Publication Report

The National Drug-Related Deaths Database (Scotland) Report: Analysis of Deaths occurring in 2012

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Contents

Key Points

The National Drug-Related Deaths Database

- This report provides information on the nature and social circumstances of individuals who died a drug-related death in Scotland in 2012.
- The 479 cases analysed in this report are a subset of the 581 drug-related deaths already published by National Records Scotland (NRS) in August 2013.

Profile of Individuals

- As in previous years, over three quarters (75%) of those who died were male, over half (57%) lived in the most deprived areas of Scotland and the 25-44 years age group accounted for around two-thirds (67%) of deaths.
- Drug-related deaths in those aged 45 and over were higher in 2012 (26%) than in 2011 (14%). Deaths in those aged under 25 were lower in 2012 (8%) than in 2011 (12%).
- Nearly three-fifths (59%) of individuals who were known to have used drugs also had a history of intravenous (IV) drug use.
- More than one quarter of those who died (28%) were on prescription for an opioid substitute therapy drug at the time of death.
- Over four-fifths (85%) had a medical condition recorded in the six months prior to death and over half (56%) had a psychiatric condition recorded in the six months prior to death.
- Over a third (37%) of those who died, were a parent or parental figure. 286 Children lost a parent or parental figure to a drug-related death in 2012, which was less than in 2011 (331 children).

Contact with Services

- Six in ten individuals (60%) 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.
- More than one quarter (27%) had been in police custody and around one in ten (12%) had been in prison in the six months prior to 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 69% 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 (79%), followed by methadone (50%), heroin/morphine (48%), alcohol (47%) and anti-depressants (44%). Opioids (methadone, heroin, morphine or buprenorphine) were *present* in 80% of cases.
- The percentage of deaths with heroin/morphine *present* declined from 73% in 2009 to 48% in 2012. The percentage of deaths with methadone *present* fell to 50% in 2012 from 57% in 2011.

- The drug most frequently found to be *implicated* in death in 2012 was methadone (46%), followed by heroin/morphine (41%), diazepam (30%) and alcohol (19%). In only three cases was methadone identified as the only drug *implicated* in death.
- There were 36 cases with a 'new' or 'novel' psychoactive substance (NPS) *present* in the body at death. They were categorised into two main types: Benzodiazepine-type drugs (mainly Phenazepam) and Stimulant-type drugs (e.g. BZP, Mephedrone).

Deaths by Suicide

- In addition to the 479 non-intentional deaths in the 2012 NDRDD, 52 deaths by suicide were recorded. Again, these were a subset of the 581 drug-related deaths (including suicide statistics) already published by National Records Scotland (NRS) in August 2013.
- Half of deaths by suicide recorded by NDRDD were among males and half among females. The average age of deaths by suicide was ten years higher than the main NDRDD cohort.

1: Introduction

1.1: Overview

This is the fourth report from the National Drug-Related Deaths Database (NDRDD) for Scotland which presents data for the calendar year 2012 and trend data back to 2009. The NDRDD was established to collect detailed information regarding the nature and social circumstances of individuals who have died a drug-related death. This report analyses a cohort of drug-related deaths in Scotland already reported by the National Records of Scotland (NRS), formerly known as the General Register Office for Scotland.

The NRS and NDRDD gather their 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 upward trend in drug-related deaths in Scotland since 1997 [1]; the NDRDD reports have sought to contextualise these deaths in relation to the 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 notable definitions come from the NRS [1] and previous NDRDD reports [2-4]. The NRS obtains details of all deaths that are registered in Scotland and identifies drug-related deaths based on a supplementary questionnaire 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 previous three NDRDD reports [2-4] matches that of the NRS with the exception that it did not include confirmed deaths by suicide. However, for this report on 2012 deaths, the definition used matches that of the NRS, with deaths by suicide included for the first time. This 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 in this report accounts for much of the observed increase in the NDRDD cohort for 2012 compared to 2011. However, to maintain consistency with previous publications the main body of this report focuses on unintentional deaths (n=479), while deaths by suicide (n=52) are described separately in Appendix A2[1].

It is important to note that the 52 deaths by suicide reported in Appendix A2 are a further subset of the 581 drug-related deaths (including suicide statistics) already published by National Records Scotland (NRS) in August 2013.

1.3: NRS Report on Drug-Related Deaths 2012

In its most recent publication [1], NRS reported that 581 drug-related deaths were registered in Scotland in 2012. This was similar to the number reported in 2011 (584). The 2012 figure was the second highest number of drug-related deaths recorded by NRS, 52% higher than in 2002. The annual number of drug-related deaths has shown only a slight

[1] The authors would like to thank Lorraine Copeland for her contribution to this section of the report.

upward trend since 2008. A detailed summary of the NRS report is included in Appendix A3.

1.4: 'New' or 'Novel' Psychoactive Substances

In recognition of the international evidence that global drug markets and drug trends are changing [5-6], the 2012 NRS report [1] included a section on 'New' or 'Novel' Psychoactive Substances (NPS). This report also contains a new section (Appendix A4) 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.

Again, it is important to note that the 36 NPS-related deaths reported in Appendix A4 are a subset of the 581 drug-related deaths already published by National Records Scotland (NRS) in August 2013. However, unlike deaths by suicide, NPS-related deaths are also included in the analysis of 479 non-intentional deaths included in the main body of this report.

1.5: Report Outline

This report focuses on the **nature and social circumstances of drug-related deaths occurring in Scotland in 2012**. 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 2012 NDRDD cohort;
- a full description of results from the 2012 NDRDD cohort and comparison with results from previous NDRDD cohorts to identify changes and trends over time;
- a description of the role of methadone and 'New' or '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.

2: Methods

The National Forum on Drug-Related Deaths (NFDRD) 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 NFDRD Data Collection Sub-Group comprises of individuals from a wide range of organisations and professional backgrounds[2].

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)[3]. 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' social circumstances and health. Although the dataset has been reviewed 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. Further information on methods is available in Appendix A5.

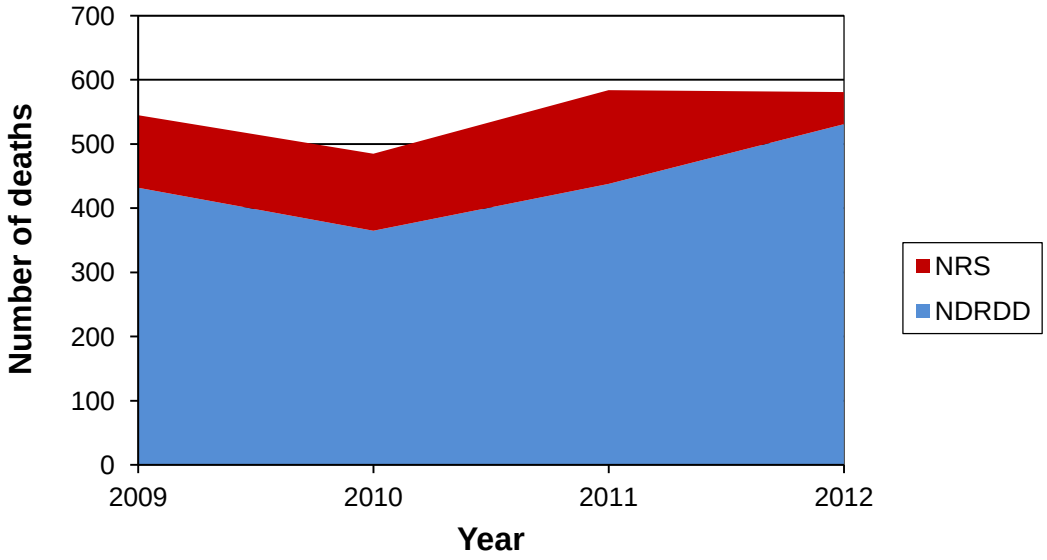
2.1: The 2012 National Drug-Related Deaths Database Cohort

In 2012, a total of **531** records were identified as eligible for inclusion in the NDRDD cohort. This was an increase in comparison to the number of cases reported in 2011 (438). This apparent increase from the 2011 report was due to the inclusion of deaths by suicide in an attempt to harmonise the NDRDD and NRS drug-related death definitions (see Introduction) and efforts by ISD and NFDRD to improve data collection. Figure 1 shows the increasing convergence in terms of cohort size between the two datasets over time.

[2] See Appendix A6 for a full list of Data collection Sub-Group members.

[3] In addition to the NRS and NDRDD reports, NHS Health Boards may also report independently on drug-related deaths within their area. NHS Lothian published an Annual Report in 2012 [7] and have developed a website (http://www.drdlothian.org.uk/) to disseminate findings and signpost further information on drug-related deaths.

Figure 1: Volume of Drug-Related Deaths in NRS and NDRDD cohorts (2009-2012)

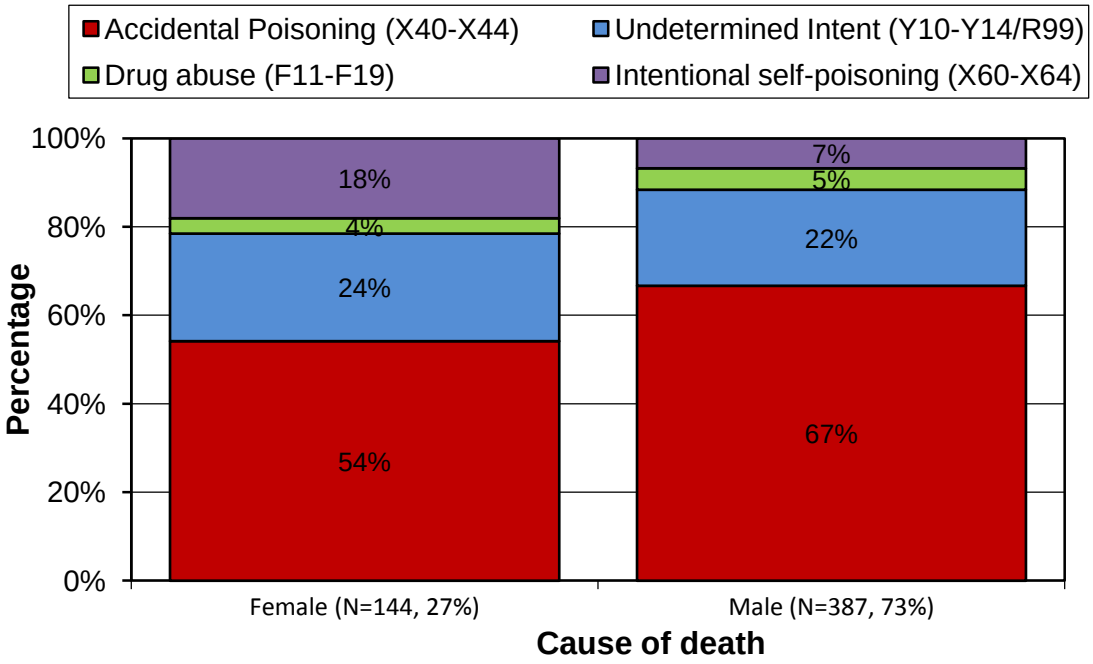


In 2012, a total of 560 records were submitted to ISD for the NDRDD but 29 (5%) did not meet the criteria for inclusion. The reasons for excluding these 29 cases are detailed in Appendix A9. The percentage of cases that were excluded from the 2012 NDRDD cohort was lower than for 2011 (12%).

After matching to NRS data on drug-related deaths, it was possible to identify a total of 41 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 A9. In 2012, the percentage of missing records was 7% (41/531+41=572) which was lower than for 2011, 19% (106/544). Excluding the 52 cases classed as deaths by suicide (reported in Appendix A2), a total of **479** records were identified as eligible for inclusion in the main NDRDD cohort in 2012 (hereafter referred to as 'the NDRDD cohort' or as 'non-intentional deaths').

Figure 2 shows the percentage of causes of death (as classified by ICD10 code) by gender. It can be seen that the number of deaths by suicide ('intentional self-poisoning' in the figure) was similar for both sexes but these accounted for a higher percentage of deaths among females (18%) than males (7%).

Figure 2: Cause of Drug-Related Deaths by Gender (NDRDD, 2012)



2.1.1: NPS-related deaths

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

"The term 'New 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]

Within the 2012 NDRDD cohort of 479 non-intentional deaths, there were a total of 36 (8%) cases where NPS were found to be present in the body at post mortem (henceforth referred to as 'NPS-related' DRDs). Although these cases were included in the main NDRDD cohort, Appendix A4 also reports on these NPS-related DRDs in greater depth, comparing the characteristics of these individuals/deaths with the 479 cases within the 2012 NDRDD cohort.

3: Results and Commentary

This section presents the findings from the 479 non-intentional drug-related deaths in the 2012 NDRDD cohort, along with comparisons to previous years. Please note that, unlike previous reports, findings are organised by theme, with each subsection also containing a short discussion.

The data tables include findings from four cohorts since 2009, allowing comparisons to be made. Comparisons included in the analysis are generally restricted to those where a significant difference between groups was identified. 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%.

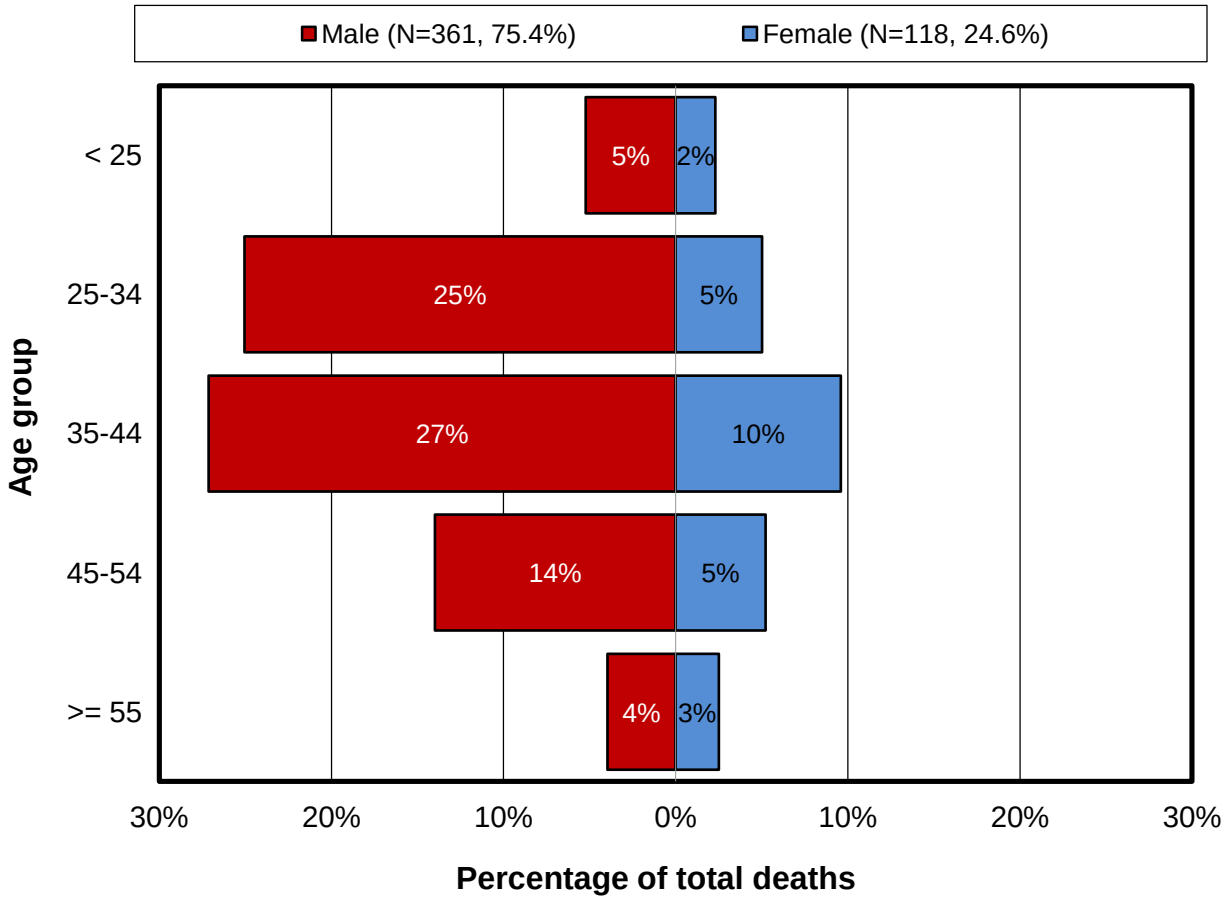
3.1: Socio-demographics

This section examines the demographic and social characteristics of those who died a drug-related death in Scotland in 2012. 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

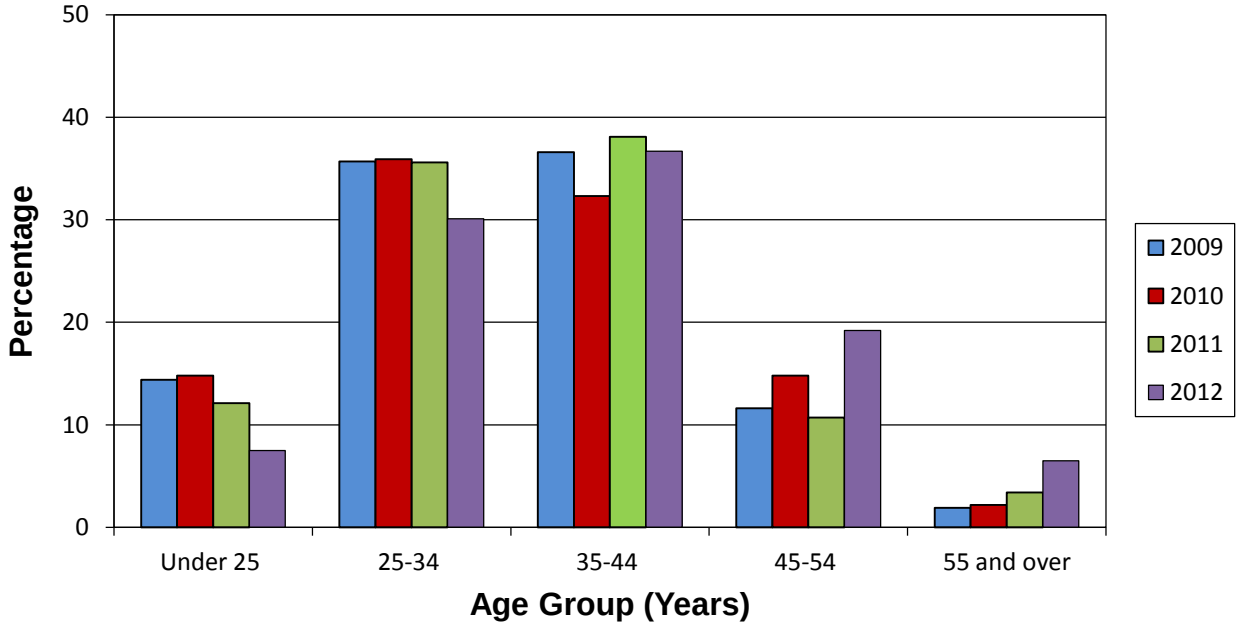
Three quarters of those who died a drug-related death in 2012 were male (361, 75%), which was comparable with 2011 (343, 78%). Across both sexes, the highest percentages of deaths were for those aged between 25 and 44 years, accounting for nearly 70% of the deaths (320, 67%) (Figure 3).

Figure 3: Percentage of Drug-Related Deaths by Age Group and Gender (2012)



The percentage of drug-related deaths in those aged under 25 (36, 8%) was at its lowest level since the NDRDD began (2009: 14%, 2010: 15%, 2011: 12%). The number and percentage of drug-related deaths in those aged 45 and over was higher in 2012 (123, 26%) than in any other year (2009: 13%, 2010: 17%, 2011: 14%) (Table 1 and Figure 4). NRS[1] also compared drug-related deaths in 1998-2002 and 2008-2012 and showed a similar pattern with increases being seen in older age groups and a decrease seen for those aged under 25. .

Figure 4: Percentage of Drug-Related Deaths by Age Group (2009-2012)



The ratio of male to female deaths has remained fairly constant at around 3:1 since the start of the NDRDD. The increased prevalence of those in older age groups among drug-related deaths was apparent in both genders. For example, the over 45 age group accounted for 14% of deaths among males in 2009 compared with 24% in 2012. Similarly, for females, 11% of deaths in 2009 were in those of this age group compared with 31% in 2012 (Table 1). The higher prevalence of deaths in those aged 45 and over in 2012 was somewhat different from previous years [2-4].

3.1.2: Deprivation

The Scottish Index of Multiple Deprivation classifies postcode areas by deprivation on a scale of one to five, with one being the most deprived. Almost three in five of those who died (261, 57%) had lived in the most deprived neighbourhoods in Scotland. Only fifteen individuals (3%) who died a drug-related death lived in the least deprived areas. These percentages were similar to those in 2011 (53% and 4% respectively) (Table 2).

3.1.3: Living Arrangements

Around three quarters of those who died were reported to be living in their own home prior to death (342, 72%) and around one fifth (85, 18%) were living with relatives (Table 3)[4]. Around 5% were reported to have lived with friends and more than 3% were in supported/homeless accommodation, were in a hostel or had no fixed abode/sleeping rough. Viewed as a single group, the percentage of individuals living in the most vulnerable circumstances (in a hostel or no fixed abode/sleeping rough) prior to death was at its lowest level (6%) since the start of the NDRDD in 2009. The percentage of those living in their own home had increased from the three previous cohorts (all 61%).

[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.

More than half of the cohort lived on their own prior to death (270, 58%); an increase from 2011 (49%). Both figures were higher than the 34% of adults estimated to live alone among the general Scottish population in 2012 [8]. Eighty-eight (19%) individuals were reported to live with their spouse or partner. Sixty individuals (13%) were reported to have lived with their parents, 43 (9%) 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 2012 (173, 37%) were a parent or parental figure to a child or children aged under 16 (although a decrease from 2011 (44%), no overall pattern from 2009 was evident). The total number of children who lost a parent/parental figure due to a drug-related death in 2012 was 286 (the second highest total seen in NDRDD cohorts (the highest total (331) was observed in 2011)) (Table 5).

However, only 39 individuals (8%) who died a drug-related death were living with a child when they died (similar to previous years (2009: 9%, 2010: 9%, 2011: 10%)). Of the 286 children who lost a parent/parental figure due to drug-related death in 2012, 65 (23%) were living with them at the time of death. This figure was similar to the highest recorded by NDRDD (2011: 67) (Table 6).

Gender did not influence the likelihood of being a parent; 127 (36%) males and 46 (40%) females had children aged under 16 and the average number of children was also similar for males (1.6) and females (1.7). However, female parents (17, 37%) were more likely to be living with their children at the time of death than male parents (22, 17%) (data not shown in tables).

Whether parents used drugs intravenously was known for 87% of those living with children (34/39). Ten individuals known to use drugs intravenously lived with children. A total of 19 children resided alongside those known to use drugs intravenously prior to their death (data not shown in tables).

3.1.5: Discussion

In line with the overall gender pattern of problem drug use in Scotland [9-10] (and England [11]), the NDRDD cohort continues to be predominantly male (75%). Similarly, the finding that over 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 most significant demographic change in 2012 was the increasing prevalence of individuals from older age groups among drug-related deaths. While the largest proportion of deaths continued to be among those aged 25-44, the percentage of individuals aged 35 and over increased from half in 2011 to around two-thirds in 2012 and, in particular, deaths involving individuals aged 45 and over rose to a quarter of the cohort. This change was observed among both males and females.

Comparison with the 2012 Scottish population [13] showed differences in the age distributions, with drug-related deaths over-represented for those aged 25-34 (30% of 2012 NDRDD vs. 13% of Scottish population), 35-44 (37% vs. 13%) and 45-54 (19% vs. 15%). No comparison has yet been made with the estimated population of problem drug users in Scotland [14]. However, the increased prevalence of drug-related deaths among individuals aged over 45 suggests that the age structure of the population of problem drug users may be changing. Several sources [1, 15-17] provide support for this change, while evidence from other ISD statistics [18] also indicates that an increasing percentage of

people from older age groups are being treated for drug-related morbidities. The impact of an ageing population of problem drug users needs to be assessed more thoroughly in terms of risk awareness, targeting interventions, growing service provision costs and the impact on the landscape of resource planning.

Changes in living circumstances are also likely to be linked to changes in the age structure. The percentages living alone and at home (more common among older age groups and both acknowledged as risk factors for drug-related death [19]) increased in 2012 while the percentage living with parents decreased. Despite an apparent increase in risks associated with an ageing population of problem drug users, the percentage of individuals living in a hostel or no fixed abode/sleeping rough continued to decrease. The link between homelessness and drug use is well-established and individuals living in these circumstances are also recognised to be among the most vulnerable in terms of a range of risks including drug-related death [20].

In 2012, fewer children were affected by the loss of a parent (286) or were living with parents known to use drugs (65) at the time of their death than in 2011. However, for both measures, these were the second highest annual totals in the four years the NDRDD study has been undertaken. 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 19 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 (92), suggests that child protection practice may be minimising risks for such children. However, the additional impact upon such children of losing a parent to a drug-related death is of particular concern, and is an issue not covered in the 'Hidden harm' report and so this may be an area for further investigation. Likewise, the high prevalence in the cohort of parents living apart from their children may indicate an elevated risk of drug-related death and would also be a worthwhile avenue for further research.

3.2: Drug Use History

Information on previous drug use, whether individuals injected drugs intravenously, had overdosed or undertaken a drug detoxification contribute to our understanding of the extent and duration of illicit drug use and associated risks among the NDRDD cohort. Substitute prescribing data allows a subgroup of opiate users receiving controlled drugs in a treatment setting to be identified in order that their deaths might also be understood in context.

3.2.1: Drug Use and Injecting Status Prior to Death

Nine out of ten individuals (419, 87%) were known to be using drugs prior to death (Table 7). This figure was broadly consistent with previous years. Length of drug use was known for 376 (89.7%) of these individuals. Of these, 315 (84%) were known to have used drugs for six years or more and around three in ten (107, 28%) had used drugs for 20 or more years. In 2012, the percentage known to have used drugs for 20 years or more was higher than that observed in 2011 (20%).

Of those known to use drugs, 246 (59%) individuals were also known to inject drugs intravenously (IV), a decrease from 2011 (63%) and the lowest percentage in the four years of the NDRDD study. Data on the length of IV drug use was available for 215 (87%) people (Table 8). Fifty-nine per cent of these (127) had been injecting drugs for more than ten years, a marked increase compared to 2009 (44%) and 2011 (49%)[5].

3.2.2: Drug Detoxification

Fewer than one in ten individuals suffering a drug-related death (37, 8%) were known to have undertaken a drug detoxification in the year prior to death, the lowest level in the four years since NDRDD started. Of these, eight had undertaken drug detoxification in the month before death (22%) while two-thirds (24, 67%) had done so in the six months before death (Table 9).

3.2.3: Substitute Prescribing[6]

More than one quarter of the cohort (132, 28%) had been prescribed an opioid substitute therapy drug at the time of death, similar to in 2011 (Table 10). Females (45, 38%) were more likely to have been receiving a substitute prescription than males (87, 24%) (data not shown in tables). The vast majority (127, 96%) received methadone, with the others receiving either suboxone (3) or buprenorphine (2). The percentage of individuals prescribed methadone was slightly higher than in 2011 (90%).

Around three quarters of all substitute prescriptions were supervised (94, 73%) (Table 11). Two-thirds of those receiving methadone (84, 67%) were prescribed 31-90mg daily, 13% (16) were prescribed up to 30mg daily and 6% (7) were prescribed over 120mg. These figures were similar to 2011 (data not shown in tables).

Information on the length of time individuals had been prescribed a substitute therapy indicated that more than four-fifths (101, 81%) of these had been prescribed a substitute drug for one year or more (Table 12). A similar percentage of methadone users had received the substitute drug for more than one year (99, 83%) (Table 13).

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[5] 2010 Data not available.

[6] No substitute prescribing data was available for 2009 or 2010.

3.2.4: Previous Non-Fatal Overdoses

Around half of individuals in the 2012 cohort had previously experienced a non-fatal overdose (251, 53%), a similar percentage to 2011 but higher than in previous years (2009: 47%, 2010: 46%, 2011: 52%). Among those who had previously overdosed, two-fifths (100, 40%) had one known occurrence, while 49 (20%) were known to have overdosed at least five times prior to their death (Table 14).

Of these who had suffered a previous non-fatal overdose, 30 individuals (13%) had overdosed within the three months prior to death and 29 individuals (12%) had experienced their most recent overdose between three and six months prior to death. The percentage experiencing an overdose within three months of death was similar to 2011 (13%) but lower than in 2009 or 2010 (both 21%) (Table 15).

3.2.5: Discussion

The overall composition of the NDRDD cohort has remained unchanged – the overwhelming majority were known to have used drugs, more than one half were known to have used drugs intravenously and around half had previously overdosed prior to death. In addition, approximately one quarter of the cohort were receiving a substitute prescription for their drug use at the time of death (most were prescribed methadone and were supervised when consuming the drug).

While the key indicators of problem drug use remained largely unchanged over time, changes were observed in the percentage of individuals known to have used drugs for 20 years or more (increased by 39% since 2011) and used drugs intravenously for more than ten years (increased by 20% since 2011). These changes are likely to be related to changes in the age structure of drug-related deaths as the population of individuals engaged in problem drug use grows older. Many of the older members of the NDRDD cohort were likely to have experienced the wide availability of heroin in the UK in the 1980s and early 1990s and may have been included in the large numbers of injecting heroin users that emerged during that time [16]. This is the first NDRDD report in which there has been a strong indication of the impact of this ‘ageing cohort’ of individuals using drugs and it will be interesting to observe how these trends develop in the future.

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, 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.

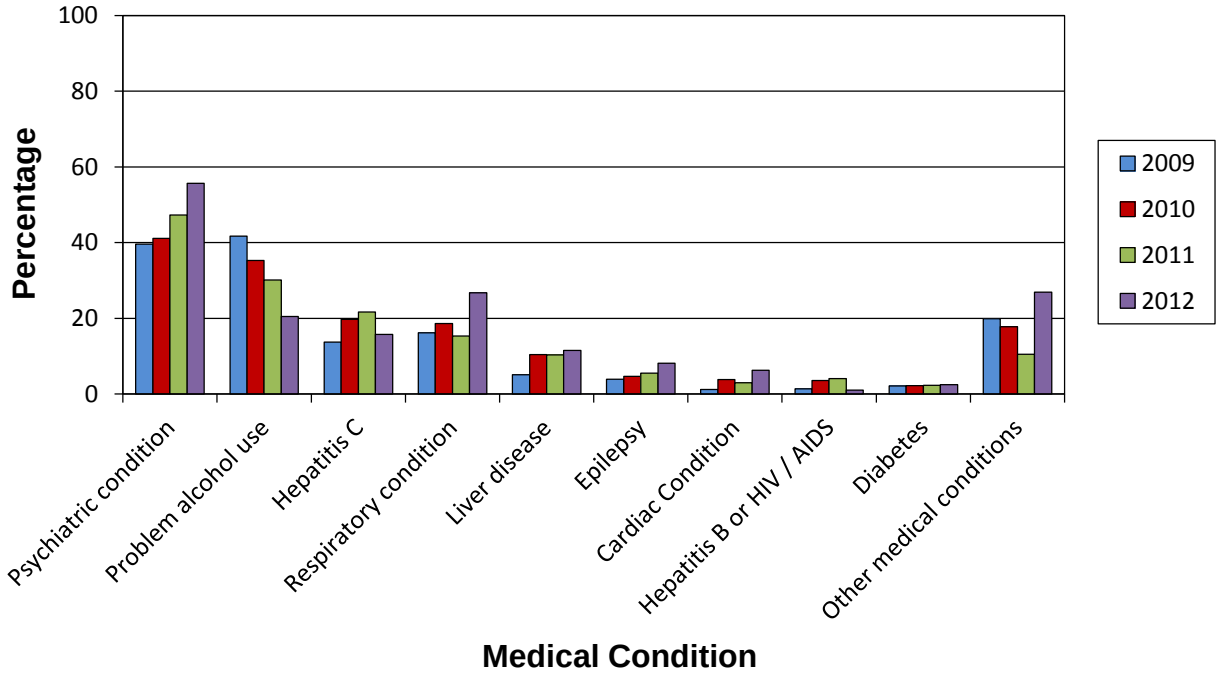
3.3.1: Recent Medical History

There were 406 cases in the cohort (85%) where a medical condition had been recorded in the six months prior to death (Table 16) [7]. This figure was similar to that recorded in 2009 and was higher than 2010 (74%) and 2011 (77%). In 2012, 267 individuals (56%) were recorded as having a psychiatric condition, 128 (27%) had a respiratory condition, 98 (21%) exhibited problematic alcohol use, 75 (16%) had hepatitis C and 55 (11%) had liver disease.

Over time (Table 16 and Figure 5), it can be seen that the percentage of cases with a psychiatric condition was higher in 2012 than any other year (2009: 40%), as was the case for respiratory conditions (2009: 16%). In contrast, the percentage with problematic alcohol use was at its lowest since the NDRDD began (2009: 42%) and hepatitis C decreased markedly in 2012 compared to 2011 (22%).

[7] It is important to note that individuals could have more than one condition recorded.

Figure 5: Medical Conditions Recorded in the Six Months Prior to Death (2009-2012)

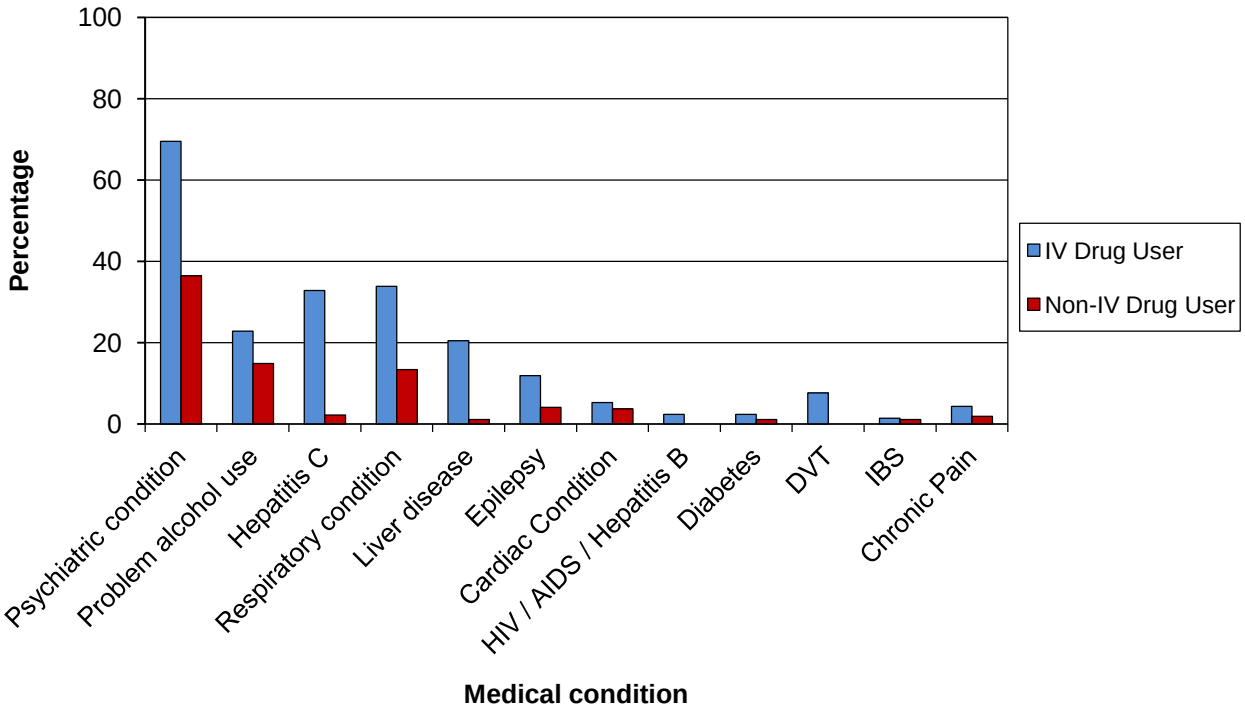


Additional analysis was conducted to investigate any differences in the prevalence of medical conditions on the basis of intravenous drug use (Figure 6). Individuals who were known to have used drugs intravenously were more likely than the rest of the cohort to have the following medical conditions recorded in the past six months:

- Psychiatric condition: 70% and 36% respectively
- Problem alcohol use: 23% and 15%
- Hepatitis C: 33% and 2%
- Respiratory condition: 34% and 13%
- Liver disease: 20% and 1%
- Epilepsy: 12% and 4%
- HIV / AIDS / hepatitis B: 2% and 0%
- Deep vein thrombosis: 8% and 0%

Examining the duration of known intravenous drug use, it was also evident that individuals known to have engaged in long-term intravenous drug use were over represented in relation to many medical conditions recorded in the past six months. Six out of ten recent hepatitis C (46/75, 61%) and liver disease (33/55, 60%) cases and over two-thirds of deep vein thrombosis cases (11/16, 69%) were among those known to have been injecting for over eleven years (data not shown in tables).

Figure 6: Medical Conditions Recorded in the Six Months Prior to Death by IV Drug Use Status (2012)



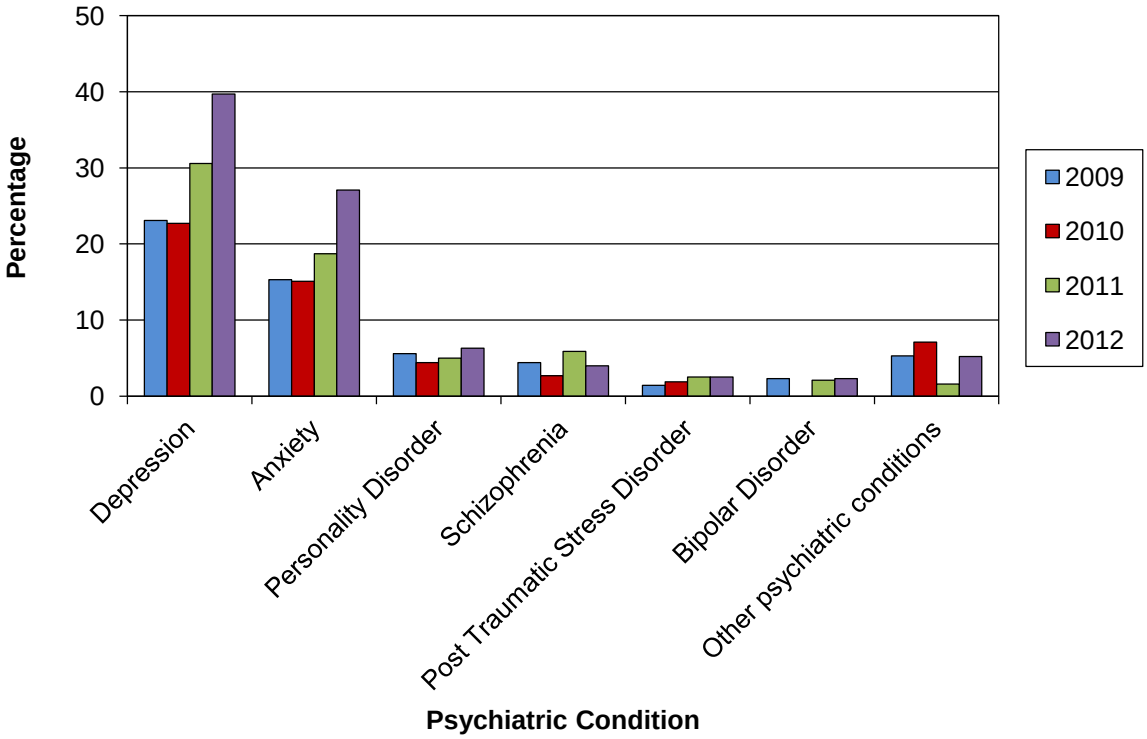
3.3.2: Recent Psychiatric History

There were 267 cases in the cohort (56%) where a specific psychiatric condition had been recorded in the six months prior to death (Table 17) [8]. This figure was higher than that observed in other NDRDD cohorts (2009: 40%, 2010: 41%, 2011: 47%). In 2012, 190 individuals (40%) were recorded as having depression, followed by anxiety (130, 27%), personality disorder (30, 6%) and schizophrenia (19, 4%).

Over time (Figure 7), increases in the percentages with depression and anxiety recorded in the six months prior to death were observed when compared with data from previous years (both were recorded in a higher percentage of deaths than in the 2011 cohort: 31% and 19% respectively).

[8] It is important to note that individuals could have more than one condition recorded.

Figure 7: Psychiatric Conditions Recorded in the Six Months Prior to Death (2009-2012)



3.3.3: Recent Significant Events

In 2012, 282 individuals (59%) were recorded as having experienced a significant event in the six months prior to death (Table 18)[9]. This figure was similar to previous NDRDD cohorts.

In 2012, 77 individuals (16%) were recorded as suffering ill health or a recent diagnosis and 52 (11%) experienced a relationship breakdown in the past six months. Forty-four individuals (9%) had relapsed into problem drug use, while 33 (7%) suffered a bereavement. The prevalence of homelessness or housing problems (3%) was lower than in 2011 (6%), but there was little change over time in other categories.

3.3.4: Domestic and Sexual Abuse

Among the 478 cases where previous domestic abuse was recorded as having occurred or not, it was observed that 60 individuals (13%) had experienced this at some point prior to death (Table 19), of whom more than three quarters were female (78%). Thus, four in ten females (47/118, 40%) who died a drug-related death in 2012 had experienced domestic abuse at some point in their lives. The comparable figure for men was 4% (13/360).

Eighty-two individuals (17%) who died a drug-related death had experienced sexual abuse at some point prior to death (Table 20), 50 (61%) of whom were female. Again, females (50/118, 42%) were more likely to have experienced this form of abuse than were males (32/360, 9%).

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

3.3.5: Discussion

Whilst the EMCDDA [22] highlighted older age as a risk factor for drug-related deaths (noting that the effect of older age may be due to the cumulative toxicity of drugs over the years and/or increased poor health), the influence of other factors (combined with age) need to be considered.

The cohort had high levels of medical and psychiatric conditions recorded in the six months prior to death. As categories within the analysis of medical conditions, 'psychiatric conditions' and 'respiratory conditions' were recorded in the highest percentage of drug-related deaths since the NDRDD started. Depression and anxiety were also recorded in the highest percentage of deaths since NDRDD began. Changes may be linked to the increasing prevalence of older drug-related death victims in the NDRDD cohort. The average number of medical conditions for individuals in each age group in 2012 was calculated (Under 25s: n=36 mean=1.0, 25-34: n=144 mean=1.4, 35-44: n=176 mean=1.7, 45-54: n=92 mean=1.8, 55+: n=31 mean=1.7) and showed a relationship between age and increasing co-morbidity. In conjunction with the impact of IV drug use (which was strongly associated with a higher prevalence of almost all medical co-morbidities), an ageing cohort, including more individuals known to have injected drugs for a considerable length of time, may help explain changes in the prevalence of some medical conditions. However, identifying the underlying causes of co-morbidity requires further investigation and is beyond the scope of this report.

Although these did not alter the overall trend toward increasing co-morbidity, decreases in problematic alcohol use and hepatitis C were observed. The decreasing prevalence of problematic alcohol use was consistent with wider trends indicating decreases in overall and per capita sales of alcohol, consumption and alcohol-related hospital discharges [23-24]. In relation to hepatitis C, a recent study [25] based on Scottish treatment data to 2006 found that older age only increased the risk of a drug-related death for those with a diagnosis of hepatitis C. However, despite a decrease in 2012, hepatitis C prevalence among the cohort has fluctuated over recent years (possibly due to changes in the extent of testing, improvements in testing processes) and a clear pattern in prevalence is yet to emerge.

The majority of the cohort had experienced a significant event in the six months prior to death (most commonly ill health or a recent diagnosis). A significant minority of the cohort had suffered domestic or sexual abuse at some point in their lives; these were both more common among females [26].

These findings describe a cohort of individuals who had experienced a range of medical and psychiatric co-morbidities and significant life events in the period leading up to their death. It is possible that some of these events/conditions may have acted as triggers for the drug use that contributed to death. Other events/conditions may have been brought about as a result of the combined effects of older age, IV drug use etc. Again, these findings require further examination with reference to the existing literature on the causes and correlates of drug misuse and risk factors associated with drug-related death [27-28].

3.4: Contact with Services

Information on recent contact with services can provide valuable indications of 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 experience of police or prison custody indicates potential criminal activity, which may also have been linked to the use of drugs. For the first time, recent contact with non-drug treatment services are also examined to ascertain the range of services individuals were known to and the types of support they sought. Although the NDRDD collects information on contact within different time periods (ever, within six months and at the time of death), throughout this section the emphasis is 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.

3.4.1: Contact with Drug Treatment Services

Where known, around three quarters (335, 74%) of those suffering a drug-related death in 2012 had been in contact with a drug treatment service at some point in their lives (an increase compared to previous years (2009: 60%)) (Table 21). Sixty per cent (269) had been in contact with drug treatment services in the six months prior to death (the highest percentage since NDRDD started (2009: 34%, 2010: 35%, 2011: 34%). At the time of death, half of individuals (224, 50%) were actively being treated for their problem drug use (data not shown in tables).

Around four in ten were in contact with their GP (176, 39%) or an addiction service (170, 38%) in the six months prior to death. Seven per cent (31) were in contact with psychiatric services, 5% (22) with an Accident & Emergency department and 2% (11) with social work services. The percentages in recent contact with an addiction service or their GP for the purpose of drug treatment were both at their highest levels since NDRDD started (2009: 26% and 23% respectively) (Table 22).

Among individuals who had opiates present at death and were in contact with a drug treatment service in the six months prior to death, 129 (51%) were in receipt of a substitute prescription (data not shown in tables).

3.4.2: Contact with Services other than for Management of Drug Misuse

This was the first year the NDRDD included questions on non-drug treatment services. Over two-thirds of individuals (315, 69%) had been in contact with services for reasons other than management of a drug misuse problem at some point in their lives.

Focusing on the six months before death, half of the cohort (229, 50%) were in contact with services for reasons other than management of a drug misuse problem. Females (64/112, 57%) were slightly more likely (not significant) to be in contact with such services during this period than males (165/345, 48%). Where known, almost one third of the cohort (146, 32%) had been in contact with mental health services in the six months before death. Over one fifth (94, 21%) had been in contact with alcohol services, 81 (18%) had attended social work, 79 (17%) had been in contact with housing services, 69 (15%) had been in contact with a homeless service and 18 (4%) had been in contact with employability services (Table 23).

3.4.3: Contact with the Criminal Justice System

More than one quarter of the cohort (121, 27%) had been in police custody at some point in the six months prior to death. There was a decrease in the percentage in police custody in the six months prior to death since 2011 (40%) (Table 24). Thirty-nine individuals had been in police custody in the four weeks prior to death, while 74 had been in police custody in the twelve weeks prior to death. The comparable figures in 2011 were 62 individuals released in the four weeks prior to death and 105 released in the twelve weeks prior to death (Table 25).

Around half of the cohort (216, 47%) had been in prison at some point in their lives prior to death. Over one in ten (57, 12%) had spent time in prison in the six months prior to death, a decrease compared to 2011 (18%). Males (49, 14%) were more likely than females (8, 7%) to have been in prison in the six months prior to death (Table 26). Twenty-four individuals were released from prison in the four weeks prior to death and 42 were released in the twelve weeks prior to death. In 2011, the comparable numbers were 43 and 61 respectively (Table 27).

3.4.4: Discussion

More individuals were in recent contact with drug treatment services in 2012 than in previous years, and there was no difference between the sexes. Most had been treated by a specialist addiction service or in a primary care setting. Contact with drug treatment services was increasingly recent, indicating that a sizable proportion of the cohort were actively addressing their problem drug use shortly before, or at, the time of death. Despite this, only around half of those with opiates found present at post mortem who were in recent contact with a drug treatment service were also in receipt of a substitute prescription. Given the evidence for the efficacy of methadone compared to other forms of treatment [29-30], this raises a number of questions about the impact of treatment modality.

This was the first year the NDRDD included questions on non-drug treatment services, and found that over two-thirds had been in contact with these services (e.g. mental health, social work, homelessness) at some point before their death, with around half in contact in the six months before death. These findings demonstrate that individuals suffering a drug-related death had complex and multi-faceted needs and were often accessing a range of health and social care services prior to death. The high level of engagement with non-drug treatment services also raises the possibility that drug death prevention could also be embedded within these areas.

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 [27-28]. 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. In this report, the time periods used for reporting previous experience of police and prison custody have been aligned to the timeframes used in ISD's report on take-home naloxone (in custody 4 and 12 weeks before death) [31][10], which was underpinned by evidence (for the prison context) about the period of

[10] 2012 Naloxone prison performance data are not yet available for comparison due to technical problems with the Scottish Government prison database which was previously used to identify drug-related deaths following release from prison. A manual matching exercise using the Scottish Prison Service management information system to identify drug-related deaths occurring after release from prison will be undertaken in the

greatest overdose risk [27-28]. In future iterations of this report it is envisaged that the analysis of drug-related deaths following periods of custody or treatment will become more comprehensive (e.g. through linkage to ISD's routine collected datasets) and help inform initiatives such as the National Naloxone Programme in targeting harm reduction measures on periods of high overdose risk.

Focusing on services that individuals may have come into contact with as a result of problem drug use, two-thirds of the 2012 NDRDD cohort (325, 68%) had been in drug treatment, in prison custody or in police custody in the six months prior to their death. Of these individuals, 295 (91%) had opioids present at the time of death and could therefore have been identified as having a high overdose risk. There is therefore considerable potential to reduce the number of drug-related deaths by undertaking targeted harm reduction measures.

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 [31][11]. As part of the programme, a total of 7,291 'take home' kits were issued in Scotland in 2011/12 and 2012/13. Drug treatment services provide an ideal setting to identify individual's drug treatment needs, identify risks and intervene to reduce associated harms. Custodial settings also provide opportunities to detect and respond to individuals who are thought to be at risk of overdose after their release. While the prison setting generally allows more time to assess and respond to individual's drug use needs, the frequent periods of police custody often experienced by offenders known to use drugs may also enable officers to gain insights into motivations for offending. Although there is a lack of academic literature on the link between police custody and drug-related death, experience of recent police custody among this cohort (many of who were known to have used drugs), suggests this could be a significant additional opportunity for intervention.

near future. Interim figures gathered by NDRDD are likely to provide a slight underestimate of the true figure as Data Collection Co-ordinators may not be able to gain access to the full custodial history prior to death.

[11] 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 individuals who died a drug-related death, the NDRDD also collected a range of information on the circumstances of 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 uniformly distributed across days of the week (Table 28). Although not significantly different from other months, drug-related deaths were most common during May 2012 (Table 29). There appeared to be no evidence for a consistent pattern when compared to previous years.

3.5.2: Geographical Distribution[12]

NRS examined the geographical distribution of 2012 drug-related deaths in their August 2013 publication. 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 (0.22 deaths per 1,000 population), followed by West Dunbartonshire (0.19 deaths per 1,000 population) and City of Glasgow and Clackmannanshire (both with 0.18 deaths per 1,000 population). In Argyll & Clyde, East Dunbartonshire and Western Isles council areas, zero mortality rates were recorded (Table 30). The NHS Health Boards with the highest crude mortality rates were NHS Greater Glasgow and Clyde (0.14 deaths per 1,000 population) followed by NHS Tayside (0.12 deaths per 1,000 population) and Ayrshire and Arran (0.11 deaths per 1,000 population). Western Isles was the only NHS Board area where a zero mortality rate was recorded (Table 31). With the exception of the high mortality rate observed in Clackmannanshire (where the rate of problem drug use was estimated as being below the national average), these findings are broadly in line with the council area and health board estimates from the most recent drug prevalence study published by ISD [14].

3.5.3: Place of Drug Use and Place of Death

Where known, the majority of those suffering a drug-related death (295, 68%) consumed the drugs present at death in their own home (an increase from previous cohorts (2009: 55%, 2010: 59%, 2011: 61%)) while 112 (26%) consumed drugs in another person's home. In 2012, a further 32 individuals (7%) had used drugs in either a hostel, outdoors, in supported accommodation, in temporary accommodation or in a public place indoors (Table 32).

Where known, over three-fifths of the cases (293, 62%) died within their own home (an increase from previous years (2009: 51%, 2010: 53%, 2011: 53%)) and over a fifth (103, 22%) died in the homes of other people. Fifty four individuals (11%) died in hospital, having been admitted following symptoms of overdose. One in twenty individuals (23, 5%) died in either a hostel, outdoors, in supported accommodation or in temporary

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

accommodation (the lowest percentage observed by NDRDD (2009: 12%, 2010: 8%, 2011: 10%)) (Table 33).

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, 54%) of drug-related deaths in 2012, with 105 (23%) in the same room (Table 34). These percentage of deaths where persons at the scene was lower than in previous years (2009: 64%, 2010: 62%, 2011: 62%).

3.5.5: Ambulance Attendance and Attempted Resuscitation

In the majority of cases (390, 82%) an ambulance attended the scene of death while in 87 cases (18%) it did not. Among the cases where an ambulance did not attend, there were 21 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%) (Table 35).

Where known, in around a third of cases (185, 39%) an attempt was made to resuscitate the individual. This was similar to previous years (2009: 44%, 2010: 47%, 2011: 43%) (Table 36).

In two-thirds of cases where resuscitation was attempted, this was done by ambulance staff (117, 64%). Resuscitation was also attempted in a smaller number of cases by a friend (45, 25%), a witness (44, 24%), a spouse/partner/ex-partner (21, 12%) or a relative (20, 11%) (Table 37)[13]. .

3.5.6: Naloxone Availability and Use[14]

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 379 of the 476 drug-related deaths with known toxicology (80%). Whether or not there was a 'take-home' naloxone kit available was known in 313 (83%) of the opioid deaths. Naloxone was reported to be available in only five of these deaths (2%) and was administered in four instances (1%) (Table 38). One person was given naloxone by their partner, one by a family member, one by a friend and one by another person at the scene (data not shown in tables).

3.5.7: Discussion

More than six in ten of the cohort consumed the drugs that contributed to their death in their own home and died in their own home. These indicators were at their highest level since

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

[14] 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.

the start of NDRDD and are related to the increase in the numbers of individuals living in their own home. The increase in the percentage living alone prior to death in 2012 is likely to have contributed to the decrease in deaths where another person was present from previous cohorts. However, in spite of this decrease other persons were present at more than half of overdoses.

It was apparent that potential 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.

In relation to opioids, a further aspect of overdose prevention was the availability of naloxone. Naloxone was reported to be available in five cases where opioids (methadone, heroin, morphine and/or buprenorphine) were present in toxicology results and was administered in only four of them. It may be difficult to reduce the number of 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 may enhance the potential for life saving interventions to be delivered and help reduce the number of opioid-related deaths recorded in Scotland. For more information on the distribution of 'take-home' naloxone as part of Scotland's National Naloxone Programme, refer to ISD's Annual Report [31].

3.6: Toxicology Data

While the NDRDD data provide information about the drugs *present* in the body at post mortem, NRS provides additional information about whether the drugs 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 experience before coming to a conclusion. However, 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.

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 (374, 79%) (Table 39), with similar percentages seen for both sexes in 2012 (Table 40).

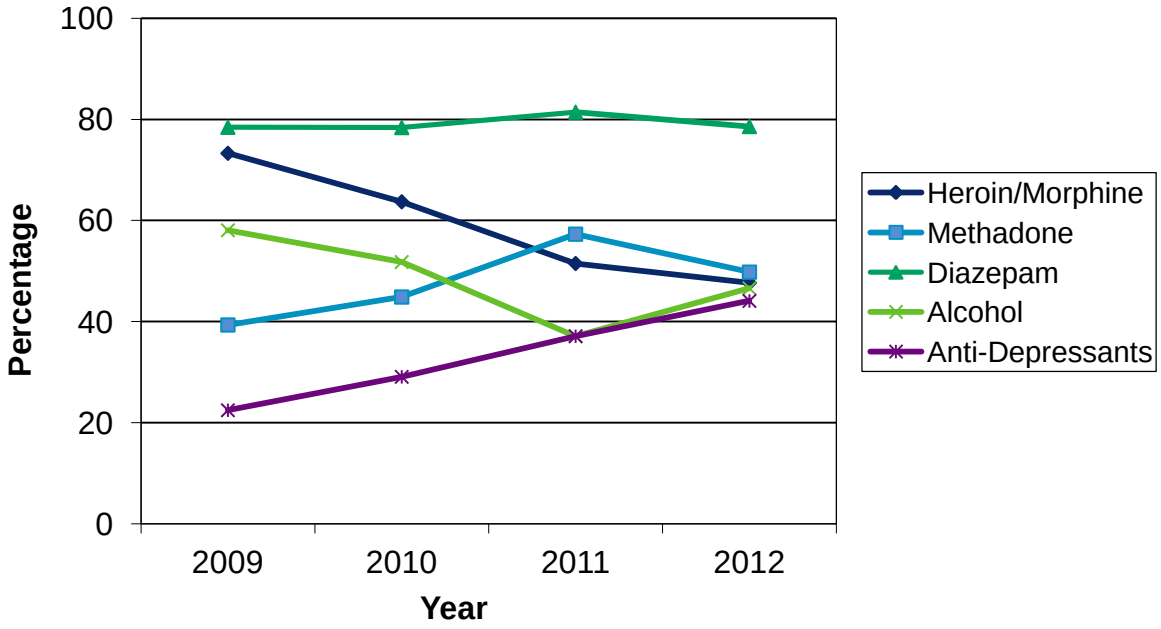
In 2012, the second most common drug found at post mortem was methadone (237, 50%). Despite a decrease in presence since 2011 (57% of drug-related deaths), prevalence in 2012 was the second highest since NDRDD started. In 2011, there had been a higher percentage of females (72%) with methadone present than in males (53%). In contrast, there was no difference between the sexes in 2012.

Heroin/morphine was present in just under half of the 2012 cases (227, 48%). Prevalence of heroin/morphine continues to decrease among those suffering a drug-related death and was lower than in 2009 (73%) or 2010 (64%). Heroin/morphine was present at post mortem in around half of males (188, 52%) and a third of females (39, 34%). The percentage of males with heroin/morphine present remained largely unchanged from 2011 (53%), but was markedly less than in 2009 (76%). However, the percentage of females with heroin/morphine present has continued to fall since 2009 (64%).

Alcohol was present in 222 cases (47%) in 2012, which was higher than in 2011 (37%) but within the range identified in previous NDRDD cohorts. Alcohol prevalence was similar among males (172, 48%) and females (50, 43%). Looking at previous cohorts, alcohol prevalence among males fluctuated considerably (2009: 62%) while prevalence among females showed little change.

Anti-depressants were present in 210 cases (44%) in 2012, continuing an increasing trend since NDRDD began (2009: 23%, 2010: 29%, 2011: 37%). The presence of anti-depressants was higher among females (76, 66%) than males (134, 37%). A pattern of increasing presence over time was evident for both genders (2009: 33% and 20% for females and males respectively).

Figure 8: Most Common Drugs Present at Post Mortem: 2009-2012



The next most common drugs found present at post mortem were dihydrocodeine (95, 20%) and codeine (69, 14%). Among other drugs, cannabis was present in 80 deaths (17%). Cocaine prevalence at post mortem (41, 9%) was lower than in 2011 (13%).

3.6.2: Combinations of Drugs Present at Time of Death

Of the 476 drug-related deaths with known toxicology in 2012, the vast majority (464, 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%). 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 41).

Methadone-diazepam was the most common combination found at post mortem (203, 43%), with similar use by both sexes (males: 151, 42%; females: 52, 45%). Presence of this combination was similar to 2011 (49%); its second highest level since NDRDD began. There had been a difference between the sexes in 2011, however, with more females having methadone-diazepam present (60%) than males (46%).

The second most common drug combination in 2012 was heroin-diazepam (197, 41%). A higher percentage of males (160, 44%) than females (37, 32%) had this combination of drugs present at post mortem. The overall percentage of drug-related deaths with this combination present continues to decrease each year and was lower than 2009 (58%) or 2010 (50%), but similar to 2011 (45%).

Diazepam-alcohol was the next most commonly present drug combination in 2012 (173, 36%). Its prevalence was higher than in 2011 (29%). A similar proportion of males (132, 37%) and females (41, 35%) had both of these drugs present in 2012. The fourth most common drug combination present was methadone-alcohol (108, 23%), similar to 2011 (19%).

3.6.3: Drugs Implicated in Death

Toxicology information supplied by NRS was available for 456 (95%) drug-related deaths. In 2012, multiple drugs were implicated in 69% (314/456) of NDRDD deaths. Methadone was the drug most frequently implicated in deaths (210, 46%), followed by heroin/morphine (187, 41%), diazepam (136, 30%), alcohol (86, 19%), dihydrocodeine (61, 13%) and anti-depressants (56, 12%) (Table 42). Methadone was implicated in a lower, and diazepam in a higher, percentage of deaths than in 2011 (53% and 23% respectively). Other drugs were roughly similar in terms of implication from 2011 to 2012.

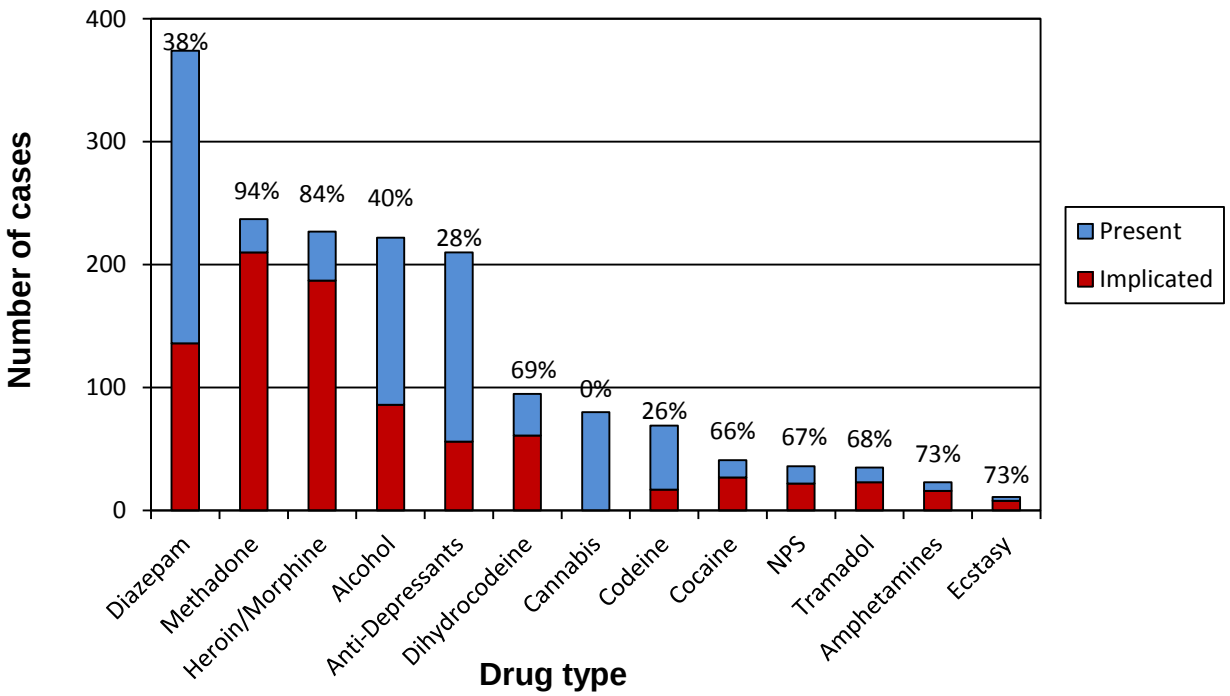
Gender differences in drugs implicated were also analysed but were found to reflect the differences observed in drugs present (see Section 3.6.1). For example, heroin/morphine was more likely to be implicated in deaths in males than females (45% and 28% respectively).

In order to calculate drugs implicated as a percentage of drugs present, the data for the 23 cases with no implicated information were removed from the NDRDD dataset. This resulted in toxicology data for drugs present and drugs implicated being available for 456 individuals (Table 42 and Figure 9).

Where methadone was present, it was implicated in 94% of deaths (210/224). The drug with the next highest proportion of implicated to present was heroin/morphine (84%, 187/223). Although both amphetamines and ecstasy appeared to have a high implicated/present ratio, they were based on a small number of deaths (16/22 and 8/11 respectively). In contrast, despite alcohol, diazepam and anti-depressants being among the most common drugs found present at post mortem, they were implicated in a lower percentage of deaths where present (alcohol: 86/214, 40%; diazepam: 136/361, 38%; anti-depressants: 56/203, 28%) (Table 43).

In 2012 there were increases in the percentage of cases where heroin/morphine (75% in 2011), and diazepam (28%) were both present and implicated in the death. A decrease was seen in the percentage of deaths where alcohol was both present and implicated from 55% in 2011.

Figure 9: Number and Percentage of Deaths where Drugs Present and Implicated (2012)



3.6.4: Discussion

Diazepam continued to be the substance most commonly found in toxicology results after a drug-related death (present in around four of every five deaths). Methadone, heroin/morphine, alcohol and anti-depressants were each present in around half of deaths recorded in 2012.

Data supplied by the NRS regarding the drugs that were implicated in the deaths were incorporated into the NDRDD dataset. Using these data, it was seen that methadone was the drug most frequently implicated in deaths, followed by heroin/morphine, diazepam, alcohol, dihydrocodeine and anti-depressants. Despite their overall prevalence in toxicology results these drugs varied in terms of the percentage of deaths in which they were implicated; methadone was implicated in nearly all deaths where present while diazepam was implicated in only around a third of cases.

Despite it being the most common drug present in toxicology, there is limited academic research on the influence of diazepam in drug-related death. In both Scotland and Ireland [32], diazepam features as a distinctive component of illicit drug markets. Its ubiquity among the NDRDD cohort across all years suggests that its consumption may be associated with increased risk of drug-related death, either as a risk factor in itself or as an indicator of other risks (e.g. chaotic drug use). Further research on the cultural and toxicological role of diazepam could enhance understanding of this aspect of drug-related deaths in Scotland.

The proportion of deaths with heroin/morphine present continued its downward trend from 2009. In contrast, the proportion of deaths with methadone present had risen from 2009-2011 but then fell in 2012. In last year's report [4], the proposed explanation offered for the decrease in heroin/morphine focused on the heroin drought in 2010 and 2011, where the purity of the heroin available in the UK was unusually low [33-34]. Under these

circumstances, individuals may seek alternatives such as methadone and/or increase their polydrug use (particularly the use of combinations of benzodiazepines, alcohol and methadone) [35]. The fact that the percentage of deaths with methadone present has fallen since the heroin drought ended in 2012 supports this explanation. However, the continuing decrease in heroin/morphine deaths suggests that the heroin drought contributed to only part of this change, but did not explain it all. One such possible reason for this could be due to increased methadone prescription, particularly among females (see Sections 3.2.3 and 3.7). The finding that, as in previous years, almost the entire 2012 NDRDD cohort (97%) had used multiple drugs at the time of death, suggests that polydrug use, rather than being an indicator of specific market forces, is simply a continuing feature of the illicit drug scene in Scotland.

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 and 14.0 in 2012/13 [36]. While methadone prescription among the NDRDD cohort did not reflect these changes (a slight increase was recorded in 2012), the presence of methadone in toxicology results did decrease in 2012. In relation to mortality and morbidity, methadone is regarded as a safer drug than heroin [37] and therefore the finding that the proportion of deaths with methadone implicated was higher than the proportion of deaths with heroin/morphine implicated can possibly be explained by the effects of polydrug use (there were only three deaths within the entire cohort (0.6%, or 1.4% (3/210) of methadone implicated deaths) where methadone was the only implicated substance). Likewise, the high methadone-implicated to present ratio could be related to the specific dose of prescribed methadone. A dose that is too high can lead to an overdose, however a dose that is too low can induce withdrawal symptoms, leading to individuals 'topping up' with other drugs such as illicit opiates and benzodiazepines [38]. The role of dosing and illicit methadone consumption in methadone-implicated deaths is explored further in Section 3.7.

As discussed earlier in the context of problem alcohol use (Section 3.3.1), decreases in alcohol presence in the NDRDD cohort are consistent with wider trends indicating decreases in overall and per capita sales of alcohol, consumption and alcohol-related hospital discharges [23-24].

It is also worth noting changes in the pattern of anti-depressant presence in toxicology results over the period 2009-2012, increasing from around a quarter to more than four in ten deaths. Given that diazepam, methadone, heroin/morphine and alcohol are mood-depressants, the rise in the presence of anti-depressants in toxicology may indicate attempts by individuals to elevate their mood while continuing to take these other substances. However, the rise may be indicative of increasing mental health co-morbidities or the tendency for such drugs to be prescribed alongside opioid replacement therapies. The role of anti-depressants in drug-related deaths warrants further investigation, particularly in females who were more likely than males to have these drugs present in their toxicology.

3.7: The Impact of Substitute Prescribing

The 2011 NDRDD report 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, 45% in 2010 and 57% in 2011). As discussed in Section 3.6, the percentage of cases with methadone found present at post mortem then fell to 50% in 2012. Despite this decrease, the high percentage of deaths where methadone was present and the extremely high rate of implication in death provides the basis for continued examination of the role of substitute prescribing in drug-related deaths.

The importance of this issue was further emphasised by publication in 2013 of the Scottish Drug Strategy Delivery Commission's Expert Review of Opioid Replacement Therapies in Scotland [30]. 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. However, it was recognised that further information on substitute prescribing (and other forms of treatment) was required in order to evaluate treatment efficacy in Scotland.

Key themes to be examined as part of this analysis of drug-related death and substitute prescribing are:

- individuals consuming illicit drugs in addition to their substitute prescription ('topping up');
- the possible diversion of substitute prescriptions by those in receipt of such medication; and,
- deaths were methadone was implicated.

Individuals who consume illicit drugs in addition to their prescribed substitute drugs are at higher risk of overdose than those complying with a treatment programme tailored specifically to their needs. 'Topping up' suggests that individuals may be receiving an insufficient dose (possibly as part of titration process) of their prescribed drug, may be insufficiently motivated to comply with treatment and/or may be diverting/selling some or all of their prescribed drug. 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.

Diversion of substitute prescriptions 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 a prescription. While the former measure suggests non-consumption or possible diversion by an individual, the latter measure is indicative of illicit supply.

3.7.1: Drugs Present by Substitute Prescription

In order to examine adherence to substitute prescriptions and potential diversion of such drugs it is necessary to examine drugs present in the body at post mortem (Figure 10 and Table 44). Over nine-tenths (120/131, 92%) of those receiving a substitute prescription (or 94% (119/126) of those receiving methadone[15]) had methadone present in their body at post mortem compared to 34% (117/344) of those who were not receiving a substitute

[15] Of the seven individuals with a methadone prescription who did not have methadone present in their body at post mortem, five received their methadone in a supervised setting.

prescription. While there was no significant change in the percentage of those on a methadone prescription with methadone present (2009: 90%, 2010: 96%, 2011: 97%), there was a substantial fall from 2011 (46%) in the percentage of those not receiving a substitute prescription who had methadone present in toxicology; this decreased to a level comparable with the 2009 (28%) and 2010 (32%) cohorts (Table 44).

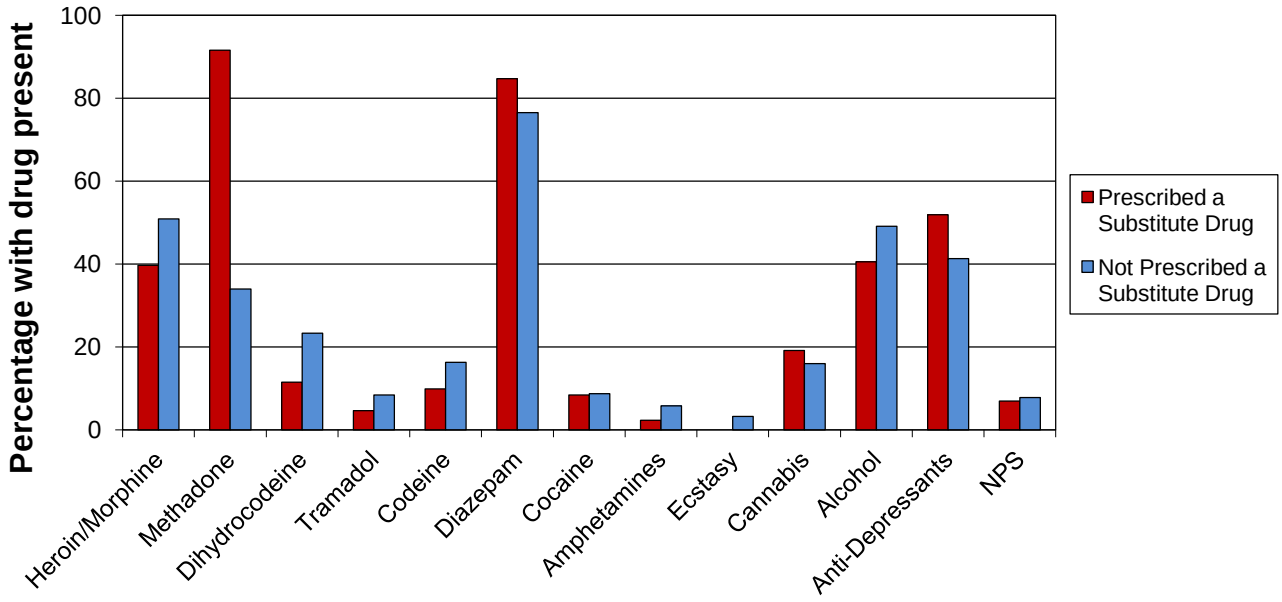
Other drugs which were more prevalent among those on a substitute prescription than those who were not, were diazepam and anti-depressants, both of which are more likely to be prescribed to individuals receiving opioid replacement therapies[16]. Eighty-five per cent (111/131) of those receiving a substitute prescription had diazepam present compared with 76% (263/344) who were not receiving a substitute prescription. Over half (68/131, 52%) of those in receipt of a substitute prescription had anti-depressants present at post mortem compared to 41% (142/344) who were not receiving a substitute prescription.

Drugs which were less often observed present among those in receipt of a substitute prescription were heroin/morphine, dihydrocodeine and alcohol. Two-fifths (52/131, 40%) of those in receipt of any substitute prescription had heroin/morphine present in their body at post mortem. This compared with just over half (175/344, 51%) of those who were not in receipt of a substitute prescription. The proportion of those on a substitute prescription and with heroin/morphine present has decreased since 2009 (57%).

One tenth (15/131, 12%) of those receiving a substitute had dihydrocodeine present at post mortem compared to 23% (80/344) who were not receiving a substitute prescription. Two–fifths (53/131, 41%) of those receiving a substitute prescription had alcohol present at post mortem. This compared to alcohol prevalence of 49% (169/344) among those not receiving a substitute prescription.

[16] Data on prescriptions other than opioid substitutions were not collected by the NDRDD in 2012. It is hoped that analysis of such information can be included in future reports,

Figure 10: Percentage with Drugs Present at Post Mortem by Substitute Prescription (2012)



3.7.2: Methadone-related deaths

Much of the concern about the impact of methadone has been focused on the rise in deaths directly attributed to it. Therefore, this section aims to describe the characteristics of substitute prescribing for cases where methadone was implicated in death.

Despite a decrease since 2011 (53%), methadone remained the drug most frequently implicated in deaths in 2012 (210, 46%). In over half of these cases (108, 52%) individuals were in receipt of a methadone prescription prior to death (Table 45). This equates to there being 127 individuals in the cohort who were in receipt of a methadone prescription, and of them 108 (85%) had methadone implicated in their death.

Three quarters of individuals (79, 75%) who received methadone and whose death was methadone-implicated had been receiving their prescription on a supervised basis while the other 26 were unsupervised (Table 46). Among the 19 cases where methadone was prescribed but not implicated in the death, 13 (68%) were supervised.

In some NHS Board areas, methadone consumption is supervised on six days of the week but may be unsupervised on Sundays. Although deaths where methadone was implicated appeared to be slightly more common on Sundays (37, 18%) than on other days of the week, no significant difference was evident (data not shown in tables).

Among the entire 2012 NDRDD cohort, the majority of those prescribed methadone (99, 83%) had been receiving 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; 82% (83) had been prescribed methadone for over one year, while the other 18 individuals had been prescribed it for one year or less (Table 47).

Individuals prescribed a range of methadone doses were considered to have methadone implicated in their death. While around two-thirds (11/16) of those on very low daily doses (0-30mg) were thought to have methadone implicated in their death, it was thought to partially responsible for the deaths of all of those receiving over 120ml per day (7/7) (Table 48). No clear patterns were evident when compared to 2011 data; aside from the inclusion

of only two years worth of data, the confounding factor in such an analysis is the potential consumption of illicit methadone, for which no data were available.

There were only three deaths within the entire cohort (0.6%, or 1.4% (3/210) of methadone implicated deaths) where methadone was the only implicated substance. Among these individuals, only one was in receipt of a substitute prescription (methadone; duration 4-10 years) at the time of death (data not shown in tables).

3.7.3: Discussion

By examining the associations between substances and prescribing patterns it was evident that almost all those receiving a substitute prescription 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 on substitute prescriptions. As these drugs are often prescribed together, this is unsurprising.

However, four in ten of those prescribed a substitute drug also had heroin/morphine or alcohol present, while one in eight had dihydrocodeine present. Although these percentages were lower than those observed among individuals without a substitute prescription (thereby providing some evidence of treatment effectiveness) they also provide evidence of 'topping up' substitute prescriptions with other drugs. The wide range of methadone doses (including some which were very low) prescribed to individuals whose deaths were attributed (at least partially) to methadone also provided a further indication that some may have been using illicit methadone in addition to their prescribed dose. However, compliance with treatment and the context of consumption was largely unknown and is likely to be key to understanding these deaths. The multi-drug toxicity observed may be the result of an abnormal 'binge' rather than a sustained pattern of non-compliance with opioid replacement therapy.

There was also evidence of drug diversion in the cohort. Methadone was present at post mortem in 117 individuals (34%) who were not receiving a substitute prescription (down from 46% in 2011). Although it may indicate temporary non-compliance, a small number of individuals with a methadone prescription (most of whom consumed it in a supervised setting) did not have methadone present in their body at post mortem. Although information on such prescriptions was not available in the database, the high overall prevalence of diazepam in the cohort (79%) was also suggestive of diversion. Unlike last year, the majority of those with methadone present in toxicology (50.4%) were prescribed methadone (40% in 2011). The reduction in methadone presence among those not on a substitute prescription suggests a number of possible conclusions. Demand for illicit methadone may have reduced due to the end of the heroin drought (although heroin/morphine prevalence continued to decrease). In line with the observed changes in prescribing volumes, the supply of illicit methadone may also have reduced, possibly also as an indirect result of the end of the heroin drought. Drug use patterns may also be changing with the increasing availability of 'new' or 'novel' psychoactive substances that mimic the effects of opiates.

Although methadone is regarded as a safer drug than heroin [37], where present it was implicated in a high percentage of deaths (94%). Therefore, it is unsurprising that nearly all of those who were 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 (in only three cases was methadone the only substance implicated), vulnerability due to other co-morbidities, suicide or a combination of the above. It may also be that pathology reporting practice contributes

to the high rates of methadone implication observed in the NDRDD cohort. These factors require further investigation.

4: Conclusions

This is the fourth report from the National Drug-Related Deaths Database (NDRDD) which describes the characteristics and circumstances surrounding 479 individuals who died a non-intentional drug-related death in Scotland in 2012. The NDRDD began in 2009 to better understanding of Scotland's high rate of drug-related mortality. In 2012, UK Focal Point on Drugs estimated that the rate of drug-related death per 100,000 people was 10.3 in Scotland, compared with 1.9 per 100,000 in England and Wales and 2.4 per 100,000 in Northern Ireland [39].

The NDRDD provides a rich dataset which contextualises the circumstances surrounding many of those who have died from a drug-related death in Scotland. It highlights the complexities and heterogeneities among this population while at the same time facilitating the detection of associations or trends. Examination of such patterns may assist in identifying future individuals or groups vulnerable to a drug-related death; and in facilitating the implementation of potential prevention measures. This section draws together the discussions from throughout the report and summarises the key messages.

4.1: 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 appear to be increasingly from older age groups. These individuals were often known to have injected drugs for a long time, to have significant medical and psychiatric co-morbidity and were likely to have been in contact with a range of services due to their complex health and social care needs.

Over two thirds of individuals had recent experience of drug treatment, 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. From next year, NDRDD will also include information on hospital admissions (research has found that release from hospital can also increase overdose risk [40]), allowing a wider perspective of this issue to be gained. 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 awareness and provision by services is a key preventative measure which can help to prevent fatal opioid overdoses and save lives.

Opiate use continues to be the key factor in most drug-related deaths. Despite decreasing heroin presence since 2009, which happens to coincide with the start of the NDRDD, opiates continued to be implicated in a high proportion of deaths. However, the vast majority of drug-related death victims had used multiple drugs prior to death including, in many cases, diazepam. Despite featuring as a distinctive component of the illicit drug market in Scotland, there is little research on the role of benzodiazepines (of which diazepam is one) in drug-related death and their influence in terms of toxicology and decision-making or risk perception.

Given the continued emphasis on opioid replacement therapies, it is important to continue to examine their implication in drug-related deaths. Toxicology results provided evidence of individuals 'topping up' substitute prescriptions with illicit drugs. Further, despite a reduction in the prevalence of methadone among those not on substitute prescriptions, toxicology results provided continued evidence of drug diversion. However, it is hard to

determine if these findings reflect underlying changes in drug markets, treatment prevalence or are toxicological indicators of chaotic problem drug use.

This report also recognised the emergence of 'new' or 'novel' psychoactive substances. There were 36 NPS cases within the 2012 cohort, but it was possible to distinguish two distinct groups of deaths linked to specific types of substances. Given the dynamic nature of the NPS market and the variety of substances available, it seems likely that more deaths involving NPS will occur in future years and that analysis will need to become increasingly multi-faceted to try to identify risk factors and possible preventative measures which can be taken to try to reduce the deaths from these new, emerging substances.

The NDRDD also gathered information on deaths by suicide from controlled substances for the first time. Reporting focused on distinguishing two groups of deaths which may differ on the basis of whether the individual was known to use drugs or not.

In respect of both the NPS and suicide analyses, it is hoped that the emerging findings presented in this report can, over time, become more robust and contribute to future harm reduction measures.

4.2: Future Developments

The key challenge is to use these data to have an impact on the depressing statistics they represent. The big issues are still opiate-related toxicity, injecting drug use, supplementation of prescription drugs by illegal opiates and benzodiazepines and co-existing alcohol dependency. How much ageing and multimorbidity add to the risk of death requires further examination as does an explanation for the cause of death in individuals who are often similar to survivors in drug and health profiles. Next year, renewed efforts will be made to explore these and other indicators of causes of death and opportunities to intervene.

NDRDD data collection continued to improve in 2012; there were only 41 deaths which were known to have met the NDRDD inclusion criteria but were not included in the dataset because records were not returned to ISD (see Appendix A9). The increasing convergence between the deaths reported by NRS and those described in depth by NDRDD is very encouraging. It is hoped that the NDRDD will continue to capture an increasing proportion of drug-related deaths so that they can be added to this unique resource and utilised to generate intelligence with the potential to reduce the risk of drug-related death.

ISD is in the process of developing data linkages to collect further data on hospital episodes and prescribing activity prior to death. Both areas were identified as potential developments in the previous NDRDD report. These enhancements will help make data collection more efficient and may be used to explore co-morbidities, periods of heightened overdose risk and diazepam prescribing and consumption in more detail.

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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
NDRDD:	National Drug-related Deaths Database
NPS:	‘New’ or ‘Novel’ Psychoactive Substances
NRS:	National Records of Scotland
SCDEA:	Scottish Crime and Drug Enforcement Agency
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 48 tables	2009-2012	198kb
1	Age and gender	2009-2012	-
2	SIMD quintile areas of deprivation	2009-2012	-
3	Where the deceased was living at the time of death	2009-2012	-
4	Whom the deceased was living with at the time of death	2009-2012	-
5	Children under 16 years the deceased was a parent or parental figure to	2009-2012	-
6	Children under 16 years who lived with the deceased	2009-2012	-
7	Known to have used drugs prior to death?	2009-2012	-
8	Known intravenous (IV) drug use and length of IV use	2009-2012	-
9	Drug detoxification within the 12 months prior to death and length of time prior to death since last drug detoxification	2009-2012	-
10	Prescribed a substitute drug at time of death?	2011-2012	-
11	How prescribed substitute drug was dispensed by type of substitute drug	2011-2012	-
12	Length of time in receipt of substitute prescription	2011-2012	-
13	Length of time in receipt of methadone prescription	2011-2012	-
14	Overdoses experienced prior to death	2009-2012	-
15	Number of months since last known non-fatal overdose	2009-2012	-
16	Experienced a particular medical condition in the six months prior to death?	2009-2012	-
17	Experienced a particular psychiatric condition in the six months prior to death?	2009-2012	-
18	Experienced a significant event in the six months prior to death?	2009-2012	-
19	Victim of domestic violence prior to death	2012	-
20	Sexual abuse prior to death	2012	-

21	Contact with drug treatment services at any time prior to death	2009-2012	-
22	Type of services people were in contact with prior to death	2009-2012	-
23	Type of services people were in contact with prior to death for reasons other than management of a drug misuse problem	2012	-
24	Been in police custody in six months prior to death?	2009-2012	-
25	Number of weeks between police custody release and death	2011-2012	-
26	Been in prison custody ever or in six months prior to death?	2009-2012	-
27	Number of weeks between prison release and death	2011-2012	-
28	Deaths by day of occurence	2009-2012	-
29	Deaths by month of occurence	2009-2012	-
30	Numbers and crude mortality rates by council area of death	2009-2012	-
31	Crude mortality rate by NHS Board of residence	2009-2012	-
32	Number of deaths by place of drug use	2009-2012	-
33	Where the individual was pronounced dead	2009-2012	-
34	Persons present at scene of fatal overdose and their location	2009-2012	-
35	Ambulance attending the scene of fatal overdose?	2009-2012	-
36	Resuscitation attempted?	2009-2012	-
37	Resuscitation attempted by whom?	2009-2012	-
38	Naloxone availability and administration	2009-2012	-
39	Drugs found present in body at post mortem by age and gender	2009-2012	-
40	% Drugs found present in body at post mortem for all deaths by gender	2009-2012	-
41	Drug combinations found present in body at post mortem for all deaths by age and gender	2009-2012	-
42	Drugs found present in body at post mortem and drugs implicated in the deaths	2009-2012	-
43	Drugs implicated as a percentage of drugs found present in body at post mortem	2009-2012	-

44	Prescribed a substitute drug at time of death by drug found present in body at post mortem	2009-2012	-
45	Methadone implicated deaths and prescribed substitute drug	2011-2012	-
46	Methadone implicated deaths and dispensing of prescribed methadone	2011-2012	-
47	Methadone implicated deaths and length of time in receipt of methadone prescription	2011-2012	-
48	Dose of prescribed methadone and methadone	2011-2012	-

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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 [1].

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: Deaths by Suicide in the 2012 NDRDD Cohort

A2.1: Introduction

Known risk factors for death by suicide in the general population are wide ranging and can include: depression, other mental health problems, unemployment, alcohol and/or substance abuse, tragic life events, previous suicide attempts, incidents of self-harm, violence and sexual abuse [1, 2, 3]. Research has shown that individuals engaged in problematic drug use, particularly in the Scottish context, exhibit such risks [4, 5, 6, 7]. In addition, studies of individuals in drug and alcohol treatment have shown previous suicide attempts and current suicidal thoughts are common [8]. 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 [9] – there is no known single reason for this. However, from the period 2000-02 to 2010-12, Scotland's suicide rate reduced by 18%. 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 suicides in Scotland (this work is now led by ISD Scotland). The 2012 ScotSID report, based on 2009-2010 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 [10]. In December 2013, The Scottish Government published a new suicide prevention strategy for 2013–2016 [11]. 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" [12].

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 first year that deaths by suicide have been included in the NDRDD Report and as such offers an opportunity to provide evidence of relevant markers in population of individuals known to have used drugs. There were 52 deaths by suicide in 2012 making it difficult to draw many definitive conclusions from data exploration of this small group.

It is important to note that the 52 deaths from suicide reported in this Appendix are a subset of the 581 drug-related deaths and of the 762 deaths by suicide already published by National Records Scotland (NRS) in August 2013.

A2.1.1: Methods

In 2012, the NDRDD adopted the full NRS definition for drug-related deaths The NDRDD uses the following definition for deaths from suicide from controlled substances: Intentional self-poisoning by drugs, medicaments and biological substances (ICD Codes X60 - X64). In 2012, 531 records were identified as eligible for inclusion in NDRDD overall, of whom 52 (10%) were categorised as death from suicide. In this Appendix, comparisons between the 479 NDRDD non-intentional deaths (known here as the 'NDRDD cohort') and the 52 deaths from suicide records were made, where possible (Sections A2.2 – A2.7). Further analysis was undertaken, looking at those deaths by suicide which were in individuals known to use

drugs (n=31) and in those with no known drug use history (n=21); these findings are presented in Section A2.8.

A2.2: Sociodemographic Data

A2.2.1: Age and Gender Comparison

The mean age of the 52 deaths from suicide was 48.2 years while it was 38.3 years in the 479 individuals in the NDRDD cohort. A very different pattern was observed between these two cohorts in respect to gender. More of the individuals in the NDRDD cohort were likely to be male (361, 75%), whereas there were equal numbers of deaths from suicide in males and females (26 in each).

A2.2.2: Living Situation

The deaths from suicide were similar to the NDRDD cohort in many respects: around three-quarters lived in their own home at the time of death (38 deaths from suicide; 72% in NDRDD) with similar percentages living with relatives (approximately 17%) and around two-thirds of both cohorts were childless at death (deaths from suicides 35 out of 52; NDRDD: 63%). However, a greater proportion of the individuals in the NDRDD cohort were single at death (61%) than were single among those dying from suicide (18/52).

A2.2.3: Employment Status

Among deaths from suicide, 25 of the 52 were categorised as ‘unemployed’ compared with the majority of the NDRDD cohort (360, 79%), with only slightly more who were employed of the deaths by suicide: (8/52) than in the NDRDD cohort (35/479) and more who were retired (8 of the 52 deaths by suicide compared with 8 of the 479 drug-related deaths). In both cohorts around a quarter were categorised as ‘long-term sick/disabled’ (26%).

A2.3: Drug Use History

A2.3.1: Drug Use and Injecting Status Prior to Death

Considerably fewer of those dying from suicide were known to have used drugs (31/52) than those dying from a drug-related death 419 (87%). However, similar to the overall cohort, the majority of the 31 dying from suicide who had used drugs were male (20), and most of these 31 individuals were known to have used drugs for a considerable length of time (24 were known had been using for six years or more).

For the 31 deaths from suicide among those known to have used drugs, 12 were known to have injected drugs; this proportion was slightly lower than the proportion known to have injected drugs in the NDRDD cohort (59%). The length of time the individuals had been injecting drugs was similar in the two cohorts, with eight known to have been injecting drugs for 11 years or more (length of time was known for 11 of these 12 individuals).

A2.3.2: Substitute Prescribing

Eleven of the 52 deaths from suicide had been prescribed a substitute drug at the time of death (10 of these had been prescribed methadone). These figures are similar to the proportions in the NDRDD cohort.

A2.3.3: Previous Non-Fatal Overdoses

Twenty-five of those dying from suicide had experienced at least one overdose previously, with nine of these having only one previous overdose. These figures are similar to those for the NDRDD cohort.

A2.4: Medical and Psychiatric History and Significant Life Events

A2.4.1: Recent Medical History

In the six months prior to death, a similar proportion experienced a medical condition (deaths from suicide: 47/52; NDRDD: 406/479, 85%), with a number of individuals experiencing more than one medical condition, and similar proportions of most conditions seen in both cohorts. However, there was higher problem alcohol use in the NDRDD cohort (98, 21%) than in the cohort of deaths from suicide (4/52), but fewer other medical conditions in the NDRDD cohort (129, 27%) than in the suicide cohort (27 of the 52).

A2.4.2: Recent Psychiatric History

In the six months prior to death, 33 of the 52 individuals dying from suicide experienced a particular psychiatric condition, similar to the proportion experienced in the NDRDD cohort (56%). Many of the individuals were suffering from more than one psychiatric condition, and the occurrence of most psychiatric conditions were similar in both cohorts.

A2.4.3: Recent Significant Events

More than half (35) of the individuals dying from suicide had experienced at least one significant life event, with 10 experiencing recent ill health and three a breakdown of a significant relationship. These proportions were similar to those in the overall NDRDD cohort.

A2.4.4: Domestic and Sexual Abuse

Eleven of those dying from suicide had a history of domestic abuse, similar to the proportion in the NDRDD cohort (13%) There was also a similar experience of sexual abuse in both cohorts, at around a fifth of individuals experiencing this form of abuse (deaths from suicide: 10; NDRDD: 17%).

A2.4.5: Suicide Attempts

A similar percentage of individuals had made previous suicide attempts in both cohorts (14 of the deaths from suicide and 133 in the drug-related deaths cohort).

A2.5: Contact with Services

A2.5.1: Contact with Drug Treatment Services

Reflecting that fewer of the individuals dying from suicide were known to have used drugs than in the NDRDD cohort (Section A2.3), a lower proportion of individuals dying from suicide were known to have had contact with drug treatment services at some point in time (19 of the 44 where this was known; 16 of these within six months) than in the NDRDD cohort (335/450 where known (74%), of whom 269 were within six months).

A2.5.2: Contact with the Criminal Justice System

Fourteen of those dying from suicide had served time in prison compared with around half of the NDRDD cohort (216). The majority of these individuals were male (11/14), similar to the proportion in the NDRDD cohort.

A2.6: Circumstances of Death

A2.6.1: Place of Death

A similar percentage of those dying from suicide were pronounced dead in their own home (38/52) as in the NDRDD cohort (62%). It is interesting that none of the deaths from suicide were pronounced dead in hospital, compared with more than one in ten in the NDRDD cohort.

A2.6.2: Persons Present at Scene of Overdose

Those dying from suicide were more likely to be on their own at death (34/51) compared with around half of the NDRDD cohort (210 of the 459, where this was known). Only six of the seventeen individuals who died in circumstances where at least one individual was present at the location, were known to have had the person(s) in the same room.

A2.6.3: Attempted Resuscitation[17]

Similar proportions of those dying from suicide were attended by an ambulance (44/51) and had a resuscitation attempt made on them (24/52, with 17 made by ambulance staff) as there were in those individuals dying from a drug-related death. Around a quarter of the resuscitation attempts made on individuals suffering a drug-related death were made by friends compared with only one of the 24 resuscitation attempts made on those dying from suicide.

A2.7: Toxicology Data

Diazepam (30/52), heroin/morphine (16/52) and methadone (14/52) were present in the body at death in smaller proportions of deaths for the individuals who died from suicide than for those dying from a drug-related death (79%, 48% and 27%, respectively).

A slightly different pattern was observed in the drugs which were implicated in the deaths. Methadone was implicated in the deaths for 13 of the 52 individuals dying from suicide; which was lower than the proportion with methadone implicated in the NDRDD cohort (210/456, 46%). Similarly, a smaller percentage of those dying of suicide had diazepam implicated in the death (7/52) than in the NDRDD (136/456, 30%). However, a higher proportion of those dying from suicide had anti-depressants implicated in the death (17/52) than there was in the drug-related deaths cohort (56/456, 12%).

A2.8: Comparison within the Death from Suicide Cohort

It is known that 31 of the 52 deaths from suicides were in individuals who were known to have used drugs. Some of the data presented above is suggestive that these individuals

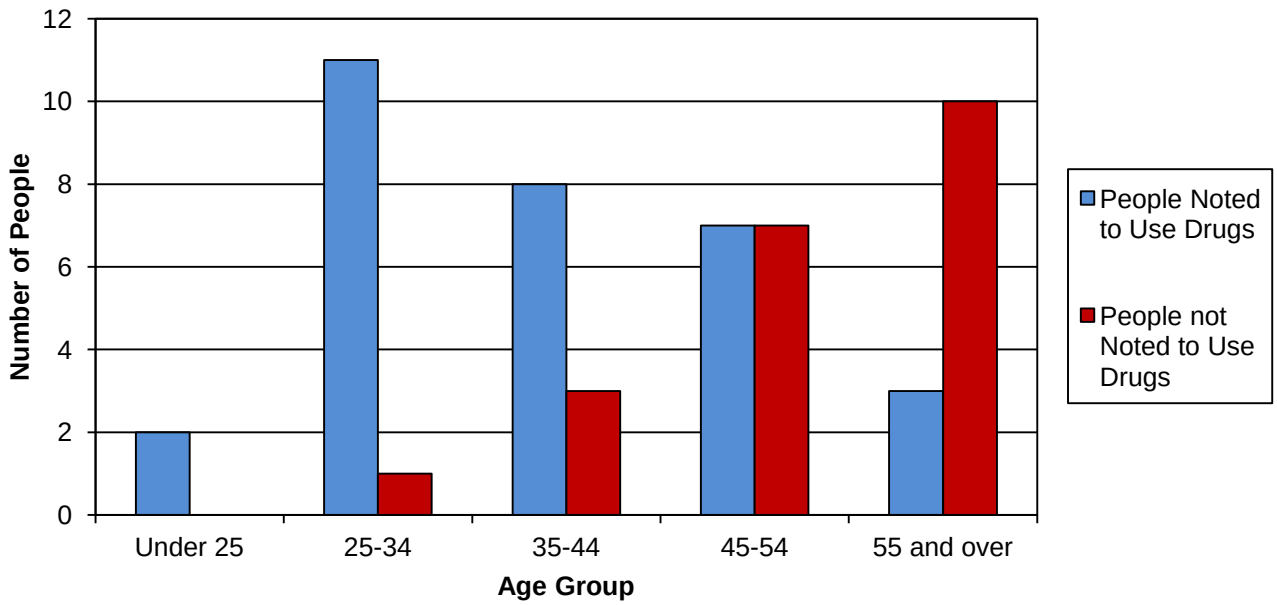
[17] Resuscitation on any one individual may have been attempted by more than one person

were different to the 21 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 groups, and also between the overall drug-related deaths cohort and the deaths from suicide in those known to have used drugs.

A2.8.1: Sociodemographics

The 21 individuals who died from suicide and were not known to be a drug user were considerably older than the 31 individuals who died from suicide and were known to have used drugs. For example, 17/21 were aged 45 and over and 10 of these were aged 55 and over. This is in comparison with 10/31 aged 45 and over, with only three of these aged 55 and over in the deaths from suicide in those who were known to use drugs. The age structure of the 31 deaths from suicide in those who were known to use drugs was similar to the age structure of the NDRDD.

Figure A2.1: Age Group at Death by Known Drug Use (NDRDD, Deaths by Suicide, 2012)



There was also a difference between gender in the two groups, with the 21 individuals who died from suicide and were not known to be have used drugs much more likely to be female (15/21) compared with the 31 individuals who died from suicide and were known to have used drugs (11/31).

A2.8.2: Drug Use History

The proportion of individuals dying from suicide who were not known to have used drugs and who were known to have had at least one previous overdose (6/19) was lower than the proportion of individuals dying from suicide who were known to have used drugs and who were known to have had at least one previous overdose (19/31). This latter figure is similar to the proportion in the NDRDD cohort 53% (251/478) who were known to have experienced at least one overdose.

A2.8.3: Medical and Psychiatric History and Significant Life Events

A large percentage of all individuals had experienced a medical condition in the six months prior to death (18/21, 19/31 and 406/479 in the individuals dying from suicide in those not known to use drugs, the individuals dying from suicide in those known to use drugs and in the NDRDD cohort, respectively).

A similar proportion of the individuals dying from suicide had experienced a psychiatric condition in the six months prior to death in those who were known to have used drugs (23/31) and those who were not known to have used drugs (10/21).

A similar proportion of the individuals dying from suicide had experienced a significant event in the six months prior to death in those who were known to have used drugs (22/31) and those who were not known to have used drugs (13/21).

A2.8.4: Ever Served Time in Prison

A large percentage of all three groups had experienced a particular medical condition in the 6 months prior to death but this was slightly higher in the known drug users from the Suicides cohort at 93.5% (29/31) compared to 85.7% (18/21) in the non-drug users and 84.8% (406/479) in the NDRDD. Evidence of Liver Disease (13.5% of NDRDD, 10.3% of known drug user suicides) and Hepatitis C (18.5% of NDRDD, 10.3% of known drug user suicides) was apparent in both the NDRDD cohort and known drug user Suicides but was present in ***none*** of the non-drug user Suicides cases.

A2.8.5: The Death

In 14 of the 31 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, similar to the situation in the NDRDD (54%). Another person was present in same the room at the point of overdose for five of these 14 deaths. In contrast, only 3 of the 21 who were not known to have used drugs and who had died from suicide had someone present at the scene of death, with only one of these being in the same room. This suggests that the circumstances of the deaths in these two groups were different.

A2.8.6: Drugs

Unsurprisingly, heroin/morphine and methadone were present in the body infrequently in those who were not known to have used drugs and who died of suicide (3/21 and 0/21, respectively). This is in contrast with the presence of these drugs (14/31 for both) in the toxicology of deaths from suicide in those known to have used drugs. Similarly, diazepam was more common in this latter group. There was, however, no difference between the presence of alcohol or anti-depressants between the two groups.

A2.9: Discussion

Many of the problems recognised as inherent among individuals known to use drugs are also recognised causes of suicide (1-8). The risk factors for death from suicide applicable to the general population (depression, other mental health problems, unemployment, alcohol abuse, substance abuse, tragic life events, previous non-fatal suicide attempts, incidents of self-harm, 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.

The demographic composition, types of medical conditions, drug using history and behaviour, and toxicology for the two cohorts differed in a variety of respects. The individuals dying from suicide were generally older (mean age 48.2) than the NDRDD cohort (mean age 38.3). Males and females were equally represented in the deaths from suicide (26 in each) whereas the NDRDD cohort was predominantly male (75%). Importantly, the deaths from suicide cohort had a smaller percentage of individuals known to have used drugs (31/52) compared with the majority of the NDRDD (87%). The NDRDD cohort had more evidence of the problems associated with drug use such as unemployment (79%) and alcohol problems (24%) than those individuals dying from suicide.

Indications from drug use and toxicology data were suggestive that some individuals who were dying from suicide were not habitual drug users. Among the deaths from suicide, a smaller proportion had heroin/morphine (16/52) or methadone (14/52) present in the body at post mortem compared with the NDRDD cohort (48% and 50%, respectively). Drugs implicated in the deaths revealed a similar pattern in that a smaller percentage of deaths from suicide (13/52) had methadone implicated in the death than in the NDRDD cohort (46%). In addition, anti-depressants were implicated in 17 of the 52 deaths from suicide compared with 12% in the NDRDD cohort. However, although there was lower drug use in the individuals dying from suicide as a whole, the data indicated that there was a group within that group who were engaged in problematic drug use.

When further analysis was carried out to explore potential differences between deaths from suicide among those known to use drugs, those who were not and the NDRDD cohort, evidence emerged that the group of deaths from suicide among those known to use drugs were similar to the NDRDD cohort. It was also apparent that deaths from 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 in that most were male and very few were aged 55 and over. In comparison, individuals dying from suicide with no known drug use noted were more likely to be female and around half were in the oldest age group.

Around half of the individuals dying from suicide among those known to use drugs and the NDRDD cohort 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 the deaths of 13/31 deaths from suicide among those known to use drugs and in 46% of the NDRDD cohort but was not implicated in any of the deaths by suicide with no known drug use noted.

This analysis has looked at 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 from 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 52 individuals whereas the 479 were categorised as non-intentional deaths from drugs. Perhaps a strange anomaly is that a similar percentage of previous suicide attempts had been made by individuals in both groups (14/52 of the deaths from suicide and 28% of the NDRDD cohort).

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.

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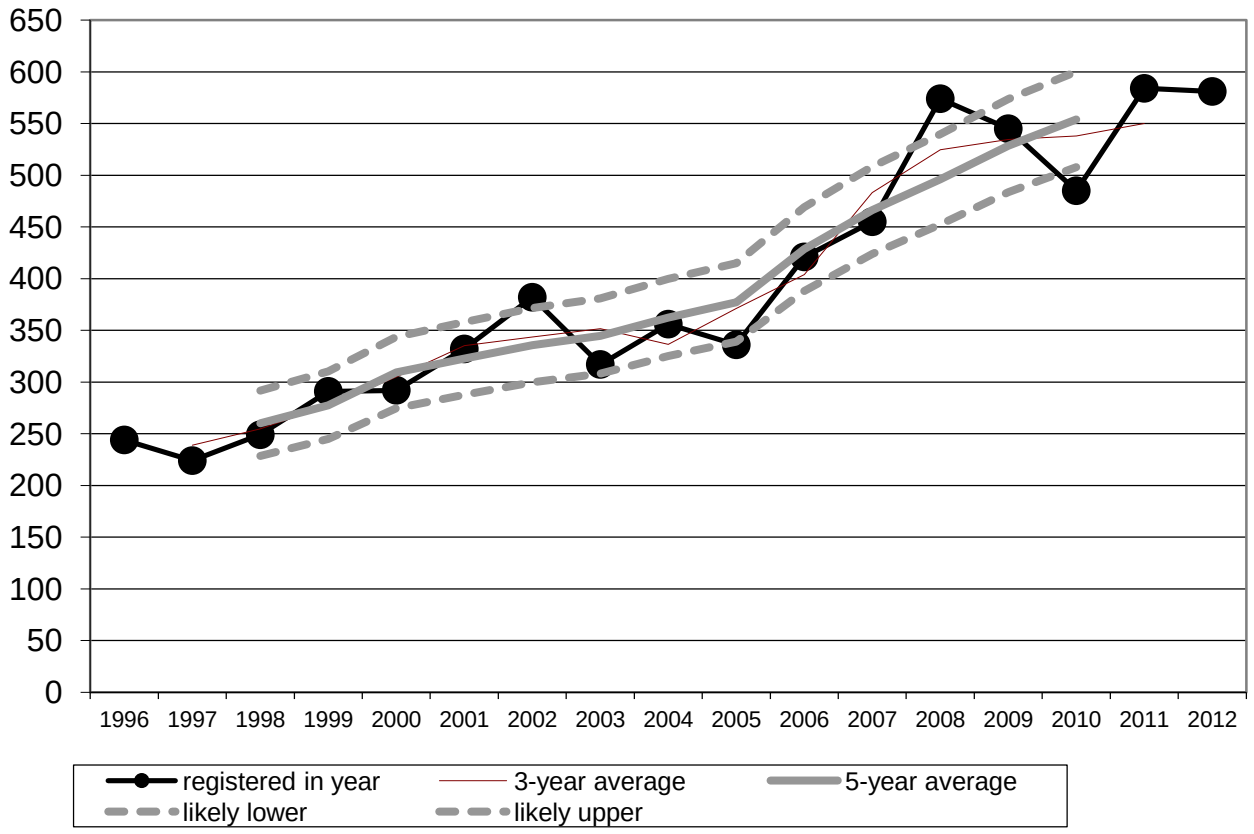
A3: National Records of Scotland (NRS) Report on Drug-Related Deaths 2012

In its most recent publication [1], the NRS reported that 581 drug-related deaths were registered in Scotland in 2012. Figure 1 shows the long-term trend of drug-related deaths in Scotland since 1997.

Figure A3.1: Drug-Related Deaths in Scotland, 3- and 5-Year Moving Averages and Likely Range of Values around the 5-Year Moving Average



Source: NRS (2013), Drug-Related Deaths in Scotland 2012 [1]

There was a reduction of three drug-related deaths between 2011 (584) and 2012 (581). Regardless of the slight fall in deaths, this was the second highest number ever recorded by the NRS and 52% higher than in 2002. However, this figure was similar to recent values of the 3-year moving average indicated in Figure 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 2008-2012 with that for 1998-2002, the NRS reported a greater percentage increase in the number of females who had died drug-related deaths compared with males (136% and 65% 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 Tayside.

Of the 581 drug-related deaths reported by NRS in 2012, methadone was implicated in or potentially contributed to 41% of deaths followed by heroin and/or morphine (38%), benzodiazepines (34%), cocaine (5%), amphetamines (3%) and ecstasy (2%). In 2012, heroin and/or morphine were implicated in, or potentially contributed to, more deaths than in 2011, but the number was markedly below the level of 2008 and 2009. However, the corresponding figure for methadone fell in 2012, but represented a large increase compared with 2008 and 2010. There were also more deaths in which benzodiazepines were implicated or to which they potentially contributed. Finally, alcohol was implicated in or contributed to 19% of the 581 drug-related deaths in 2011 which was the lowest number in all the years for which figures on this basis were available (starting from 2008).

A4: 'New' or 'Novel' Psychoactive Substances (NPS)

A4.1: Introduction

Although not a new phenomenon, the growth of Novel (New) Psychoactive Substances (NPS) over the last decade, both in terms of availability and consumption, is of increasing public health concern. In the UK, the Advisory Council on the Misuse of Drugs (ACMD) defines 'new' psychoactive substances as: "psychoactive drugs which are not prohibited by the United Nations Single Convention on Narcotic Drugs or by the Misuse of Drugs Act 1971, and which people are seeking for intoxicant use".

The number of NPS reported to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) has increased year on year from 24 in 2009 to 73 in 2012 [1]), while the United Nations Office on Drugs and Crime UNODC [2] estimates that 251 NPS had been identified by member states by mid-2012, a number likely to increase further. A recent UN report categorises the current NPS market into six main groups of drugs: synthetic cannabinoids (e.g. Spice); synthetic cathinones (e.g. Mephedrone); ketamine; phenethylamines (e.g. Benzo-fury); piperazines (e.g. BZP); and plant based substances [3]. It also reports on a 7th group of miscellaneous substances that contain recently identified NPS (e.g. tryptamines) that don't fit into any of these groups. Other pharmaceutical medications not used within the UK, for example benzodiazepines such as Phenazepam, have also been included within the broad definition of NPS by the ACMD and the UK National Programme on Substance Abuse Deaths (np-SAD).

The scale of NPS use globally is less clear due to an absence of epidemiological data from robust population-based based samples and only limited data from a few countries on specific substances and sub-populations [2]. Moreover, a lack of common definitions, the large and increasing number of substances regarded as NPS, and differences in legislation further complicate the ability to accurately understand use within and across countries. Prevalence at a population level is likely to be low but elevated within certain sub-groups, particularly younger people. For example, a recent prevalence study found prevalence of NPS use by 15-64 year olds in Northern Ireland and Ireland in the last year between 1% and 3.5%, but much higher figures of between 3.3% and 9.7% for those aged 15-24 [4]. These figures were further patterned by gender with young males being more likely to be users of NPS in the previous year than young females. European levels for NPS use by 15-24 year olds are estimated at around 5%, however rates in the UK and Ireland are believed to be among the highest of all the EU countries [5]. These results should be treated with caution, though, given the relatively small samples involved across each country and the broad range of substances incorporated within the surveyed category.

Robust data on NPS prevalence within Scotland is equally limited. For the first time, the Scottish Crime and Justice Survey (SCJS) added five NPS (BZP, GBL, khat, synthetic cannabinoids and mephedrone) to its dataset in 2010/11 [6]. Less than 2% of respondents reported having taken any of the five included NPS in their lives, less than 1% in the past year. Mephedrone was the most commonly used of the five drugs with adults aged 16-24 the most likely to report use; 3.6% in the last year compared to an average of 0.7% amongst adults aged 16 and over. Men aged 16-24 were more than twice as likely to have used Mephedrone as women. Reported use of mephedrone by 16-24 year olds was lower than reported use of cocaine powder (5.8%), ecstasy (5.0%) and amphetamines (3.8%). The Scottish Schools Adolescent Lifestyle and Substance Use Survey (SALSUS) also added five NPS (mephedrone, BZP, ketamine, spice and 'GBL or GBH') to its dataset for the first time in 2010. Reported use of mephedrone by 15 year olds was around 1% [7]. Reported use of other NPS [beyond mephedrone] in both surveys is at very low levels (~0.1%).

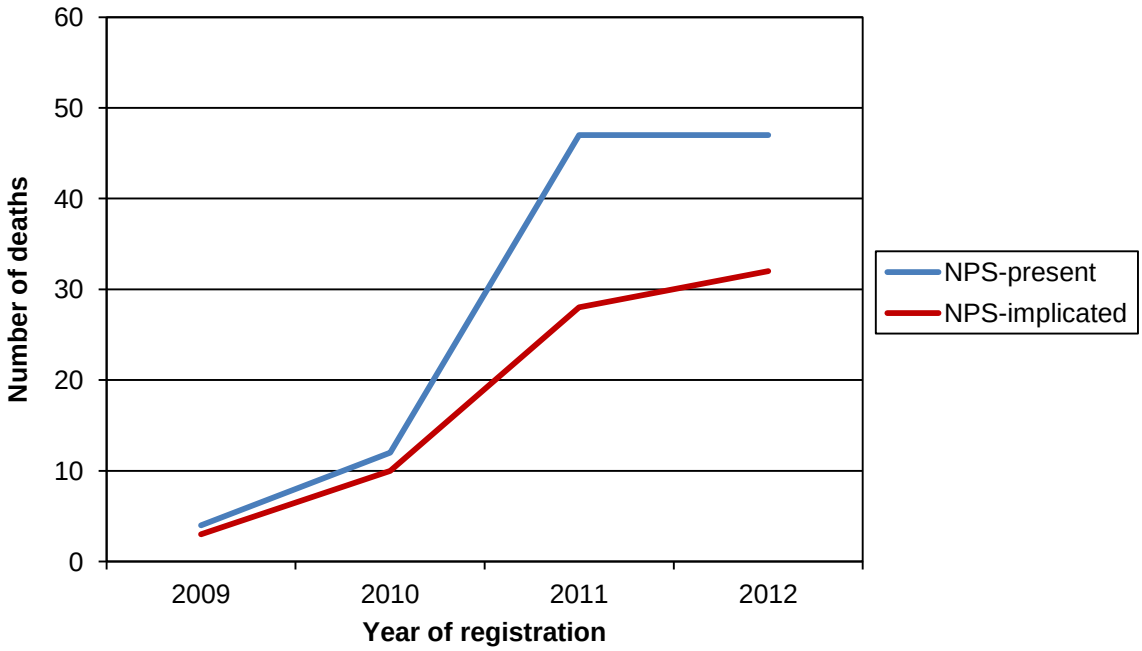
Harms related to NPS use are multi-faceted and could be physical or social in nature [8]. As with prevalence, there is a dearth of evidence on NPS-related harm. Most studies to date have been conducted on animals or individuals presenting with intoxication. Rigorous scientific scrutiny on toxicity, abuse and risks associated with acute and long term use has yet to be conducted. In Scotland, among individuals attending drug treatment services, presentations by people using amphetamines, ecstasy or NPS (e.g. mephedrone) are small in number. There is currently no reliable evidence, to date, to suggest any significant increase in presentations associated with the use of these drugs. A recent freedom of information (FOI) request suggested hospital admissions associated with NPS have been increasing in recent years [9], however this was based on figures supplied from less than half of the territorial Health Boards in Scotland. Effectively this FOI highlights the inconsistencies in data recording on NPS across the country and the limitations of interpreting the results with any degree of confidence.

The main research on NPS-related harms that has emerged in recent years is in relation to fatal poisonings. Official statistics on UK DRDs reported an increase in NPS deaths from 9 in 2007 to 52 in 2012 [10]. The 2012 data were made up of deaths mainly related to cathinones (18 of the 52), GHB/GBL (13) and piperazines (9). Using a different definition, np-SAD reported an increase in NPS implicated in DRDs from 10 in 2009 to 68 in 2012 [11]. In the most recent np-SAD report, the majority of these deaths were accounted for by ‘methcathinones’ (n=24) and ‘amphetamine-type substances’ (n=23). The methcathinones reported are largely made up of deaths involving mephedrone, the amphetamine-type substances mainly involved paramethoxyamphetamine (PMA).

Despite recent increases in related mortality, the characteristics of NPS deaths remain relatively unknown. One of the few descriptive studies of NPS-related DRDs was conducted by Corkery [12]. The cohort of 60 deaths shared some similarities with the typical UK DRD profile that has emerged over the past 20 years i.e. mainly white males, most with a history of drug use, usually dying in a home environment with polydrug use common. However, some differences were highlighted, in particular the younger age group involved and the higher proportions who had died in hospital. The authors also noted the large number of suicides/open verdicts for deaths related to mephedrone (18/60). Researchers from the same programme have also published an extensive descriptive analysis of mephedrone-related fatalities [13]). A similar profile to their overall NPS-related DRD cohort emerged; typically young white males with a history of drug use, dying in their own or a friend’s home, the majority of which involved polysubstance consumption. It is important to note, though, that the deaths described in these two studies do not primarily focus on drug poisonings or drug dependence; instead, they included other reasons (e.g. suicide, violence) where it is unknown whether the drug directly contributed to the event. This weakens comparability with other DRD cohorts.

In Scotland, overall crude numbers of NPS-related DRDs have been increasing in recent years, in line with trends at the UK level. Data from Drug-Related Deaths in Scotland 2012, published by National Records of Scotland [14], illustrate this trend (Figure A4.1).

Figure A4.1: Number of NPS-related DRDs (Scotland, NRS, 2009-2012)



This appendix analyses an NPS-related subset of the 2012 drug-related deaths reported by NRS in August 2013. While 47 cases where NPS were found to be present in the body at post mortem (NPS-related DRDs) were reported by NRS in August 2013, NDRDD recorded information on 36 of these cases occurring in 2012 (see Section 2.1.1 for further information on methods and Appendix A9 for further information on differences in data collection between the NRS and NDRDD cohorts).

Although these cases were included in the main NDRDD cohort, this is the first year that additional analysis of these cases has been performed, allowing a more detailed exploration to be conducted. The following analysis provides a descriptive account of the data available on the 36 NPS-related DRDs recorded by NDRDD in 2012. Findings are presented alongside comparable data from the overall NDRDD cohort, and any notable differences reported between these cohorts where appropriate. The analysis suggests the NPS-related DRDs can be split into two groups; 24 deaths involving Benzodiazepine-type NPS (henceforth referred to as 'Benzo-type') and 12 featuring Stimulant-type NPS. Due to the small numbers of deaths from these types of NPS it is difficult to draw any firm conclusions around any apparent differences and all findings should be treated with caution.

A4.2: Results and Commentary

In total there were seven different NPS recorded across the 36 deaths; categorised as either 'Benzo-type' or 'Stimulant-type' drugs (see Table 1, below). The majority of NPS-related DRDs involved Benzo-type drugs (24), mainly 'Phenazepam' (n=23). The remaining 12 NPS-related deaths featured a range of different Stimulant-type drugs, two of whom had multiple NPS drug types present.

Table A4.1: Substances recorded in NPS-related DRDs (NDRDD, 2012)

a) Benzo-type deaths (n=24)

Substance name	n
Phenazepam	23
Etizolam	1

b) Stimulant-type deaths (n=12)[18]

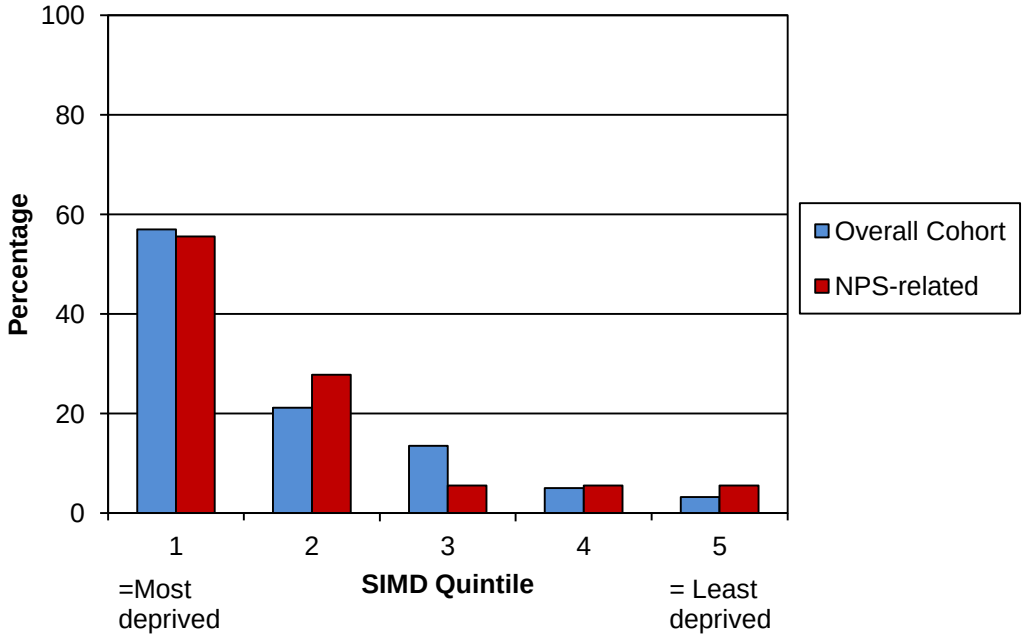
Substance name (chemical group)	n
AMT (Tryptamine)	5
6-APB (Phenethylamines)	3
BZP (Piperazines)	3
Mephedrone (Cathinones)	2
TFMPP (Piperazines)	1

A4.2.1: Sociodemographics

The majority of the 36 NPS-related deaths were from the Greater Glasgow & Clyde (14), Lothian (9) and Lanarkshire (5) NHS Health Board areas. The remaining eight cases were spread between five other NHS Health Boards, both urban and rural. The remaining six NHS Health Boards had no NPS-related deaths.

The breakdown of the 36 NPS-related deaths by deprivation was similar to that of individuals in the overall NDRDD cohort, with deaths recorded in all SIMD quintiles and the majority from the most deprived areas (SIMD quintile 1 (20) and quintile 2 (10)). This pattern was also evident for the Benzo-type drug deaths where 23 of the 24 deaths involved individuals from quintiles 1 and 2. However, only seven of the 12 Stimulant-type drug deaths involved individuals from quintiles 1 and 2.

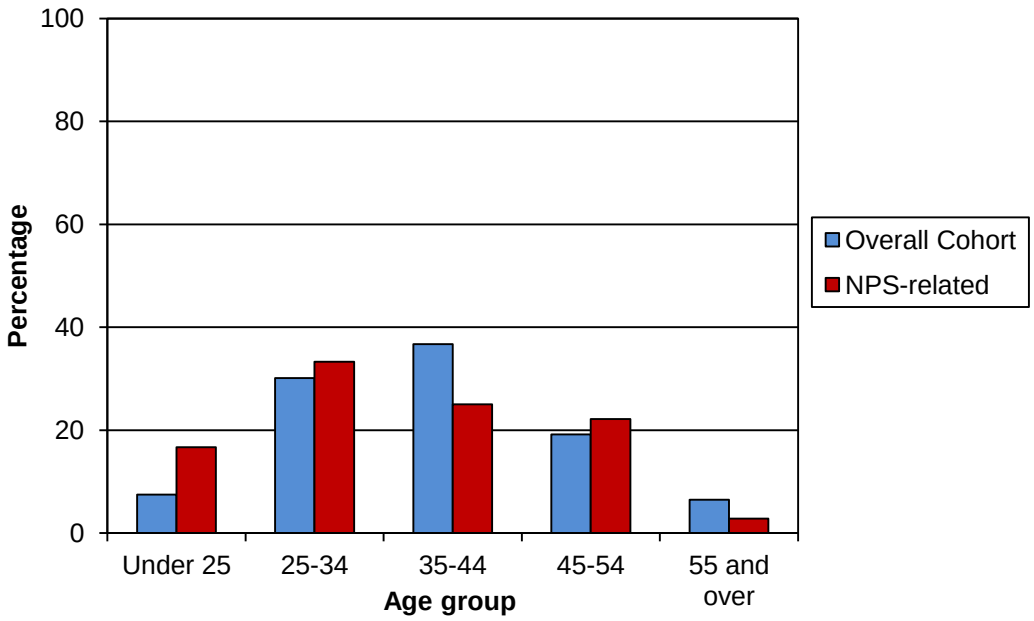
Figure A4.2: DRDs by deprivation, Overall Cohort vs NPS-related DRDs (NDRDD, 2012)



[18] Number exceeds the base total as two of the deaths had more than one NPS recorded at toxicology.

Deaths involving NPS were evident across all age groups, with half in those aged 35 and over. The overall NDRDD cohort was similar with deaths across all age groups (62% aged 35 and over). Benzo-type deaths tended to be older with only one individual aged under 25 years, whereas there were no Stimulant-type deaths in those aged over 45.

Figure A4.3: DRDs by Age Group, Overall Cohort vs. NPS-related DRDs (NDRDD, 2012)



Similar to the overall NDRDD cohort (75%), most of the NPS deaths were in males (29/36). Indeed deaths in males were the majority for most of the age groups except the 35–44 age group, where five of the nine deaths were among females.

Again, similar to the overall NDRDD cohort, where known, the majority of NPS related deaths involved individuals living on their own (19/35), with their parents (7) or with a spouse/partner (5). Similar numbers of the two drug type groups lived on their own (6 out of 12 Stimulant-type deaths and 13 out of the 24 Benzo-type deaths)

A third of the individuals with a NPS-related death had parental responsibility (12/36), although only four of them had children living with them at the time of death. These figures are also similar to those in the overall NDRDD cohort.

A4.2.2: Drug Use History

As in the overall NDRDD cohort, the overwhelming majority of NPS-related DRDs (33/36) were among individuals known to have used drugs prior to their death and almost half (16) for a considerable period of time (i.e. 11 years or more). The Benzo-type group had 14 of 23 individuals known to have used drugs intravenously compared with two of eight in the Stimulant-type group where data was available. Although both NPS drug types had high proportions of individuals known to have used drugs between them, long-term drug use of 11 years or more was more likely to be observed among the Benzo-type group (16/21) than the Stimulant-type group (0/8) where data was available.

Despite the majority of NPS-related deaths involving individuals known to have used drugs, few had undertaken a drug detoxification in the past year (3/32) where data was available. This mirrored the overall NDRDD cohort where only 8% had undergone a detoxification in the past year.

One quarter of the NPS-related DRDs (9/36) were known to be on a substitute prescription at the time of death, the majority via supervised consumption (8). These figures were comparable to the overall NDRDD cohort where 28% were prescribed a substitute drug at the time of death, 73% of whom were supervised. All NPS-related DRDs on substitute prescriptions were from the Benzo-type group.

Overdose experience was fairly common in NPS-related DRDs with over a third (14/36) known to have overdosed previously. In comparison, just over half (53%) of the overall NDRDD cohort had previous overdose experience. The majority of those in the NPS-related DRD cohort who had previously experienced a non-fatal overdose had done so only one or two times (9/14), with multiple overdose experience less common. Only a small minority (2/14) had overdosed in the three months prior to death.

A4.2.3: Medical, Psychiatric History and Significant Life Events

Almost three-quarters (26/36) of NPS-related DRDs had experienced a medical condition in the six months prior to death, with some individuals experiencing more than one condition. A range of conditions were noted, most common of which were psychiatric conditions (13), respiratory conditions (11), problem alcohol use (9) and hepatitis C (8). The overall NDRDD also reported high proportions of individuals with known recent medical conditions (85%), the most prevalent of which were similar to those reported within the NPS-related DRD cohort.

Nine individuals in the NPS-related DRD cohort had depression and five had anxiety recorded within the previous six months. Only a handful had one of the more severe and enduring mental health conditions (e.g. Schizophrenia, Post Traumatic Stress Disorder, Bipolar). The overall NDRDD cohort also reported higher prevalence of anxiety and depression. It is worth noting, however, that almost two-thirds (23) of NPS-related DRD cohort had no psychiatric conditions recorded in the six months prior to death, higher than in the overall NDRDD cohort (44%).

In addition to medical and psychiatric events, 20 of the 36 NPS-related DRDs were known to have had a significant life event in the six months prior to death. A range of adverse events were noted, the most frequent of which were ‘bereavement’ which affected six individuals and ‘breakdown of a significant relationship’ which affected four individuals. The overall NDRDD cohort had equivalent proportions of significant life events (59%), with ill-health/recent diagnosis and breakdown of a significant relationship the most common recorded.

A4.2.4: Contact with Services

Seventeen of the 32 NPS-related DRDs had been in contact with drug treatment services in the six months prior to death where data was available; this was similar to the drug treatment service contact rate in the overall NDRDD cohort (60%). Drug treatment service contact was marginally higher in the Benzo-type group (15/23) than in the Stimulant-type cases (2/9) where data was available.

Where known, nine of the 32 NPS-related DRDs had been in police custody within the six months prior to their death; this was similar to the proportion in the overall NDRDD cohort (27%). Two of the NPS-related cases had been in police custody in the week prior to death and a further three within 12 weeks, again proportionately similar to the overall NDRDD cohort.

Prison custody within the six months prior to death was recorded in only three NPS-related DRDs (two who had been released 1-2 weeks prior to death and a further one case deceased within 7-8 weeks of liberation). The percentage from the overall NDRDD cohort

was similar (12%). However, 19 of the 36 individuals dying from an NPS-related death had served time in prison at some point in their lives (a similar proportion to the overall NDRDD), but there was a difference between the two groups, with individuals in the Benzo-type group being more likely to have been in prison (17/24) compared with those in the Stimulant-type group (2/12); this may partly be related to their respective ages.

A4.2.5: Circumstances of Death

Similar to the overall NDRDD cohort, the drug use that led to the fatality typically took place in a home environment (28/30) where data was available; either the deceased's own home (17) or in the home of someone else (11). There was no obvious variation in place of drug use between NPS drug types.

Where individuals were pronounced dead followed similar patterns to place of drug use with a home environment most common in both the NPS-related DRDs (27/36) and in the overall NDRDD cohort. It is interesting to note that Stimulant-type deaths (5/12) were more likely to be pronounced dead at hospital (including Accident & Emergency departments) than cases involving Benzo-type drugs (2/24).

There were persons present at almost three-quarters of NPS-related DRDs where data was available, compared to just over half in the overall NDRDD cohort (54%). Persons were equally likely to be present in the two drug type groups (11 of 12 Stimulant-type deaths and 14 of 24 deaths involving Benzo-type drugs). Of the 25 who were present at the time of the NPS-related DRDs, around half (12) were known to be in the same room at the time of the fatal overdose, similar to the overall NDRDD cohort (42%).

Ambulance attendance was recorded at the scene of most of NPS-related DRDs (31/36), similar to the overall NDRDD cohort (82%), however resuscitation was attempted in only around half of cases (17), most of which were carried out by the ambulance staff (11). Resuscitation attempts were recorded on a similar number of individuals in the two drug type groups (seven of the 12 Stimulant-type deaths and ten of the 24 Benzo-type deaths).

A4.2.6: Toxicology Data

Similar to the overall DRDD cohort, polydrug use was a key feature of the 36 NPS-related DRDs with presence of more than one drug recorded by toxicology in every case. The drugs most likely to be present in the body at post mortem alongside NPS were diazepam (20), methadone (14), alcohol (14), antidepressants (11), dihydrocodeine (9) and heroin/morphine (8). The main differences between these and the overall NDRDD cohort were in relation to increased presence of Heroin/Morphine (48%) and Diazepam (79%) in the overall cohort. Both NPS drug type groups had co-presence with a wide-range of other drugs, however Benzo-type cases were more likely to also feature methadone (13/24) than deaths involving Stimulant type drugs (1/12).

The extent to which certain drugs were considered to be implicated in each death (as opposed to being present within the body) revealed a slightly different picture. In total, two-thirds of NPS recorded as present in the body at post mortem were considered to be implicated in deaths where data was available (22/33). As in the main NDRDD cohort, presence of methadone (14/14), tramadol (3/3) ecstasy (3/3), heroin/morphine (7/8), cocaine (6/7) and amphetamines (3/4) generally equalled implication in most of the NPS-related DRDs in which they were recorded. In contrast, alcohol (5/13) dihydrocodeine (3/8), diazepam (5/18), codeine (1/5), antidepressants (1/10) and cannabis (0/5) were much less likely to be considered implicated in the death. Where data was available, the proportion of the NPS implicated was similar in the two drug type groups (Benzo-type drugs were implicated in 13 of 21 deaths and Stimulant-type drugs in 10 of 12 deaths).

Table A4.2: Number of Cases where Drugs implicated in death/Drugs Present in Body at Post Mortem by NPS-related death group (NDRDD, 2012)

Drug	Drugs Implicated/Drugs Present	
	Benzo-Type (n=21)[1]	Stimulant-Type (n=12)
Alcohol	5/10	0/3
Amphetamines	1/2	2/2
Anti-Depressants	1/6	0/4
Cannabis	0/4	0/1
Cocaine	1/2	5/5
Codeine	1/3	0/2
Diazepam	4/13	1/5
Dihydrocodeine	3/6	0/2
Ecstasy	0/0	3/3
Heroin/Morphine	5/5	2/3
Methadone	13/13	1/1
NPS	13/21	10/12
Tramadol	2/2	0/0

Note:
1. NRS did not record three of the Benzo-type deaths, therefore 'drugs implicated' information was not available, reducing the number of cases for this group to 21.

A4.3: Discussion

This is the first year that data on NPS-related DRDs has been available to allow further, more in-depth analysis of the individuals involved and the circumstances surrounding each of their deaths. However, with only 36 cases in the cohort, just one year of data, and lack of a sufficient control population to compare against, caution should be taken when interpreting these initial results and applying the findings more widely. Indeed, NPS were recorded as present in 8% of Scottish DRDs registered in 2012, but implicated in just 5% [14]. The main problem drugs in Scotland, at least in relation to mortality, continue to be polydrug combinations of opioids, benzodiazepines [i.e. diazepam] and alcohol.

Despite these limitations, this snapshot of NPS-related deaths provides some valuable insights into an emerging public health issue which can be used to inform future research, policy and practice. The data identifies a number of areas which merit further investigation, most notably the apparent dichotomy of cases as involving either Benzo-type or Stimulant-type NPS.

The most prevalent NPS recorded in 2012 DRDs by NDRDD was Phenazepam, a long-acting benzodiazepine developed in the former Soviet Union in the 1970s [15]. Although not licensed for use in the UK, it is known to be used in Russia via prescription to treat epilepsy and neurological disorders. It has recently emerged as a drug of concern due to increasing use and related harm reported in Western Europe and the USA, with the first seizures in the UK recorded in Scotland in 2008 [15]. Hospital admissions related to Phenazepam followed soon after prompting the Scottish Government to issue a warning in 2010 about its availability and risks associated with consumption. The first recorded deaths in the UK where Phenazepam was implicated were in 2011 [16], with slightly decreasing numbers noted in 2012 [11]. Phenazepam was made a Class C drug in the UK in June 2012.

The association between Benzodiazepines and DRDs in Scotland is well established [17], but not yet fully understood. However, Phenazepam presents additional cause for concern

given its high levels of toxicity; it is reported to be particularly effective at 0.5-1.0mg, or 10% of a standard 10mg dose for diazepam [18]. The extent to which Phenazepam is being used as a substitute or supplemental benzodiazepine, or perhaps being marketed as diazepam and being taken unwillingly is currently unknown and should be a priority for future research. Indications from Phenazepam seizures indicate that the latter theory is the most plausible with markings suggestive of diazepam-like features [15]. Trends should also be continually monitored to assess the impact of Phenazepam's change of legal status. Indeed there is evidence to suggest that Mephedrone-related deaths have fallen since it was made illegal in 2010 [11]. It will be important to determine responses by both sellers and consumers since the Phenazepam ban came into force and any associated impacts on harm.

Interestingly, the 23 individuals whose death involved Phenazepam shared many similar characteristics to the overall NDRDD cohort; mainly male, aged between 25 and 54 years old, living in deprived communities, known to have used drugs (often intravenously), a range of co-morbidities, some recent experience of a significant life event, known to services but not always in receipt of substitute prescribing and with previous experience of serving time in prison at some point in their lives. Moreover their deaths mirror the tragic circumstances of the majority of DRDs in Scotland; died in a home environment, sometimes with other people present and generally featuring polydrug consumption of opioids, benzodiazepines and alcohol, the majority of which were implicated in death. Frontline services should ensure service users are continually informed of the risks associated with polydrug use, including non-prescribed medications like Phenazepam which can be particularly toxic.

The 12 Stimulant-type deaths shared some similarities with the Benzo-type group, but the data also indicate some differences in terms of the individuals involved and the circumstances of their deaths which merit further exploration in future reports. They appeared to be a younger group, mainly aged under 35 years old and living in *both* deprived and affluent communities. They were less likely to be known to have used drugs on a long-term basis partly due to their younger age, and were largely unknown to services. Equally, they were less likely to have served time in prison during their lives. Like the Benzo-type cases, polydrug use was common, however individuals appeared more likely to be pronounced dead at hospital indicating overdose symptoms were often recognised.

Despite their small numbers, deaths involving Stimulant-type NPS have attracted particular media attention. Indeed, the additional focus of the press on alleged mephedrone-related fatalities in 2010 had the unintended consequence of actually increasing interest in purchasing the drug [19]. A similar, intensive media response has been evident in relation to fatalities linked with PMA over the past 12 months. Although no PMA-related deaths were recorded in this 2012 Scottish cohort, the UK National Programme on Substance Abuse Deaths recorded PMA in five fatalities in 2011, increasing to 19 in 2012, the vast majority of which were implicated in the cause of death [20]. Future analysis of will be important in determining the extent of PMA (and other NPS) involvement in DRDs and the circumstances surrounding each death. This is of particular importance given the increasing number and variations of Stimulant-type NPS drugs appearing on the market.

A4.4: Conclusion

Given the limited evidence base on NPS-related death more widely, this exploratory study provides a useful addition to the literature and offers scope for further research. Although based on a small sample, it highlights important issues for policy and practice, not least the notable role of Phenazepam in drug-related mortality, but also the need for different harm reduction strategies to target the two distinct groups; one which mirrors the established 'ageing cohort' of DRDs, the other more closely aligned to the recent reported increases in recreational use of Stimulant-type NPS by younger people.

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A5: Methods

A5.1: Data Collection Development

A5.1.1: 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 A6. See Appendix A7 for a full list of Data collection Sub-Group members.

A5.1.2: 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.

A5.2: Data Collection Process

A5.2.1: 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.

A5.2.2: 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 A8 for a list of the local Data Collection Co-ordinators.

A5.2.3: 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.

A5.2.4: 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.

A5.2.5: 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.

A5.3: 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 A9

A5.4: 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.

A6: 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.'

A7: 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, Information Services Division, NHS National Services Scotland
Peter Fairbrother	Drug-related Death Review Co-ordinator, NHS Lothian
Garry Hecht	Senior Information Analyst, Information Services Division, NHS National Services Scotland
Robin Lawrenson	Clinical Performance Manager, Scottish Ambulance Service
Tony Martin	Research Associate, University of Glasgow and Data Collection Co-ordinator, NHS Greater Glasgow & Clyde
Andrew McAuley	Public Health Information Manager, NHS Health Scotland
Dr Claire McIntosh	East Central Scotland MCN Drug Death Group, NHS Forth Valley
Gillian McKenzie	Secretary, Scottish Families Affected by Alcohol & Drugs
Jim Sherval	Specialist in Public Health, NHS Lothian

Scottish Government Official Support

Fiona Fraser, Justice Analytical Services, Scottish Government

Julie Carr, Drugs Policy Unit, Scottish Government

A8: 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	Julie Murray
Dumfries & Galloway	Jackie Davies	Dumfries & Galloway ADP	jdavies1888@nhs.net	
Fife	Julia Neufeind	NHS Fife	julia.neufeind@nhs.net	
Forth Valley	Julia Neufeind	NHS Fife	julia.neufeind@nhs.net	Elaine Lawler & Anita Dufton
Grampian	Lynn Sutherland	Grampian Public Health	lynnsutherland@nhs.net	Maria Rossi & Jean Adams
Greater Glasgow & Clyde	Tony Martin	Glasgow Drug & Alcohol Partnership	tonymartin@nhs.net	
Highland	Sarah Mackenzie	Highland ADP	sarah.mackenzie6@nhs.net	John Glenday
Lanarkshire	Fiona McIntyre	Lanarkshire ADP	fiona.mcintyre1@nhs.net	Lucie Giles
Lothian	Jim Sherval	Lothian Public Health	jim.sherval@nhs.net	Peter Fairbrother
Orkney	Claire Proctor	Highlands & Islands Division	claire.proctor@scotland.pnn.police.uk	
Shetland	Karen Smith	NHS Shetland	karenk.smith2@nhs.net	Tom Ogilvie
Tayside	Julia Neufeind	NHS Fife	julia.neufeind@nhs.net	Caroline Snowdon
Argyll & Bute[2]	Sarah Marquis	Argyll & Bute ADP	s.marquis@nhs.net	Yennie Van Oostende
Western Isles (Eilean Siar)	Claire Proctor	Highlands & Islands Division	claire.proctor@scotland.pnn.police.uk	

[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.

A9: Construction of the 2012 NDRDD Cohort

A9.1: Drug-Related Deaths for 2012 Reported by Different Agencies

NDRDD	NRS	SCDEA
531	581	479

The National Drug-Related Deaths Database (NDRDD) reports on a subset of 531 of the drug-related deaths in Scotland in 2012 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 2012 and reported by NRS was 581.

The Scottish Crime and Drug Enforcement Agency (SCDEA) also produce an annual figure for the number of drug-related deaths reported to them by Scottish police forces (via the Association of Chief Police Officers, Scotland (ACPOS)). Whilst ACPOS report on all suspected drug-related deaths, some of these are later excluded following post mortem examination and toxicology testing. At the time of writing, of the 479 deaths reported by the SCDEA in 2012, 294 were confirmed as drug-related while 185 were suspected. It is possible that the status of some of the 185 suspected deaths has now changed.

A9.2: Matching the NDRDD Records to NRD Death Records

In line with the previous three 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 2012 NRS figure of 581 was therefore derived from this comprehensive process.

A total of 560 records were returned to ISD for inclusion in the NDRDD for 2012 and these were matched to the NRS records for every death registered in Scotland in 2012 (including the 581 drug-related deaths). Twenty-nine (out of 560) of the NDRDD records did not meet the NDRDD definition of a drug-related death. Therefore the final 2012 NDRDD cohort (analysed for this report) comprised of 531 records. The reasons for the removal of the 29 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)	21
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 2011.	8
Total	**29**

A9.3: Explanation of the Difference between the NDRDD and NRS Figures

The reasons why the NRS 2011 figure of 581 is higher than the NDRDD 2012 figure of 531 are shown in the table below.

	Number	Total
The number of drug-related deaths reported by NRS for 2012.	581	
Less the NRS deaths that occurred in 2011 but were registered in 2012 i.e. not included in the 2012 NDRDD figure.	-33	548
Add the NDRDD deaths that occurred in 2012 but were registered in 2013 i.e. not included in the 2012 NRS figure.	+5	553
Add the deaths that were not included in the 2012 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 2012.	+19	572
Less the deaths that were included in the 2012 NRS figure but for which a NDRDD record was not returned to ISD.	-41	531
Cases in NDRDD cohort to be analysed.	531	

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 33 cases to the NDRDD figure. The 33 NRS cases where death occurred in 2011 but was registered in 2012 (not included in the 2012 NDRDD figure) were included in the 2011 NDRDD cohort. Further, the five cases where death occurred in 2012 (and are reported by NDRDD in this report) but was registered in 2013 (and therefore not included in the 2012 NRS figure) will be included in the NRS 2013 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 19 deaths were included in the final NDRDD figure that were not counted as 2012 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 2012 at the end of May 2013. Note – NRA data is “frozen” around May/June of the following calendar year.

Taking the above explanations into account there still remains 41 deaths that NRS have counted as DRDs for which ISD did not receive any returns for the NDRD database. Of these 41 deaths, 13 (31.7%) were for NHS Fife, 8 (19.5%) for NHS Lanarkshire, 5 (12.2%) for each of NHS Tayside, NHS Forth Valley and NHS Highlands, 3 (7.3%)for NHS Lothian and 1 each (2.4%) for NHS Shetland and NHS Western Isles.

A9.4: Reasons Why 41 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 2012 (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.

A9.5: NDRDD versus SCDEA 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 SCDEA 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 SCDEA 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 SCDEA. The table at the start of Appendix A9 shows that for 2012, the SCDEA reported 479 deaths, 52 fewer than made up the final

2012 NDRDD cohort. These figures exactly match the number of non-intentional and intentional (suicide) deaths within the 2012 NDRDD cohort. It is not possible to ascertain if the NDRDD and SCDEA non-intentional cohorts contain the same individuals (their numerical convergence may be coincidental), however it is encouraging to note the increasing comprehensiveness of the NDRDD cohort in comparison to other data sources.

A10: 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 and, separately, those receiving extended Pre-Release Access.

Standard Pre-Release Access:

Scottish Government Health Department

NHS Board Chief Executives

NHS Board Communication leads

Extended Pre-Release Access

Extended Pre-Release Access of 8 working days is given to a small number of named individuals in the Scottish Government Health Department (Analytical Services Division). This Pre-Release Access is for the sole purpose of enabling that department to gain an understanding of the statistics prior to briefing others in Scottish Government (during the period of standard Pre-Release Access).

Scottish Government Health Department (Analytical Services Division)

Early Access for Management Information

These statistics will also have been made available to those who needed access to ‘management information’, ie as part of the delivery of health and care:

Early Access for Quality Assurance

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

A11: Publication Metadata (including revisions details)

Metadata Indicator	Description
Publication title	The National Drug-Related Deaths Database (Scotland) Report: Analysis of Deaths occurring in 2012
Description	A detailed examination of a subset of the drug-related deaths that occurred in Scotland in 2012.
Theme	Health and Social Care
Topic	Drug-related mortality
Format	PDF with Excel tables
Data source(s)	Data from the National Drug-Related Deaths Database held by ISD. Data is collected at a local level by data co-ordinators. For each record they access a variety of sources including drug treatment services, GPs, prisons, police etc. Data from the National Records of Scotland (NRS) for drug-related deaths in 2012. This was supplied to ISD by the NRS for this report.
Date that data are acquired	Data for this report were submitted to ISD by October 2013 and were then quality assured. Note: data are locally gathered soon after each death and are collated before being sent to ISD by the agreed deadline. NRS data were submitted to ISD in December 2013.
Release date	25th March 2014
Frequency	Annually
Timeframe of data and timeliness	All drug-related deaths that occurred in calendar year 2012 are considered relevant.
Continuity of data	This is the fourth NDRDD report. For 2012 deaths, the definition of 'drug-related death' was expanded to include deaths by suicide. However deaths by suicide were reported separately in Appendix A2 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 A9.
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	30th April 2013
Next published	February 2015
Date of first publication	25th January 2011
Help email	garryhecht@nhs.net
Date form completed	22nd March 2014

A12: 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.

The United Kingdom Statistics Authority has designated these statistics as National Statistics, in accordance with the Statistics and Registration Service Act 2007 and signifying compliance with the Code of Practice for Official Statistics. Designation can be broadly interpreted to mean that the statistics:

- meet identified user needs;
- are well explained and readily accessible;
- are produced according to sound methods, and
- are managed impartially and objectively in the public interest.

Once statistics have been designated as National Statistics it is a statutory requirement that the Code of Practice shall continue to be observed.