-fatal overdose had done so only one or two times (63, 66%), with multiple overdose experience less common. Around one in eleven (8, 8%) of those who had overdosed before had done so in the three months prior to death.

Those with Benzo-type NPS drugs recorded in their toxicology were more likely (81, 57%) than the Stimulant-type NPS group (15, 25%) to have previous overdose experience. In addition, all of those overdosing in the month before death were from the Benzo-type NPS group. Among all deaths with Stimulant-type NPS recorded in toxicology, those aged 35 and over were more likely (7, 50%) to have had a history of overdose than younger cases (8, 17%).

4.2.4: Significant Life Events

Suicide and Self-Harm

One quarter (51, 25%) of the total NPS-related death cohort had previously attempted suicide with the trend relatively stable between 2011 and 2013. Suicide attempts were more prevalent in those aged 35 and over (33, 32%) than those aged under 35 years (17, 18%). Similar percentages had a history of self-harming (52, 26%), with the trend again relatively stable across the 2011-2013 time series.

4.2.5: Contact with Services

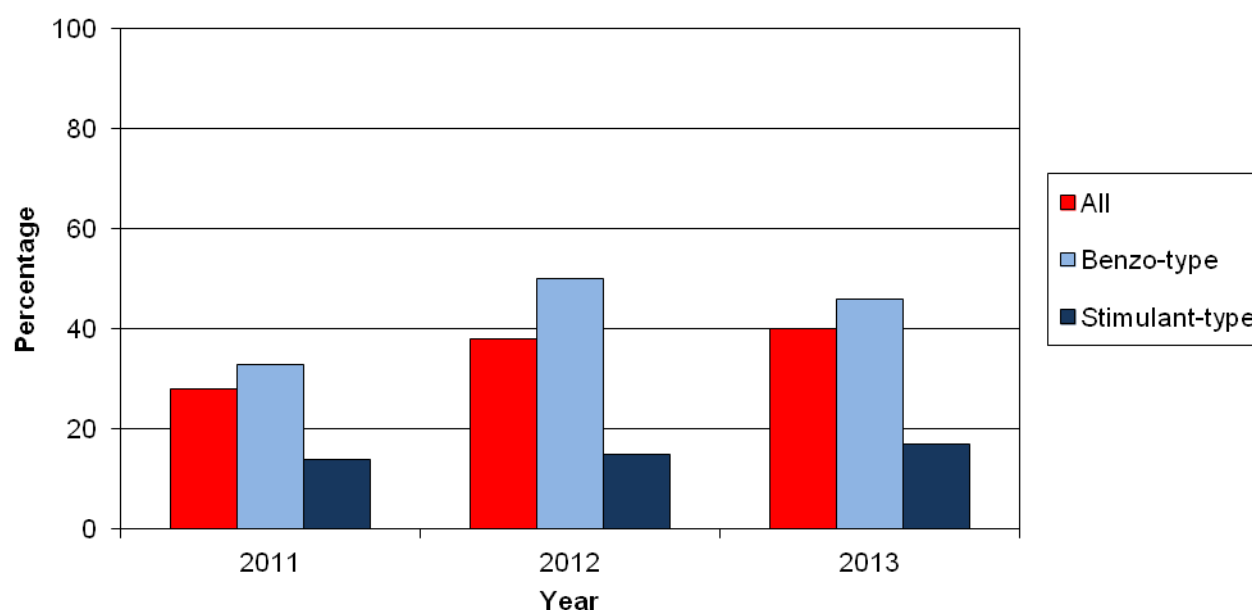
Drug Treatment Services

Around one third (70, 34%) of the total NPS-related death cohort were in contact with drug treatment services at the time of death, which was similar to the active drug treatment service contact rate in the overall NDRDD cohort in 2013 (36%). The percentage of those in contact with treatment services at the time of death has been gradually increasing from 28% (13) in 2011 to 40% (43) in 2013 (Figure N4). Those aged 35 and over were more likely (50, 48%) to be in contact with drug treatment services at time of death than younger cases (20, 20%).

Variations were evident by sub-group; deaths where Benzo-type NPS were recorded were more likely (62, 43%) to have been in contact with drug treatment services at the time of death than those involving Stimulant-type NPS drugs (8, 13%). Moreover, older cases (i.e. aged 35 years and over) among the Benzo-type NPS group were more likely (47, 52%) to have been in contact at the time of death than younger cases (15, 28%).

²⁵ See [Section 3.2.5](#) for a definition of this category.

Figure N4: Percentage of NPS-Related Deaths in Contact With Drug Treatment at Time of Death (NDRDD: 2011-2013)



General Practitioner²⁶

Over one third (73, 36%) of cases from the total NPS-related death cohort had been in contact with their General Practitioner (GP) in the month prior to their death, increasing to over two-thirds (134, 66%) when taking into account the three-month period prior to their death. No clear trend relating to GP engagement emerged across the 2009-2013 time series, although individuals aged 35 years and over (78, 75%) were more likely to have seen their GP within the past three months than those aged under 35 years (56, 57%).

As with treatment services, cases from the Benzo-type NPS group were more likely (107, 75%) to have been in contact with their GP in the three months prior to their death than those in the Stimulant-type group (28, 46%).

Hospital Stays

Approximately one in 17 (13, 6%) of the total NPS-related death cohort had been discharged from an acute general hospital setting following an inpatient or day case episode within four weeks of their death, rising to one in seven (26, 13%) within twelve weeks and one in five (41, 20%) within six months. No real differences were observed in the percentage of the Stimulant-type NPS (9, 15%) and Benzo-type NPS groups (32, 22%) discharged within six months of death.

Recent discharge from a psychiatric hospital following an inpatient episode was much less common with only ten cases (5%) in the total NPS-related cohort discharged within six months of their death. Four per cent (6) of the Benzo-type NPS group and 7% (4) of the Stim-type NPS group had a psychiatric discharge within six months of death.

²⁶ Please note that this analysis includes any GP contact and is therefore not comparable with the analysis in the main report ([Section 3.4.1](#)) which focuses on contact with a GP for the purpose of drug treatment.

Criminal Justice System

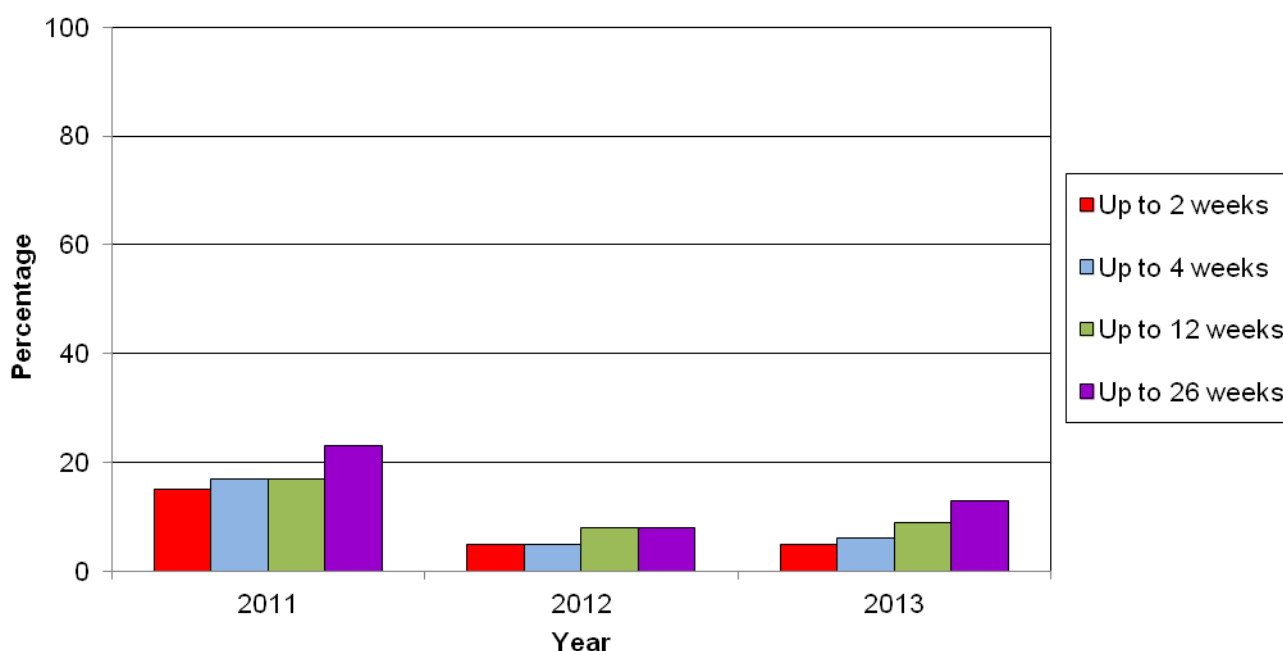
Police custody

Where known²⁷, around one third (51, 31%) of all NPS-related DRDs had been in police custody at some point in their lives. One in ten (16, 10%) had been released in the past four weeks, rising to almost one in five (32, 19%) within twelve weeks and 28% (47) within six months prior to death. Recent police custody within the total NPS-related death cohort was comparable with the overall NDRDD cohort, where between 30% and 40% had been released within six months of their death.

Prison

Where known, half (102, 52%) of all NPS-related deaths had been in prison at some point in their lives with few differences observed in terms of age and gender groups and a relatively stable trend between 2011 and 2013. Around one in twelve (16, 8%) had been liberated in the past four weeks, rising one in ten (20, 10%) within twelve weeks and 14% (27) within six months of death. Trends in recent prison release prior to death appear to show decreasing percentages dying soon after liberation (Figure N5). Recent incarceration within the total NPS-related cohort was consistent with the overall NDRDD cohort, where 13% were released from prison custody within six months of their death in both 2012 and 2013.

Figure N5: Percentage of NPS-Related Deaths by Time from Prison Liberation (NDRDD: 2011-2013)



Differences were also evident between NPS sub-groups, with cases in the Benzo-type NPS group more likely (87, 64%) to have been in prison before than those featuring Stimulant-type NPS (15, 25%).

²⁷ It should be noted that due to problems accessing police custody records in Glasgow, a large amount of data (143, 32% of the NDRDD cohort) for 2013 was missing, which may introduce bias into any comparison of trends.

4.2.6: Circumstances of Death

Place of Drug Use and Place of Death

Similar to the overall NDRDD cohort, the drug use that led to the fatality in NPS-related deaths typically took place in a home environment; either the deceased's own home (108, 53%) or in the home of someone else (61, 30%), and with no obvious change in trends across the 2009-2013 time series. However, this varied by NPS-type, with consumption of drugs in their own home more likely among Benzo-type NPS deaths (85, 59%) than deaths where Stimulant-type NPS (24, 39%) were recorded. In contrast, cases with Stimulant-type NPS recorded in toxicology were more likely (30, 49%) to have involved drugs taken in someone else's home than deaths featuring Benzo-type NPS (31, 22%).

Where individuals were pronounced dead followed similar patterns to place of drug use, with a home environment most common in both the total NPS-related death cohort (158, 78%) and in the 2013 NDRDD cohort (81%). Deaths with Benzo-type NPS cases recorded in toxicology were more likely to be pronounced dead in their own home (93, 65%) than those featuring Stimulant-type NPS (20, 33%). However, Stimulant-type NPS cases were more likely to be pronounced dead at hospital (21, 34%) than deaths where Benzo-NPS was recorded (10, 7%).

Persons Present at Scene of Overdose

There were persons present at over half (119, 61%) of all NPS-related DRDs where data were available, similar to the overall NDRDD cohort in 2013 (58%). Persons were more likely to be present at deaths where Stimulant-type NPS (48, 83%) was recorded within toxicology than those featuring Benzo-type NPS (71, 51%).

In NPS-related deaths, people were known to be present in the same room in over one third of cases (69, 35%), higher than in the overall NDRDD 2013 cohort (25%). Again, persons were more likely to be present within the same room at deaths where Stimulant-type NPS (34, 59%) were recorded within toxicology than in those featuring Benzo-type NPS (35, 25%).

Ambulance Attendance and Attempted Resuscitation

Ambulance attendance was recorded at the scene of most NPS-related DRDs (175, 86%), similar to the overall NDRDD cohort between 2009 and 2013 (81-86%). However, resuscitation was attempted in only half of all deaths (101, 50%), most of which were carried out by ambulance staff (65, 64%) or friends (37, 37%). The trend for resuscitation attempts has been increasing steadily between 2011 (20, 43%) and 2013 (55, 51%), driven by the increasing number of cases within the Benzo-type NPS group.

4.2.7: Toxicology Data

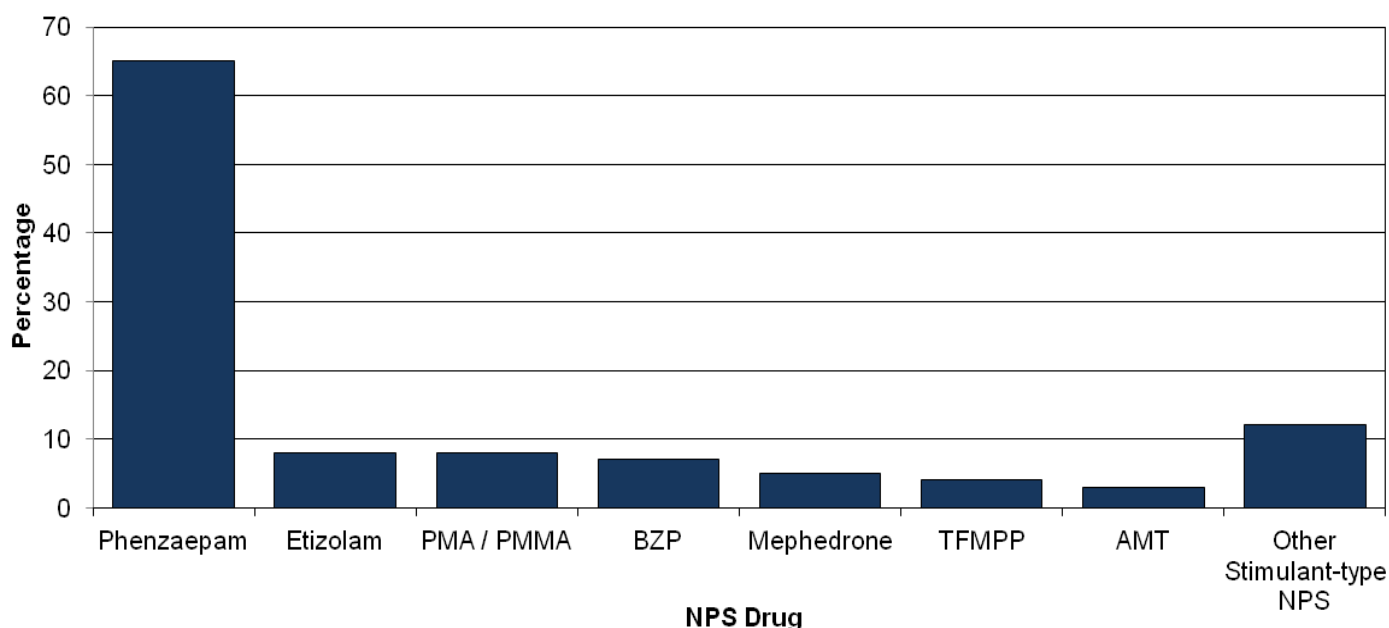
Drugs Present at Time of Death²⁸

In total there were 22 different NPS recorded across the time series with the number of different NPS recorded in DRD toxicology increasing from three in 2009 to 18 in 2013 (see Table N3 ([Appendix A8](#))). The majority (143, 70%) of NPS-related deaths had Benzo-type drugs recorded within toxicology, mainly phenazepam (132) (Figure N6). Etizolam has also been increasingly identified within DRD toxicology since 2011, recorded in a total of 17 cases thus far. A further 61 (30%) NPS-related deaths featured a range of different

²⁸ As it was possible for multiple NPS to be present in toxicology results, figures will exceed 100%.

Stimulant-type NPS. There were no clear patterns to the presence of different Stimulant-type NPS over the time series. For example, PMA/PMMA was noted in zero deaths in 2009 and 2010, eight (17%) deaths in 2011, zero deaths in 2012, and eight (7%) deaths in 2013. Mephedrone, has been consistently present but with no clear trend; noted in one (25%) case in 2009, rising to four (57%) cases in 2010, and then two cases each year thereafter (4%, 11%, 2% respectively).

Figure N6: Percentage of Total NPS Recorded Within DRD Toxicology (NDRDD: 2009-2013)



Examining all NPS-related deaths, the specific drugs most commonly present alongside NPS at toxicology were diazepam (113, 56%), methadone (97, 48%), heroin (80, 39%), anti-depressants (79, 39%) and alcohol (71, 35%) (Table N1). Other notable trends between 2011 and 2013 include increasing presence of cannabis (45, 22% overall) and gabapentin (21, 10% overall), and decreasing presence of cocaine (43, 21% overall) and ecstasy/MDMA (20, 10% overall).

There were notable differences by gender, with methadone (31, 62%) and anti-depressants (30, 60%) more prevalent among all NPS-related female deaths than in deaths involving males (49 (32%) and 66 (43%) respectively). There were also differences by age group, with phenazepam (81, 78%) methadone (61, 59%) and heroin (48, 46%) more prevalent in all NPS-related deaths among those aged 35 and over than those among younger individuals (47 (47%) 36 (36%) and 32 (32%) respectively). However alcohol (42, 42%) and ecstasy/MDMA (16, 16%) were more prevalent among the younger group aged under 35 years than among older individuals (29 (28%) and 4 (4%) respectively).

Table N1: Co-Presence of Other Drugs in NPS-Related DRDs (NDRDD: 2009-2013)

Drug	Calendar year of death (Number and Percentage)											
	2009		2010		2011		2012		2013		Total	
	N	%	N	%	N	%	N	%	N	%	N	%
Diazepam	1	25.0	3	42.9	27	57.1	20	54.1	62	57.4	113	55.7
Methadone	2	50.0	2	28.6	23	48.9	14	37.8	56	51.9	97	47.8
Heroin	2	50.0	2	28.6	20	42.6	8	21.6	48	44.4	80	39.4
Anti-depressants	1	25.0	2	28.6	22	46.8	9	24.3	45	41.7	79	38.9
Alcohol	2	50.0	3	42.9	17	36.2	15	40.5	34	31.5	71	35.0
Cannabis	1	25.0	0	0.0	6	12.8	7	18.9	31	28.7	45	22.2
Cocaine	2	50.0	1	14.3	12	25.5	8	21.6	20	18.5	43	21.2
Gabapentin	0	0.0	0	0.0	2	4.3	4	10.8	15	13.9	21	10.3
Ecstasy/MDMA	0	0.0	0	0.0	8	17.0	4	10.8	8	7.4	20	9.9
Amphetamines	0	0.0	1	14.3	6	12.8	4	10.8	9	8.3	20	9.9
Buprenorphine	0	0.0	0	0.0	1	4.3	2	5.4	7	6.5	11	5.4
Tramadol	0	0.0	0	0.0	1	2.1	2	5.4	8	7.4	11	5.4
No other drugs present	0	0.0	1	1.0	1	2.0	0	0.0	1	1.0	3	1.0

Variations by NPS drug type were also evident. For instance, co-presence within toxicology of opioids (heroin, methadone), benzodiazepines (diazepam) and anti-depressants were more likely within the Benzo-type NPS group (Table N2). Deaths where Benzo-type NPS were recorded in toxicology also typically included only one NPS (co-presence of other NPS was rare). In contrast, co-presence of other Stimulant-type drugs was more likely within the toxicology of deaths where Stimulant-type NPS were recorded; these included cocaine, ecstasy/MDMA but also co-presence of more than one Stimulant-type NPS in a number of cases. Only one case had both Benzo-type and Stimulant-type NPS drugs recorded within toxicology at time of death.

Looking at trends between 2011 and 2013, the data suggest decreasing co-presence of heroin, alcohol, ecstasy/MDMA and amphetamines in deaths with Stimulant-type NPS recorded in toxicology and increasing presence of cannabis in the Benzo-type NPS group. Other trends appear inconsistent between years, although there are exceptions, notably diazepam which remained fairly constant across both sub-groups at around 60% for the Benzo-type NPS group and 40% for the Stimulant-type NPS cases between 2011 and 2013.

Table N2: Co-Presence of Other Drugs in NPS-Related DRDs by Sub-Group (NDRDD: 2009-2013)

		Calendar year of death (Number and Percentage)											
		2009		2010		2011		2012		2013		Total	
		N	%	N	%	N	%	N	%	N	%	N	%
Heroin	Benzo-type NPS	-	-	0	0.0	16	48.5	5	20.8	45	52.9	66	46.2
	Stimulant-type NPS	2	50.0	2	33.3	4	28.6	3	23.1	3	12.5	14	23.0
Methadone	Benzo-type NPS	-	-	1	100.0	20	60.6	13	54.2	50	58.8	84	58.7
	Stimulant-type NPS	2	50.0	1	16.7	3	21.4	1	7.7	6	25.0	13	21.3
Alcohol	Benzo-type NPS	-	-	0	0.0	8	24.2	11	45.8	27	31.8	46	32.2
	Stimulant-type NPS	2	50.0	3	50.0	9	64.3	4	30.8	7	29.2	25	41.0
Diazepam	Benzo-type NPS	-	-	0	0.0	21	63.6	15	62.5	53	62.4	89	62.2
	Stimulant-type NPS	1	25.0	3	50.0	6	42.9	5	38.5	10	41.7	25	41.0
Cocaine	Benzo-type NPS	-	-	0	0.0	6	18.2	2	8.3	13	15.3	21	14.7
	Stimulant-type NPS	2	50.0	1	16.7	6	42.9	6	46.2	7	29.2	22	36.1
Cannabis	Benzo-type NPS	-	-	0	0.0	4	12.1	6	25.0	24	28.2	34	23.8
	Stimulant-type NPS	1	25.0	0	0.0	2	14.3	1	7.7	7	29.2	11	18.0
Ecstasy/MDMA	Benzo-type NPS	-	-	0	0.0	0	0.0	0	0.0	1	1.2	1	0.7
	Stimulant-type NPS	0	0.0	0	0.0	8	57.1	4	30.8	7	29.2	19	31.1
Amphetamines	Benzo-type NPS	-	-	0	0.0	4	12.1	2	8.3	6	7.1	12	8.4
	Stimulant-type NPS	0	0.0	1	16.7	2	14.3	2	15.4	3	12.5	8	13.1
Buprenorphine	Benzo-type NPS	-	-	0	0.0	2	6.1	2	8.3	6	7.1	10	7.0
	Stimulant-type NPS	0	0.0	0	0.0	0	0.0	0	0.0	1	4.2	1	1.6
Gabapentin	Benzo-type NPS	-	-	0	0.0	2	6.1	4	16.7	13	15.3	19	13.3
	Stimulant-type NPS	0	0.0	0	0.0	0	0.0	0	0.0	2	8.3	2	3.3
Tramadol	Benzo-type NPS	-	-	0	0.0	1	3.0	2	8.3	5	5.9	8	5.6
	Stimulant-type NPS	0	0.0	0	0.0	0	0.0	0	0.0	3	12.5	3	4.9
Anti-depressants	Benzo-type NPS	-	-	1	100.0	19	57.6	7	29.2	38	44.7	65	45.5
	Stimulant-type NPS	1	25.0	1	16.7	3	21.4	2	15.4	8	33.3	15	24.6

Drugs Implicated

Within this period, the number of NPS drugs recorded within DRD toxicology deemed to have been directly implicated in the cause of death also increased, from zero in 2009 to 53 in 2013. These figures relate to direct NPS implication in 50% of all DRDs with NPS recorded in toxicology across the 2009-2013 time series. Overall, these figures show direct NPS implication in 5% of the total DRDs recorded on NDRDDD across the 2009-2013 time series, increasing from 0% in 2009 to 12% in 2013.

4.3: Discussion

Despite recent increases in NPS-related mortality[1,38], the circumstances surrounding and characteristics of individuals involved in NPS-related death are relatively unknown. Following initial exploratory work in the fourth annual NDRDD report [5], this new analysis provides further insight into the circumstances surrounding deaths related to NPS in Scotland. Access to five years of data also provides the first indications of trends within NPS-related deaths which are important when informing policy and practice.

Between the years 2009-2013, a total of 203 DRDs had NPS recorded within toxicology. Over this time period the percentage of NPS recorded within toxicology has increased from 1% of all DRDs in 2009 to 24% in 2013. In 2013 the highest number of cases were recorded to date (108), an increase of 129% from the previous high of 47 in 2011. The reasons for such a sharp rise are not clear; however there was a notable increase in the

percentage of known long-term drug users and known injecting drug users within the cohort in 2013. This adds to evidence which emerged in 2014 of NPS consumption among people who inject drugs in Scotland, with reports of a cohort injecting NPS in the Lothian area [39]. This recent phenomenon has led to a range of health and social harms including mental health problems, antisocial and violent behaviour, and wound infections.

Almost all deaths with NPS present in the body at time of death had co-presence of other drugs. It was extremely rare to see NPS alone within a DRD toxicology report. Polydrug consumption is also a key feature of the overall NDRDD cohort and remains a key risk factor for drug-related mortality that has to be communicated to people who use drugs of all kinds, including NPS.

The polydrug combinations which were present in toxicology reports varied depending on which type of NPS was involved. Deaths where Benzo-type NPS were recorded were more likely to feature co-presence of opioids, other benzodiazepines and anti-depressants. Stimulant-type NPS, on the other hand, were more likely to be recorded alongside other stimulant drugs including other Stimulant-type NPS.

The apparent dichotomy of cases involving either Benzo-type or Stimulant-type NPS was first identified in the fourth annual NDRDD report [5]. This new analysis adds further weight to this categorisation, with clear differences emerging in the profile of the two sub-groups.

4.3.1: Benzo-Type NPS-Related Deaths

This was a mainly male cohort, more likely to be older, to be living alone, to be known to have used drugs (often intravenously), to have previous overdose experience, and to be known to a range of services (including health and criminal justice), often recently. Moreover, they were also more likely to have consumed the drugs that led to their fatality within their own home where they were more likely to be pronounced dead. This socio-demographic profile mirrors many of the characteristics of the mainly opioid-related DRD cohorts in Scotland [5,40] and elsewhere that are now well understood and established.

These findings are important in that they potentially identify existing or past clients of traditional drug treatment services and a number of potential opportunities for intervention across both health and criminal justice settings; including general practice, Injecting Equipment Provision (IEP) services, police custody and prisons. It should be noted, though, that the percentage of NPS-related deaths dying soon after release from prison has decreased between 2011 and 2013. During the same period the National Naloxone Programme in Scotland has been associated with a reduction in its primary outcome indicator: the percentage of opioid-related deaths occurring within four weeks of prison release [25].

The data also highlights the challenges that an ageing drug user cohort present for prevention, particularly those affected by isolation and co-morbidity. There is an urgent requirement for services in contact with those at risk to recognise the broad range of NPS drugs, their role within polydrug consumption, and the associated impact on mortality.

The Benzo-type group continued to be dominated by phenazepam consumption, despite it being controlled as a Class C drug in the UK since June 2012. This suggests that the impact of the ban, at least in terms of reducing associated mortality, has not been immediate and that phenazepam remains a major contributor to NPS-related death in Scotland. Phenazepam presents additional cause for concern given its high levels of toxicity [41]. Indications from both seizure data [42] and anecdotal feedback from peer networks suggest that drug users are taking phenazepam unknowingly and are therefore unaware of their level of risk. The emergence of another toxic benzodiazepine analogue, etizolam, within the recent death statistics may signal its arrival as the long-term

replacement for phenazepam and its impact on NPS-related mortality should be monitored closely in future reports.

4.3.2: Stimulant-Type NPS-Related Deaths

Although sharing many similar traits with the Benzo-type group, deaths where Stimulant-type NPS were recorded within toxicology also had a number of distinctive features that merit further investigation. On average they appeared to be a younger group, more likely to be living with their parents and were unlikely to be known to have used drugs on a long-term basis, partly due to their younger age. They were more likely to have consumed the drugs that led to their fatality within someone else's home where there were often persons present, including in the same room. Also, they were more likely to be pronounced dead at hospital.

These data suggest that an increasing percentage of deaths where Stimulant-type NPS were recorded within toxicology feature known drug users who are using NPS to either supplement or substitute existing drug use, as has been demonstrated within the Lothian NPS injecting cohort [39]. However, the findings also highlight a minority group of less established users, typically using a range of stimulant drugs which include NPS, where overdose signs and symptoms are often recognised but resuscitation attempts are limited. Indeed, these Stimulant-type NPS cases more closely mirrored the risk factor profile described in analysis of a Mephedrone-related death cohort by Corkery et al [43]. Despite their smaller numbers, deaths involving Stimulant-type NPS have generated particular media interest, possibly due to the younger age of the individuals affected or as a result of a wider strategy to represent problems associated with such drugs [44]. Opportunities for intervention and prevention with this latter group may be better tailored toward peers, families and acute hospital settings.

The broad range of Stimulant-type NPS reported in the death data and the inconsistency in their involvement from year to year presents difficulties in how best to target prevention strategies to those who use these drugs and to ensure staff are adequately trained to respond appropriately. This reflects the wider market for Stimulant-type NPS which is expanding rapidly to cope with demand and to counter legislative intervention. Such dynamics reinforce the need to prioritise harm reduction strategies for those at risk.

4.3.3: NPS Implication

In approximately half of all cases where NPS drugs were recorded, the reporting pathologist considered them to be implicated in the actual cause of death. However, a degree of caution is advised given that the majority of NPS-related deaths feature Benzo-type drugs. Interpretation of the extent to which benzodiazepines contribute to respiratory depression (main mode of death) and therefore their implication in DRDs, is complex, leading to variation in pathology practice between areas. This may be particularly relevant for new drugs about which the toxicological data and evidence base is not developed. With this in mind, the NPS analysis in this chapter has largely focussed on cases where NPS were recorded in toxicology i.e. NPS-related deaths.

5: Deaths by Suicide in the 2013 NDRDD Cohort

5.1: 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 abuse, tragic life events, violence and sexual abuse [45-47]. Research has shown that individuals engaged in problematic drug use, particularly in the Scottish context, exhibit such risks [24,48-50]. In addition, studies of individuals in drug and alcohol treatment have shown previous suicide attempts and current suicidal thoughts are common [51]. The risk of death by suicide is greater when several risk factors occur concurrently.

Scotland had the highest suicide rate in the UK in the mid to late 2000s – there is no known single reason for this. However, from the period 2000-02 to 2011-13 Scotland's suicide rate reduced by 19% [52].

During the 2008 'Choose Life' summit, NHS Health Scotland made a commitment to lead work to establish a Scottish Suicide Information Database (ScotSID) to improve the quality of information available on deaths by suicide in Scotland (this work is now led by ISD Scotland). The 2014 ScotSID report, based on 2009-2012 data, highlighted the link between death by suicide and the most deprived populations. It reported that almost three quarters of those who died from suicide in Scotland were male and almost half were aged between 35 and 54 years [53].

In December 2013, The Scottish Government published a new suicide prevention strategy for 2013–2016 [54]. In relation to this, Mok et al (2013) posed the question "Why does Scotland have a higher suicide rate than England?" They conducted a multilevel study of suicide risk in Scotland and England during 2001- 2006 and examined a range of social, cultural and health-related factors. They concluded that 'Any attempt to reverse the divergent trend in suicide between Scotland and England will require initiatives to prevent and treat mental ill health and to tackle alcohol and drug misuse' [55].

Given that problem drug use is a risk factor for death by suicide, it is important to identify individuals engaged in problematic drug use who might be at particularly high risk for death by suicide due to the multiple risk factors. This is the second year that deaths by suicide have been included in the NDRDD Report (in the 2012 report they were included as an Appendix) and as such offers an opportunity to provide evidence of relevant markers in population of individuals known to have used drugs.

NDRDD forms were submitted to ISD in respect of 37 deaths by suicide in 2013. It is important to note that these deaths are largely a subset of the 485 NDRDD drug-related deaths and of the 526 drug-related deaths and 795 deaths by suicide on which NRS published National Statistics in 2014.

5.1.1: Methods

For information on methods and definitions, please refer to [Section 2.1](#).

5.2: Results and Commentary

In this section, where possible, comparisons between the 448 NDRDD non-intentional deaths (known here as the 'NDRDD cohort') and the 37 deaths by suicide records were made. Further analysis was undertaken, examining deaths by suicide among individuals known to have used drugs (n=23) and those with no known drug use history (n=14); these

findings are presented in [Section 5.2.7](#). In the results below, only statistically significant differences ($p < 0.05$ based on a simple comparison of proportions or chi-square test where groups were thought to be different in nature) are described as 'higher' or 'lower'.

Please note that 2012 and 2013 death by suicide cohorts are not compared in the following analysis. This is because there may be selection bias in the submission of NDRDD forms relating to drug-related deaths among older individuals. Additionally, NHS Tayside did not submit data for deaths by suicide in 2012 or 2013.

Deaths by suicide were over-represented among the deaths included by NRS where no NDRDD form was completed. Taking into account the different time periods for case inclusion and delays in determining drug-related deaths, NDRDD could potentially have received forms for 516 NRS deaths (49 of which were 'intentional self-poisoning'). Of these, a total of 459 NDRDD forms were returned (57 potential NDRDD forms were not completed). Therefore, for the suicide cohort, 37 NDRDD forms out of a potential 49 were completed (24% non-completion) compared to 10% for the non-intentional ('main') cohort (422/467). Comparable non-completion figures for 2012 were 19% and 6% respectively.

While some of this shortfall will be due to non-completion by NHS Tayside, differing perceptions of case inclusion by Local Critical Incident Monitoring Groups may also be influencing completion rates. For these reasons, the representativeness of the deaths by suicide cohort for each year cannot be verified and inter-year comparisons have not been undertaken.

5.2.1: Socio-Demographics

Age and Gender

The mean age of the 37 deaths by suicide (45.3 years) was higher than the 448 individuals in the NDRDD cohort (39.1 years). In both cohorts, there was a higher percentage of males than females: 76% (342/448) in the NDRDD cohort; and 65% (24/37) in the deaths by suicide cohort.

As described in [Section 2.1](#), deaths by suicide ('intentional self-poisoning') accounted for a higher percentage of deaths among females (11%) than males (7%).

Living Arrangements

The deaths by suicide were similar to the NDRDD cohort in many respects: around three-quarters lived in their own home at the time of death: 78% (29/37) amongst deaths by suicide and 71% (318/447) in the NDRDD cohort. Similarly, the percentage living with parents was roughly the same in both cohorts: 14% (5/37) of deaths by suicide and 15% (68/441) of the NDRDD cohort. A higher percentage of those dying from suicide were childless at death (30/37, 81%) compared to individuals in the NDRDD cohort (285/444, 64%). In terms of marital status, the percentage of those dying from suicide who were single at death (14/37, 38%) was lower than in the NDRDD cohort (255/435, 59%).

Employment Status

Among deaths by suicide, 65% (24/37) were categorised as 'unemployed' compared with 73% (328/448) in the NDRDD cohort. The percentage categorised as 'long-term sick/disabled' in the deaths by suicide cohort (14/37, 38%) was higher than in the NDRDD cohort (106/448, 24%).

5.2.2: Substance Use History

Drug Use and Injecting Status Prior to Death

Considerably fewer of those dying from suicide were known to have used drugs (23/37, 62%) than those dying from a drug-related death (395/448, 88%). However, similar to the overall cohort, the majority of the 23 dying from suicide who were known to have used drugs were male (18, 78%), and most were known to have used drugs for a considerable length of time (19 (83%) were known had been using for six years or more).

Of the 23 deaths by suicide among those known to have used drugs, 57% (13) were known to have injected drugs; this percentage was similar to the NDRDD cohort (64%). The length of time the individuals had been injecting drugs was similar to the NDRDD cohort, with seven known to have been injecting drugs for eleven years or more (length of time was known for ten of these 13 individuals).

Substitute Prescribing

Nine of the 37 (24%) deaths by suicide had been prescribed an ORT drug at the time of death (all had been prescribed methadone), compared with 31% (138/448) among the NDRDD cohort.

Previous Overdoses

Twenty-three (62%) of those dying from suicide had experienced at least one overdose previously, compared with (227/448, 51%) in the NDRDD cohort. Among deaths by suicide the number who had experienced only one previous overdose (13/23, 57%) was higher than the NDRDD cohort (81/227, 36%).

5.2.3: Medical and Psychiatric History and Significant Life Events

Recent Medical History

A similar percentage in both cohorts experienced a medical condition in the six months prior to death: 29/37 (78%) among deaths by suicide; and 322/448 (72%) in the NDRDD cohort, with a number of individuals experiencing more than one medical condition. However, there was higher percentage with Hepatitis C in the NDRDD cohort (82/448, 18%) than in the cohort of deaths by suicide (2/37, 5%), but fewer with diabetes in the NDRDD cohort (15/448, 3%) compared to deaths by suicide (6/37, 16%).

Recent Psychiatric History

In the six months prior to death, 28 of the 37 (76%) individuals dying from suicide experienced a particular psychiatric condition; the percentage experiencing such conditions in the NDRDD cohort was 63% (283/448). Many of the individuals were suffering from more than one psychiatric condition and the occurrence of most psychiatric conditions was similar in both cohorts.

Recent Significant Events

More than half (23/37, 62%) of the individuals dying from suicide had experienced at least one significant life event, with 12 (32%) experiencing recent ill health and six (16%) suffering the breakdown of a significant relationship. These percentages were similar to those in the overall NDRDD cohort (62%, 25% and 9% respectively).

Domestic and Sexual Abuse

Four out of 37 (11%) individuals dying from suicide had experienced a history of domestic abuse, roughly the same as the percentage in the NDRDD cohort (59/448, 13%). The percentages for individuals experiencing sexual abuse were slightly higher: in the deaths by suicide (8/37, 22%); and in the NDRDD cohort (71/448, 16%).

Suicide Attempts

The same percentage of individuals had made previous suicide attempts in both cohorts: (10/37 (27%) of the deaths by suicide; and 121/448 (27%) in the NDRDD cohort.

5.2.4: Contact with Services

Drug Treatment Services

Reflecting that fewer of the individuals dying from suicide were known to have used drugs than in the NDRDD cohort ([Section 5.2.2](#)), a lower percentage of individuals dying from suicide were known to have had contact with drug treatment services at some point in time (19 of the 37 (51%) where this was known; 16 of these within six months) than in the NDRDD cohort (311/448 where known (69%), of whom 239 were within six months).

Non-Drug Treatment Services

Seventy per cent (26/37) of those dying from suicide had contact with services for reasons other than management of a drug misuse problem, compared with 76% (341/448) in the NDRDD cohort.

Hospital Stays

Recent (in the six months before death) general acute hospital admissions (SMR01) were similar in both cohorts: 13/37 (35%) among deaths by suicide; and 134/448 (30%) in the NDRDD cohort.

Recent psychiatric hospital admissions (SMR04) were also similar in both cohorts: 1/37 (3%) among deaths by suicide; and 23/448 (5%) in the NDRDD cohort.

5.2.5: Circumstances of Death

Place of Death

A higher percentage of those dying from suicide were pronounced dead in their own home (28/37, 76%) compared to the NDRDD cohort (269/447, 60%). Only two (5%) of the deaths by suicide were pronounced dead in hospital, compared with 13% (57/447) in the NDRDD cohort.

Persons Present at Scene of Overdose

Those dying from suicide were more likely to be on their own at death (25/36, 69%) compared with 184/433 (42%) of the NDRDD cohort (data was only known for 433 cases). Among the eleven individuals who died in circumstances where at least one individual was present at the location, only three died when another person(s) was in the same room.

Ambulance Attendance and Attempted Resuscitation²⁹

Of the 37 deaths by suicide, 28 were attended by an ambulance (76%) and seven (19%) had a resuscitation attempt made on them (with two attempts being made by ambulance staff). In those individuals dying from a drug-related death 81% (363/448) were attended by an ambulance, and 45% (196/438) had a resuscitation attempt made on them. In both cohorts, around a quarter of the resuscitation attempts were made by friends.

5.2.6: Toxicology Data

Drugs Present at Time of Death

Diazepam (23/37, 62%), and methadone (16/37, 43%) were present in the body at death among individuals who died from suicide; this was similar to the overall NDRDD cohort (66% and 47%, respectively). However, heroin/morphine was present in the body in fewer individuals who died from suicide (9/37, 24%) compared to the overall NDRDD cohort (223/448, 50%).

Among individuals who died from suicide, the most frequently found drugs present in the body were: diazepam (62%), alcohol (59%), anti-depressants (51%), methadone (43%), followed by heroin/morphine, dihydrocodeine and codeine (all 24%).

Drugs Implicated in Death

A slightly different pattern was observed in the drugs which were implicated in the deaths. Methadone was implicated in the deaths for 15 of the 37 (41%) individuals dying from suicide; roughly the same as in the NDRDD cohort (185/437, 42%). Similar percentages of those dying of suicide (6/37, 16%) and in the NDRDD (81/437, 19%) had diazepam implicated in the death. Among those dying from suicide 7/37 (19%) had anti-depressants implicated in the death compared with 58/437 (13%) in the NDRDD cohort.

For the individuals who died from suicide the drugs most frequently implicated in the death were: methadone (41%), dihydrocodeine (24%), heroin/morphine and anti-depressants (both 19%), diazepam (16%) and alcohol (14%).

5.2.7: Comparison within the Death from Suicide Cohort

It is known that 23 of the 37 deaths by suicide were in individuals who were known to have used drugs. Some of the data presented above suggests that these individuals may have had different characteristics to the 14 individuals who died from suicide but were not known to have used drugs. This section examines whether it is possible to draw out conclusive differences between these two groups, and also between the overall drug-related deaths cohort (NDRDD) and the deaths by suicide in those known to have used drugs.

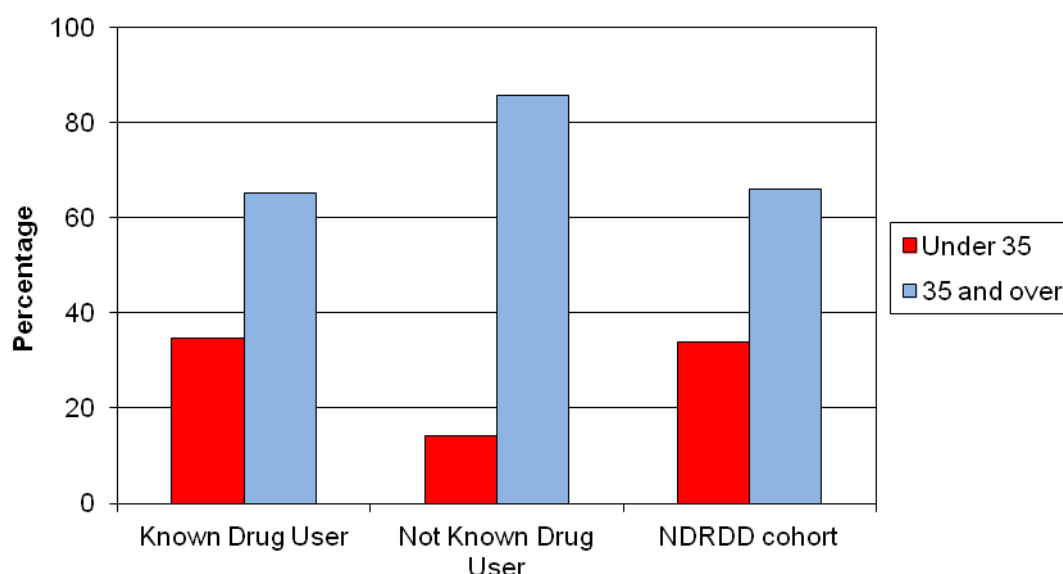
Age and Gender

Around one quarter of all deaths by suicide (10/37, 27%) were in people aged under 35 years: 8/23 (35%) in those who were known to have used drugs; and 2/14 (14%) in those who were not known to have used drugs. This compares to 152/448 (34%) in the NDRDD cohort.

The age structure of the 23 deaths by suicide in those who were known to have used drugs was similar to the age structure of the NDRDD (Figure S1).

²⁹ Resuscitation on any one individual may have been attempted by more than one person

Figure S1: Age Group at Death by Known Drug Use (NDRDD, Deaths by Suicide, 2013)



There was a difference between gender in the two groups who died from suicide; those not known to have used drugs were more likely to be female (8/14, 57%) than those who were known to have used drugs (5/23, 22%).

Employment Status

Twenty four (65%) of the 37 individuals dying from suicide were categorised as 'unemployed': this was higher in those known to have used drugs (19/23, 83%) than in those not known to have used drugs (5/14, 36%). This compares to 328/448 (73%) in the NDRDD cohort.

The percentage of deaths categorised as 'long-term sick/disabled' amongst those who were known to have used drugs was 48% (11/23), and in those not known to have used drugs it was 21% (3/14). The percentage of sick/disabled amongst those who were known to have used drugs was significantly higher than in the NDRDD cohort (106/448, 24%).

Deprivation

Twenty three (62%) of the 37 individuals dying from suicide were living in the most deprived SIMD quintile (SIMD1): 16/23 (70%) in those who were known to have used drugs; and 7/14 (50%) in those who were not known to have used drugs. When looking at SIMD1 and SIMD2 together the percentage of those who were known to have used drugs 21/23 (91%) was considerably higher than in those who were not known to have used drugs (7/14, 50%), and also higher than in the NDRDD cohort (325/427, 76%). Only two out of the 23 (9%) known to have used drugs lived in the least deprived SIMD quintile (SIMD5) compared to 3/14 (21%) of those who were not known to have used drugs. This compares to 15/427 (4%) living in SIMD5, in the NDRDD cohort.

Previous Overdoses

Twenty three (62%) of the 37 individuals dying from suicide were known to have had at least one previous overdose: 18/23 (78%) in those known to have used drugs, which is considerably higher than in those who were not known to have used drugs (5/14, 36%), and also higher than those in the NDRDD cohort (227/448, 51%).

Recent Medical History

The percentage of individuals experiencing a medical condition in the six months prior to death was similar across all comparison groups: 18/23 (78%) of those who were known to have used drugs; 11/14 (79%) of those who were not known to have used drugs; and 322/448 (72%) in the NDRDD cohort.

Evidence of Liver Disease (13% of NDRDD, 17% of known drug user suicides) and Hepatitis C (18% of NDRDD, 9% of known drug user suicides) was apparent in both the NDRDD cohort and known drug user suicide deaths, but was present in *none* of the deaths in those who were not known to have used drugs.

Recent Psychiatric History

Around three quarters (28/37, 76%) of all individuals dying from suicide had experienced a psychiatric condition in the six months prior to death: 20/23 (87%) in those who were known to have used drugs, which was higher than in those who were not known to have used drugs (8/14, 57%), and also higher than those in the NDRDD cohort (283/448, 63%).

Recent Significant Life Events

Twenty three (62%) of the 37 individuals dying from suicide had experienced a significant event in the six months prior to death: 11/23 (48%) in those who were known to have used drugs which was lower than those who were not known to have used drugs (12/14, 86%), but the same as the NDRDD cohort (277/448, 62%).

Ever Served Time in Prison

Forty-five percent (15/33 where this was known) of individuals dying from suicide were known to have ever been in prison. All 15 were known to have used drugs (71% (15/21) of deaths by suicide among known drug users), and 12% (4/33) had been in prison in the six months prior to death. In the NDRDD cohort the comparative figures were: 51% (213/417 where this was known) who had ever been in prison, and 13% (55/417) who had been in prison in the six months prior to death.

Persons Present at Scene of Overdose

In nine of the 23 (39%) individuals who died from suicide and who were known to have used drugs, at least one individual was present at the scene of fatal overdose. Another person was present in same the room at the point of overdose for three of these nine deaths.

Only two of the 14 (14%) individuals who died from suicide and who were not known to have used drugs had someone present at the scene of death, with none of these being in the same room.

In the NDRDD cohort, 58% (249/433 where this was known) of deaths had at least one individual present at the scene of fatal overdose (which was higher than in individuals who died from suicide and who were known to have used drugs), and 25% (110/433) had someone present in the same room.

Drugs Present at Time of Death

Unsurprisingly, methadone was present in the body infrequently in those who were not known to have used drugs and who died by suicide (1/14, 7%). This was lower than in the deaths by suicide in those known to have used drugs (15/23, 65%).

The presence of diazepam in the body in those known to have used drugs was 74% (17/23); similar to those who were not known to have used drugs (43%, 6/14).

There was also little difference between the presence of alcohol in those known to have used drugs (14/23, 61%), and those who were not known to have used drugs (8/14, 57%), or anti-depressants: those known to have used drugs (12/23, 52%), and those who were not known to have used drugs (7/14, 50%).

Zopiclone and paracetamol were only present in those who were not known to have used drugs (29% and 36% respectively).

For the individuals who died from suicide and who were known to have used drugs, the most frequently found drugs present in the body were: diazepam (74%), methadone (65%), alcohol (61%), anti-depressants (52%), heroin (22%), and dihydrocodeine (22%).

For the individuals who died from suicide and who were not known to have used drugs, the most frequently found drugs present in the body were: alcohol (57%), anti-depressants (50%), diazepam (43%), codeine (36%), paracetamol (36%), followed by heroin, dihydrocodeine and zopiclone (all 29%).

For the NDRDD cohort the most frequently found drugs present in the body were: diazepam (66%), heroin (50%), methadone (47%), alcohol (42%), and anti-depressants (39%).

Drugs Implicated in Death

Within the deaths by suicide cohort the drug most frequently implicated in the death was methadone (15/37, 41%). The percentage of methadone implicated deaths was higher amongst those known to have used drugs (14/23, 61%) than in those who were not known to have used drugs (1/14, 7%), and also higher than the NDRDD cohort (185/437, 42%).

For the individuals who died from suicide and who were known to have used drugs, the drugs most frequently implicated in the death were: methadone (61%), dihydrocodeine (22%), diazepam, heroin/morphine and anti-depressants (all 17%), and alcohol and phenazepam (both 13%).

For the individuals who died from suicide and who were not known to have used drugs, the drugs most frequently implicated in the death were: dihydrocodeine (29%), heroin/morphine, anti-depressants and codeine (all 21%), and diazepam and alcohol (both 14%).

For the NDRDD cohort the drugs most frequently implicated in the death were: heroin/morphine (44%), methadone (42%), diazepam (19%), alcohol (18%), anti-depressants (13%) and dihydrocodeine (13%).

5.3: Discussion

Many of the problems recognised as inherent among individuals known to use drugs are also recognised causes of suicide [24, 45-51]. The risk factors for death from suicide applicable to the general population (depression, previous non-fatal suicide attempts, incidents of self-harm, other mental health problems, unemployment, alcohol and/or substance abuse, tragic life events, violence and sexual abuse) were clearly evident in both the individuals dying from suicide and NDRDD cohort. However, there were indications

from the descriptive comparisons of the individuals who died from suicide and the NDRDD cohort that there were differences between the two in several key areas.

Clearly, while robust conclusions cannot be drawn from small numbers, there are indications that within the population of those known to use drugs there are a wide variety of individuals with complex needs and problems. Emphasis should be placed on the heterogeneity of those using drugs when considering their care and treatment.

This analysis has studied those individuals who had died from suicide from a controlled substance to try to help highlight any emerging patterns which will aid those involved in the care of problem drug users, in an attempt to identify those who are particularly vulnerable to drug-related death. It is perhaps unsurprising that deaths by suicide as a whole were different from the NDRDD cohort given that some of these deaths were not in individuals known to use drugs. Although drugs were involved in the death, the key difference from the main cohort is that the death had been categorised as 'intentional' in these 37 individuals whereas the 448 in the main cohort were categorised as 'non-intentional' deaths from drugs. Perhaps a strange anomaly is that a similar percentage of individuals had made previous suicide attempts in both the deaths by suicide cohort and the NDRDD cohort (27%). Similar percentages were also reported for drug-related deaths in 2012.

The demographic composition, types of medical conditions, drug using history and toxicology for the two cohorts differed in a variety of respects. The individuals dying from suicide were older (mean age 45.3) than the NDRDD cohort (mean age 39.1). In the NDRDD cohort there was a higher percentage of males (76%) than females: in deaths by suicide this figure was slightly lower (65%). As in 2012, the deaths by suicide cohort had a smaller percentage of individuals known to have used drugs (62%) compared with the NDRDD (88%). Among deaths by suicide there were a higher percentage of individuals categorised as 'long-term sick/disabled, than in the NDRDD cohort.

Indications from drug use and toxicology data were that some individuals who were dying from suicide were not habitual drug users. As in 2012, among deaths by suicide, a smaller percentage had heroin/morphine present in the body at post mortem or implicated in death compared with the NDRDD cohort. A higher percentage of deaths by suicide had dihydrocodeine implicated in the death than in the NDRDD cohort.

Although proportionally fewer individuals among the death by suicide cohort were known to use drugs, further analysis of the data indicated that there was a group among the deaths by suicide cohort who had similar characteristics to the main 'non-intentional' deaths cohort and were engaged in problematic drug use. It was also apparent that deaths by suicide with no known drug use noted were clearly different to those who had drug use noted.

The group of individuals who had died from suicide and who were known to have used drugs and the NDRDD cohort were demographically similar: most were male and two thirds aged 35 and over. In comparison, individuals dying from suicide with no known drug use noted were more likely to be female and over four fifths were in the oldest age group.

Over half of individuals in the 'non-intentional' NDRDD cohort and over half who were known to use drugs and who died from suicide, had been in prison, whereas none of those dying from suicide with no known drug use noted had a prison history recorded.

Methadone was implicated in a higher percentage of the deaths by suicide among those known to have used drugs, than in the NDRDD cohort, but was only implicated in one of the deaths by suicide with no known drug use noted.

Only three individuals (all of whom were known to use drugs) from the death by suicide cohort had anyone present in the same room at the time of death. This compared to presence in the same room at one in four of the non-intentional deaths. This suggests that the circumstances of the deaths between these groups may have been different.

6: Conclusions

This is the fifth report from the NDRDD. The main section of the report describes the characteristics and circumstances surrounding 448 individuals who died a non-intentional drug-related death in Scotland in 2013. The NDRDD began in 2009 in an attempt to gain a better understanding of Scotland's high rate of drug-related mortality. Using figures based on the EMCDDA definition of drug-related death from UK Focal Point on Drugs' 2014 report [56], it can be estimated that, in 2013, the rate of drug-related death per 100,000 people was 9.6 in Scotland, compared with 2.1 in England and Wales and 3.6 in Northern Ireland.

The NDRDD provides a rich dataset, contextualising many of the drug-related deaths occurring in Scotland each year. It highlights the complexities and heterogeneities among this population while facilitating the detection of associations or trends. Examination of such patterns assists in identifying individuals or groups at risk of drug-related death and may facilitate the implementation of measures to reduce those risks. This section draws together the discussions from throughout the report and summarises the key messages.

6.1: Key Messages

Those who died a drug-related death continue to be predominantly male and live in the most deprived communities in Scotland. Reflecting changes in the wider population of people with problematic drug use, victims of drug-related death were increasingly from older age groups. This demographic change is reflected in the increase in long-term intravenous drug users, increases in the percentage living alone and in their own home and is likely to be driving increases in contact with drug treatment and ORT prescribing (particularly in the long term). Moreover, as long-term intravenous drug use was related to higher prevalence of key medical and psychiatric conditions, related hospital admissions and, along with age, was related to higher average numbers of conditions, this demographic change is also likely to be driving trends towards increasing medical and psychiatric morbidity and hospital admission.

The correspondence between Scotland's ageing cohort of problem drug users, NDRDD's increasing number of older, long-term intravenous drug users and the changes observed above, raise some important questions regarding future service provision. The complex health and social care needs of this group are likely to result in simultaneous increases in demand for services, increased risk of death due to co-morbidities and increased exposure to periods of elevated overdose risk.

Seven in ten individuals had recent experience of drug treatment, hospital, prison or police custody. While such services are aiming to support individual's needs, each may lead to a period of elevated overdose risk as support is withdrawn or individuals relapse into drug use. However, the evidence on increased overdose risk after release from custody or following treatment already suggests it is vitally important that services (both drug-related and non drug-related) work together to promote retention in treatment, continuity of care and awareness of overdose risk. Naloxone [25] awareness and provision by services is a key preventative measure which can help to prevent fatal opioid overdoses and save lives.

ORT prescription among the cohort increased over time, as did prescription of other drugs with abuse potential. Given the continued public interest in ORT prescribing, it is important to continue to examine implication in drug-related deaths. Toxicology results provided evidence of individuals 'topping up' ORT prescriptions with illicit drugs and of drug diversion via the presence of methadone among those not prescribed ORTs. Despite indications of adherence to other prescribed medication, this new analysis also provided further evidence of drug diversion. However, these results cannot provide an indication of treatment efficacy among the wider population prescribed such drugs.

Opiate use continues to be the key factor in most drug-related deaths. Despite being the substances most often implicated in deaths, heroin presence has stabilised since 2011 and methadone presence has decreased. However, nearly all drug-related death victims had used multiple drugs prior to death including, in many cases, diazepam. Diazepam presence decreased markedly among 2013 deaths, but the presence of other NPS benzodiazepines increased. Research on the role of benzodiazepines (e.g. diazepam) in drug-related deaths will be undertaken in association with NFDRD in the near future.

This report documented the continuing emergence of 'Novel' Psychoactive Substances (NPS) in drug-related death. The presence of NPS within toxicology reports alongside other legal and illegal drugs has increased markedly over the past five years. This is largely due to the consumption of illicit benzodiazepines and to a lesser extent NPS which mimic the effects of Stimulant type drugs. Both groups have similarities; however the data clearly highlights distinct differences between the two which can be used to better inform policy and practice when developing prevention, treatment and harm reduction strategies.

The extent to which NPS drugs are directly contributing to drug-related mortality remains unclear, although the data presented suggest that their role is increasing and this is becoming an important area for public health moving forward. That said, the major drugs contributing to drug-related mortality in Scotland continue to be combinations of opioids, benzodiazepines and alcohol and it is important to view NPS within this wider context.

Deaths by suicide in using controlled substances were included in this report for the second time. Comparing the intentional and non-intentional deaths, demographic composition, types of medical conditions, drug using history and toxicology for the two cohorts differed in a variety of respects. Deaths by suicide among those with no known drug use noted were also clearly different to those among individuals who had drug use noted. The former group were older, included more females, had no experience of prison custody and ORTs were rarely implicated in death.

While there are issues with the completeness of the death by suicide cohort reported by NDRDD, there was further evidence that known drug users among this cohort shared some key characteristics (and associated risks) with the 'non-intentional' NDRDD cohort. While further analysis (incorporating multiple years' worth of data) would be beneficial, this suggests that harm reduction messages based on study of non-intentional deaths may also be applicable to some individuals who died from suicide.

6.2: Future Developments

Again, the challenge for practitioners and policy makers is to use these data to have an impact on the depressing statistics they represent. They further underline that the major issues are opiate-related toxicity, injecting drug use, poly substance misuse and the complex needs and risks associated with an ageing population.

Study on older drug users and the role of benzodiazepines in drug-related death is due to take place in the near future. These areas of research are complementary in the present context and will enhance our understanding of the effects of population changes and specific substance-related risks. The new multi-year analyses of NPS, hospital stays and prescribing are important developments that have added further valuable detail to this report. All were reliant upon a significant investment of time and resource in collecting these data, developing the NDRDD dataset and linking it with other data sources held by ISD. Likewise, further insights into these new areas of study will be made possible by continuing to capture detailed data on drug-related deaths and by actively utilising this resource to generate public health intelligence with the potential to save lives.

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Glossary

ACMD:	Advisory Council on the Misuse of Drugs
ACPOS:	Association of Chief Police Officers, Scotland
DRD:	Drug-Related Death
EMCDDA:	European Monitoring Centre for Drugs and Drug Addiction
ICD:	International Classification of Diseases
ISD:	Information Services Division
IVDU:	Intravenous Drug Users
LT-IVDU:	Long-Term Intravenous Drug Users
NDRDD:	National Drug-related Deaths Database
N-IVDU:	Non-Intravenous Drug Users
NKDU:	Individuals Not Known to be Drug Users
NPS:	Novel Psychoactive Substances
NRS:	National Records of Scotland
ORT:	Opioid Replacement Therapy
SIMD:	Scottish Index of Multiple Deprivation
SPS:	Scottish Prison Service

List of Tables

Table No.	Name	Time period	File & size
ALL	Full worksheet containing all 55 tables	2009-2013	273kb
1	Age and gender	2009-2013	-
2	SIMD quintile areas of deprivation	2009-2013	-
3	Where the deceased was living at the time of death	2009-2013	-
4	Whom the deceased was living with at the time of death	2009-2013	-
5	Children under 16 years the deceased was a parent or parental figure to	2009-2013	-
6	Children under 16 years who lived with the deceased	2009-2013	-
7	Known to have used drugs prior to death?	2009-2013	-
8	Known intravenous (IV) drug use and length of IV use	2009-2013	-
9	Drug detoxification within the 12 months prior to death and length of time prior to death since last drug detoxification	2009-2013	-
10	Prescribed a substitute drug at time of death?	2009-2013	-
11	How prescribed substitute drug was dispensed by type of substitute drug	2009-2013	-
12	Length of time in receipt of substitute prescription	2009-2013	-
13	Length of time in receipt of methadone prescription	2009-2013	-
14	Overdoses experienced prior to death	2009-2013	-
15	Number of months since last known non-fatal overdose	2009-2013	-
16	Experienced a particular medical condition in the six months prior to death?	2009-2013	-
17	Mean number of medical conditions	2009-2013	
18	Experienced a particular psychiatric condition in the six months prior to death?	2009-2013	-
19	Mean number of psychiatric conditions	2009-2013	
20	Experienced a significant event in the six months prior to death?	2009-2013	-
21	Victim of domestic violence prior to death	2009-2013	-

22	Sexual abuse prior to death	2009-2013	-
23	Contact with drug treatment services at any time prior to death	2009-2013	-
24	Type of services people were in contact with prior to death	2009-2013	-
25	Type of services people were in contact with prior to death for reasons other than management of a drug misuse problem	2009-2013	-
26	Deaths by time since most recent hospital admission	2009-2013	
27	Deaths by time since most recent acute hospital admission	2009-2013	
28	Deaths by time since most recent psychiatric hospital admission	2009-2013	
29	Been in police custody in six months prior to death?	2009-2013	-
30	Number of weeks between police custody release and death	2009-2013	-
31	Been in prison custody ever or in six months prior to death?	2009-2013	-
32	Number of weeks between prison release and death	2009-2013	-
33	Deaths by day of occurrence	2009-2013	-
34	Deaths by month of occurrence	2009-2013	-
35	Numbers and crude mortality rates by council area of death	2009-2013	-
36	Crude mortality rate by NHS Board of residence	2009-2013	-
37	Number of deaths by place of drug use	2009-2013	-
38	Where the individual was pronounced dead	2009-2013	-
39	Persons present at scene of fatal overdose and their location	2009-2013	-
40	Ambulance attending the scene of fatal overdose?	2009-2013	-
41	Resuscitation attempted?	2009-2013	-
42	Resuscitation attempted by whom?	2009-2013	-
43	Take-home naloxone availability and administration	2012-2013	-
44	Drugs found present in body at post mortem by age and gender	2009-2013	-
45	% Drugs found present in body at post	2009-2013	-

	mortem for all deaths by gender		
46	Drug combinations found present in body at post mortem for all deaths by age and gender	2009-2013	-
47	Drugs found present in body at post mortem and drugs implicated in the deaths	2009-2013	-
48	Drugs implicated as a percentage of drugs found present in body at post mortem	2009-2013	-
49	Prescribed a substitute drug at time of death by drug found present in body at post mortem	2009-2013	-
50	Methadone implicated deaths and prescribed substitute drug	2011-2013	-
51	Methadone implicated deaths and dispensing of prescribed methadone	2011-2013	-
52	Methadone implicated deaths and length of time in receipt of methadone prescription	2011-2013	-
53	Methadone implicated deaths and dose of prescribed methadone	2011-2013	-
54	Prescribed a drug at time of death by drug found present in body at post mortem	2009-2013	-
55	Prescribed an anti-depressant within 30 days prior to death, by anti-depressant prescribed	2009-2013	-

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Appendices

A1: National Records of Scotland Definition of a Drug-Related Death

The following is an extract taken from the National Records of Scotland, Drug-Related Deaths in Scotland 2011 report [57].

- A1. The definition of a 'drug-related death' is not straightforward. Useful discussions on definitional problems may be found in articles in the Office for National Statistics publication 'Population Trends' and in the journal 'Drugs and Alcohol Today' (please go to References in Annex C). A report by the Advisory Council on the Misuse of Drugs (ACMD) – (mentioned in the References), considered current systems used in the United Kingdom to collect and analyse data on drug-related deaths. In its report, the ACMD recommended that 'a short life technical working group should be brought together to reach agreement on a consistent coding framework to be used in future across England, Wales, Scotland and Northern Ireland'. National Records of Scotland (NRS), formerly General Register Office for Scotland (GROS), was represented on this group, and this publication presents information on drug-related deaths using the approach that was agreed, on the basis of the definition as it was implemented by GROS and, now, NRS.
- A2. The 'baseline' definition for the UK Drugs Strategy covers the following cause of death categories (the relevant codes from the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision [ICD10], are given in brackets):
- a) deaths where the underlying cause of death has been coded to the following sub-categories of 'mental and behavioural disorders due to psychoactive substance use':
 - (i) opioids (F11);
 - (ii) cannabinoids (F12);
 - (iii) sedatives or hypnotics (F13);
 - (iv) cocaine (F14);
 - (v) other stimulants, including caffeine (F15);
 - (vi) hallucinogens (F16); and
 - (vii) multiple drug use and use of other psychoactive substances (F19).
 - b) deaths coded to the following categories and where a drug listed under the Misuse of Drugs Act (1971) was known to be present in the body at the time of death:
 - (i) accidental poisoning (X40 – X44);
 - (ii) intentional self-poisoning by drugs, medicaments and biological substances (X60 – X64);
 - (iii) assault by drugs, medicaments and biological substances (X85); and
 - (iv) event of undetermined intent, poisoning (Y10 – Y14).

Note:

If a drug's legal status changes, NRS aims to count it on the basis of its classification on the day the person died (as they do not know when the drug was taken). For example, mephedrone was banned under the Misuse of Drugs Act with effect from 00.01 on 16 April 2010. Therefore, if mephedrone was the only drug found to be present in the body, a death coded to one of the categories listed under (b) would not be counted in NRS's implementation of the 'baseline' definition if it occurred before 16 April 2010.

A3. A number of categories of what may be regarded as 'drug-related' deaths are excluded from the definition because the underlying cause of death was not coded to one of the ICD10 codes listed above. Examples of deaths which are not counted for this reason are:

- deaths coded to mental and behavioural disorders due to the use of alcohol (ICD10 code: F10), tobacco (F17) and volatile substances (F18);
- deaths from AIDS where the risk factor was believed to be the sharing of needles;
- deaths from drowning, falls, road traffic and other accidents (except the inhalation of gastric contents, or choking on food) which occurred under the influence of drugs; and
- deaths due to assault by a person who was under the influence of drugs, or as a result of being involved in drug-related criminal activities.

Also excluded from the GROS/NRS implementation of the definition are a small proportion of the deaths which were coded to one of the ICD10 codes listed in paragraph A2, specifically:

- deaths coded to drug abuse where the direct cause of death was secondary infections or related complications. These include deaths which were due to clostridium novyi infection that was the result of the injection of contaminated heroin (Annex A of 'Drug-related Deaths in Scotland in 2000' explained that 22 such cases had been identified when the 2000 deaths data file was closed in May 2001, adding that it was not clear whether additional deaths had subsequently been identified). Similarly, these figures exclude the 13 deaths which were caused by the outbreak of anthrax that was associated with contaminated heroin and started in December 2009. Also excluded from the statistics are deaths caused by bronchopneumonia, organ failure and other later complications of drug use, in cases where drug misuse was not the direct and immediate cause of death (even though it may have damaged greatly the person's health). However, it should be noted that deaths for which the cause was given as (e.g.) 'bronchopneumonia, heroin intoxication' are included in these statistics because it is assumed that the medical condition is an immediate consequence of the drug toxicity;
- deaths where a drug listed under the Misuse of Drugs Act was present as part of a compound analgesic or cold remedy. These deaths are excluded in order that deaths from overdoses of legally prescribed non-controlled drugs are not counted as 'drug-related'. Examples of such combinations include:
 - co-proxamol (paracetamol and dextropropoxyphene);
 - co-dydramol (paracetamol and dihydrocodeine); and
 - co-codamol (paracetamol and codeine sulphate).

All three of these compound analgesics, particularly co-proxamol, have commonly been used in suicidal overdoses. As it is believed that dextropropoxyphene has rarely, if ever, been available other than as a constituent of a paracetamol compound, deaths caused by

dextropropoxyphene have been excluded even if there is no mention of a compound analgesic or paracetamol. However, deaths for which codeine or dihydrocodeine were reported without any mention of paracetamol have been included, as these drugs are available on their own and are known to be abused in that form.

A4. From time to time, there may be minor discrepancies between the figures for 2006 and earlier years that were published previously and those which are produced now. This is due to a change in the way in which 'drug-related' deaths are identified using the data held by NRS. This process has two stages:

- first, extract all the records of deaths which satisfy the 'wide' definition (Annex B). The method used for this stage has not been changed; and
- second, scrutinise the extracted records and identify the ones which should be counted under NRS's implementation of the 'baseline' definition. The method used for this stage was changed with effect from June 2008.

Previously, the data were examined by the former GROS Vital Events Statistician, who had considerable knowledge and experience of dealing with information about drug-related deaths. He used Excel's facilities to set a number of indicators, and so identified the cases which should be counted under GROS's implementation of the 'baseline' definition. This method clearly relied greatly on the Statistician's personal expertise. He retired in Spring 2008.

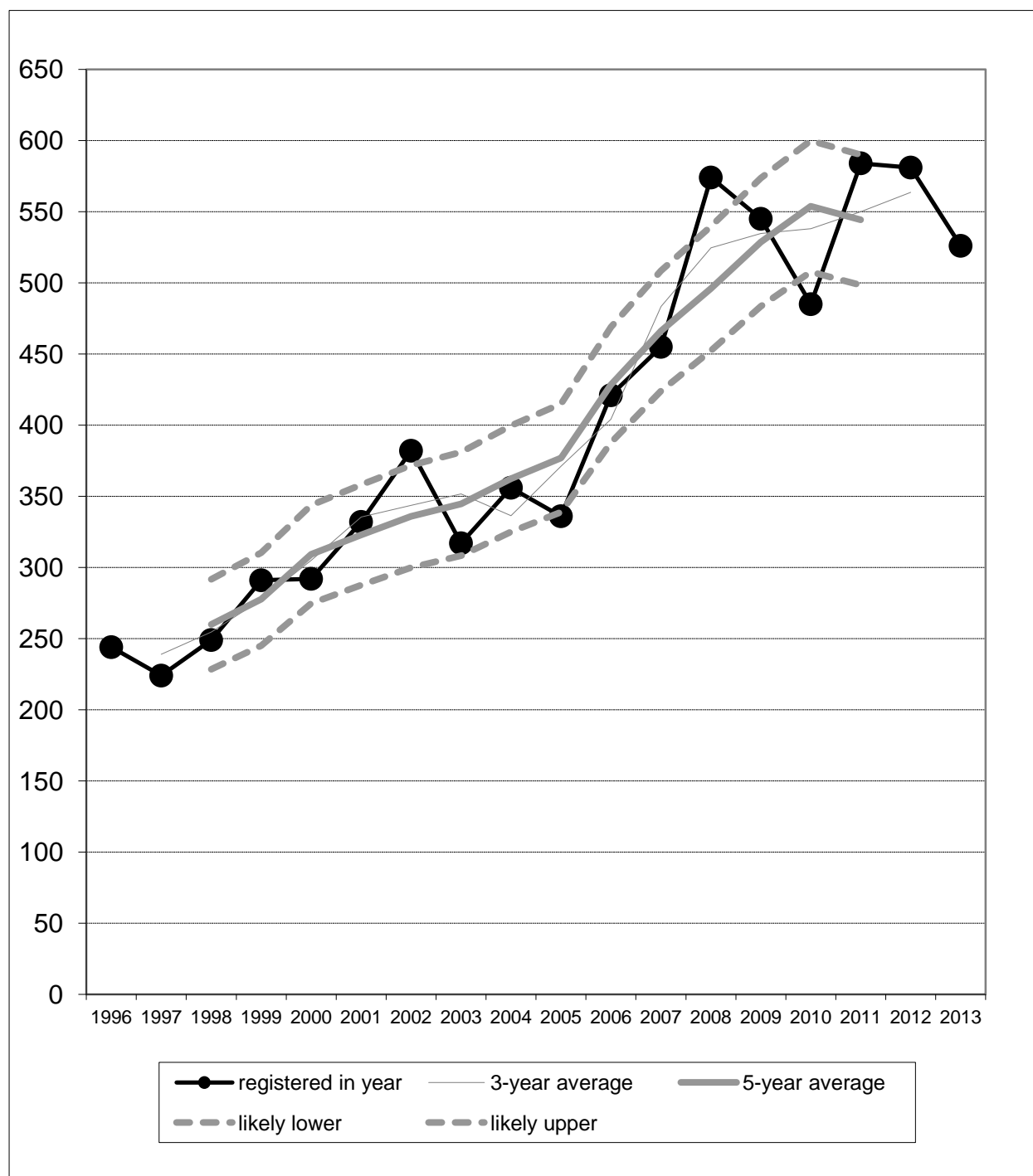
Now, most of this work is done by SAS computer programs, using a look-up table to identify particular types of drugs (John Corkery of the National Programme on Substance Abuse Deaths supplied most of the content of the look-up table).

The new method was tested by using it to prepare figures for each year for 2000 to 2006, inclusive. The results were the same as, or within just 1-2 of, the figures which had been published previously. After examining the cases which were being counted differently by the old and the new methods, it was concluded that any flaws in the new method were not significant, and that it should be used henceforth. However, to avoid confusing users of these statistics, the tables which appeared in editions of this publication which were produced before the method was changed give figures for 2006 and earlier years which were extracted from the database produced by the old method, and so are as published previously. However, any subsequent new analyses of the data for 2000 onwards are likely to use the database produced by the new method, and so may include some totals or sub-totals (for the years from 2000 to 2006, inclusive) that differ slightly from the figures which were published previously, because the new method was used to produce the database of relevant cases for those years.

A2: National Records of Scotland (NRS) Report on Drug-Related Deaths 2013

In its most recent publication [1], the NRS reported that 526 drug-related deaths were registered in Scotland in 2013. Figure 1 shows the long-term trend of drug-related deaths in Scotland since 1996.

Figure A2.1: Drug-Related Deaths in Scotland, 3- and 5-Year Moving Averages and Likely Range of Values around the 5-Year Moving Average



Source: NRS (2014), Drug-Related Deaths in Scotland 2013 [1]

There was a reduction of 55 drug-related deaths between 2012 (581) and 2013 (526). Regardless of the fall in deaths, this was the fifth highest number ever recorded by the NRS and 66% higher than in 2003. However, this figure was lower than recent values of the 3-year moving average indicated in Figure A2.1. This suggests that, aside from an unusually low (for recent years) number in 2010, annual numbers of drug-related deaths appear to have stabilised since 2008.

When comparing the annual average for 2009-2013 with that for 1999-2003, the NRS reported a greater percentage increase in the number of females who had died drug-related deaths compared with males (139% and 53% increases respectively). Furthermore, there were increases for those aged 25-34, 35-44, 45-54 and 55 and over, with the largest percentage increase occurring in the 45-54 age group. This contrasted with the number of drug-related deaths in those under 25 years of age which declined. The NHS Board areas with the largest numerical increases were Greater Glasgow and Clyde, Lothian and Lanarkshire.

Of the 526 drug-related deaths reported by NRS in 2013, heroin and/or morphine was implicated in or potentially contributed to 42% of deaths followed by methadone (41%), benzodiazepines (28%), cocaine (8.6%), amphetamines (5.1%) and ecstasy (3.2%). In 2013, heroin and/or morphine were implicated in, or potentially contributed to, the same number of deaths as in 2012 (221), and far fewer deaths than in 2008 (324). The corresponding figure for methadone was below that for 2012 (237), but was still higher than in 2008 (149). The number for benzodiazepines was also lower than in 2012 (196) and was at the same level as in 2008 (149). were implicated or to which they potentially contributed. Finally, alcohol was implicated in or contributed to 19.6% of the 526 drug-related deaths in 2013 which was the lowest number in all the years for which figures on this basis were available (starting from 2008).

A3: Methods

A3.1: Data Collection Development

A3.1.1: The National Forum on Drug-Related Deaths (NFDRD) Data Collection Sub-Group

In line with the previous three NDRDD projects [2-4], the National Forum on Drug-Related Deaths (NFDRD) Data Collection Sub-Group oversaw the process of data collection. Whilst the National Drug-Related Deaths Database is led by ISD, the NFDRD Data Collection Sub-Group comprises of individuals from a wide range of organisations and professional backgrounds. For a more detailed account of how the NFDRD was originally established see [Appendix A4](#). See [Appendix A5](#) for a full list of Data collection Sub-Group members.

A3.1.2: The NDRDD Data Collection Form

The proforma used for NDRDD data collection was developed by the NFDRD Data Collection Sub-Group. It was designed to collect data on a wide range of details concerning the individuals' social circumstances and health. 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.

A3.2: Data Collection Process

A3.2.1: 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 as per the NDRDD definition). If these criteria are met, a case record is submitted to ISD.

A3.2.2: Local Area Drug-related Death Surveillance

Drug-related deaths 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 drug-related death. See [Appendix A6](#) for a list of the local Data Collection Co-ordinators.

A3.2.3: 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 the deceased 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 Health Boards in Scotland. However for some items there was variance in their recording depending on local practice.

A3.2.4: Information Support, Data Entry and Data Transfer

The electronic spreadsheet used for data has been in place since 2010. As was the case in previous years, ISD received the data into a restricted mailbox via the Government Secure Internet email network. This data was then entered into a secure Oracle database at ISD. Information that could identify the deceased individuals was removed prior to data extraction and analysis using SPSS software. The ISD NDRDD manager was available to provide IT support, advice and guidance throughout this process.

A3.2.5: Incorporation of 'Drugs Implicated' Data from NRS

The NDRDD contains data which indicate the presence of drugs in the body through toxicological examination but it does not contain details as to whether or not the drug was implicated in or contributed to the death. Such information, however, is collected by the NRS. Assessment as to whether or not a drug present in the body was implicated in or contributed to the death is conducted by the pathologists. The presence of a drug in the toxicology of a deceased individual does not necessarily mean that the drug contributed towards the death.

This report incorporates this information, which was supplied to ISD 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.

A3.3: Data Quality Assurance

In addition to front-end validation within the electronic spreadsheet and Oracle database, the NDRDD data were cross-matched with records obtained from the NRS Vital Events database which contains the records of all those who die in Scotland. ICD-10 codes were then extracted and compared with the relevant codes within the NDRDD. This quality assurance process made it possible to thoroughly investigate any anomalous differences between the NDRDD and NRS data. Details regarding the outcomes of this matching process can be found in [Appendix A7](#)

A3.4: Data Confidentiality and Information Governance

The data collected for the NDRDD are not directly covered by the Data Protection Act 1998. However, ISD considers the data to be protected under a duty of confidence. Person-identifying details regarding each individual are entered into the NDRDD as this information is necessary for potential linkage to other data sets and cross-matching. However, all measures are taken to protect the confidentiality of these data and the NDRDD project adheres to the six Caldicott Guardian Principles.

A4: Establishment of the National Forum on Drug-Related Deaths (NFDRD)

The following extract is taken from Section 2 of the National Drug-Related Deaths (Scotland) 2009 report which was published in December 2010 [2] and explains the origins of the NFDRD Data Collection Sub-Group. Please note that the references indicated in square brackets in this extract correspond with the references found in Section 5 of the 2009 report [2].

‘2.2 Background, Policy Context and Rationale

Following the rise in drug-related deaths in the early 2000s, the then Scottish Executive set up a National Investigation into drug-related deaths [2]. Reporting in 2005, this examined the clinical and social circumstances surrounding all drug-related deaths in Scotland for the calendar year 2003. The Scottish Advisory Committee on Drug Misuse (SACDM) convened a short life working group in 2005 to develop a policy response to the findings and proposals from both the National Investigation and the Association of Drug and Alcohol Teams report on Drug-Related Deaths published earlier that year [3, 4]. Key recommendations from both reports with regard to future monitoring of drug-related deaths included the need to improve record keeping of both clinical details and social circumstances of service users; the need for standardisation of the definition and reporting of a drug-related death (including a standard approach by pathologists); that local areas establish drug-related deaths databases to be overseen by Critical Incident Groups; the need to develop a comprehensive minimum dataset for reporting of deaths and the proposal of the establishment of a national confidential enquiry. The then Scottish Executive responded to these recommendations in the plan Taking Action to Reduce Scotland’s Drug-Related Deaths Dec 2005, a principle action of which was to set up a National Forum on Drug-Related Deaths (NFDRD) to study trends of drug-related deaths and disseminate good practice [5].

In its first annual report in 2007, the National Forum on Drug-Related Deaths proposed that a new system for data collection on drug-related deaths should be established [6]. Local Alcohol and Drug Action Teams (ADATs) should be ‘asked to gather data in a systematic format on each death after being notified of these by the police or the SCDEA (Scottish Crime and Drug Enforcement Agency)’ and that ‘the data should be standardized by ISD (Information Services Division) in a suitable electronic format which will allow analysis and reporting’. In 2008 the Scottish Government published the national strategy for tackling drug misuse, the Road to Recovery, in which it outlined the commitment to work with ISD to create a Drug-Related Deaths Database ‘to give a more complete picture of a person’s treatment pathway prior to death’ [7]. The development of the NDRD Database and collection of NDRDD data was led by ISD working in close collaboration with the Alcohol and Drug Partnerships (which replaced Drug and Alcohol Teams) and local DRD monitoring groups under the auspices of the National Forum on Drug-Related Deaths through its Data Collection Sub-Group.’

A5: National Forum on Drug-Related Deaths Data Collection Sub-Group Membership

Name	Title/Organisation
Dr Roy Robertson (Chair)	Reader, Centre for Population Health Sciences, University of Edinburgh and Muirhouse Medical Group, Edinburgh
Lee Barnsdale	Principal Information Analyst, ISD, NHS National Services Scotland
D.I. Tommy Crombie	National Drugs Co-ordinator, Police Scotland
David Early	Data Manager, Information Services Division, NHS National Services Scotland
Peter Fairbrother	Drug-related Death Review Co-ordinator, NHS Lothian
Ruth Gordon	Senior Information Analyst, ISD, NHS National Services Scotland
Dr Lesley Graham	Associate Specialist, Public Health, Health Improvement Team, ISD, NHS National Services Scotland
Robin Lawrenson	Clinical Performance Manager, Scottish Ambulance Service
Dr Tony Martin	Drugs Death Research Associate, Glasgow Drug and Alcohol Partnership
Andrew McAuley	Public Health Information Manager, NHS Health Scotland
Dr Claire McIntosh	Consultant Addiction Psychiatrist, NHS Forth Valley
Angela Prentice	Information Manager, ISD, NHS National Services Scotland
Carolyn Rixon	Data Management Officer, ISD, NHS National Services Scotland
Jim Sherval	Specialist in Public Health, NHS Lothian

Scottish Government Official Support

Fiona Fraser, Drugs Policy Unit, Scottish Government

Michael Crook, Drugs Policy Unit, Scottish Government

A6: National Drug-Related Deaths Data Collection Co-ordinators

Health Board Area	Data Collection Co-ordinator(s)	Organisation	Email	Other Data Collectors
Ayrshire & Arran	Lesley Robb	East, North & South Ayrshire ADP ¹	lesleyrobb@nhs.net	Ruth Shepherd
Borders	Susan Walker	Scottish Borders ADP	susan.walker14@nhs.net	Fiona Doig
Dumfries & Galloway	Jackie Davies	Dumfries & Galloway ADP	jdavies1888@nhs.net	
Fife	Fleur Davey	NHS Fife	fleurdavey@nhs.net	
Forth Valley	Elaine Lawlor	ADP	elainelawlor@nhs.net	Anita Dufton
Grampian	Lynn Sutherland	Public Health Officer	lynnsutherland@nhs.net	Joy Hay
Greater Glasgow & Clyde	Tony Martin	Research Associate	tonymartin@nhs.net	Stephanie Dargan
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Orkney	Katie Spence	ADP	katiespence@nhs.net	
Shetland	Karen Smith	NHS Shetland	karenk.smith2@nhs.net	Edwin Graham
Tayside	Caroline Snowdon	Public Health Intelligence Officer	caroline.snowdon@nhs.net	
Western Isles (Eilean Siar)	Fiona Hall	Substance Misuse Information & Research Officer	Fionahall1@nhs.net	
Argyll & Bute ²	Carol Muir Anne Ndlozi	ADP Information Officer	carol.muir@nhs.net Anne.ndlozi@nhs.net	Sarah Marquis

¹ ADP stands for Alcohol and Drug Partnerships Support Team

² Part of Argyll and Bute belongs to Highland Health Board with the other part belonging to Greater Glasgow and Clyde Health Board. However Argyll and Bute is treated as a separate entity as far as the NDRD data collection is concerned.

A7: Construction of the 2013 NDRDD Cohort

A7.1: Drug-Related Deaths for 2013 Reported by Different Agencies

NDRDD	NRS	Police Scotland
485	526	549

The National Drug-Related Deaths Database (NDRDD) reports on a subset of 485 of the drug-related deaths in Scotland in 2013 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 drug-related deaths that are registered annually in Scotland is published by the National Records of Scotland (NRS) in its annual Drug-Related Deaths report [1]. The number of drug-related deaths registered in 2013 and reported by NRS was 526.

Police Scotland also produced an annual figure for the number of drug-related deaths reported to them by Scottish police divisions. This report is on all suspected drug-related deaths, some of these are later excluded following post mortem examination and toxicology testing. Police Scotland dealt with 549 suspected drug deaths. It is possible that the status of some of these 549 suspected deaths will change.

A7.2: Matching the NDRDD Records to NRD Death Records

In line with the previous four NDRDD reports [2-4], the data were quality assured by matching the NDRDD death records to those held by NRS. The NRS thoroughly reviews the death certificates for all deaths registered in a given calendar year before determining whether or not they are drug-related. The 2013 NRS figure of 526 was therefore derived from this comprehensive process.

A total of 508 records were returned to ISD for inclusion in the NDRDD for 2013 and these were matched to the NRS records for every death registered in Scotland in 2013 (including the 526 drug-related deaths). Twenty three (out of 508) of the NDRDD records did not meet the NDRDD definition of a drug-related death. Therefore the final 2013 NDRDD cohort (analysed for this report) comprised of 485 records. The reasons for the removal of the 23 records are shown in the following table.

	Number of cases excluded
NRS coded the death (ICD 10 codes) to something unrelated to the use of a controlled substance e.g. chronic ischaemic heart disease (ICD10 code I25), status asthmaticus (J46), other chronic obstructive pulmonary disease (J44)	20
NRS coded the death to 'other ill-defined and unspecified causes of mortality' (R99) and no additional toxicology and cause of death information was made available before NRS finalised its statistical database for deaths registered in 2013.	3
Total	23

A7.3: Explanation of the Difference between the NDRDD and NRS Figures

The reasons why the NRS 2013 figure of 526 is higher than the NDRDD 2013 figure of 485 are shown in the table below.

	Number	Total
The number of drug-related deaths reported by NRS for 2013.	526	
Less the NRS deaths that occurred in 2012 but were registered in 2013 i.e. not included in the 2013 NDRDD figure.	-10	516
Add the NDRDD deaths that occurred in 2013 but were registered in 2014 i.e. not included in the 2013 NRS figure.	+11	527
Add the deaths that were not included in the 2013 NRS figure due to their not being classifiable as 'drug-related' on the basis of the information that was available to NRS when it finalised its statistical database for deaths registered in 2013.	+15	542
Less the deaths that were included in the 2013 NRS figure but for which a NDRDD record was not returned to ISD.	-57	485
Cases in NDRDD cohort to be analysed.	485	

The table above illustrates that the NDRDD uses the date of death to allocate the death to a particular year whereas NRS uses the date death registered, resulting in a net loss of 10 cases to the NDRDD figure. The 10 NRS cases where death occurred in 2012 but was registered in 2013 (not included in the 2013 NDRDD figure) were included in the 2012 NDRDD cohort. Further, the 11 cases where death occurred in 2013 (and are reported by NDRDD in this report) but was registered in 2014 (and therefore not included in the 2013 NRS figure) will be included in the NRS 2014 cohort. Thus, although there is a difference

in the case inclusion criteria used by NRS and NDRDD reports, this only affects deaths occurring at the end of each calendar year. Notwithstanding data collection issues affecting the NDRDD cohort, no cases are entirely excluded from either cohort.

A further 15 deaths were included in the final NDRDD figure that were not counted as 2013 DRDs by NRS because this was not appropriate on the basis of the information that was available to NRS when it finalised its statistical database for deaths registered in 2013 at the end of May 2014. Note – NRA data is “frozen” around May/June of the following calendar year.

Taking the above explanations into account there still remains 57 deaths that NRS have counted as DRDs for which ISD did not receive any returns for the NDRD database. Of these 57 deaths, 15 (26.3%) were for NHS Fife, 11 (19.3%) for NHS Highland, 10 (17.5%) for NHS Lothian, 5 (8.8%) for NHS Lanarkshire, 4 (7.0%) for each of NHS Ayrshire & Arran and NHS Forth Valley, 3 (5.3%) for each of NHS Borders and NHS Tayside, 1 each (1.8%) for NHS Greater Glasgow & Clyde and NHS Western Isles.

A7.4: Reasons Why NRS DRDs Were Not Captured By the NDRDD 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 ISD 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 drug-related death whereas the information that NRS received had indicated that the death was a drug-related death.
3. The NRS decided that the death was a drug-related death because an illicit drug was present in the toxicology, but the pathologist (or the Local Critical Incident Monitoring Group) considered that:
 - i) either the level of the illicit drug was so small that the death could not be considered as being a drug-related death, or
 - ii) 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" definition of a drug-related death (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 Point 2.b in [Appendix A1](#)).

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 Coordinator was not informed about a drug-related death. For example, when there is no evidence at the time of death to suggest that a death is drug-related the Police Sudden Death report would not show the death as being a suspected drug-related death. Occasionally, via post-mortem and toxicology testing, the Procurator Fiscal will later find that such a death is in fact a drug-related death. In some areas the Procurator Fiscal does not tell the police and the Local Critical Incident Monitoring Group about such a drug-related death and consequently ISD will not be sent a NDRDD record. The NRS will normally know about these drug-related deaths 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 Coordinator.
6. There is an ongoing criminal investigation surrounding a drug-related death and the Procurator Fiscal has not given permission for certain information relating to a death to be released to the Data Collection Coordinator and the Coordinator 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 drug-related deaths 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.

A7.5: NDRDD versus Police Scotland Figures

The definition of a drug-related death used by the Association of Chief Police Officers, Scotland (ACPOS) is:-

"Where there is prima facie evidence of a fatal overdose of controlled drugs. Such evidence may be recent drug misuse, for example controlled drugs and/or a hypodermic syringe found in close proximity to the body and/or the person is known to the police as a drug misuser although not necessarily a notified addict."

Prior to the inclusion of suicide cases in NDRDD, the process for identifying a death as drug-related and triggering the return of a NDRDD record to ISD was the same as the process by which the Police Scotland arrive at their figure for confirmed drug-related deaths:-

- 1) The Police Sudden Death report contains information that shows that the death was unintentional and meets the ACPOS drug-related death definition given above e.g. there is evidence of a fatal overdose of controlled drugs
- 2) The pathologist (or Drug-Related Death Monitoring group) confirms the death as being drug-related following post mortem examination and toxicology testing

Given that the criteria by which non-intentional deaths are counted as being drug-related deaths by Police Scotland is the same as the previous criteria used to decide whether a NDRDD record is returned to ISD, one would expect the number of such deaths in the final

NDRDD cohort to be similar to the number reported by Police Scotland. The table at the start of [Appendix A7](#) shows that for 2013, Police Scotland reported 549 deaths, 64 more than made up the final 2013 NDRDD cohort. However, it is possible that the status of some of these 549 suspected deaths will change.

A8: NPS Recorded within DRD

Table N3: Total Number of Cases with NPS Recorded within DRD (NDRDD: 2009-2013)

NPS	2009	2010	2011	2012	2013	Total
Benzo-type NPS						
Phenzaepam	0	1	33	23	75	132
Etizolam	0	0	0	1	16	17
Diclazepam	0	0	0	0	1	1
Stimulant-type NPS						
PMA / PMMA	0	0	8	0	8	16
BZP	2	0	3	2	7	14
Mephedrone	1	4	2	2	2	11
TFMPP	2	2	2	1	2	9
AMT	0	0	0	4	3	7
APB	0	0	0	3	1	4
MPA	0	0	0	1	3	4
MDPV	0	0	1	0	2	3
Benzocaine	0	0	0	2	0	2
API / 5-IT	0	0	0	1	2	3
Naphyrone	0	1	0	0	0	1
Methylamphetamine (4-MA)	0	0	1	0	0	1
MDEA	0	0	0	1	0	1
Chlorophenylpiperazine	0	0	0	0	1	1
Methylone	0	0	0	0	1	1
Cannabinoids	0	0	0	0	1	1
Ethylphenidate	0	0	0	0	1	1
Camfetamine	0	0	0	0	1	1
Methylethcathinone	0	0	0	0	1	1

Note: As it was possible for multiple NPS to be present in toxicology results, numbers will exceed 100% of cases.

A9: Early Access Details (Including Pre-Release Access)

Pre-Release Access

Under terms of the "Pre-Release Access to Official Statistics (Scotland) Order 2008", ISD are 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
- Scottish Prison Service

Early Access for Quality Assurance

These statistics will also have been made available to those who needed access to help quality assure the publication:

- NDRDD Data Collection Sub-Group

A10: Publication Metadata (including revisions details)

Metadata Indicator	Description
Publication title	The National Drug-Related Deaths Database (Scotland) Report: Analysis of Deaths occurring in 2013
Description	A detailed examination of a subset of the drug-related deaths that occurred in Scotland in 2013 (including trend data from 2009-2013 where available).
Theme	Health and Social Care
Topic	Drug-related mortality
Format	PDF with Excel tables
Data source(s)	<p>Data from the National Drug-Related Deaths Database held by ISD. 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.</p> <p>Data from the National Records of Scotland (NRS) for drug-related deaths in 2013. This was supplied to ISD by the NRS for this report.</p>
Date that data are acquired	Data for this report were submitted to ISD in October 2014 and were then quality assured. Note: data are gathered locally soon after each death and are collated before being sent to ISD by the agreed deadline. NRS data were also submitted to ISD in October 2014.
Release date	28 April 2015
Frequency	Annually
Timeframe of data and timeliness	All drug-related deaths that occurred in calendar year 2013 are considered relevant.
Continuity of data	This is the fifth NDRDD report. In 2012 the definition of 'drug-related death' was expanded to include deaths by suicide. However deaths by suicide were reported separately in Section 5 of the report, to ensure the continued comparability of findings from the main cohort of non-intentional deaths. Other definitions and data collection techniques have remained consistent over time.
Revisions statement	No planned revisions
Revisions relevant to this publication	N/A
Concepts and definitions	Detailed information of the deaths relevant to this report is shown in Appendix A1 .
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 ISD database. Any issues identified within the record are highlighted to the data provider and corrected before analysis begins.
Completeness	Detailed breakdowns of completeness are available in Appendix A7 .
Comparability	The data captured can be used for year-on-year comparisons.
Accessibility	It is the policy of ISD Scotland to make its web sites and products accessible according to published guidelines .
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 ISD protocol on Statistical Disclosure Protocol was followed.
Official Statistics designation	Official Statistics
UK Statistics Authority Assessment	N/A
Last published	25 March 2014
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Date of first publication	25 January 2011
Help email	r.gordon@nhs.net
Date form completed	14 April 2015

A11: ISD and Official Statistics

About ISD

Scotland has some of the best health service data in the world combining high quality, consistency, national coverage and the ability to link data to allow patient based analysis and follow up.

Information Services Division (ISD) is a business operating unit of NHS National Services Scotland and has been in existence for over 40 years. We are an essential support service to NHSScotland and the Scottish Government and others, responsive to the needs of NHSScotland as the delivery of health and social care evolves.

Purpose: To deliver effective national and specialist intelligence services to improve the health and wellbeing of people in Scotland.

Mission: Better Information, Better Decisions, Better Health

Vision: To be a valued partner in improving health and wellbeing in Scotland by providing a world class intelligence service.

Official Statistics

Information Services Division (ISD) is the principal and authoritative source of statistics on health and care services in Scotland. ISD is designated by legislation as a producer of 'Official Statistics'. Our official statistics publications are produced to a high professional standard and comply with the Code of Practice for Official Statistics. The Code of Practice is produced and monitored by the UK Statistics Authority which is independent of Government. Under the Code of Practice, the format, content and timing of statistics publications are the responsibility of professional staff working within ISD.

ISD's statistical publications are currently classified as one of the following:

- National Statistics (ie assessed by the UK Statistics Authority as complying with the Code of Practice)
- National Statistics (ie legacy, still to be assessed by the UK Statistics Authority)
- Official Statistics (ie still to be assessed by the UK Statistics Authority)
- other (not Official Statistics)

Further information on ISD's statistics, including compliance with the Code of Practice for Official Statistics, and on the UK Statistics Authority, is available on the [ISD website](#).