Deaths Related to Drug Use in York

National Programme on Substance Abuse Deaths

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Introduction

The National Programme on Substance Abuse Deaths (NPSAD) was established in 1997 following the decentralisation of drug-related death collation by the Home Office. The granularity of data collated by NPSAD is much higher than that of the Office for National Statistics (ONS), enabling a more detailed bespoke analysis. For example, NPSAD records deaths according to their date of death, whereas ONS records deaths by their date of registration, which is the date that the death is reported upon conclusion of coronial inquest. As a result, ONS reports for a given year (e.g., 2023) are those received in that year, as opposed to those that occurred in that year: due to the time frame between death and conclusion of coronial inquest (average 10-12 months) most deaths in an ONS report (e.g., dated 2023) will have actually occurred in the previous year (i.e., 2022). Another key difference between ONS and NPSAD is that for a drug to be assigned as causative in a death by ONS it needs listing specifically on the death certificate. However, in cases with ambiguous causes of death (e.g., multidrug toxicity, opioid overdose), this cannot be done. As NPSAD receives the full toxicology report from coroners these drugs can be identified and assigned as causative in death.

Deaths following drug use in York

Cases included in this analysis are those:

i. Reported to the National Programme on Substance Abuse Deaths (NPSAD) before 1st November 2023.

ii. Where death occurred in and/or of persons resident in the above areas 2018-2023, inclusive.

As a result, people who died outside the coronial jurisdiction area but were listed as resident within area are included in the analysis.

A total number of 72 cases matched these criteria. More deaths may still be reported to the NPSAD upon conclusion of inquest due to cases with extended periods of coronial investigation (e.g., in cases with evidence of neglect).

Deaths by Year

For 2019-2022 (the years with the most complete data), the average number of reported deaths (n=16) equates to approximately 7.9 per 100,000 people (based on a City of York census population of 202,800 persons in 2021)[1].

This is 49% higher than the national average of 5.3 deaths per 100,000 in England[2]. The immediate rationale for such an increased rate of drug-related death in York would be that there is a higher proportion of people using drugs in the area than nationally, which is then reflected in the number of people who suffer a drug-related death. Indeed, drug use rates are known to be higher in the North of England[2].

Year of death	Frequency
2018	4
2019	18
2020	16
2021	15
2022	15
2023	4
Total	**72**
Average 2019 - 2022	**16**

The smaller number of deaths in 2018 is likely a reporting artefact from under-reporting. Dr Copeland began running the program in 2019 and has worked to re-engage such coroners. The smaller number of deaths in 2023 are again likely a reporting artefact, but this can be accounted for by the delay between date of death and conclusion of coronial inquest (given that this report comprises cases received by November 1st, 2023): the average time taken between date of death and conclusion of coronial inquest for all cases in this report was 9-10 months. However, in recent years this has shortened to 7.5 months for cases which occurred in 2022 and 5.5 months for cases occurring in 2023. Accordingly, projections have been performed to estimate the total number of cases NPSAD expects to receive in 2022 and 2023 (note: margin of error in 2023 will be greater due to the small number of reported cases).
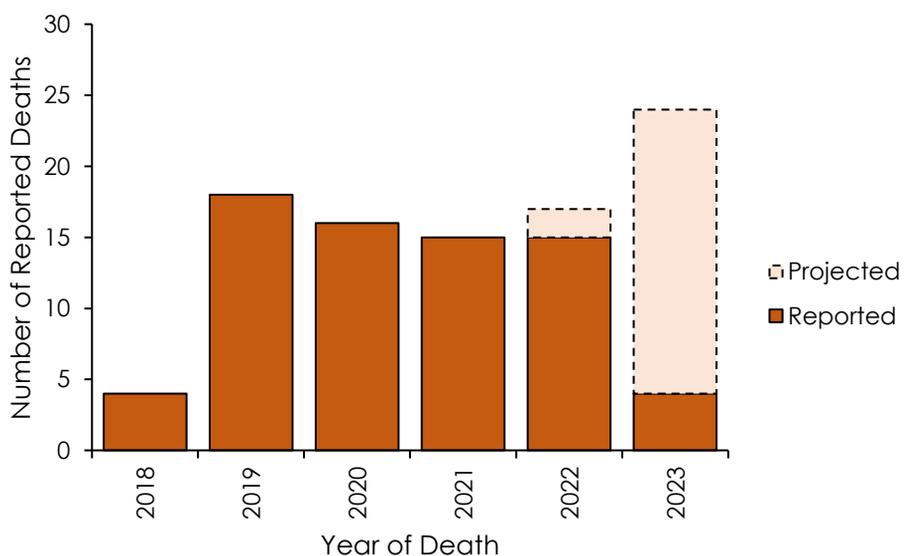
Age and Age Range

Decedents were, on average, of similar age (mean age 43.6 ±12.4) to people who died following drug use across England (mean age 43.8±12.5).
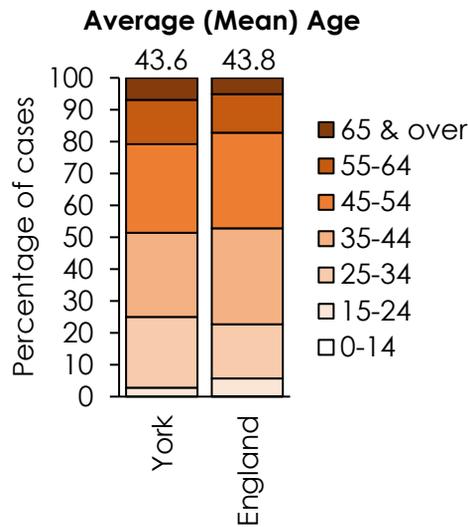
Average (Mean) Age

In York there is an increasing trend for average age over time (trendline equation y = 2.1x + 37.0). Across England, average age at death has also significantly increased over time (2017 mean age: 42.3±12.8; 2021 mean age: 44.8±12.0). This has been attributed to improved health and social care for people who use drugs leading to an increase in life expectancy. However, this will bring its own challenges as poor health conditions – which often precipitate as a consequence of chronic drug use – will be more marked in an aging population[3].
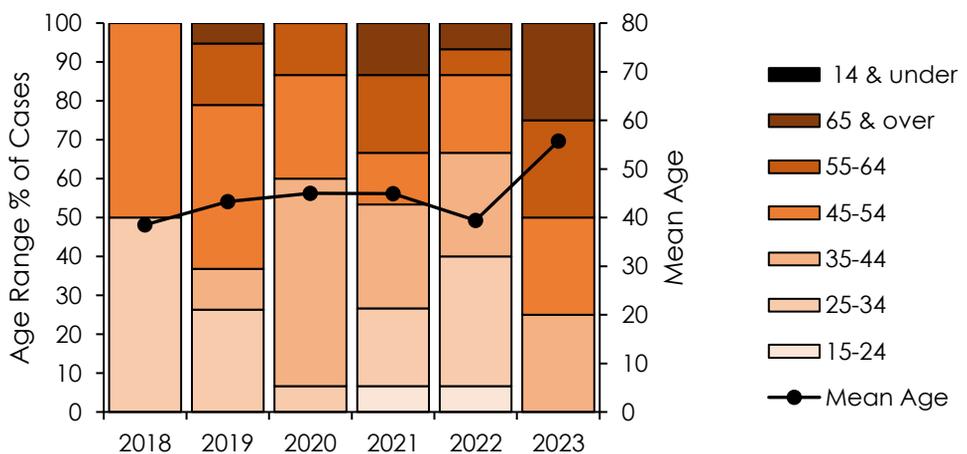
Deaths in Older Adults

There were five deaths in people aged over 65. Summaries of these cases can be found below.

Case 1
66-year-old female
Manner of death: Suicide
Cause of death: 1a Combined drug toxicity (morphine, promethazine and cyclizine)
Comments: The decedent was found dead. They had a history of several suicide attempts, the most recent of which was 10 weeks prior to death when they drank a bottle of morphine. They suffered with depression and anxiety.

Case 2
72-year-old female
Manner of death: Suicide
Cause of death: 1a Mixed drug overdose
Comments: Found dead with a note. They had a history of depression and anxiety, overdose, suicidal ideation and previous suicide attempts.

Case 3
75-year-old female
Manner of death: Drug-related death
Cause of death: 1a Ranolazine toxicity; 2 Bronchopneumonia with empyema, ischaemic heart disease
Comments: Found collapsed and taken to hospital. They had a previous history of suicidal ideation.

Case 4
67-year-old female
Manner of death: Misadventure
Cause of death: 1a Morphine overdose; 2 Codeine and amitriptyline use
Comments: Found dead in bed having vomited. They were receiving cancer treatment, with the medications detected at post-mortem likely prescribed for this condition (although prescription details were not provided).

Case 5
67-year-old male
Manner of death: Drug-related death
Cause of death: 1a Methadone overdose and pregabalin use
Comments: Found unresponsive; ambulance called but life pronounced extinct upon arrival. They had a history of drug dependency.

Gender

Drug-related deaths are more predominant in men[3]. There are likely several different reasons for this, including that men are more likely to engage in risky behaviour[4], drug use in women is more stigmatised[5], and drugs (and alcohol) are more readily available to men[5]. The proportion of deaths in males in York is less than that of the national trend, although not significantly (X^2 $p>0.05$).
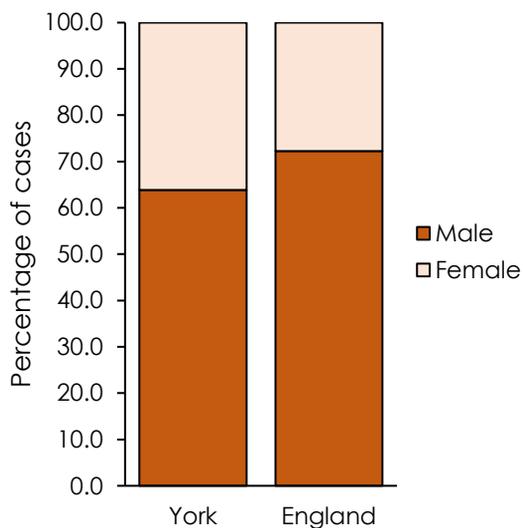
Age at death was not significantly different between the two genders (males 42.4 ±11,1; females 45.8 ±14.6; Student's t-test $p>0.05$). If further sub-analysis of gender differences in drug-related deaths is required, please submit a request to caroline.copeland@kcl.ac.uk

Employment Status

The largest proportion of decedents in York were unemployed at the time of their death, in line with the national trend. It is well recognised that people who use drugs experience disproportionately high levels of unemployment[6]. Barriers to employment, such as employer discrimination, workplace drug testing, a criminal record, possessing limited formal education of employment skills, and chronic homelessness exclude many from desired employment opportunities in the formal workforce[7]. There were no deaths reported in people who were registered as students or school pupils.

York

England

- Unemployed
- Employed
- Retired/Disabled
- Student/Pupil
- Homemaker
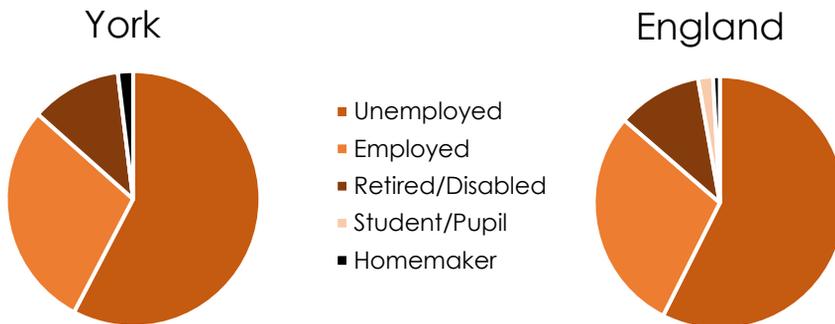
Living Arrangements

The largest proportion of decedents in York were registered as living alone, consistent with the national trend. Whilst there is a recognised correlation between drug use and loneliness, it is unclear as to whether those living alone are more susceptible to substance use disorders, or whether the development of a substance use disorder has led to them living alone[8]. There were a greater proportion of decedents in York who were listed as either experiencing homelessness or were living in a hostel. People who use drugs are disproportionately represented amongst people with no fixed abode[9] and is likely linked to lack of employment leading to unstable housing[6] in combination with drug use cited as able to provide release from unbearable situations, such as experiencing homelessness, by enabling detachment from reality[10].

York

■ Alone
■ Partner/family/friends
■ No fixed abode
■ Sheltered accommodation
■ Hostel
■ Other

England

Decile of Deprivation

The Index of Multiple Deprivation is the official measure of relative deprivation in England[11]. It takes into account average income, employment rates, health deprivation & disability, education & skills training, crime rates, barriers to housing & services, and living environment. Areas ranked in the lower deciles are considered those most deprived (e.g., Deciles 1 & 2), with those ranked in the higher deciles least deprived (e.g., Deciles 9 & 10). The largest proportion of people from York were living in Decile 3 with nearly half of all decedents (47.8%) living in the upper decile areas (Deciles 6-10). This is in direct contrast to the national trend where the largest proportion of decedents were living in Decile 1, with nearly half of all decedents living in the lowest deciles (Decile 1-2; 46.5%). Note: the 5 decedents listed as of no fixed abode have been excluded from the below graph.
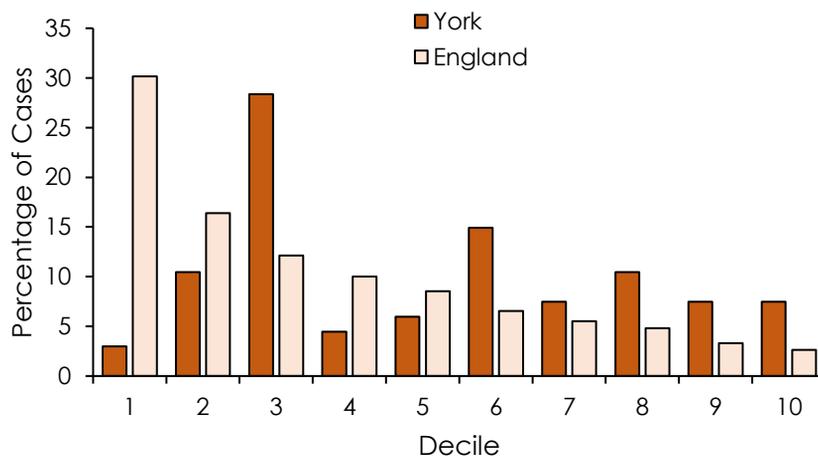
People who were either experiencing homelessness or living in Deciles 1-3 were comparatively younger and more likely to be male than those living in Deciles 8-10, although neither of these were significantly different (age – Student's t-test $p>0.05$; gender – X^2 $p>0.05$).

	No fixed abode or Deciles 1-3	Deciles 8-10
Age (mean) ±STDEV	45.3±11.1	41.6±13.5
Males (%)	79%	53%
Females (%)	21%	47%

Furthermore, prevalence of individual substances and patterns of use were similar between the two cohorts.

	No fixed abode or Deciles 1-3 % of Cases	Deciles 8-10 % of Cases
Heroin/Morphine	42%	53%
Cocaine	21%	18%
Methadone	18%	18%
Pregabalin or Gabapentin	15%	18%
Alprazolam	12%	12%
Antidepressant	21%	18%
Rate of polydrug use	50%	59%

Manner and Cause of Death

Manner of death refers to the intentionality of the death.

Cause of death refers to the circumstances that lead to death, which are categorised on the death certificate issued by the coroner, as follows:
Cause 1a: The immediate cause of death (and underlying if no 1b or 1c cited)
Cause 1b: Any disease/circumstances underlying Cause 1a
Cause 1c: Any disease/circumstance underlying Cause 1b
Cause 2: Any disease/circumstance that did not cause the death but contributed in some way

It is not a requirement for a Cause 1b, 1c or 2 to be cited for all deaths.

The majority of deaths were related to acute drug use and were accidental in nature. Accidental drug overdoses can occur for a multitude of reasons including: administering more active drug than intended (e.g., cocaine with higher purity[12]), administration of a more potent drug which was not the purchase intent (e.g., flubromazolam where the purchase intent was diazepam[13]), administration of multiple drugs together (e.g., opioids, benzodiazepines, Z-drugs, sedating antihistamines and alcohol[14]), and administration of the usual amount of drug after a period of abstinence leading to loss of tolerance[15].

Manner of Death

	York		All England	
	n	**%**	**n**	**%**
Accidental	64	88.9	8563	84.1
Suicidal	7	9.7	1010	9.9
Undetermined	1	1.4	338	3.3
Natural	0	0.0	270	2.7
Homicidal	0	0.0	2	0.0

Cause of Death

	York	
	n	**%**
Drug Use	69	95.8
Acute	67	93.1
Chronic	2	2.8
Trauma	2	2.8
Hanging	1	1.4

Drug Use History

The proportion of decedents in York who were known drug users was comparable to that of all England (X^2 p>0.05). IV drug use (IVDU) was also comparable to that across all England in people who were known to use drugs.

Mental Health and Social Histories

The sharing of data regarding mental health and social histories appeared to vary, with medical histories provided in 73.6% of cases and social histories in 41.7% of cases.

Depression and anxiety were the mental health conditions most often cited with prevalences of 40%. For reference, according to the World Health Organisation approximately 5% of the world's adults live with depression[16], and 4% with anxiety[17]. Dual diagnosis of problem drug use and mental health problems[18] demonstrates the imperativeness of providing decedents with access to both Drug & Alcohol services and Mental Health services concurrently. This is a well-recognised challenge as these services are designed, commissioned, and provided almost entirely separately from each other in England[19].

Where a past social history was provided, over half of decedents had a history of previous overdose(s), 43% had a previous history of suicide attempt(s) and/or suicidal ideation, and over a quarter had a history of self-harm. Such 'missed opportunities' should be examined to understand if interventions at these points of contact could mitigate against future fatal overdose.

Mental Health History

Mental health issue	n	%
PMH Provided	53	73.6
Anxiety	21	39.6
Depression	21	39.6
Eating Disorder	1	1.9
Bipolar disorder	0	0.0
Paranoia	1	1.9
Psychosis	2	3.8
PTSD	3	5.7
Schizophrenia	2	3.8
Unknown mental health issue	8	15.1

Missed Opportunities for Intervention

History indicated	n	%
History provided	30	41.6667
Previous GP or hospital visit	4	13.3
Contact with services	9	30.0
Mental health services	3	10.0
Drug services	8	26.7
Previous overdose(s)	17	56.7
Previous self-harm	8	26.7
Previous suicidal ideation / attempt	13	43.3
Previous incarceration	1	3.3
Victim of domestic violence	1	3.3

Note: cases could have more than one history indicated

Types of Drugs which Caused Death

For each drug class detailed two graphs have been provided – one showing proportion of deaths with post-mortem detections of these drugs, and one showing the proportion of cases where these drugs were implicated in causing death. Those detected at post-mortem were drugs which were positively identified during toxicology testing. However, not all ingested drugs will have caused death (e.g., a single dose of aspirin). Drugs which were identified by the coroner and consulting pathologist as causing death are those listed as implicated. It is important to note that drugs are implicated dependent upon knowledge of the harms of these drugs, which can change over time. For example, it is now well accepted that therapeutic doses of the gabapentinoids, pregabalin and gabapentin, can cause death when taken together with opioids. However, this was not common knowledge as recently as ten years ago, and correspondingly the implication rates of these drugs have since increased[20].

Opioids

When compared to the all-England trend, in general similar proportions of York cases had an opioid detected at post-mortem which were implicated in causing death. The increase above the national average in 2019 of overall opioid-related death can be attributed to heroin/morphine use.

Legend:
- Any Opioid in Area
- Any Opioid England
- Heroin/Morphine in Area
- Heroin/Morphine England
- Methadone in Area
- Methadone England
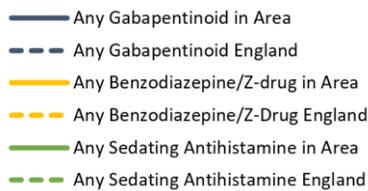
Detected at Post-Mortem
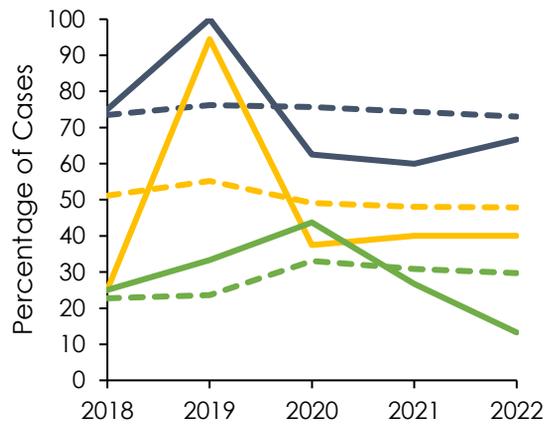
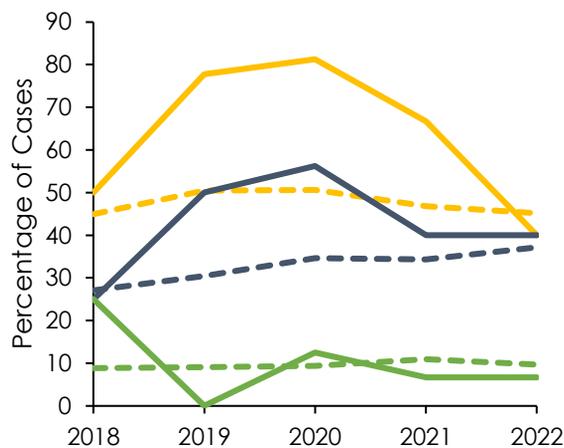**Implicated in Causing Death**
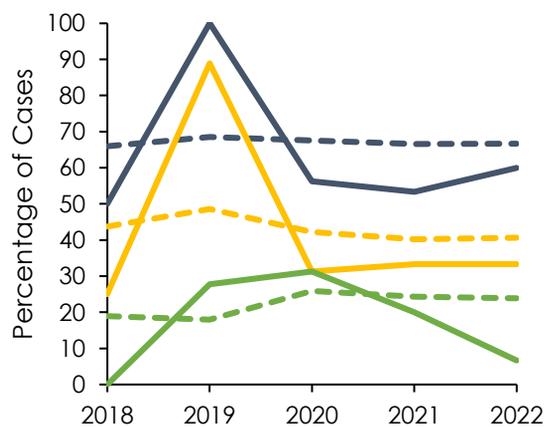
Other Sedative Drugs

Benzodiazepine/Z-drug and gabapentinoid post-mortem detections and implications in causing death have generally approximated or exceeded the national average. Also of interest are the post-mortem detections – but not implications – of sedating antihistamines. These drugs are clinically used for insomnia, not allergy, and correspondingly have heavy sedative effects. They are being increasingly sought by opioid users to help with the 'come down' from opioid use, but when taken together can enhance respiratory depression. However, it is thought that the potential toxicity of these compounds when taken with other sedatives is not well recognised due to the general safety of these drugs when used alone, leading to lower implication rates in causing death[21].
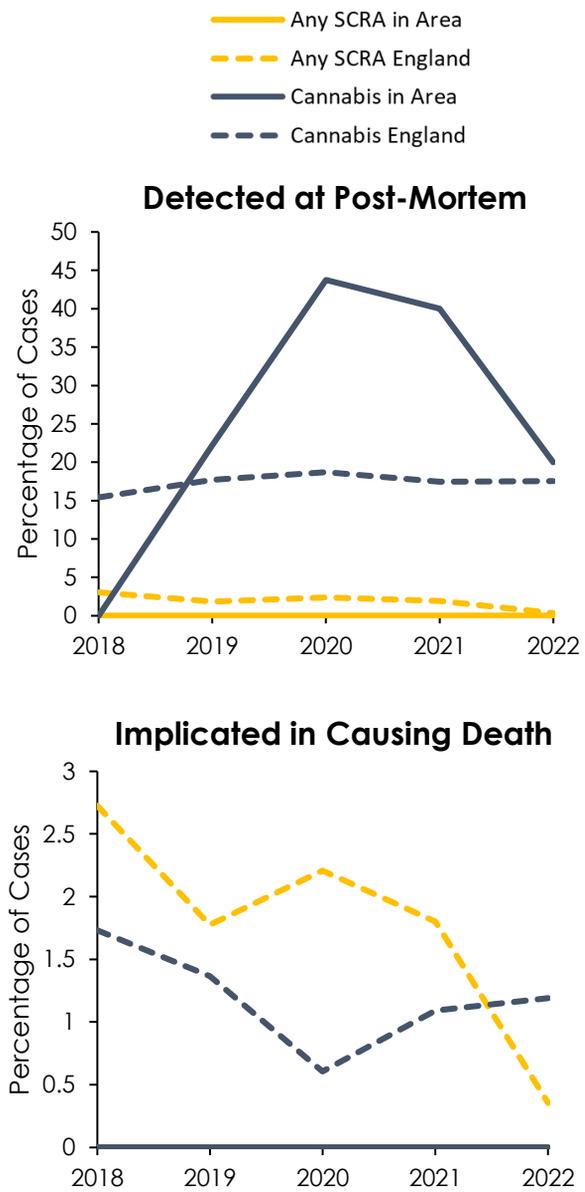

Detected at Post-Mortem

Implicated in Causing Death
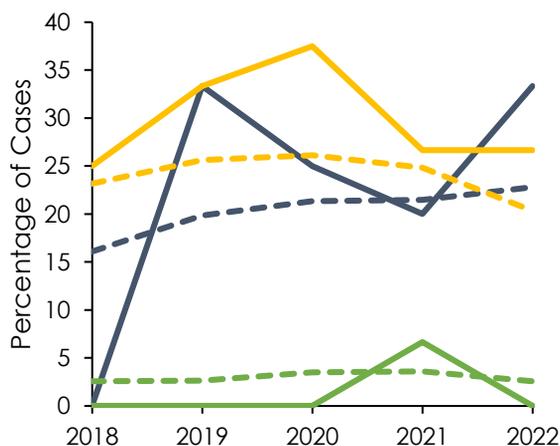
Cannabinoids

Generally, the proportion of cases in York with cannabis detections were above that of the national average. However, in no cases was cannabis implicated in causing death. Indeed, a recent study of deaths where cannabis was detected at post-mortem found that cannabis was implicated in only 7% of cases, and then usually in combination with other sedative drugs[21]. In no cases were there detections or implications of synthetic cannabinoid receptor agonists (SCRAs, colloquially known as 'Spice'). Spice compounds are not detected by routine toxicology screens and require additional testing panels to be requested. It is therefore possible that a lack of spice-related deaths could be reflective of a true lack of deaths, or a lack of testing for these compounds.

Legend:
— Any SCRA in Area
- - - Any SCRA England
— Cannabis in Area
- - - Cannabis England

Detected at Post-Mortem
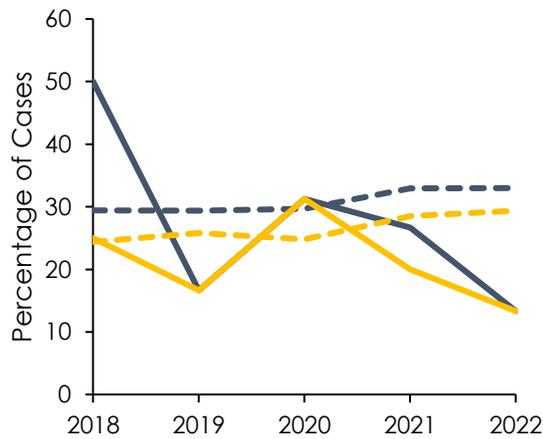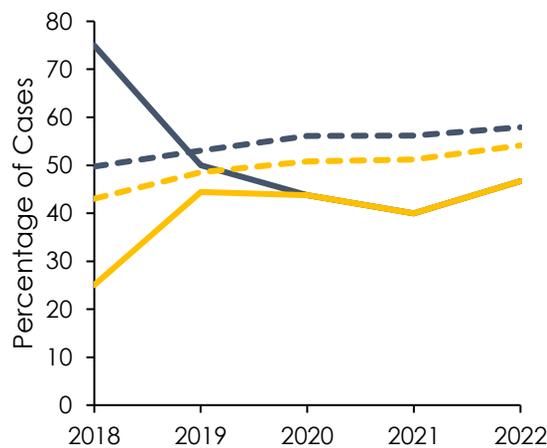

Implicated in Causing Death

Stimulants

Stimulant drugs are those which increase energy levels and produce feelings of euphoria and reward by increasing the amounts of dopamine, serotonin and noradrenaline released in the brain. These include the traditional stimulants cocaine, amphetamine and MDMA (ecstasy) and psychoactive substances more recently introduced to the illicit drug market such as mephedrone and synthetic cathinones. In York, post-mortem detections and implications of stimulants in causing death has been either at or below the national average.

Legend:
— Any Stimulant in Area
- - - Any Stimulant England
— Cocaine in Area
- - - Cocaine England

Detected at Post-Mortem

Implicated in Causing Death

Prescribed Drugs Implicated in Causing Death

There were 26 cases where decedents had been prescribed psychoactive medications. In 15 of these cases, the prescribed drug(s) were also implicated in causing death.

In all cases where methadone was listed as prescribed (n=3) it was also implicated in causing death. In two of these cases methadone was co-implicated in combination with other non-prescribed opioids and benzodiazepines.

In 3 of the cases where a gabapentinoid had been prescribed (gabapentin or pregabalin), the gabapentinoid had been co-implicated in causing death in combination with an illicitly sourced opioid. A recent publication found that people who co-use gabapentinoids and opioids are more likely to have the gabapentinoid legitimately prescribed and then illicitly source the opioid(s)[23]. By contrast there was one case where an opioid had been legitimately prescribed and the gabapentinoid illicitly sourced.

Case #	Prescribed & Implicated Medication(s)	Co-Implicated Drug(s)
1	Fentanyl	-
2	Methadone	-
3	Codeine	-
4	Mirtazapine, zopiclone	-
5	Pregabalin	Methadone
6	Venlafaxine	Cocaine
7	Amitriptyline	Lorazepam, tramadol
8	Codeine, pregabalin	Oxycodone
9	Buprenorphine	Diazepam, heroin/morphine, pregabalin
10	Olanzapine, mirtazapine	Diazepam, heroin/morphine, pregabalin
11	Diazepam	Cocaine, heroin/morphine, methadone
12	Codeine, amitriptyline	Alcohol, alprazolam, flubromazolam
13	Methadone	Alprazolam, diazepam, etizolam, heroin/morphine
14	Methadone	Alcohol, diazepam, flubromazolam, heroin/morphine, pregabalin, zopiclone
15	Gabapentin	Alprazolam, codeine, diazepam, heroin/morphine, methadone, pregabalin

Summary of Findings

The distinct differences from national trends evident in decedents who lived in York were an aging cohort who were less predominantly male and often living in the least deprived parts of the area. Drug & Alcohol services need to consider these findings when planning and implementing harm reduction strategies to engage this demographic and bring about the needed change to reduce incidence of fatal overdoses.

For any queries, please email caroline.copeland@kcl.ac.uk or npsad@kcl.ac.uk

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