Drug Related Deaths in NHS Lothian in 2019

Naomi Honhold
Drug Related Deaths Co-ordinator
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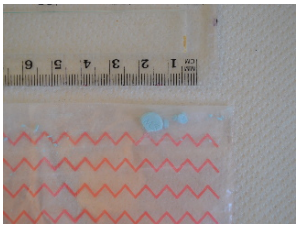
A complex problem: The last three WEDINOS submissions in 2019 from EH postcodes:

Date Received: 16/12/2019
Postcode: EH41
Purchase Intent: Xanax 2mg
Package Label: Xanax-2
Sample Colour: White
Sample Form: Tablet
Consumption Method: Oral
Self-Reported Effects: Increased Confidence, Relaxed, Memory Loss
Sample Upon Analysis (Major): Flualprazolam

Date Received: 23/12/2019
Postcode: EH22
Purchase Intent: 2C-B
Package Label: Not Stated
Sample Colour: Brown
Sample Form: Tablet
Consumption Method: Oral
Self-Reported Effects: No Effect
Sample Upon Analysis (Major): 2-bromo-4,5-dimethoxyphenethylamine



Date Received: 30/12/2019
Postcode: EH7
Purchase Intent: valium
Package Label: Diazepam 10mg
Sample Colour: Blue
Sample Form: Tablet
Consumption Method: Not Stated
Self-Reported Effects: Not Stated
Sample Upon Analysis (Major): Diazepam

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Abbreviations, acronyms, definitions and explanations

2C-B	2,5-dimethoxy-4-bromophenethylamine, a psychedelic drug of the 2C family.
Benzos	Benzodiazepines and more specifically those sold illicitly, “street benzos”
CEC	City of Edinburgh Council and the area it covers
COD	Cause of death
CoE	City of Edinburgh
DRD	Drug related death; a person who dies due to the misuse of drugs
ED NE	Edinburgh North-East HSCP/Locality
ED NW	Edinburgh North-West HSCP/Locality
ED SE	Edinburgh South-East HSCP/Locality
ED SW	Edinburgh South-West HSCP/Locality
EL	East Lothian HSCP/Locality/Local Authority
GP-NES	General Practitioner National Enhanced Service.
HSCP	Health and Social Care Partnership
IntQ25%	The interquartile value at the 25% boundary of a distribution
IntQ75%	The interquartile value at the 75% boundary of a distribution
IQR or **IQ range**	Inter-quartile range. The data range in which the central half of the population is found. One quarter lies above and one quarter below this range. The median is the central point of the IQ range although it may not be the halfway point.
Locality	NHS Lothian is divided into 7 localities that also match HSCPs
MCCD	Medical Certificate of Cause of Death
Mean	The mathematical average of a population calculated as the sum of all the values in a data set divided by the number of values in the dataset. Useful for symmetrical populations and easily distorted by outliers.
Median	The value that represents the value in a set of data which half of the population lies above and half below.
ML	Midlothian HSCP/Locality/Local Authority
NFOD	Non-fatal overdose
NHSL	NHS Lothian health board and NHSL health board area
NRS	National Records of Scotland
OD	Overdose
Opiate	Naturally occurring opioid such as opium, heroin, morphine
Opioid	Any substance acting at opioid receptors, natural or synthetic.
PWUD	Person or people who use drugs (problematic use is implied)
PDP	Person or People with a Drug Problem.
SD	Standard deviation. A useful measure of the distribution of a particular type of symmetrical distribution. 95% of such a population lies within ±2 SDs, and 67% within ±1 SD. Should be used with care unless the population is clearly symmetrical and has a Normal distribution.
SMS	Substance Misuse Services of NHS Lothian
SMS/SMD	Substance Misuse Services/Directorate. Tertiary tier substance misuse services provided by the NHS
WEDINOS	Welsh Emerging Drugs and Identification of Novels Substances Project
WL	West Lothian HSCP/Locality/Local Authority

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Summary

1. The number of drug related deaths (DRD) recorded by NHS Lothian in 2019 is 172 compared to 151 in 2018, a 14% increase.
2. The number of DRDs recorded by NRS in NHS Lothian in 2019 is 155 compared to 152 in 2018, a 1% increase.
3. There is a large and significant difference between the NHS Lothian and NRS figure for drug related deaths in 2019. The reasons for this are examined in detail in the annual report. It has been concluded that the NHS Lothian figures represent more closely the actual level of drug related deaths, therefore the analysis in the annual report is based on these figures.
4. There is a continued year on year upward trend of drug related deaths across NHS Lothian. This reflects the upward trend observed nationally.
5. There has been no significant change in the median age, age distribution or gender composition of those recorded as suffering a DRD compared to the previous 5 years.
6. The median number of drugs implicated in a DRD is 4 with a range of 1 to 11. This compares to a median and range of 4 and 1 to 9 in 2019.
7. There was an increase in 2019 of drug related deaths involving only one drug in combination with a non-drug pathology, most commonly a stimulant combined with a cardiac pathology.
7. The number of drugs implicated in at least one DRD has increased markedly to 50 in 2019 from 21 in 2018. The combinations and drugs found in drug related deaths are myriad.
8. There is a widening set of drugs available on the street and burgeoning routes of supply. Obtaining illicit drugs seems cheaper and easier than ever before and with a wider selection on offer.
9. There has been an increased contribution to the number of DRDs from non-OST/non-heroin opioids, benzodiazepines and stimulants. The increase in DRDs is from all three drug groups and is not due to a single drug or drug class.
10. Using estimates of the population of PDPs in NHS Lothian, the mortality rate from a DRD in that group overall was 1.9% in 2019. For those in specialist services it was 0.8% overall, 1.5% in SMS and 0.4% in GP-NES. For those not in specialist services at the time of death, the mortality rate is estimated to be around 3.3%. But it is important to understand that the overall population figure is an estimate.
11. 80% of those who suffered a DRD in 2019 were found dead, 20% died at a later stage.
    35% of those who suffer a DRD were alone in the property at the time of death, 65% were not.
    Up to 45% of those suffering a DRD were found dead but were not alone in the property at the time of death.
    85% of those who suffered a DRD lived in their own accommodation, owned or rented.

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Recommendations

Enhancing services

1. The recently published Medical Assisted Treatment (MAT) Standards should be systematically implemented and evaluated across NHS Lothian[1]

2. Opioids remain the most commonly implicated drug class in death. This emphasises the need to expand the provision of naloxone and to do this at all levels including as close to the user level as possible. There is a move towards a wider range opioids being implicated in drug related deaths more frequently and this may have an impact on the dose of naloxone used to achieve reversal; this should be examined.

3. The growing use of "street benzos" and their implication in DRDs is of concern. The range of drugs being sold is growing and the variation in drug potency is worrying, something being expressed by users. There is a need to develop a response to reduce these harms through clinical and psychosocial intervention building upon work being developed to facilitate the production of local prescribing guidelines for clinicians that reflect the current clinical situation and risks associated from more toxic novel benzos circulating and linked to poly-drug DRDs. Emerging work to look at reducing benzo related harms thorough for example residential stabilisation should be progressed.

Improving understanding

4. There are opportunities for intervention by those present at DRDs that are not being taken because the signs of a fatal overdose are mostly non-specific. Increasing education and distribution of naloxone should be progressed.

5. It is very common to find a combined use of depressants and stimulants in drug related deaths (and also in oral fluid tests). The impact of this combination on the CNS and cardio-respiratory systems is not understood. A research project to investigate this should be considered.

6. Further work is required to understand the structure, circumstances and drug use patterns of the overall population of people with a drug problem (PDP). This will help to properly identify risk factors for drug related deaths and assess the impact of interventions. This cannot be done by only looking at those who have died.

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Introduction

This report uses the analysis of data to create information and, from interpretation of information, hopefully creates knowledge and understanding that can help inform actions to facilitate a reduction in the harms and avoidable deaths associated with drug use.

Drug related deaths are preventable and as well as the impact of each on the family, friends and communities that these people were part of they also impact on the police and ambulance crews who find them as well as the health and social care staff and third sector organisations who have been involved in the provision of care and support.

The information presented in this report comes from the collation, analysis and interpretation of standard data sets from all of the cases. Thus facilitating the identification of lessons learned and conclusions and recommendations.

The report is structured in a way that reflects a standard epidemiological approach to investigation:

What?	The case definition. What constitutes a drug related death? How does the case definition used here differ from others, why is that and what are the implications of that?
How many?	This seems to be the first question that people ask about DRDs, almost like the gender of a baby at birth. But is it the most important question to ask?
Where?	Whereabouts did these deaths occur and can we learn anything from that?
When?	Is there any temporal pattern to the deaths? Can we find a way of predicting the future (spoiler alert, no)?
Who?	Some idea of who these cases are and how may that relate to the rest of the population.
Why?	Drugs implicated: Which drugs have been implicated in the deaths and how is this changing?
Why?	Engagement with specialist services: What was the status of those who died in terms of ongoing, previous of no recorded engagement with specialist services?
Why?	Circumstances of death: Was there something about the lives of these people that made their death more likely at the time of death? This will focus on the

	period immediately leading up to the death rather than more general issues.
Possible lessons:	Is there anything that we can learn from the data analysis undertaken?

This method is mostly descriptive and can be used to formulate a hypothesis. But it cannot test any hypothesis; that requires working with those affected and those unaffected, the whole population or with a test and control group. Engaging those with lived experience therefore is a key element in building our understanding of what works in reducing harm from drugs.

For further information about this report contact:
drugs.surveillance@nhslothian.scot.nhs.uk

Definition of a DRD used in NHS Lothian

DRDs are reported here according to the cause of death (COD) as given by the pathologist in the detailed pathology and toxicology examination of deaths that are suspected to be drug related. These are classified in to four possible overall outcomes:

Primary DRD	A death in which controlled substances are included in lowest line of the primary cause of death. These are the causes that are directly related to death. It is possible that other causes may also be included such as COPD. All primary DRDs **WILL** be included in the NHS Lothian annual report. It is possible that some will **NOT** be included in the National Records Scotland (NRS) annual national report due to the ICD coding rules that they follow.
Secondary DRD	A death in which controlled substances are included in the secondary cause of death (if one is present) but not in the primary cause of death. This secondary cause may include specific drugs or evidence that chronic drug abuse has contributed to death, although not directly. These cases will normally **NOT** be included in the NRS annual national report. They will also not be further analysed here but are included in the overall table of DRD numbers.
Unascertained	In these cases, no cause of death can be determined by the pathologists with any degree of certainty and the primary and only cause of death is "1a Unascertained". It is possible that drugs were detected in some, but this is not adequate to show how they or other causes might have been implicated. In any case, no definite or probable cause of death has been determined. In some, the role of drugs is explicitly excluded. In some, but not most, of these cases, there may be a definitive indication that drugs had recently been used. In others, the person may have been a known drug user. But it is important to remember that just because someone misuses drugs does not mean that they have died through drug misuse. Cases with an unascertained COD will **NOT** be included in the NHS Lothian DRD report unless other evidence suggests drugs were the proximate cause (rarely the case) but **MAY** often be included in the Nation Records Scotland (NRS) annual national report.
Not a DRD	In these cases, whilst a police report of a suspect drug related death was received, a cause not involving controlled substances has been determined to be the cause(s) of death, primary and (where present) secondary. These cases are, of course, **NOT** included in the NHS annual or NRS annual national report.

Numbers of drug related deaths recorded in NHS Lothian in 2019

Key findings:

- There were 172 DRDs in NHS Lothian in 2019, a record high number and an increase of 14% compared with 2018
- Since 2014, DRDs in NHSL have increased by 74%, increasing every year.
- Since 2014, DRDs have risen by 51% in CoE and by 176% in the three Lothians LAs

Table 1 shows the numbers of suspect death reports received and the final outcome for each Locality/HSCP within NHS Lothian in 2019. Deaths occurring in prisons are treated as separate as they are not necessarily related to the geographical area in which they ocurred. Those who had no fixed abode (NFA) have been allocated to the locality in which reports show they were mainly based. It is accepted that this is not always accurate, even those with no fixed abode do have communities they live amongst. The accommodation status of those suffering a DRD is discussed in a section below.

The table also shows numbers of DRDs for each locality in 2018 as a comparison.

Table 1 Reports received and final outcome by locality 2019 with 2018 DRD comparison

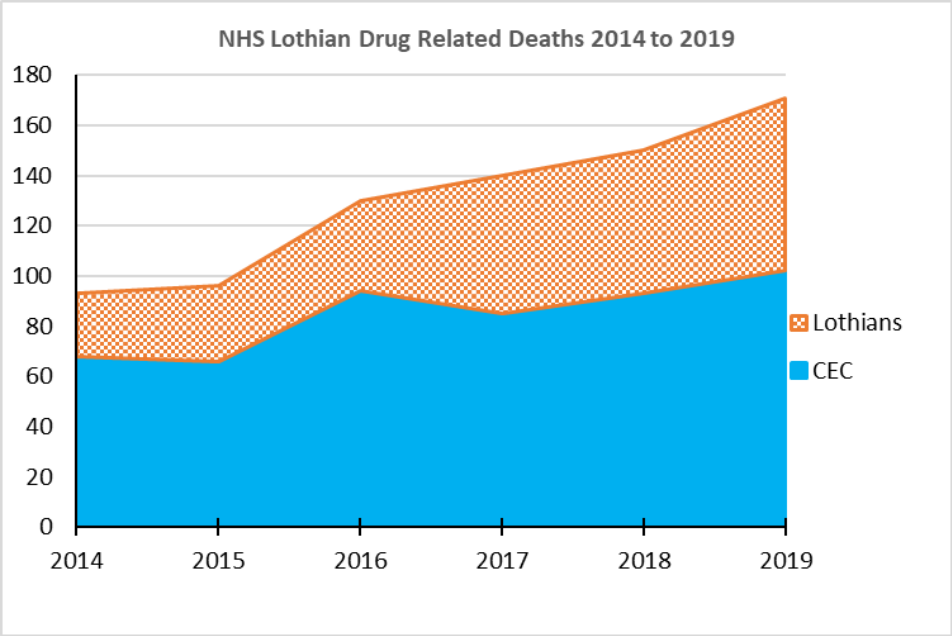
	2019						*2018*
Area	Reports received		Not DRD	No cause given	Drugs secondary	**Primary DRD**	*2018 1° DRDs*
Edinburgh NE	51		9	4	4	**34**	*32*
Edinburgh NW	25		7	0	0	**18**	*17*
Edinburgh SE	37		9	2	3	**23**	*24*
Edinburgh SW	40		10	1	1	**28**	*20*
East Lothian	24		4	0	1	**19**	*17*
Midlothian	29		5	1	3	**20**	*14*
West Lothian	38		7	0	1	**30**	*26*
HMP Edi/Addi	2		2	0	0	**0**	*1*
NHS Lothian	246		53	8	13	**172**	*151*
City of Edinburgh	153		35	7	8	**103**	*93*
Lothians	91		16	1	5	**69**	*57*
Mid and East Lothian	53		9	1	4	**39**	*31*

*Note: HMP Addiewell and HMP Edinburgh are counted together as a separate locality effectively “outside” CoE and the Lothians but within the responsibility of NHS Lothian

There has been a 14% increase in DRDs in 2019 compared with 2018. The total is the highest number of DRDs ever recorded in NHSL. There has been a year on year increase in DRDs since 2014 as shown in Figure 1 below.

Note that an apparent decrease in DRDs in NHSL in 2018 compared to 2017 that was shown in the 2018 annual report was based on figures already published by NHSL for 2017 prior to appointment of the current DRD review co-ordinator. The 2017 data were reviewed recently because of the significant difference compared to NRS figures for that year. This has resulted in the NHSL figure for 2017 being revised downwards and it now agrees more closely with the NRS figure.

Figure 1: Primary DRDs in NHSL, 2014 to 2019



The 2016 rise that is particularly evident for the City of Edinburgh is probably an impact of the use of NPS (novel psychoactive substances) in that year, perhaps particularly the stimulants. But this is superimposed on a general upward trend and the reduction in NPS implications did not lead to a decrease in DRDs overall.

NHSL and NRS reported numbers for drug related deaths in 2019

Key findings:

- Using the NHSL definition of a DRD, there were 172 DRDs in the NHSL board area in 2019.
- The NRS has recorded 155 DRDs in the NHSL board area in 2019.
- The major difference is cases where the cause of death was given as a non-drug related cause AND a drug related cause, both in the 1a line of the cause of death with the controlled substance mentioned second. This was most commonly a cardiac condition AND a stimulant.

There have always been relatively small differences between the numbers of drug related deaths reported for the NHS Lothian area by National Records of Scotland (NRS) and by NHS Lothian. There are well understood reasons for these small differences such as NRS using the date of registration of death and NHSL using date of death as the temporal marker of the event. This is the reason for most of the differences in most years. Efforts are always made to be sure that the NHSL figure is as close as possible to the NRS figure. For example, in 2018 NRS reported 152 DRDs in NHS Lothian and NHSL recorded 151. It is important to note that the 2018 figures were the result of using the same NHSL and NRS definitions of a DRD as have been used in 2019.

In 2019, the number of DRDs in the NHSL board area recorded by NRS is 155 and by NHSL, 172 a relatively large difference, with the NHSL figure 11% more than the NRS figure.

The detailed situation is more complex. Between the two sets of cases, there is a total of 186 patients. Only 141 people are in both sets of cases, 76% of the total. Fourteen are in the NRS set of cases but not NHSL and 31 are in the NHSL set of cases but not NRS. The figure below shows this visually and roughly proportionately.

NRS only	Both NRS and NHSL	NHSL only
14	141	31

Each of the 45 cases that appear in only 1 of the datasets has been checked against the final pathology/toxicology reports and ME4 forms for 2019 (as have the 141 that appear in both).

The main cause of the difference is cases included by NHSL that NRS does not. The commonest reason for this is that NRS follows the ICD-10 coding rule that the primary cause of death is the first mentioned cause on the lowest line of the primary cause of death sequence. This means that where the cause is written by the pathologists as, for example, “1a Amphetamine toxicity and ischaemic cardiac disease”, this will be counted by NHSL and NRS as a drug related death, where it is written as “1a Ischaemic cardiac disease and amphetamine toxicity”, it will be included as a DRD by NHSL but not by NRS.

A detailed analysis of all the differences between the NRS and NHSL cases is included as Annex A. But the major trend is of stimulants (cocaine and perhaps most notably amphetamine) linked to death in combination with pre-existing ischaemic heart disease. It is noted in the pathology reports that the cardiac disease may itself be due to the chronic use of stimulants. This increase in these deaths in 2019 is new in NHSL and would not be detected using the ICD-10 coding rules that NRS must follow.

Where and when did people die from a drug related death?

Key Findings:

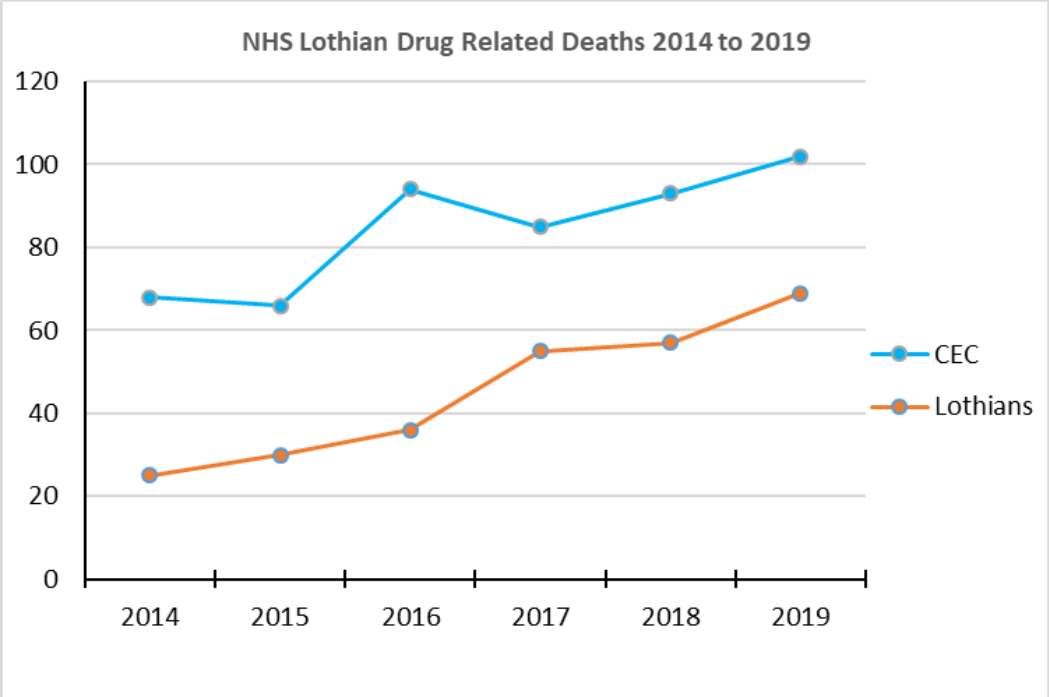
- DRDs are widespread across the NHSL area but are concentrated in a few postcode areas.
- There was a relative rise in DRDs in the first few months of 2019 but this was not maintained.

Drug related deaths by locality/HSCP within NHSL, 2014 to 2019

The figures on the next page show that

Figure 2 shows that DRDs have increased in both the City of Edinburgh and the Lothians over the period but have grown more rapidly in the Lothians relative to the City of Edinburgh, close to tripling (a 200% increase) in the Lothians whilst CoE has increased by 50%.

Figure 2 Drug related deaths in COE and the Lothians, 2014 to 2019



Figures 3 and 4 show the numbers of primary drug related deaths by locality/HSCP over the period 2014 to 2019. West Lothian (WL), Midlothian (ML) and Edinburgh North-East (ED NE) show fairly consistent increases since 2014 but the others show more variable patterns. However, none show a decrease. More detailed analysis for WL (not included here) also showed that as well as numbers rising, the geographical spread has also changed, widening in a way that likely reflects a change in ways in which drugs are sold and distributed.

Figure 3: Primary drug related deaths by locality within CoE, 2014 to 2019

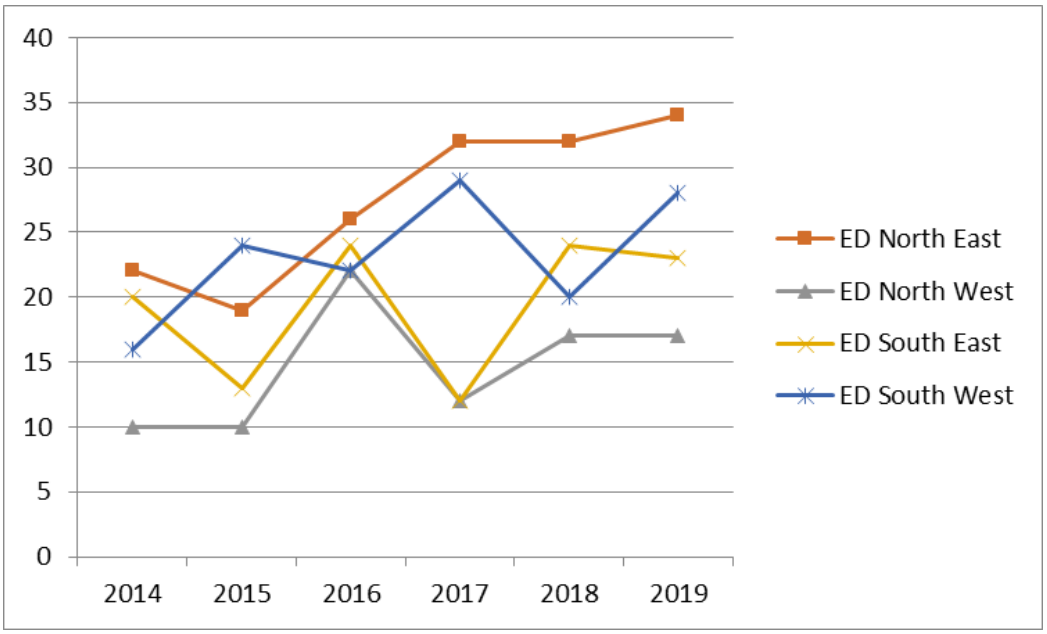
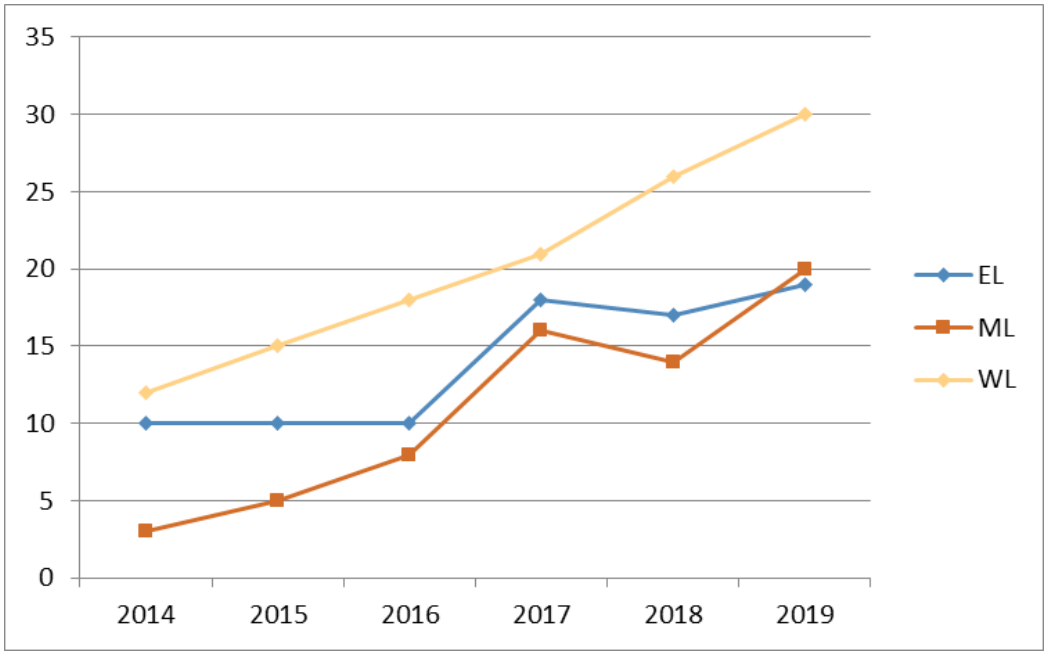


Figure 4 Primary drug related deaths for each of the Lothians HSCPs, 2014 to 2019



Postcode areas

Drug related deaths are widespread across NHSL. During 2019 drug related deaths were recorded in 41 of the 48 postcode areas (the first half of the full postcode). This spread not even with a concentration being observed in certain postcode areas. Fifteen postcode areas

had 5 or more recorded deaths and six had 10 or more, with the highest recorded number being 17. That was in EH11 and represents roughly 10% of all DRDs in 2019.

The 8 postcode areas with the highest numbers of recorded DRDs (9 or more) were the place of residence around 50% (87 of 172) of the recorded DRDs in 2019. These postcode areas are shown in Table 2 below.

Table 2 Drug related deaths by postcode area, NHSL 2019

Locality	Post code area of residence	Recorded DRDs in 2019
ED SW	EH11	17
ED NE	EH6	12
ED NE	EH7	10
ED NE	EH8	10
ED SW	EH14	10
ED NE/SE	EH16	10
ED NW	EH4	9
ML	EH22	9

Post code areas EH6, 7 & 8 neighbour each other within City of Edinburgh as do postcode areas EH11 and EH14. These two postcode area groupings account for 59 of the 103 primary DRDs in CoE in 2019.

There is clearly clustering of drug related deaths which will match the clustering of deprivation due to other factors. It is likely that drug misuse is also clustered in these areas and so, in turn, DRDs. Drug related deaths do not occur in isolation. They are perhaps an ultimate indicator of underlying social deprivation.

Decreasing the numbers of DRDs will require multi-faceted approaches including evidenced based intervention and support for those at risk, legal enforcement measures and addressing the causes of social inequalities and deprivation. Legal enforcement measures to control the supply of substances of abuse does not seem to be effective at present. Even when drug supply systems were more centralised, it was rarely possible to achieve a sustainable control of the illicit supply of a then limited number of drugs. Now the routes of supply have become decentralised and the numbers and types of drugs of abuse has expanded rapidly, both trends related to the use of the internet and supply by post, courier and in response to text orders. This means that legal control will struggle to be effective without more intrusive and possibly repressive measures.

Those already experiencing inequalities in health have been disproportionately affected by the pandemic and as such the risk of drug related deaths amongst an already vulnerable population is likely to increase.

Reports received and outcomes by month of death

Figure 5 shows the wide variation in numbers of suspect death reports received over the past two years and that there is no clear pattern to this. It is also clear that the numbers of reports received per month is not closely related to the final outcome. A comparison of March in 2018 with March in 2019 or July 2019 with April 2019 makes that clear. It is possible to make a projection of numbers of DRDs from the number of suspect reports based on historical data but it is not possible to make a prediction. Annex C analyses the relationship between number of reports received and the number of primary DRDs in more detail and quantifies the degree of uncertainty involved.

Figure 5 Suspect DRD death reports and final outcome by month, NHSL 2018 and 2019

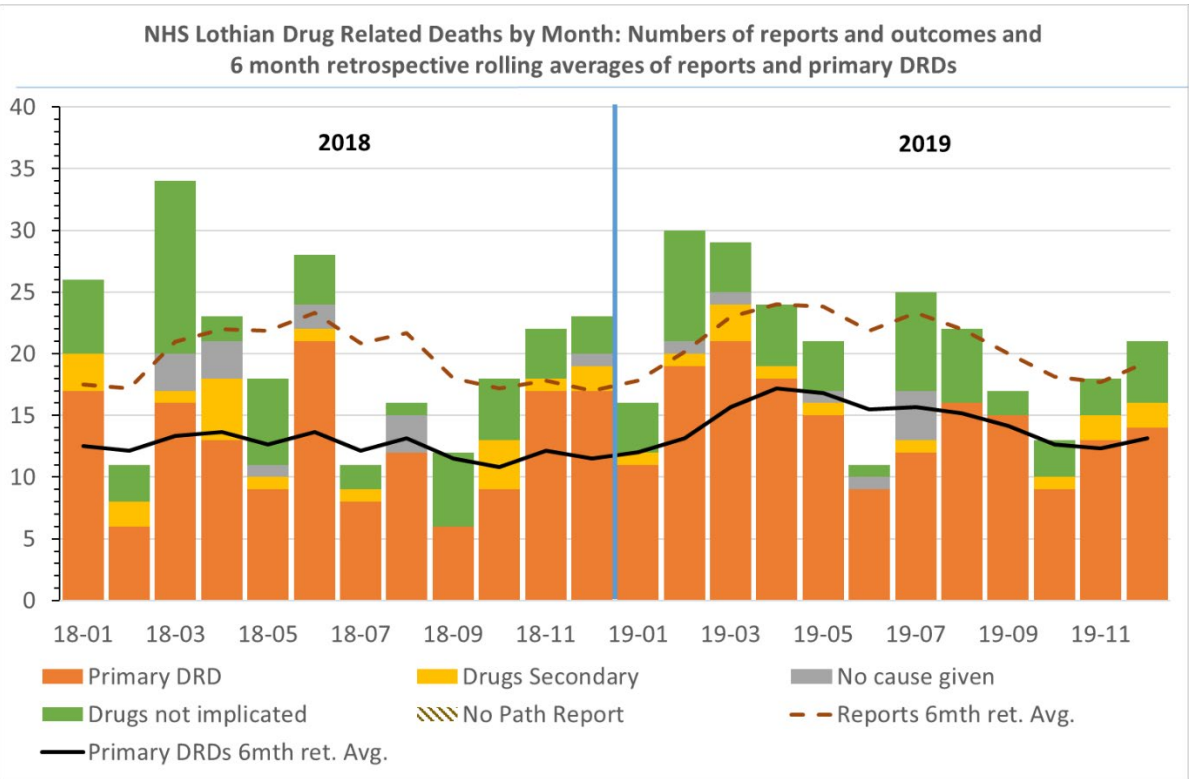


Figure 6 shows the same data but, for clarity, only the primary DRDs.

DRDs by quarter

Looking at the numbers of DRDs recorded by the quarter of the year in which the death occurred, the inherent variability is reduced as shown in Figure 7. The increase in DRDs in 2019 compared with 2018 is due to a combination of a relatively low number in Q3 of 2018 and a relatively high number in Q1 of 2019. The reasons for these are unclear and is likely to remain unexplained.

Data thus far indicates quarterly levels in 2020 have returned to a relatively constant level of around 40 per quarter. There is likely to be an increase in 2021 Q1 compared to 2020 but similar to 2019 Q1 but this is not yet certain, nor is it clear that it will be maintained.

Figure 6 Numbers of primary drug related deaths by month of death in NHSL 2018 and 2019

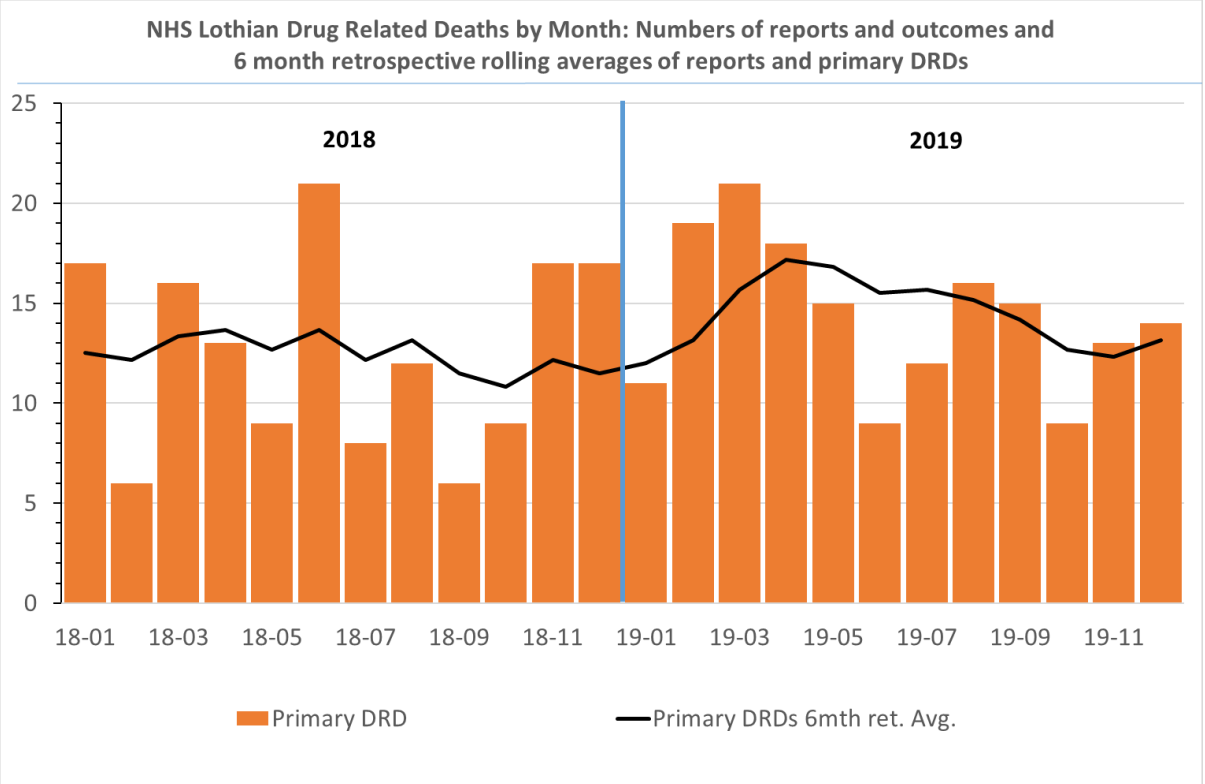
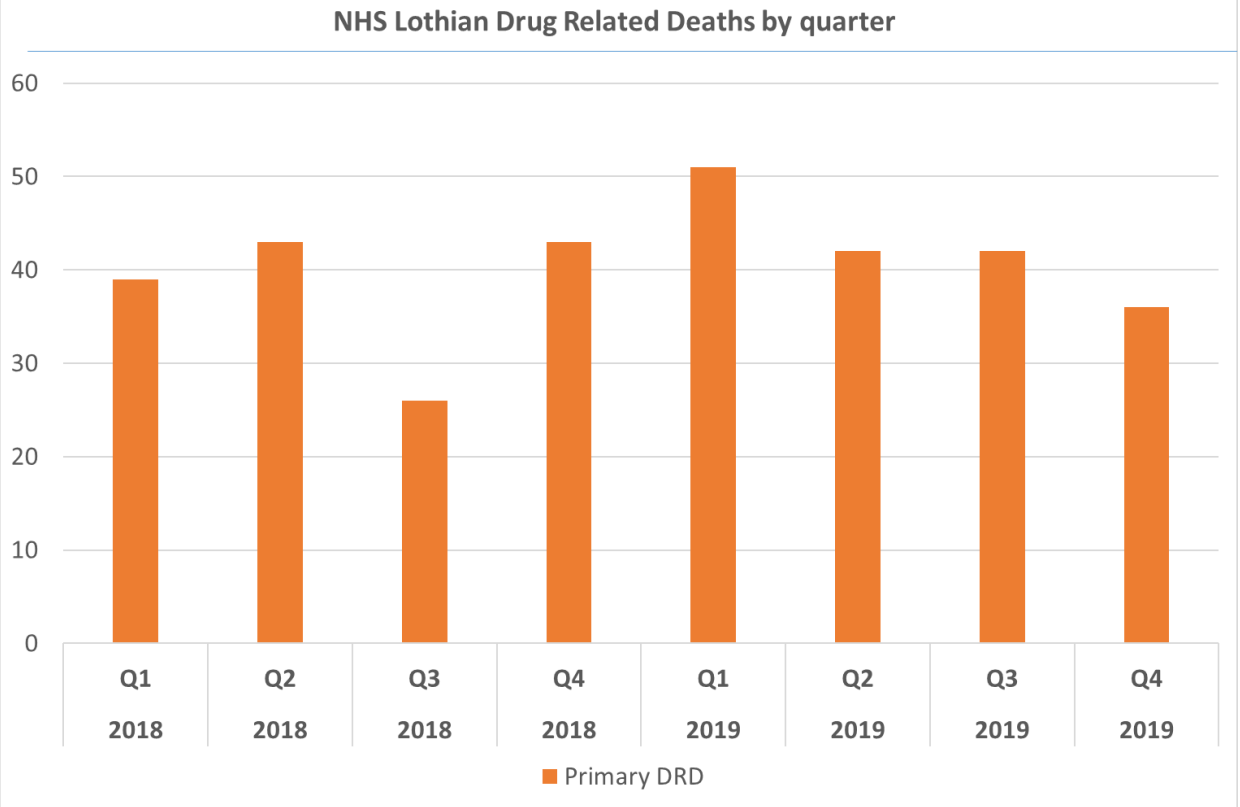


Figure 7: Primary DRDs in NHSL 2018 and 2019 by year and quarter



Gender and age of those suffering a primary DRD in NHSL in 2019

Key Findings:

- The median age and age distribution of those suffering a DRD has not changed significantly from the past 5 years with a median of 42 in 2019.
- The gender distribution of those suffering a DRD was 70% male and 30% female, the same as in the previous 5 years.

Of the primary DRDs in NHSL in 2019, 120 were male (70%), 51 female and one was transgender. The latter has been included in the female total as that was her lived gender. The split between genders has stayed roughly stable over the period 2014 to 2019 with fluctuations from year to year but no trend.

The age distribution is shown below in Table 3.

Table 3: Age distribution for primary DRDs in NHSL in 2019 by gender

Gender	Mean	SD		Min	IQR1	Median	IQR3	Max	DRDs
Female	42.5	11.2		15	36.5	43	49	66	52
Male	42.1	9.5		19	37	43	49	67	120
All	42.3	10		15	37	43	49	67	172

The mean/average and SD of age is perhaps more frequently used but can be skewed by single extreme cases so the preferred metric is the median and IQR. The median age at death is the same for males and females in 2019. There is no overall pattern of difference of median age at death being higher or lower over the past 6 years according to gender as shown in Figure 8.

Figure 8: Median age by year and gender for primary DRDs in NHSL 2014 to 2019

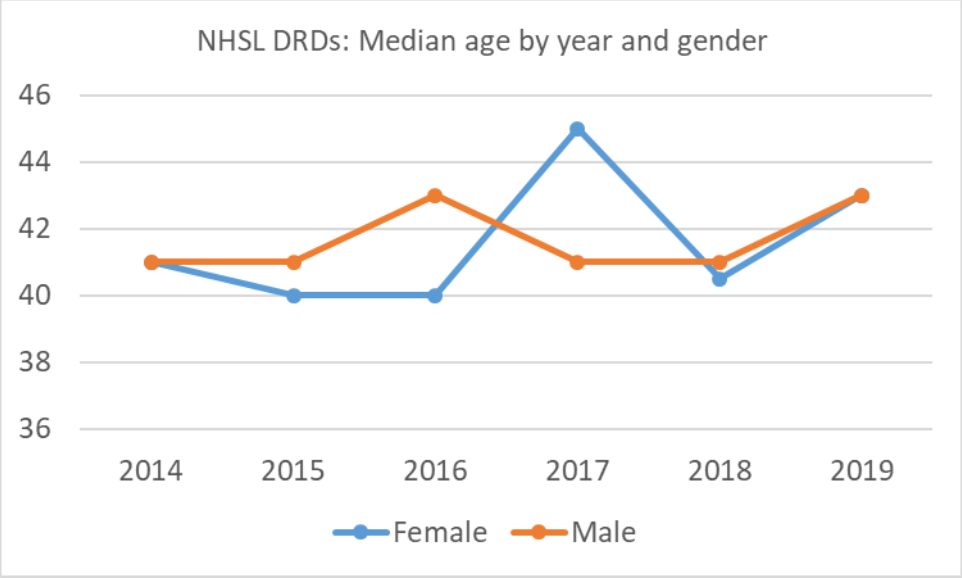
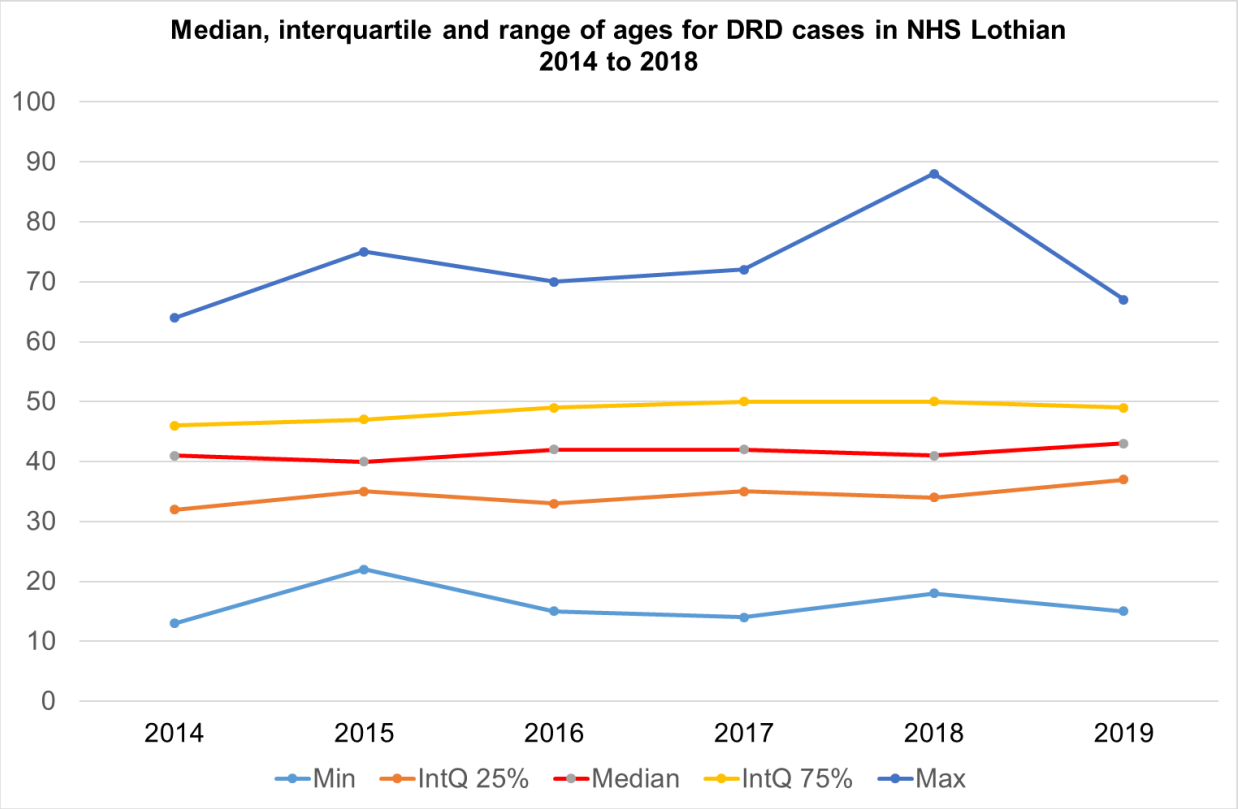


Figure 9 shows the overall median, IQR and range for age at death for primary DRDs in NHSL for the years 2014 to 2019.

Figure 9: Age distribution for DRDs in NHSL in 2014 to 2019



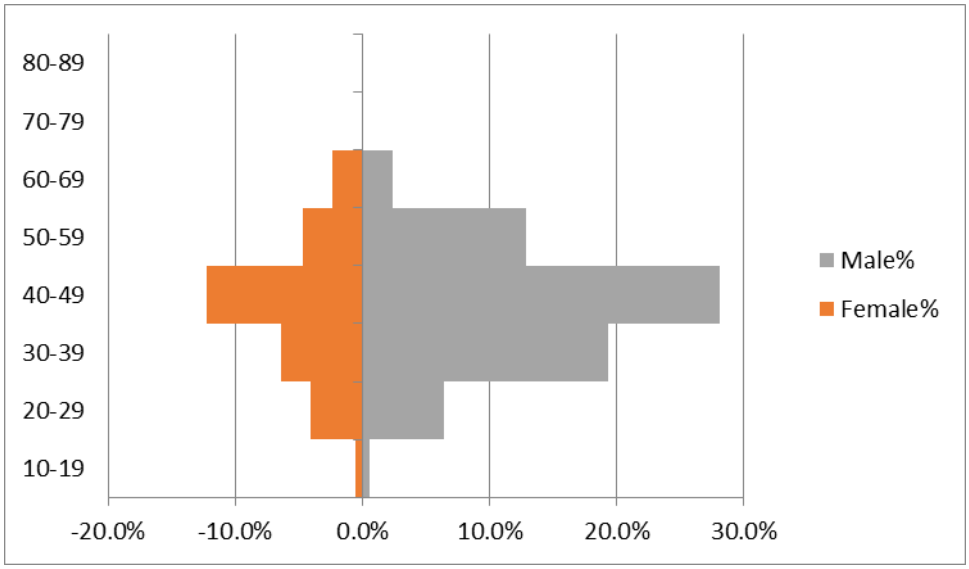
The median age at death had been stable from 2015 to 2018. There has been a slight increase to a median of 43 years old at death in 2019 compared with 41 in 2018 and 42 in 2017 and 2016. This does not as yet constitute a trend. Overall there has been little if any significant change in the age distribution of those suffering a DRD in the past 6 years.

50% of deaths occurred in those aged 37 to 49 years, this has been relatively constant over the past 4 years with some indication of a slow rise in the lower boundary of this range. 25% of deaths are above and below this age range. Without clear knowledge of the age structure of the overall population of people with a drug problem (PDP), it is not possible to look at the relative risk of death by age, only the proportion of those who die.

Using the same age range boundaries as NRS uses, 119 of 171 (69.6%) of DRDs were aged between 35 and 54 years. Within NHSL, that age range is 27.0% of the overall population but it is not clear what proportion of the drug using population it represents. The age range 35-54 has a mid-point of 44.5, similar to the median age of death so it would be expected that most deaths would occur in this age range. In NHS Lothian in 2019, 36 DRDs were in people aged <35 years old, 20.1% of all DRDs. And many of those who die at older ages are at risk from a younger age and may die when they do because of the impacts of chronic drug use over the previous decade(s).

In terms of gender and age, the overall age range and distribution is the same in males and females in 2019 as shown in Figure 10.

Figure 10: Numbers of DRDs in NHSKL in 2019 by gender and decade of life



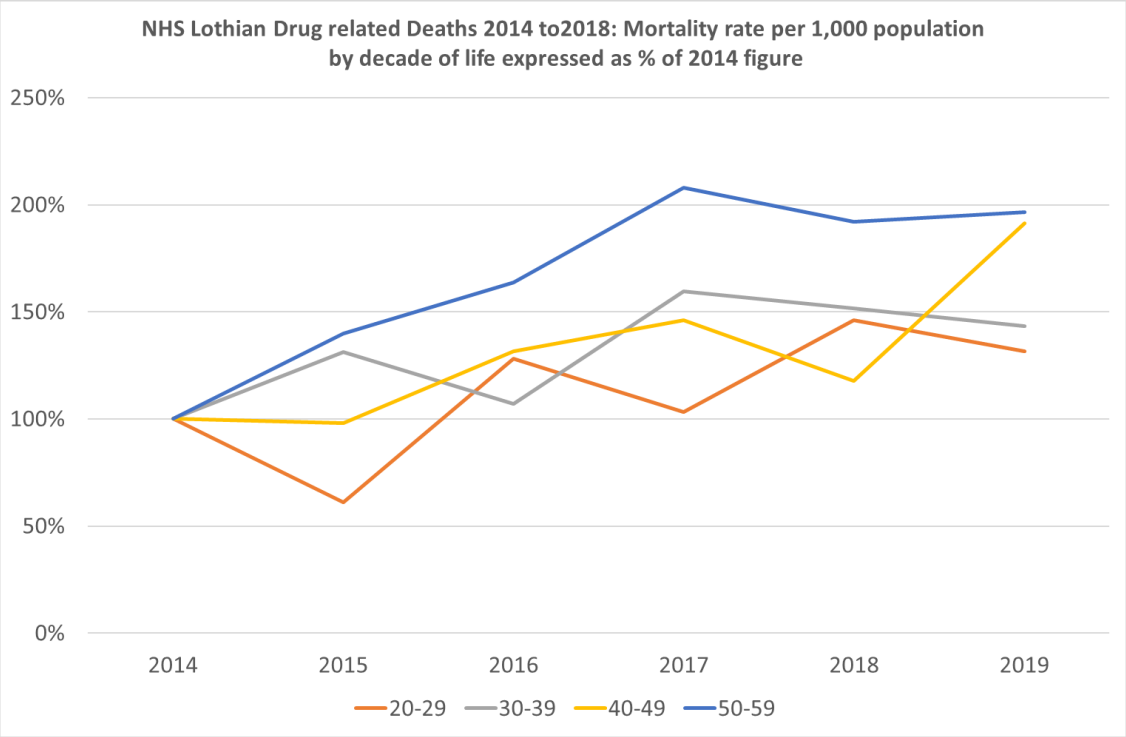
The decade 40-49 is clearly the one with most DRDs (69). However, there are almost as many in the 20s and 30s combined (64) and fewer aged 50 or over (39). There are many other ways to present this data such as proportion aged 35 or older (136) or aged 40 and older (108) but whilst this shows what proportion are above a particular chosen age, they do not give an overall picture of the population who are dying and tend to move the focus away from particular age groups.

Mortality rate by decade of life as a % of the 2014 value

Using NRS mid-year estimates of the population of NHS Lothian, the mortality rate by decade of life is shown in the Figure 11 from 2014 to 2019 expressed as % of the rate in 2014.

Death rates have risen in all decades of life that are significantly involved in DRDs. There has been an increase in mortality rate in the 40-49 decade in 2019 compared with previous years but whether this is a sustained trend compared to the other decades will need subsequent years to confirm. The 50-59 death rates had risen but has been fairly constant for the past three years with a similar picture in the 30-39 year olds. The death rate in the 20-29 year old age band has been rising fairly consistently over the past 5 years.

Figure 11: Mortality rate due to primary DRD by decade of life as a % of the 2014 rate, NHSL 2014 to 2019



Drugs implicated in drug related deaths in 2019

Key Findings:

- There were 55 drugs implicated at least once in a DRD in 2019 compared with 21 in 2018, a remarkable increase.
- The median number of drugs implicated in death was 4.
- Opioids are the most commonly implicated class of drug.
- The range of opioids implicated has increased in numbers and the relative importance of non-OST/non-heroin opioids has increased.
- Benzodiazepines are a concern, particularly in combination with other depressant drugs. There is a wider and changing range of these drugs available illicitly and the growing influence of "street benzos" is a problem both for the substances involved but also for the unknown and unpredictable doses include in them.
- The role of stimulants in DRDs has increased, in combination with depressant drugs but also particularly alone combined with cardiac conditions. The latter are known to be related to the chronic use of stimulants so the drug may be both part of the proximate cause of death but also responsible for the raised underlying risk.

The drugs implicated in death are those shown as such on the ME4 form issued by the pathologist. The level of implication in death has been determined from the pathology report using the opinion of the pathologists. Any drug implicated in a primary DRD will be coded as follows.

10 The drug was probably the cause of death on its own

20 The drug could have caused death on its own but other drugs will or may have contributed

30 The drug was one of a number of drugs that, acting in combination, were responsible for the death

40 The drug was implicated in death alone or in combination with other drugs AND with another non-drug related factor e.g. COPD

Classes of drugs implicated

Table 4 shows the classes of drugs implicated in the drug related deaths, their level of involvement in the deaths and total number of implications in death.

Table 4: Classes of drugs implicated in primary DRDs in NHSL in 2019

Drug class	Different drugs implicated	Level of implication in death				Total implications in death
		10	20	30	40	
Opioids	11	3	17	156	38	214
Benzodiazepines	13	0	1	145	28	174
Stimulants	3	10	2	62	24	98
Gabapentinoids	2	0	2	78	11	91
Anti-depressants /anti-psychotics	7	0	1	27	8	36
Alcohol	1	0	0	21	4	25
Zopiclone/Zolpidem	2	0	1	5	1	7
Other drugs	11	1	1	8	3	13
Total drugs	**50**	**14**	**25**	**502**	**117**	**658**

Fifty different drugs were implicated in drug related deaths in NHSL in 2019 (Table 5). Note that this does not include metabolites of drugs, only the drug taken. This total compares to 21 drugs detected in 2018, a startling increase in drug diversity implicated in deaths.

Opioids remain the most commonly implicated drug in drug related deaths. Opioids were implicated more often than the total of DRDs which indicates that it is not uncommon for more than one drug of that class to be implicated in death. This class of drugs is also the one most commonly implicated as the sole or potentially sole cause of death. Of note is the relatively large numbers of different opioids implicated in death.

Benzodiazepines are the second most frequently implicated class of drug. There is also a wide range of benzodiazepines implicated in deaths. But of note is that, unlike opioids and stimulants, this class of drugs is rarely said to have been able to cause death alone and even in that case, other drugs were present.

Stimulants are the third most commonly implicated class of drugs. They were implicated in 98 DRDs in 2019 which compares with 64 in 2018. They were the class of drugs most frequently implicated alone.

Gabapentinoids were implicated in roughly the same number of DRDs in 2019 as in 2018 (91 vs 87). These are important drugs in DRDs and the reclassification in April to make them controlled substances has had little impact on this.

Of these 4 most commonly implicated drug groups, Table 5 shows the number of drugs, number of DRDs in which they were implicated and the total number of times they were implicated in death in 2019.

Individual drugs implicated in death

Table 6 shows the individual drugs, sorted by drug class, implicated in primary drug related deaths in 2019. They are shown by drug class.

Table 5: Implication of major drug classes in drug related deaths in NHS Lothian, 2019

Drug class	Number of different drugs implicated	Number of DRDs implicated in	Number of implications
Opioids	11	136	214
Benzodiazepines	13	117	174
Stimulants	3	90	98
Gabapentinoids	2	81	91

National reports combine heroin and morphine in to one drug (heroin/morphine). This is a debatable step and loses a useful level of information. The use of Heroin in the 12-24 hour period prior to death should be detectable by the presence of 6-monacetylemorphine (6-MAM) in the urine using the type of assay used by the toxicology laboratory. 6-MAM is a specific metabolite of heroin and will only be found when heroin has been used, unlike morphine which can be present after the use of morphine alone, heroin or codeine. The use of heroin is also often indicated by the presence of a low level of codeine as acetylcodeine is a frequent contaminant found in heroin. Additionally, it is clear from cases where morphine has been detected on toxicology but 6-MAM has not, that in a significant number, morphine has been found to be present at the scene or known to have been prescribed or consumed. For these reasons, in this report, the presence of 6-MAM is taken as indicating heroin use in the period relating to the death. Morphine in the absence of 6-MAM or higher levels of codeine is taken here as indicating the use of morphine in the period relating to death, often supported by background information. It is possible that this somewhat underestimates the implication of heroin but only combining the two will obscure the role of morphine (often oramorph) in drug related deaths, an apparently increasing trend.

The four main drug classes and some individual drugs are discussed in more detail below.

Table 6: List of individual drugs implicated and level of implication

Drug class	Drug name	10	20	30	40	Total	*Ranking*
Opioid	Methadone	0	3	61	16	80	*1*
	Heroin derived morphine	1	0	32	5	38	*6*
	Morphine	1	2	19	5	27	*7*
	Dihydrocodeine	1	5	13	5	24	*9*
	Codeine	0	1	7	3	11	
	Buprenorphine	0	0	9	2	11	
	Oxycodone	0	3	5	1	9	
	Tramadol	0	2	6	1	9	
	Fentanyl	0	0	2	0	2	
	Hydrocodone	0	0	2	0	2	
	Tapentadol	0	1	0	0	1	
Benzodiazepine	Etizolam	0	1	61	17	79	*2*
	Diazepam	0	0	51	6	57	*5*
	Alprazolam	0	0	12	2	14	
	Phenazepam	0	0	5	1	6	
	Fluaplrazolam	0	0	4	1	5	
	Diclazepam	0	0	3	0	3	
	Lorazepam	0	0	3	0	3	
	Temazepam	0	0	1	1	2	
	Bromazepam	0	0	1	0	1	
	Chlordiazepoxide	0	0	1	0	1	
	Delorazepam	0	0	1	0	1	
	Flubromazepam	0	0	1	0	1	
	Lormetazepam	0	0	1	0	1	
Other GABA-ergic	Zopiclone	0	1	4	1	6	
	Zolpidem	0	0	1	0	1	
Gabapentinoids	Pregabalin	0	0	57	9	66	*4*
	Gabapentin	0	2	21	2	25	*=8*
Alcohol	Alcohol	0	0	21	4	25	*=8*
Anti-depressants	Mirtazapine	0	0	9	4	13	
	Amitriptyline	0	0	9	1	10	
	Olanzapine	0	0	4	1	5	
	Venlafaxine	0	1	2	2	5	
	Citalopram	0	0	1	0	1	
	Sertraline	0	0	1	0	1	
	Doxepin	0	0	1	0	1	
Stimulants	Cocaine	7	0	52	15	74	*3*
	Amphetamine	2	1	7	9	19	*10*
	MDMA	1	1	3	0	5	
Cannabinoid	AB-FIBUNACA	0	0	1	0	1	
NMDA antagonist	Diphenidine	1	0	0	0	1	
	Ketamine	0	0	1	0	1	
Anti-psychotic	Chlorpromazine	0	0	1	0	1	
	Quetiapine	0	0	1	1	2	
Anti-histamine	Diphenhydramine	0	0	0	1	1	
	Promethazine	0	0	1	0	1	
Anti-cholinergic	Procyclizine	0	0	1	0	1	
Anti-nausea	Cyclizine	0	0	1	0	1	
Anti-epileptic	Valproate	0	0	1	0	1	
NSAID	Paracetamol	0	1	0	1	2	

The most commonly implicated drugs. The "top ten" and a comparison with 2018.

Table 7 shows the ten most commonly implicated drugs in 2019 and a comparison with 2018.

Table 7: The most commonly implicated drugs in primary DRDs in NHSL in 2019

Drug class	Drug name	*2018 DRDs*	2019 DRDs	*2018 rank*	2019 rank
Opioid	Methadone	*79*	80	*1*	1
Benzodiazepine	Etizolam	*43*	79	*5*	2
Stimulant	Cocaine*	*55*	74	*3*	3
Gabapentinoid	Pregabalin	*51*	66	*4*	4
Benzodiazepine	Diazepam	*64*	57	*2*	5
Opioid	Heroin derived morphine	*42*	38	*6*	6
Opioid	Morphine**	*19*	27	*12*	7
Alcohol	Alcohol	*23*	25	*11*	=8
Gabapentinoid	Gabapentin	*38*	25	*7*	=8
Opioid	Dihydrocodeine	*28*	24	*9*	9
Stimulant	Amphetamine*	*6*	19	*18*	10

* Note that cocaine and amphetamine are implicated in any death where they are found to be present and may be part of the mechanism of death as they can cause fatality in a non-dose dependant manner.

** Morphine detected in the absence of 6-MAM or higher levels of codeine.

Most drugs are at roughly the same point in the rankings as 2019 but there are some important changes. Diazepam and etizolam have swapped places in the rankings whilst alprazolam has shown a significant decrease in numbers of DRDs (25 to 14) and ranking. Morphine, alcohol and perhaps particularly amphetamine have all become more common relative to other drugs.

As before, methadone is the most commonly implicated drug but is relatively commonly prescribed to known drug addicts and so is likely to be present in any drug related death. However, it is rarely the cause of death on its own, with other non-prescription drugs also implicated. Nor is it the case that where methadone is implicated, the prescribed dose is below the 60ml advised minimum dose. This is addressed in more detail below.

Of note, the stimulants cocaine and particularly amphetamine have shown an increase in implication in death although. This may be one explanation of the increase in DRDs given the significant number of times these were involved in cases where only one or two drugs were implicated and a non-drug related cause was also part of the primary cause of death as shown in Figure 14 below. The latter was often a degree of cardiac disease and it is well known that cocaine and amphetamine both lead to cardiac disease with chronic use and are a cardiac risk acutely and so may have played a role in death through this impact as well as immediate acute effects.

Etizolam has shown an increased implication in death compared to 2018 and is the second most commonly implicated drug. Additionally, there are several newly detected benzodiazepines. This may be another explanation for the increased number of DRDs, particularly given the warning jointly issued by the MHRA and CHM in March 2020 on the dangers of co-prescribing opioids and benzodiazepines due to potentiation of respiratory depression. That isn't to imply the opioids and benzos in these DRD were prescribed but that the danger of taking these drugs together is clearly recognised. The rise in benzo implications and the diversification of the benzos found need to be acknowledged and addressed as a risky behaviour as the "new" benzos are illicit and likely to be sold in forms that do not allow the user to properly predict their strength and duration of action. Benzodiazepines are dangerous drugs with strong negative effects. But they rarely kill alone. Opioids do kill and particularly when taken in combination with benzos.

However, the overall increase in DRDs does seem to correlate strongly with the rise in stimulant implications and the rise in cases where only one or two drugs are implicated along with a non-drug cause. This is a concerning finding and needs to be closely monitored.

Drug related deaths are not simple nor explained by single causes. Focusing attention on a single drug or drug class does not reflect the actual situation on the ground where poly-pharmacy is the norm and the range of drugs available and implicated in death has grown in more than one drug class.

Opioids

Table 8 shows the opioid drugs implicated in primary DRDs in NHS Lothian in 2019 broken down into major drugs and opioid groupings.

Table 8: Breakdown of opioid drugs implicated in primary DRDs in NHSL 2019

Drug class	Drugs	10	20	30	40	Total
OST drugs*	2	0	3	70	18	91
Heroin derived morphine	1	1	0	32	5	38
Morphine**	1	1	2	19	5	27
Dihydrocodeine	1	1	5	13	5	24
Other opioids	6	0	7	22	5	32

* OST drugs were not always prescribed to those who died
** Morphine implicated in the absence of 6-MAM and higher levels of codeine

The number of DRDs in which OST drugs and/or heroin were implicated is similar to 2018. Of note is that there are more drug related deaths in which morphine, dihydrocodeine or other non-OST opioids are implicated than is the case for heroin. This is not because of a clear fall in the implication of heroin compared to 2018 but because of a clear rise in the other opioids..

There have been significant changes in the numbers of opioids implicated in DRDs in 2019 compared to 2018 and their relative importance. Table 9 shows the individual opioid drugs implicated and their level of implication.

Table 9 Opioid drugs implicated in DRDs, NHSL 2019

	10	20	30	40	Total
Methadone	0	3	61	16	80
Heroin	1	0	32	5	38
Morphine	1	2	19	5	27
Dihydrocodeine	1	5	13	5	24
Buprenorphine	0	0	9	2	11
Codeine	0	1	7	3	11
Oxycodone	0	3	5	1	9
Tramadol	0	2	6	1	9
Fentanyl	0	0	2	0	2
Hydrocodone	0	0	2	0	2
Tapentadol	0	1	0	0	1

Methadone is the most commonly implicated drug but it is not often the single cause, nor (as discussed below) is it always prescribed to the person taking it. Being on opioid substitution therapy (OST) such as methadone is known to be protective and most of the 4000+ patients on OST at any one time will be prescribed some level of methadone. Its position within a landscape of poly-drug use is a reflection of its frequency of use rather any intrinsic level of risk (although, like all opioids, it is capable of causing fatalities alone).

Heroin remains a clear risk, implicated in 38 deaths in 2019 compared to 42 in 2018. Dihydrocodeine, sometimes used an OST drug, showed a slight fall in implications 24 from 28. What is concerning is the increase in the other opioids particularly oxycodone and tramadol, the latter not being implicated in 2018. The same is true for hydrocodone and tapentadol. This emerging trend of a wider range of opioids being implicated in death presumably reflects their wider availability on the street, another aspect of how the drug supply system is diversifying.

Benzodiazepines

Table 10 shows the individual benzodiazepines implicated in death. For completeness, the table also shows two other drugs which are also GABA-ergic i.e. they act on the same receptor system as benzodiazepines, the so-called Z-drugs. Zolpidem is a new drug in 2019 compared with 2018 but overall this group of drugs shows no change in implication in death.

There were 13 different benzodiazepines implicated in 2019 compared with 3 in 2018. This, like the increased range of opioids, reflects the change in the sourcing and supply of drugs. Only one, diazepam, is widely prescribed and its implication in death has declined somewhat compared to 2018 from 64 to 57. The implication of etizolam has markedly increased from 43 in 2018 to 79 in 2019 and this drug is discussed separately below.

The remaining 11 benzodiazepines are none of them very commonly implicated but together they form and important group, implicated in 40 deaths. They are part of the "street benzos" issue and discussed as such below.

Table 10: Benzodiazepine and other GABA-ergic drugs implicated in DRDs, NHSL 2019

Drug class	Drug	10	20	30	40	Total
Benzodiazepine	Etizolam	0	1	61	17	79
	Diazepam	0	0	51	6	57
	Alprazolam	0	0	12	2	14
	Phenazepam	0	0	5	1	6
	Flualprazolam	0	0	4	1	5
	Desmethyldiazepam	0	0	3	0	3
	Diclazepam	0	0	3	0	3
	Lorazepam	0	0	3	0	3
	Temazepam	0	0	1	1	2
	Bromazepam	0	0	1	0	1
	Delorazepam	0	0	1	0	1
	Flubromazepam	0	0	1	0	1
	Lormetazepam	0	0	1	0	1
Other GABA-ergic	Zopiclone	0	1	4	1	6
	Zolpidem	0	0	1	0	1

In all but one case, benzodiazepines were not the probable or possible single cause of death and even in that case, it was not the sole drug implicated. Benzodiazepines play an important role in DRDs but act in those events as part of the cause.

Etizolam

The implication of etizolam in DRDs has increased markedly compared to 2018. It is an easy step to say that this is the reason for the increase in DRDs in NHSL in 2019 compared to 2018. But this is where the difference between the NRS and NHSL figures may be instructive. Etizolam is mostly implicated in classic mixed drug DRDs which are not notably absent from the NRS figures. The biggest difference and the biggest reason for the rise in DRDs in there NHSL data is deaths where one other drug was present with a single other non-drug cause. Whilst etizolam is a cause for concern it is evident that there are several other drugs and drug classes that are equally or more concerning.

Stimulants

Table 11 shows the implication of stimulants in drug related deaths in NHS Lothian in 2019. The implication of all three has increased compared to 2018. This is highest numerically for cocaine (55 to 74) and proportionately for amphetamine (6 to 20). The "40" level of implication increased from 8 to 24. The "10" level of implication rose from 3 to 10, with the largest increase being for cocaine. Whilst also an important contribution to multi-drug mortality, stimulant drugs increasingly kill on their own or with another pathology, often

ischaemic heart disease. Long term use of cocaine and amphetamine is known to cause heart disease so arguably they may also have been part of creating this other pathology.

Table 11: Stimulant drugs implicated in DRDs, NHSL 2019

Drug	10	20	30	40	Total
Cocaine	7	0	52	15	74
Amphetamine	2	1	7	9	20
MDMA (ecstasy)	1	1	3	0	5

Gabapentinoids

Table 12 shows the implication of gabapentinoids in drug related deaths in NHS Lothian in 2019.

Table 12: Gabapentinoid drugs implicated in DRDs, NHSL 2019

Drug	10	20	30	40	Total
Pregabalin	0	0	57	9	66
Gabapentin	0	2	21	2	25

Note that despite their name, they do not act at GABA receptors but as calcium channel blockers. Their implication in deaths has not changed greatly between 2018 and 2019 but they remain an important contributor to the multi-drug nature of most DRDs. Gabapentinoids were reclassified as controlled substances in April 2019 but this seems to have had no impact on their use or availability.

Alcohol

Minimum unit pricing for alcohol was introduced in Scotland on 01-May-2018. There was some concern that this might make some drugs such as benzodiazepines relatively cheaper compared to alcohol causing a shift towards possibly more harmful drugs. Alcohol was implicated in 23 of 151 drug related deaths in NHS Lothian in 2018 and in 25 in 172 drug related deaths in 2019. There is not, as yet, any clear indication of a decrease in alcohol implication in deaths or that this is related to the increase in DRDs.

Prescription drugs implicated in death: Proportion prescribed to the person in whom the drug was implicated in death

Table 13 shows what proportion of prescription drugs implicated in drug related deaths in 2019 were known to be prescribed to the person who died at the time of death.

Table 13: Prescription drugs (prescribed to the person who dies) implicated in primary DRDs in NHSL in 2019

Drug name	All	Prescribed	%Prescribed
Methadone	80	55	69%
Pregabalin	66	18	27%
Diazepam	57	23	40%
Morphine	27	5	19%
Gabapentin	25	10	40%
Dihydrocodeine	24	10	42%
Mirtazapine	13	7	54%
Codeine	11	3	27%
Amitriptyline	10	5	50%
Buprenorphine	11	4	36%
Oxycodone	9	2	22%
Tramadol	9	3	33%
Zopiclone	6	4	67%
Venlafaxine	5	5	100%
Fentanyl	2	0	0%
Quetiapine	2	0	0%
Temazepam	2	2	100%
Hydrocodone	2	0	0%

Methadone is the commonest prescription drug implicated in death. That is not surprising as it is commonly prescribed to known drug users.

The range of other prescription opioids that are in this list and the finding that, in the main, they are less commonly prescribed to the person in whose death they were implicated than they are not is concerning. This is a new occurrence compared to 2018 with several of these drugs being implicated in 2019 but not in 2018. These are potent drugs and the increased non-prescribed availability needs to be monitored to determine if it is local diversion of prescribed drugs or more organised illicit supply.

This further demonstrates that drug related deaths are complex and not related to a single type of drug.

Numbers of drugs implicated in a DRD

Figure 12 shows the numbers and Figure 13 the proportion of DRDs by the number of drugs implicated in each for 2018 and 2019. As with 2018, the median number of drugs implicated in death was 4 in 2019.

The IQR of numbers of drugs implicated for 2019 is 2 to 5 with a range of 1 to 11. That compares to an IQR of 3 to 6 and a range of 1 to 9 in 2018. The change in the IQR is largely

because of an increase in DRDs in which only one or two drugs were implicated. As Figure 14 shows, many of these had another cause in the cause of death and this was frequently (but not exclusively) related to the use of stimulants such as cocaine or amphetamine and the presence of a pre-existing cardiac condition. It was also often noted by the pathologists that the pre-existing condition may also be linked to the chronic use of stimulants.

Figure 12: Numbers of drugs implicated in primary DRDs in NHSL, 2018 and 2019

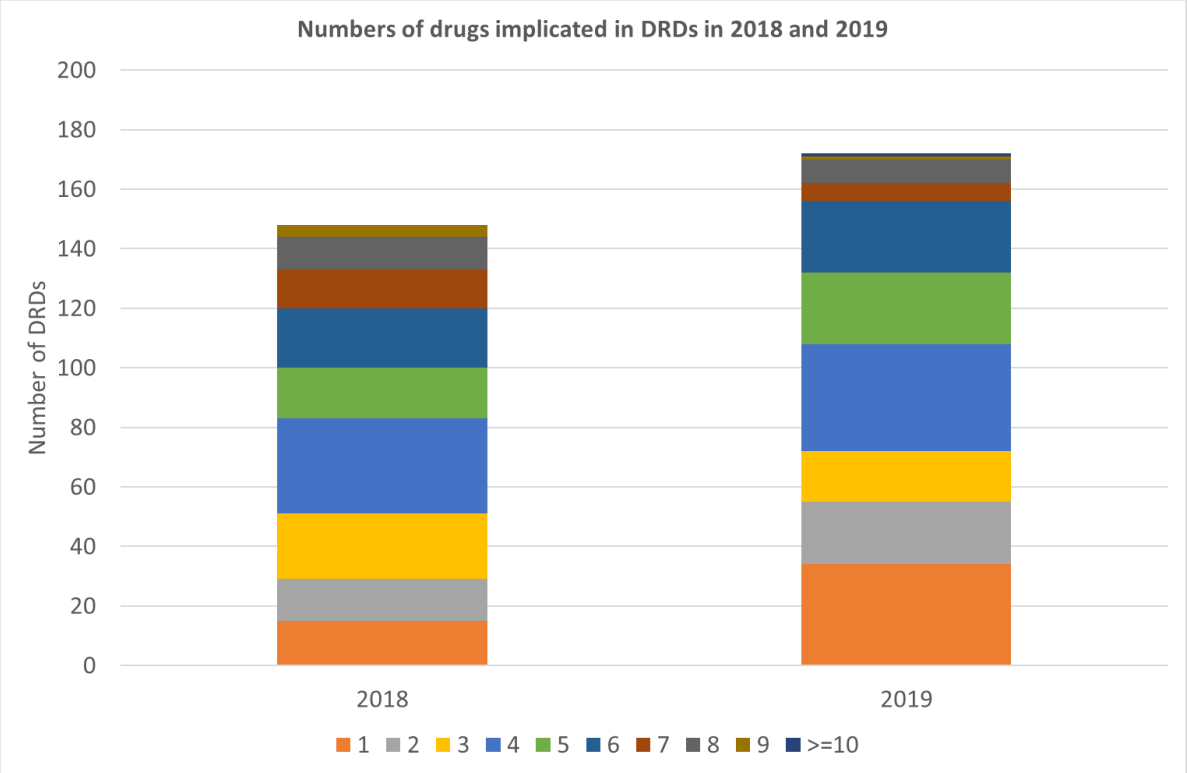


Figure 13: Numbers of drugs implicated in primary DRDs in NHSL in 2018 and 2019 as proportions

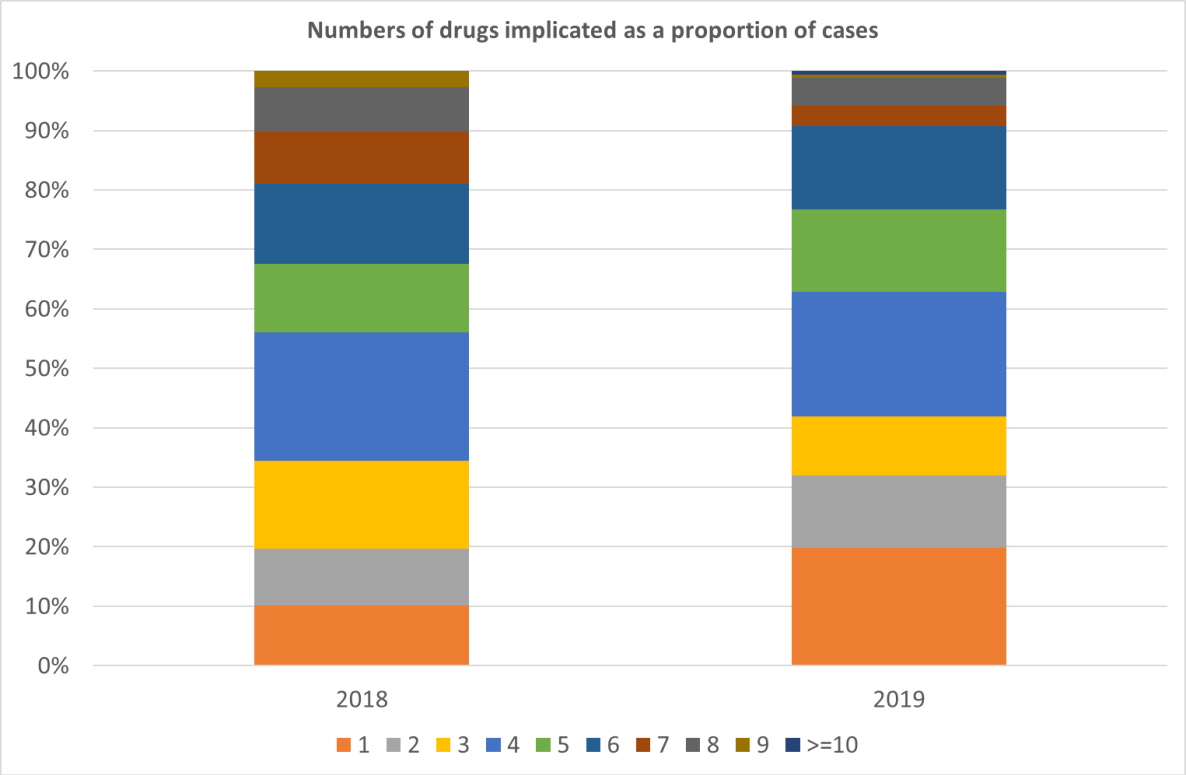
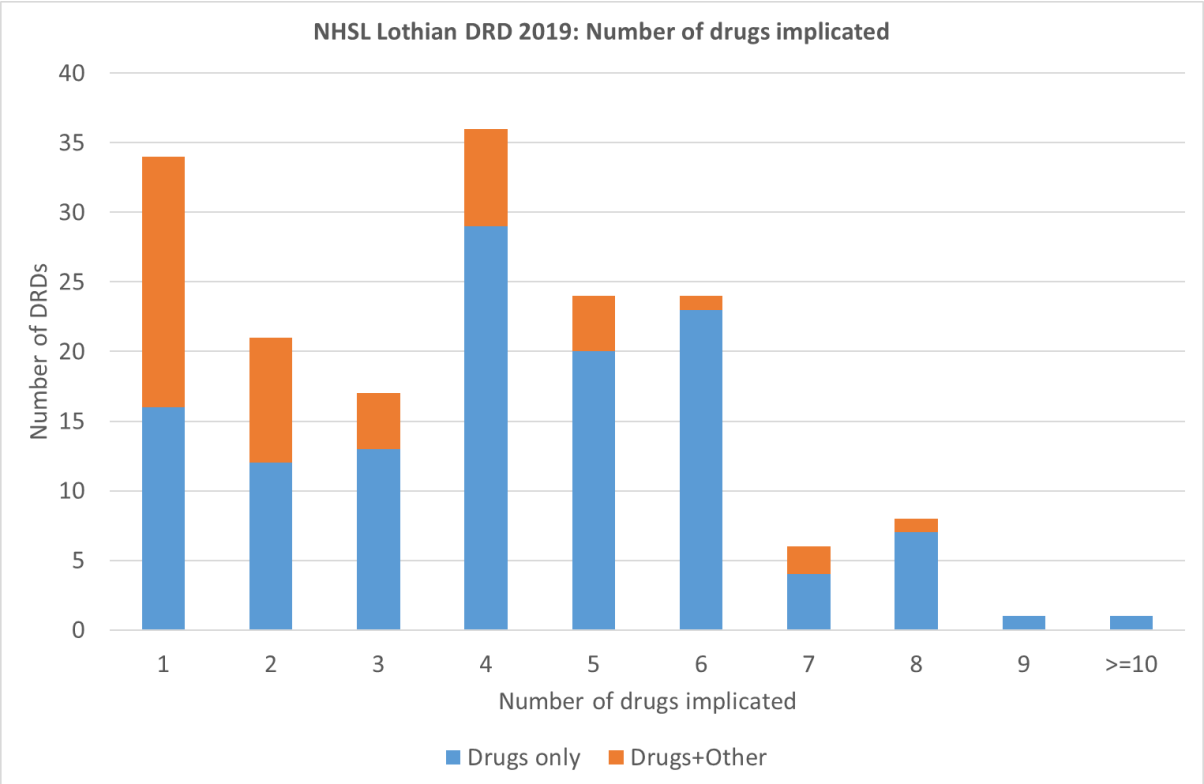


Figure 14: Number of drugs implicated in primary DRDs in NHSL in 2019, showing joint implication of non-drug causes



"Street benzos"

Key Findings:

- "Street benzos" are unpredictable by their nature: the drug(s) contained, the dose contained and the rate of release.
- Whilst there is a variable number of active compounds implicated in DRDs, there are a smaller number that are implicated in the majority of DRDs where benzodiazepines are implicated.
- The unpredictability matters as much or more than the actual active substance.

This is the group of benzodiazepines being sold on the street, often as Valium and sometimes as Xanax but including a wide range of different substances. That makes them difficult to predict for users who have been mainly used to taking diazepam. Some are illegally sourced commercially made drugs and others are tablets or powders illegally sourced and made up into doses in non-commercial illegal workshops of some sort. It is a widely diverse group of drugs with differing rates of onset, differing potency and differing duration of effects. This "back street" element introduces other and potentially important issues:

- The person taking them does not know the drug(s) or dose level(s) that are in the tablet. It may well not be what they are told is in the tablet.
- The person making the tablets may have miscalculated the concentration they expect to be present in each tablet. Such miscalculations are common in non-specialists.
- The mixing of the substance in the bulking agent(s) may not have been done fully. This is not easy to do and needs specialist machines. So the content may vary greatly between tablets.
- The pressure used in manufacturing the tablets may not be correct or constant leading to variable and unknown rates of release.

All of these introduce another set of variables on top of a lack of experience of a particular drug and how to use it safely.

Concerns are often raised about an individual novel benzodiazepine found to be being used by drug users. The reality seems to be that there are some substances that are commonly found in DRDs and others that come in and, in many cases, remain sporadic. The evolution of the substances being sold as street benzos over time as found in implications in DRDs is described below.

Evolution of the implication of benzodiazepines in drug related deaths over time

The Table 14 shows the benzodiazepines implicated to some extent in death in drug related deaths in NHS Lothian from 2018 onwards by 6 month periods for which the data is complete.

Table 14: Implications of benzodiazepines in drug related deaths Jan-2018 to Jun-2020

Drug	Jan-18 to Jun-20	2018h1	2018h2	2019h1	2019h2	2020h1
Diazepam	163	34	28	37	22	42
Etizolam	153	23	20	36	42	32
Alprazolam	43	19	8	12	2	2
Phenazepam	20	2	3	0	6	9
Flualprazolam	7	0	0	0	5	2
Delorazepam	7	4	2	0	1	0
Diclazepam	6	3	0	3	0	0
Lorazepam	5	1	0	2	1	1
Temazepam	4	0	2	2	0	0
Flubromazolam	2	0	0	0	0	2
Chlordiazepoxide	2	2	0	0	0	0
Bromazepam	2	0	1	1	0	0
Flubromazepam	1	0	0	0	1	0
Lormetazepam	1	0	0	0	1	0
Clonazepam	1	0	0	0	0	1
No of benzos implicated	15	8	7	7	9	8
Total implications of benzos	417	88	64	93	81	91
All DRDs in that period	415	82	69	93	79	92

There is a clear division in total implications between the 4 commonest benzos implicated and the rest, both in terms of number and, mostly, consistency of implications. None of the other drugs are implicated in ≥2% of DRDs overall. These are referred to as “minor” benzodiazepines in Table 15 below.

Diazepam and etizolam have been relatively constant and whilst etizolam was more commonly implicated than diazepam in the second half of 2019, that reverted in the first half of 2020 (a similar change was seen in the OFT results in early 2020 before Covid interrupted the service). The reversal may be related to frequent reports of diazepam imported illegally from other countries in Europe e.g. Bensedin.

The “minor” benzos seem to come and go relatively quickly so far, although that may change. Only diazepam, etizolam, alprazolam and phenazepam seem mostly consistent and are implicated in ≥5% of DRDs up to the end of June 2020.

Table 15: Implications of "major" and "minor" benzodiazepines by half year periods

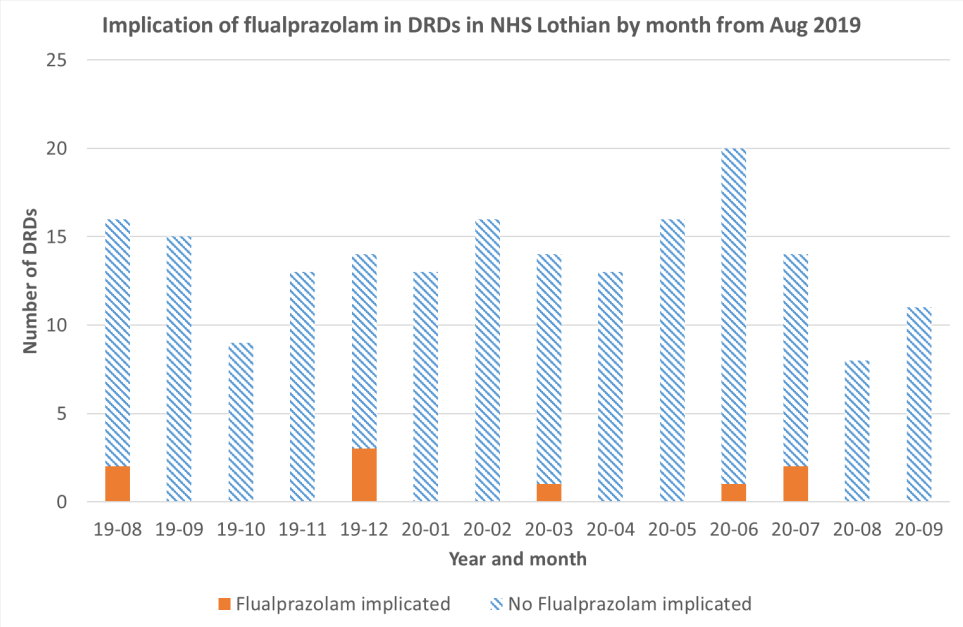
Drug	2018h1	2018h2	2019h1	2019h2	2020h1	Total
Diazepam	34	28	37	22	42	163
Etizolam	23	20	36	42	32	153
Alprazolam	19	8	12	2	2	43
Phenazepam	2	3	0	6	9	20
Minor benzodiazepines	10	5	8	9	6	38
No of benzos implicated	8	7	7	9	8	15
No of "minor" benzos	4	3	4	5	4	11
Total benzo implications	88	64	93	81	91	417
All DRDs in that period	82	69	93	79	92	415

The data for the second half of 2020 is far from complete and so has not been included. It is possible that the situation has changed. However, if possible, phenazepam should be included in the OFT test panel given its relative consistency of implication and possible rising importance. It is at least as important as flualprazolam and flubromazolam to the end of June 2020.

Flualprazolam

To look at one non-prescription street benzodiazepine in detail, in 2019, the finding of flualprazolam was a cause for concern because of its relative potency compared to the more commonly detected benzodiazepines. It was first implicated in a DRD in NHS Lothian in August 2019. Figure 15 below shows the number of DRDs by month since then where data is complete and the numbers in which flualprazolam was confirmed as being implicated.

Figure 15: Implication of flualprazolam in DRDs by month from Aug 2019 in NHS Lothian



Contact with specialist services

Key Findings:

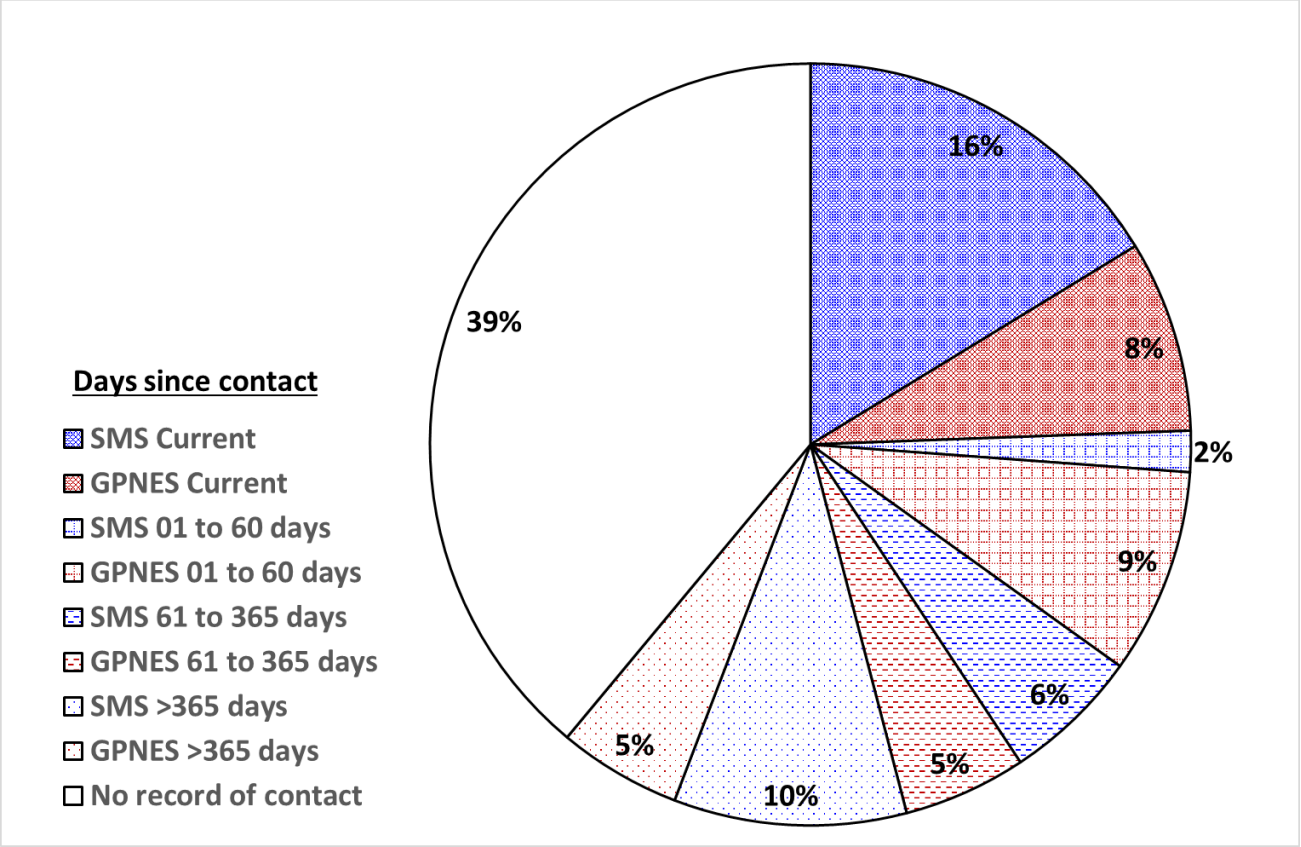
- Being under treatment by specialist services has a clear protective effect.
- This effect is stronger for those in GP-NES as opposed to SMS, but this is likely due to patient characteristics.
- There is a clear higher risk period in the 60 days after discharge/disengagement from specialist services
- Based on estimates of the PDP population, 55% are currently engaged with specialist services and 44% are not.
- Around 40% of DRDs are in people with no record of contact with specialist services.
- Around 25% of DRDs are in people currently engaged with specialist services.
- There is no evidence of linkage between methadone dose and risk of a DRD.

For each case, records were searched to try and establish the history of contact with specialist drug misuse services. The two services included are the Substance Misuse Service (SMS) and the General Practitioner National Enhanced Service (GP-NES). The current status for SMS was clearly established as patients' records are easily accessed and discharge from the service is recorded by date. This date was used to calculate how long since the SMS patients had been discharged prior to death. For GP-NES, two data sources were used, records of appointments and prescription data. Patients with a history of GP-NES registration were classified as still in service if they had an appointment *or* a prescription dated within 60 days of the date of death i.e. they were regarded as having left the service if there was no appointment or prescription record within 60 days of death. The days since contact shown below are therefore calculated from either the date of discharge from SMS or from 60 days after the last recorded GP-NES contact. There was concern last year around the seemingly high numbers of deaths occurring in GP-NES patients shortly after leaving services. It was said that this was due to poor recording by GPs. This might be the case again this year but should not be as GPs were asked to improve their record keeping and a cross check using both appointment dates and prescription dates has been used this year. Table 16 and Figure 16 show the engagement status at the date of death.

Table 16: Numbers of DRDs by engagement status in NHSL 2019

SMS Current	28	16%
GPNES Current	14	8%
SMS 01 to 60 days	3	2%
GPNES 01 to 60 days	15	9%
SMS 61 to 365 days	10	6%
GPNES 61 to 365 days	9	5%
SMS >365 days	17	10%
GPNES >365 days	9	5%
No record of contact	67	39%

Figure 16: Engagement with specialist services for primary DRDs in NHSL, 2019



Only around one quarter of the recorded DRDs were in contact with specialist services at the time of death. But around 60% had a history of contact with specialist services and close to half had a history of contact within the year prior to death. Almost as many died in the two months after leaving services as defined here as in the subsequent 10 months after leaving services. This emphasises the higher risk in the time shortly after someone leaves specialist services.

In terms of the protective effect of specialist services, Table 17 shows the overall estimate of PDP in NHS Lothian provided by ISD (now PHS) for 2015/16 and the numbers of people in specialist services at any one time. Compared to 2018, mortality rate for those not in services rose from 2.5% to 3.3%.

Table 17 Estimated crude mortality rate in people with a drug problem, NHSL 2019

	Population	DRD in 2019	Crude mortality %
Estimated not in service	4,000	130	3.3%
In specialist services	5,000	42	0.8%
In SMS services	1,850	28	1.5%
In GP-NES	3,300	14	0.4%
Estimated PDP population	9,000	172	1.9%

Within the limits of the accuracy of the estimate of the overall population of PDP in NHS Lothian, there appears to be a significant protective effect of being within specialist treatment services and that this is particularly so for those in GP-NES services. That is not surprising given that those in GP-NES have mostly (but not always) been stabilised in the SMS service before transfer to services provided by GPs. It is important not to treat these as statistically reliable results because of the estimated nature of the PDP population which may be an underestimate.

Methadone dose

The "Orange Book" sets a recommended dose range of between 60 and 100mg daily and indicates that doses below 60mg daily should be regarded as inadequate to achieve suppression of heroin use and protection against drug related deaths. Looking at the overall prescribing history of patients in NHSL specialist services who are receiving methadone as OST and are on a stable dose, around two thirds are receiving a dose within the recommended range, one third less than 60mg and a few more receiving more than 100mg.

To assess the possible link between dose of methadone and the risk of drug related death, the dose received by recorded DRDs in 2019 who were prescribed methadone was sought. Where it was possible to obtain this with confidence, around two thirds were receiving a dose within the recommended range, one third were receiving less than 60mg and a few were receiving more than 100mg. This is a small set of results and is a not derived from a planned experimental design so is not definitive or statistically reliable. However, it does not show an immediate link between risk of drug related death and methadone dose. That was equally true for the purpose for which the study was undertaken, to look at the impact of methadone dose on heroin use.

Situation and circumstances at death

Key Findings:

- 80% of those who suffered a DRD were found dead.
- 35% of those who died were alone in the property at the time of death.
- 85% of those who suffered a DRD lived in permanent accommodation, owned or rented.

Knowing the drugs implicated in death and engagement in services is necessary. However, the increasing poly-pharmacy of both numbers and classes of drugs may decrease in effectiveness of opioid substitution therapy. If this is the case, then it becomes even more important to try and understand the circumstances of death and how that impacts on the opportunities to intervene before and during a fatal overdose event.

Immediate circumstances at the time of death

Table 18 shows the immediate circumstances surrounding a primary DRD in NHSL in 2019.

Table 18: Immediate circumstances surrounding death for primary DRDs in NHSL, 2019

	Yes	?	No	Other	Total	% Yes
Lived alone	78	3	85	2	168	46%
Found dead	133	13	21		167	80%
Alone in room at fatal event	94	8	58	2	162	58%
Alone in premises at fatal event	57	4	99	2	162	35%

Living alone may indicate social isolation and is frequently cited as a common factor in drug related deaths. Less than half of the people who suffered a DRD in NHSL during 2019 are recorded as having lived alone. Around one third of households in Scotland are single person households although this represents around 20% of the total population and is said to be mostly related to an ageing population. So it is probable that within the age group of most of those who suffer a drug related death, there is a higher proportion living alone. This may be a result of drug abuse but may also reinforce drug misuse. But to know the true significance of living alone, it would be necessary to know what proportion of the overall PDP population live alone.

Of those where it was possible to record the information, 80% of those suffering a DRD in NHS Lothian in 2019 were clearly found dead (133 of 167) and only around 1 in eight (12.5%, 21 of 167) were clearly found alive.

Around a third (35%) were alone in the premises at the time of the fatal event, so around two thirds were not. Around 60% were alone in the room at the time of the fatal event. That

means that around 40% of all those suffering a drug related death were not alone in the room and yet still died. This indicates that there are opportunities for those who are present to intervene in many cases.

Of the 133 found dead, more than half (76) were not alone in the premises during the OD event that led to death and many of those were not alone in the room where they died. Those present in the premises and in the room may not have been aware of the OD event or may not themselves have been capable of recognising it due to their own condition during the event. But there are clearly situations where intervention might have been possible but the opportunity was missed. Accessing these opportunities would potentially have a clear positive impact.

Overall, signs of an overdose were described as present by witnesses in 38 DRDs (22%) in 2019 but these were only recognised as such in 15 (9%). Mostly the signs recorded were snoring or sleeping deeply but these were often said to be not unusual for that person so were not recognised as likely to indicate a fatal overdose on that occasion. This is a very real issue that we face in improving care during OD episodes to prevent an OD being fatal rather than non-fatal. Drug users do not want to be roused from their drug use episode when it is not "necessary" and may respond badly to that happening repeatedly. Trying to rouse someone is the only way of checking if they are rousable and it may take courage to do that every time any sign of a potential OD is present.

Those around those suffering dangerous OD need a way to distinguish between a non-life threatening episode and a likely fatal overdose that is reliable (sensitive and specific). Snoring is commonly present during fatal episodes but also commonly present in non-life threatening episodes. It is a test which may be reasonably sensitive but clearly has low specificity. Rousing someone is probably similar. Respiratory depression is a feature of many of the drugs used by PDPs so will almost always be present to some extent and it may be a fine line between recoverable respiratory depression and non-recoverable. It is possible that the use of small pulse oximeters may help and this is being trialled elsewhere.

Twenty deaths occurred in hospital. What this indicates is that most people who suffer a DRD do not reach this level of care, even when found alive as 39 people were. What it cannot tell us is how many did reach hospital and survive. The same is true of naloxone; it is essential to focus on when it works rather than on its use in drug related deaths. What epidemiology teaches us is that to understand the impact of any intervention, you have to have data for all four possible outcomes in the 2x2 table, not just the data for one or two. This is true of much of DRD data; we know quite a lot about those who die but we have only partial knowledge at best about those who do not.

Accommodation status at death

Table 19 shows the accommodation status at the time of death for primary DRDs in NHSL in 2019.

Table 19 Accommodation status of people suffering a DRD in NHSL 2019

Non-temporary	145	85%
Temporary other	15	9%
Hostel	3	2%
No fixed abode (NFA)	3	2%
Supported accommodation	1	
Uncertain	4	

The definitions used are:

- Non-temporary means owned, privately rented, housing association or council owned. Note that someone living long term in parents' or other family accommodation is included here.
- Temporary other includes bed and breakfast accommodation not specifically for homeless people and "sofa surfing" or staying short-term with friends.
- Hostel is an established hostel for people with no other form of accommodation
- NFA means the person was clearly sleeping outdoors.
- Supported accommodation means accommodation for those with extra needs with support staff present but not a hostel.

It is possible that some of those recorded as not being in non-temporary accommodation were actually temporary accommodation as the list of addresses this applies to changes frequently and is not clear. However, it does seem the case that the majority (>=80%) are not in temporary accommodation at the time of death. This is perhaps contrary to the common emphasis on drug related deaths in those who are homeless or in temporary accommodation. This is not to contradict the higher risk of DRD in the population who are homeless or in temporary accommodation; they are undoubtedly at a higher risk of DRDs as they are at a higher risk of other issues. But the "typical" DRD is not suffered by a homeless person.

Where found and by whom

Table 20 shows where those suffering a DRD in NHSL in 2019 were found.

Table 20: Primary DRDs in NHSL 2019: Where found

At own home	127	74%
Other's house	16	9%
In own room in temp accommodation/hostel	9	5%
Outdoors	5	3%
Other	16	9%

Almost three quarters were found in their own home. This chimes with the figure above on housing status. Most primary DRDs in NHSL in 2019 occurred in people who had permanent accommodations (owned or tenancy) and that is where they died.

Table 21 shows who found those who suffered a primary DRD in NHSL in 2019.

Table 21: Primary DRDs in NHSL 2019: Who found

Family member (including husband/wife)	50	29%
Partner	32	19%
Friend	35	20%
Police (including welfare checks)	27	16%
Other	28	16%

Around 70% were found by family of friends, with the remainder evenly split between the police and other people.

Recent non-fatal overdoses and police custody

A recorded NFOD implies that there was an opportunity for pre-emptive intervention and a recent stay in police custody may also offer a chance for this. These have been recorded where possible from the police death reports where they took place within 6 months of death; the 6 month period has been standard on national data recording.

Recent NFOD = 23 (13%)

Recent police custody = 32 (19%)

Recent NFOD and recent police custody = 5 (3%)

In total, 50 of those suffering a DRD in 2019 are known to have had either an NFOD or been in police custody within the 6 months prior to death which may represent an opportunity for intervention. Mechanisms are in place for both to be acted on although an assessment of NFOD follow up in 2018 suggested that it was hard to establish contact in the case of NFODs. As a result of this, NHS Lothian set up a more intensive NFOD recording and follow up service in January 2020 and this will allow better tracking of the outcomes after NFODs including subsequent drug related deaths from then on.

Children and young adults linked to drug related deaths.

Whilst any death can be traumatic to any person of any age closely linked to that death, it seems probable that the impacts are greater for sudden deaths and for younger people. The numbers of children and young people involved is recorded where possible for each drug related death. These are shown in Table 22.

Table 22: Children and young adults linked to a DRD, NHSL 2019

	DRDs with biological offspring in age group	Biological offspring	Living with	Present at death
Children 0-15	44	66	22	23
People aged 16 to 25	27	37	20	16

Forty four (26%) of DRDs had one of more children less than 16 years old linked to them. There were 66 biological offspring but not all children linked are of this group, they may also be from other relationships. Twenty two children less than 15 years old were living with the person who died and twenty three were present at the time of death.

Adolescence and early adulthood are periods during development when a traumatic experience such as drug related death of a parent may have as profound effect as on younger children. Fewer DRDs had people of this age linked to them (17) but it was still around 10% of DRDs and 37 young people were directly linked to DRDs with 16 of these people present at the time of death.

In total, there are more than 100 young people directly linked to drug related deaths in 2019 in NHS Lothian, all of whom are likely to benefit from help. Around 50 young people were present at the death and were sometimes the person who found the body, an undoubtedly traumatic life event. This is another impact of this ongoing crisis and one that may lead to ongoing trauma and problems in later life.

Annex A: NHSL and NRS reported numbers for drug related deaths in 2019

There have always been relatively small differences between the numbers of drug related deaths reported for the NHS Lothian area by National Records of Scotland (NRS) and by NHS Lothian (NHSL). For example, in 2018 NRS reported 152 DRDs in NHS Lothian and NHSL recorded 151.There are well understood reasons for these small differences such as NRS using the date of registration of death and NHSL using date of death as the temporal marker of the event. This is the reason for most of the differences in most years.

However, in 2019, the number recorded by NRS is 155 and by NHSL, 172 a relatively large difference, with the NHSL figure 11% more than the NRS figure which is exceptionally high.

Unfortunately, the detailed situation is more complex. Between the two sets of cases, there is a total of 186 patients. Only 141 people are in both sets of cases, 76% of the total. Fourteen are in the NRS set of cases but not NHSL and 31 are in the NHSL set of cases but not NRS. The figure below shows this visually and roughly proportionately.

NRS only	Both NRS and NHSL	NHSL only
14	141	31

Each has been checked against the NHSL dataset of suspect DRDs for 2019. This dataset includes all 155 deaths recorded as DRDs by NRS as well as around 100 other cases.

The 14 cases in the NRS dataset that are not in NHSL are made up of

Reason in NRS DRD data but not in NHSL DRD data	
Date of death between 15 and 31 Dec 2018, death registered in 2019	7
Cause of death unascertained by pathologist	4
Cause of death not a drug related death	2
Not an NHSL resident	1

The unascertained cases are cases where the pathologist did not ascribe any cause of death but it was added by NRS; this has been normal practice by NRS even if the pathology report ruled out drugs. The two cases which are included as DRDs by NRS but not by NHSL are both cases where the drugs found were not controlled substances or where the single controlled substance (codeine) was present as a result of using a co-codamol product. The case not resident in NHSL had grown up here but moved away 2 years ago to Wales. They died whilst visiting their family over Christmas/New Year.

The largest reported cause of difference between NRS and NHSL figures in the past has been because of the use by NRS of the date the death is registered and the use by the NHS of the date of death. For 2019 that would have led to NRS having 4 more cases than NHSL. An added issue at present is that there are always cases that only found to be DRDs after the final path/tox report with no suspicion before this that they may have been a DRD. With the 7-8 month delay in path/tox reports, this means some of these cases will be reported after the NRS cut-off date.

The 31 cases in the NHSL dataset but not in the NRS dataset are made up of

Reason in NHSL reported DRDs but not in NRS reported DRDs	
Controlled substance in lowest line of the primary cause of death but not the first mentioned cause in that line	19
Primary drug related death not included by NRS	5
Date of death after mid-Dec 2019 and therefore registered in 2020	3
Not known as likely DRD at time of death and final pathology after cut-off date	3
Only controlled substance is pregabalin implicated prior to reclassification	1

Of the 19 with a controlled substance in the cause of death but not mentioned as the first cause in the lowest line of the first part of the cause of death, the drug mentioned (without any depressant drug) is cocaine in 5, amphetamine in 6 and MDMA in 1 (but also with cocaine). In these cases, the cause of death first mentioned is usually a cardiac pathology. It is important to note that if two (or more) cases are on this line of the definitive cause of death and are connected by the word “and”, all have contributed directly to the death although the first may have contributed somewhat more than the subsequent causes.

The exclusion of these 19 cases from the NRS case list will lead to an undercounting of the impact of stimulant drugs (all of them controlled substances) on the numbers of DRDs in particular. The impact of this class of drugs seems to be growing, a trend that will not be seen adequately in NRS data. This is the first year when this difference has been so marked but it seems likely to continue from results so far available for 2020 so a solution is needed. The reasons why NRS do not include these cases is too detailed to discuss here but is included in Annex B. Whilst NRS are following their coding rules in the same way as in previous years, these rules are more restrictive than they need to be and are leading to a growing disconnect in the recorded figures for drug related deaths, at least in NHSL.

The 5 cases with a cause of death that is clearly a primary drug related death but not recorded as such by NRS are a separate group to the 19 cases discussed above. It is concerning that have not been included in the NRS figure. The absence is not accounted for by the date of death or delays in the final report being received. The pathology/toxicology report has been checked for each and the cause of death includes drugs in the primary cause of death and toxicology showed significant levels of at least one controlled substance that was implicated in the death by the pathologist.

Gabapentinoids (pregabalin, gabapentin) were reclassified as controlled substances in April 2019. For consistency, NHSL included any death in which they were implicated without any other controlled substance as a DRD from the start of 2019. This has led to the inclusion of 1 extra case in the NHSL case set as compared to NRS.

Annex B: NRS Definition of Drug Related Deaths

Below is a summary if the definition of drug-related deaths as agreed by a working party set up by the Advisory Council on the Misuse of Drugs and used by the General Register Office for Scotland. The relevant codes from the International Classification of Diseases, 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).

3. Categories of death excluded:
a) deaths coded to mental and behavioural disorders due to the use of alcohol (F10), tobacco (F17) and volatile substances (F18);
b) deaths coded to drug abuse which were caused by secondary infections and related complications (for example the 20 or so deaths in 2000 caused by Clostridium novyi infection);
c) deaths from AIDS where the risk factor was believed to be the sharing of needles;
d) deaths from road traffic and other accidents which occurred under the influence of drugs; and
e) deaths where a drug listed under the Misuse of Drugs Act was present because it was part of a compound analgesic or cold remedy: specific examples are:
Co-proxamol: paracetamol & dextropropoxyphene
Co-dydramol: paracetamol & dihydrocodeine
Co-codamol: paracetamol & codeine sulphate
All three of these compound analgesics, but particularly co-proxamol, have been commonly used in suicidal overdoses.

There is a more extensive (several pages) explanation of the definition used by NRS in the annual NRS publication on drug related deaths in Scotland which should be referred to in case of doubt.

Annex C: Difference between NRS and NHSL definition of a drug related death

To summarise and simplify the difference

NHSL DRD Definition

1) Controlled substances are included in the lowest line of the Part I cause of death i.e. they are directly implicated in the cause of death.

NRS DRD Definition:

1) Controlled substances are the first mentioned item in the lowest line of Part I of the cause of death
2) Controlled substances are not included in Part 1 of the cause of death but the cause is given as 1a Unascertained.

The NRS figures include cases where the cause of death is recorded as "1a Unascertained". NRS includes these cases **even when** the path/tox report states explicitly that drugs were not involved. It is important to bear in mind that a) drug users do die of causes other than drugs overdose and b) the threshold for police reporting a death as suspected drug related is very low. When I raised the issue of the inclusion of these cases with NRS in 2018, it was explained to me that adding in the "1a Unascertained" cases was a way of compensating for DRDs that might have been missed from the statistics.

It is not clear where in the ICD10 rules it is permitted to add a cause of death that is not on the medical death certificate unless it is a noted sequelae of something already on the death certificate. To do this when the pathology report specifically excludes drugs as a cause seems difficult to understand. The ICD10 rules are silent on unascertained cause of death and there is an ICD10 code (R99) that indicates where no cause of death has been ascertained.

In the NHSL data, "1a Unascertained" cases are left as that. The pathologists, in possession of a full toxicology report and detailed post mortem results, are best qualified to determine a cause of death. There is one such case in 2019 where the circumstances of the death point strongly towards a DRD but even so, if the pathologists are not prepared to give that as a cause, it has not been included as such in the NHSL data.

Cases are recorded as a DRD in NHS Lothian if a controlled substance or substances are included by the pathologists in the primary cause of death in a way that indicates they are part of the underlying cause of death. NRS, as described in section A5 of their 2019 DRD report (and previous reports), uses only a single cause of death to define deaths, including DRDs and that is the "main" cause of death. They give clear examples in that section of the report but, to simplify, a case with the primary cause of death of "1a Cocaine toxicity and ischaemic heart disease" would be counted as a DRD by NRS. If the cause of death is given as "1a Ischaemic heart disease and cocaine toxicity", this would NOT be recorded as a DRD by NRS. There are methodological reasons for this described in the NRS report and it is ascribed to the following "Under the ICD10 rules, if a death was reported as being due to

the joint effects of two (or more) conditions, the first-mentioned condition should be selected as the underlying cause of the death for the purpose of mortality statistics."

In the ICD10 rules, ICD10 Tenth Revision up to the 4th Edition, 2010, states in section 4.1.4

"In some circumstances the ICD allows the originating cause to be superseded by one more suitable for expressing the underlying cause in tabulation. For example, there are some categories for combinations of conditions, or there may be overriding epidemiological reasons for giving precedence to other conditions on the certificate."

This statement has been removed in the 5th Edition of the Tenth Revision, published in 2016. However, it (and ICD11) has the statements (Section 4.3.4 Effect of connecting terms)

"The connecting term 'and' does not imply a causal relationship, but it indicates that the terms before and after it both belong to an enumeration. Therefore, when a line ends with 'and', code the cause or causes on the next lower line last on the upper line, so that the coding reflects the enumeration implied by the connecting term."

'And' written or implied by a similar term but not first or last on a line If a connecting term that does not imply a causal relationship is written on a line but not first or last, then treat is as a comma. Do not reformat the text and do not move any part of the causes to another line."

The Guidance for completing the cause of death section of death certificates issued by the SG and NRS includes the following

"Rarely, two conditions can be given on the same line if it is impossible to say which the main cause of the condition, mentioned in the line above, was (see section 5.2 below)."

And from Section 5.2

"Where more than one condition is given on the lowest used line of part I, NRS will use the internationally agreed mortality coding rules in ICD10 to select the underlying cause for routine mortality statistics. This will normally be the first cause that is mentioned on the lowest used line of part I. Therefore, in the example above, "Chronic hepatitis C" infection will be selected as the underlying cause of death for the purpose of producing statistics.

This is particularly important if a death was caused by a mixture of natural and other causes. For example, a death due to "chronic drug misuse and atherosclerotic cardiovascular disease" will be counted in the statistics as drug-related, whereas if the cause was given as "atherosclerotic cardiovascular disease and chronic drug misuse", it will be counted as due to natural cause. Therefore, if you are unsure which condition caused the death, but have a slight suspicion as to what the main one was, put it at the start of the line."

After consultation, medical opinion is that when two (or more) causes are placed in the 1a line of the cause of death with nothing in the 1b or 1c lines, both are part of the primary cause of death and both have contributed to that death. Any cause of death where more than one process/pathology is included in 'Part 1a' of the MCCD by the registering doctor

(including the pathologist) means that all of those processes are considered to have directly contributed to the death.

The term Drug Related Death would seem to include any death in which controlled substances were implicated in the cause of death. One can argue that this would only include deaths where the controlled substances are in the primary cause as opposed to secondary/contributory cause. The NRS definition is somewhat different and includes deaths where controlled substances are mentioned in the cause of death in such a way that the ICD10 coding rules lead to the selection of one of a defined set of ICD10 codes as the main cause of death. It also includes deaths where the cause of death is unascertained and NRS adds an ICD10 code to cause the main cause of death to be one of the defined set of ICD10 codes.

Given the current importance of drug related deaths in Scotland, it would seem important to produce the most accurate statistics possible and there are certainly ways in which this can be done that ensures they do not go uncounted and do not breach the ICD-10 coding rules.

Annex D: Extract from "Guidance for Doctors Completing Medical Certificate of Cause of Death (MCCD) and Its Quality Assurance"

ADVICE FROM THE CHIEF MEDICAL OFFICER AND NATIONAL RECORDS OF SCOTLAND

THE SCOTTISH GOVERNMENT

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https://www.gov.scot/publications/medical-certificates-of-cause-of-death-guidance-on-completion/

5. SEQUENCE LEADING TO DEATH, UNDERLYING CAUSE OF DEATH AND CONTRIBUTORY CAUSES – GENERAL PRINCIPLES (PART C OF THE MCCD)

The MCCD is set out in two parts. You are asked to start with recording the immediate, direct cause of death on line I(a), then to go back through the sequence of events or conditions that led to death on subsequent lines, until you reach the one that started the fatal sequence.

Usually, if the certificate has been completed properly, the condition on the lowest completed line of part I will have caused all of the conditions on the lines above it. However, sometimes what is written on the lowest completed line will have created the circumstances for (rather than caused) the other conditions. For example, if someone had a fall, went to hospital, contracted a healthcare associated infection and died, one would say that the accident initiated the train of morbid events leading to death (even though the fall per se did not cause the infection).

This initiating condition, on the lowest line of part I, will usually be selected as the underlying cause of death. WHO defines the underlying cause of death as "a) the disease or injury, which initiated the train of morbid events leading directly to death, or b) the circumstances of the accident or violence which produced the fatal injury".

From a public health point of view, preventing this first disease or injury will result in a greater health gain than treating a subsequent direct/immediate cause of death.

The causes of death should be described succinctly i.e. naming relevant diseases, conditions or events which can be coded by NRS using International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (currently ICD10 as ICD 11 is being developed) codes, as well as providing relevant information to the family about the cause of death. Avoid long lists on the same line: for example, you should use a separate line for each condition and avoid recording both a cause and its consequence on the same line. Rarely, two conditions can be given on the same line if it impossible to say which the main cause of the condition, mentioned in the line above, was (see section 5.2 below). The "approximate interval" boxes should indicate time intervals, rather than relative time intervals such as "x" days earlier/later than the condition mentioned in the line above or below. Importantly,

write legibly (if not using the electronic version of the MCCD), and avoid abbreviations (See section 5.8).

Cause of Death

This is the disease or condition that you believe to be the underlying cause and which usually appears in the lowest completed line of part I

Most routine mortality statistics are based on the underlying cause. Underlying cause statistics are widely used to determine priorities for health service and public health programmes and for resource allocation. Remember that the underlying cause may be a longstanding, chronic disease or disorder that predisposed the patient to later fatal complications.

You should also enter any other diseases, injuries, conditions, or events that you believe contributed to the death, but were not part of the direct sequence, in part II of the certificate. Something “contributed to” the death if it made the person more vulnerable to the fatal condition, or weakened the person so that death occurred sooner than otherwise would have been the case. For example, someone with diabetes mellitus who died of lung cancer might have died sooner than would have been the case if he/she did not have diabetes mellitus. If so, diabetes mellitus should be recorded in Part II as contributing to death.

From Section 5.2

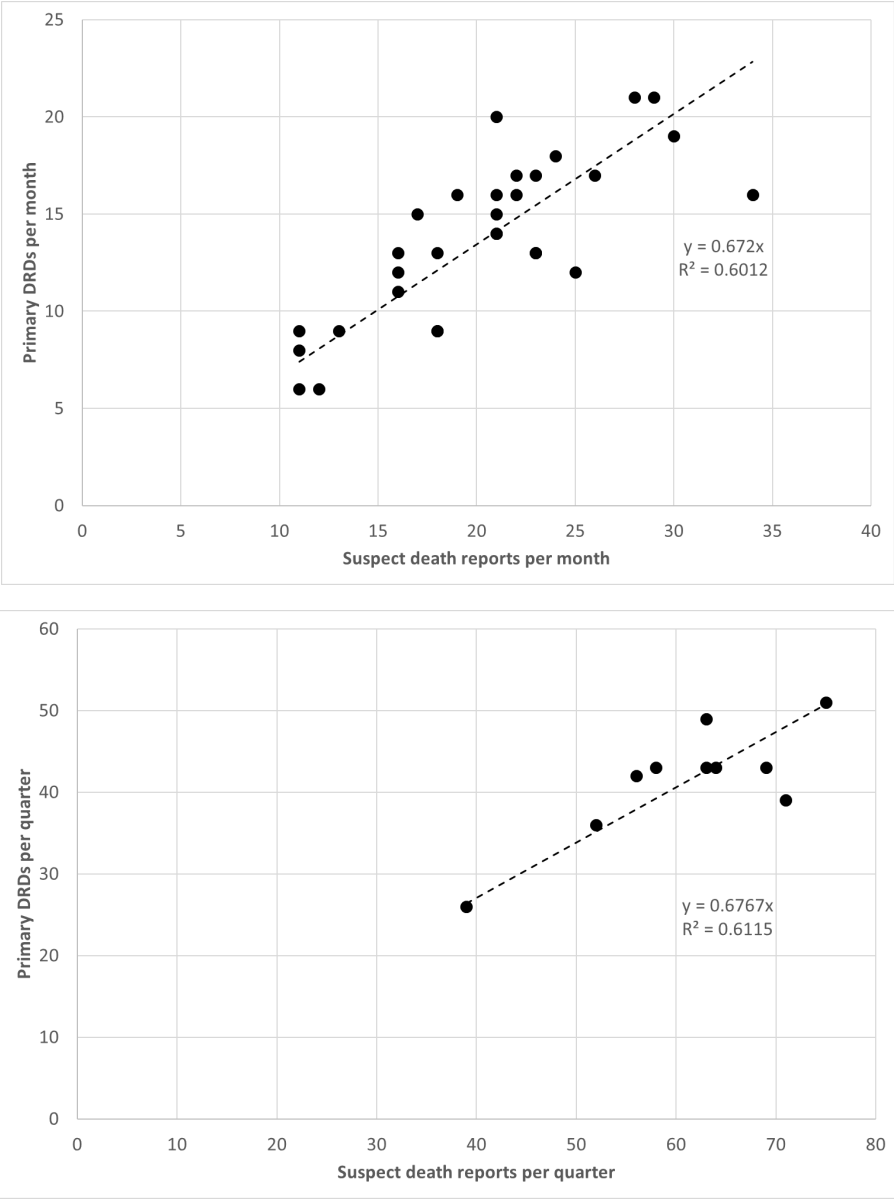
Where more than one condition is given on the lowest used line of part I, NRS will use the internationally agreed mortality coding rules in ICD10 to select the underlying cause for routine mortality statistics. This will normally be the first cause that is mentioned on the lowest used line of part I. Therefore, in the example above, “Chronic hepatitis C” infection will be selected as the underlying cause of death for the purpose of producing statistics.

This is particularly important if a death was caused by a mixture of natural and other causes. For example, a death due to “chronic drug misuse and atherosclerotic cardiovascular disease” will be counted in the statistics as drug-related, whereas if the cause was given as “atherosclerotic cardiovascular disease and chronic drug misuse”, it will be counted as due to natural cause. Therefore, if you are unsure which condition caused the death, but have a slight suspicion as to what the main one was, put it at the start of the line.

Annex E: Relationship between number suspect death reports received and primary DRDs

The long delays between a suspect drug related death and the receipt of the final pathology/toxicology report has led to a situation where there is a perceived wish for a projection to allow some judgement of the trend in numbers of DRDs before a definitive set of results are available. To try and create this, the following figures show the trend line and strength of association between the number of reports received and the final number of DRDs by month and quarter for months and quarters for which data is complete from Jan-2018 onwards.

Figure 17: Relationship between numbers of suspect death reports and primary DRDs



The origin has been forced to be zero as there can be no DRDs without a suspect death report. For both, the relationship is that on average around two thirds of the suspect death reports received will be found to be primary DRDs. However, this simple relationship only explains around 60% of the monthly or quarterly variation in numbers of Primary DRDs. The two thirds relationship works overall on average but not very well as a prediction of monthly or quarterly numbers.

[1] Drug Medication Assisted Treatment Standards: access, choice, support (May 2021). The Scottish Government https://www.gov.scot/publications/medication-assisted-treatment-mat-standards-scotland-access-choice-support/pages/2/