



Evidence Review: Opioid Substitution Therapy (OST) implicated deaths and prescribing in Scotland



HEALTH AND SOCIAL CARE

acting buprenorphine.^{9 10} The standards provide a framework to ensure that MAT is sufficiently safe, effective, acceptable, accessible and person-centred to enable people to benefit from high-quality treatment for as long as they need.¹¹

The purpose of this paper is to summarise current knowledge of trends around methadone and buprenorphine-related deaths and changes to prescribing practice – particularly in the context of the COVID-19 pandemic response. The paper also sets out plans for further research and development in this area.

This paper has been produced by the Scottish Government Health and Social Care Analysis Division with support of the drug teams from Public Health Scotland (PHS).

2. Role of OST in drug-related deaths

Scotland continues to have a high level of drug-related deaths (DRDs). The annual figure for 2020 increased from the previous year by 4.6% to 1,339, the highest number ever recorded.¹² In addition there has been a similar increase in deaths where an OST drug (methadone or buprenorphine) was implicated. These are explored separately below.

2.1 Methadone implicated in drug-related deaths

Both the number and percentage of methadone-implicated deaths has increased over time. In 2020 methadone was implicated in 708 deaths, an increase of 25% on 2019 (567) and following a long term increase over the last twenty years (Figure 1).

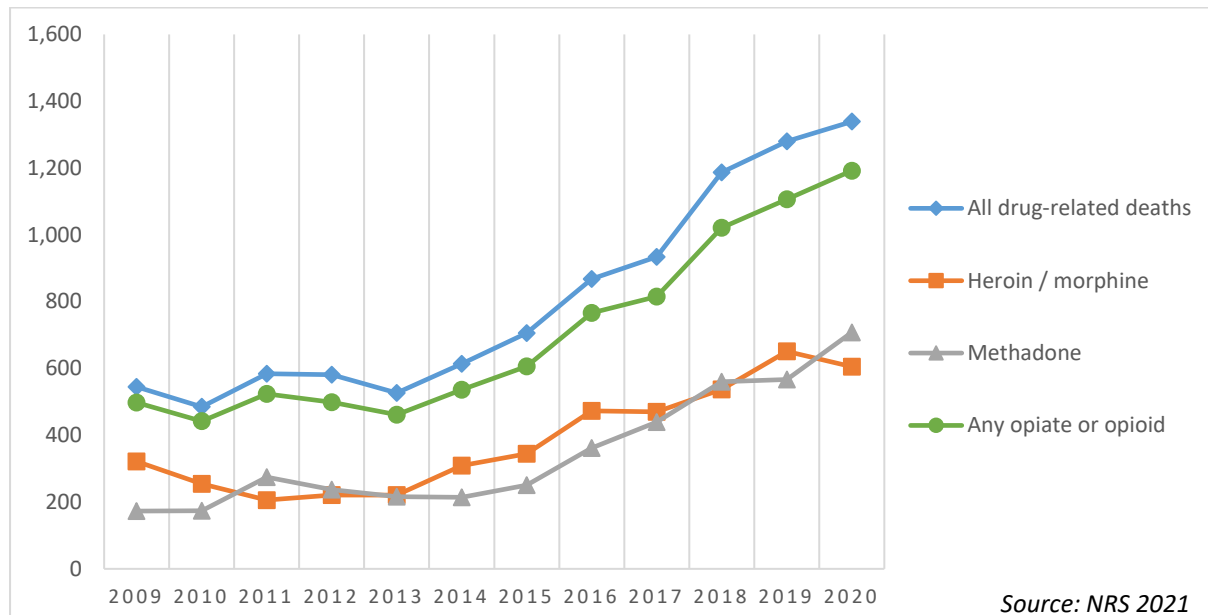
⁹ Scottish Government (2020). Available at: [Coronavirus \(COVID-19\): opiate substitution treatment in prisons - Chief Medical Officer](#).

¹⁰ Scottish Government (2021). Available at: [Medication Assisted Treatment \(MAT\) standards: access, choice, support](#).

¹¹ Ibid.

¹² National Records of Scotland (2021). Available at: [2021 Drug related deaths in Scotland in 2020](#).

Figure 1: Number of drug-related deaths in Scotland: in total and for which any opiate or opioid, heroin/morphine, and methadone are implicated, 2009-2020



In 2020, methadone was implicated in 53% of all drug-related deaths. This is the highest percentage since records began, and continues a general upward trend with some fluctuations (Figure 2).

Figure 2. Percentage of drug-related deaths where methadone was implicated, 2000-2020

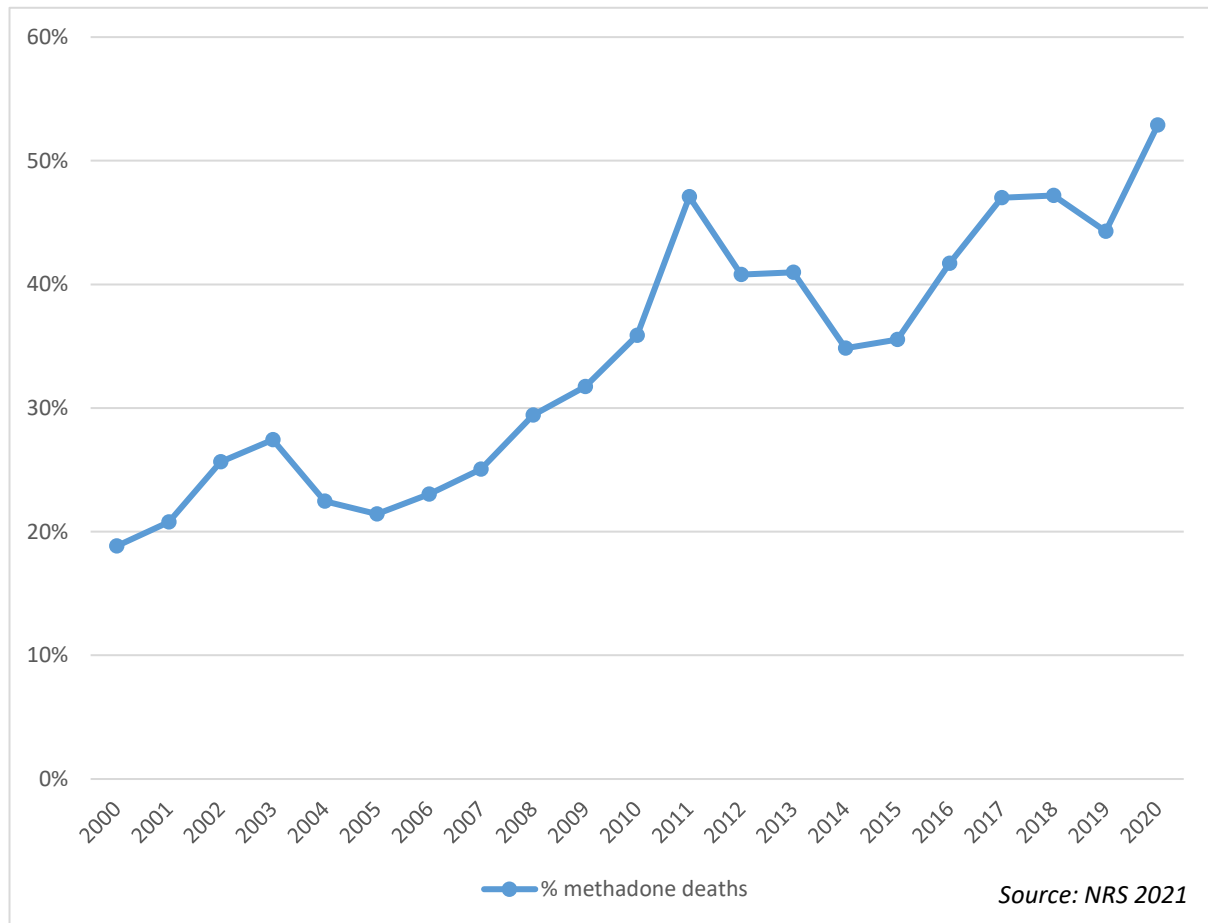
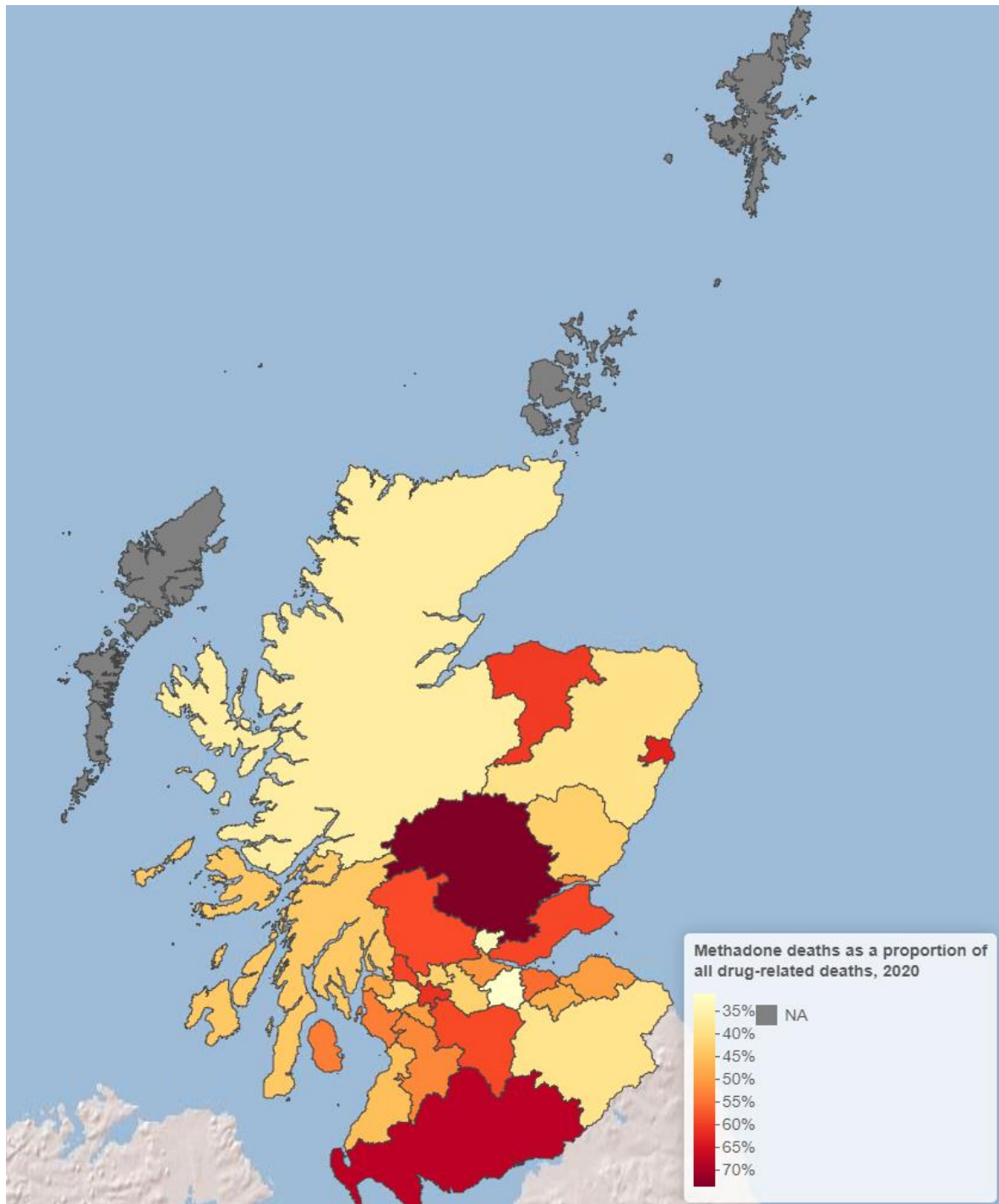


Figure 3 below shows methadone-implicated deaths in 2020 broken down by local authority area. Although Glasgow City had the highest absolute number of methadone-implicated deaths (177 of 291 DRDs), the highest percentage of methadone deaths relative to DRDs were in Perth & Kinross (73.5%, 25 of 34 DRDs) and Dumfries & Galloway (68.2%, 15 of 22 DRDs). A full table of deaths by local authority and NHS Health Board is available in Appendix 1.

Appendix 2 provides charts showing the change over time of the percentage of drug-related deaths where methadone was implicated, by health board area. Areas which have seen distinct upward trends in the percentage of DRDs where methadone was implicated are Fife, Greater Glasgow and Clyde, Lanarkshire and Tayside. Smaller health board areas with fewer DRDs present a more fluctuating picture.

Figure 3. Methadone deaths as a proportion of all DRDs by local authority area 2020*



**Figures for LAs with fewer than 5 drug-related deaths have been suppressed*

2.1.1 By age and sex

As with overall DRDs, the greatest number of methadone-implicated deaths in absolute terms in 2020 occurred in males, and those aged 35-54 (Table 1). The age distribution of methadone deaths is slightly older than the average for all DRDs, with

45.3% of all methadone-implicated deaths being among those aged over 45, compared with 43% of all DRDs. However, methadone-implicated deaths were *proportionally* more common among females than males, accounting for 59% and 51% of all DRDs, respectively. This is in line with evidence which suggests older age groups and women are more likely to be in treatment.¹³

Table 1. Methadone-implicated deaths by gender and age, 2020

		Methadone-implicated deaths	All DRDs	Percentage of all DRDs implicated by methadone
Gender	Male	492	973	51
	Female	216	366	59
Age	Under 25	19	80	24
	25-34	118	260	45
	35-44	249	418	60
	45-54	249	419	59
	55 and over	73	162	45
All		708	1,339	53

(Source: NRS 2021)

2.1.2 Drugs implicated in death

96.5% (685) of methadone deaths had more than one drug implicated, while only 23 methadone-implicated deaths had only one substance implicated. It is important to note that in cases where an OST is identified in toxicology results it is almost always thought to be implicated in death, rather than just present at death, and it is not possible to determine from the NRS data the relative contribution of different substances to the cause of death.

¹³ Information Services Division (ISD) (2018). Available at: [The National Drug-Related Deaths Database \(Scotland\) Report \(isdscotland.org\)](https://www.isdscotland.org/Information-Systems/Drug-Related-Deaths-Database/).

Figure 4. Substances most often implicated in methadone-implicated DRDs

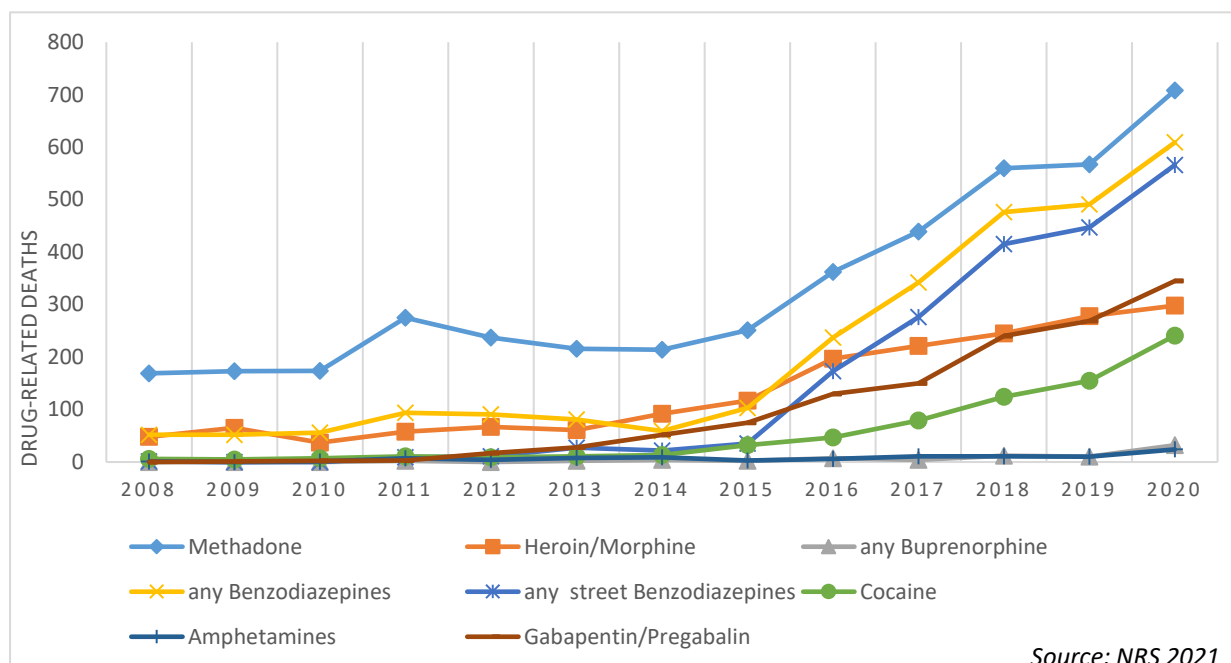


Figure 4 above shows that the most common combinations of substances in methadone-implicated deaths were:

- **Benzodiazepines:** implicated in 86% (609) of methadone-implicated DRDs. Illicit ‘street’ benzodiazepines accounted for the majority of cases (566 deaths, 80%).
- **Gabapentinoids:** implicated in 49% (345) of methadone-implicated DRDs.
- **Heroin/Morphine:** implicated in 42% (298) of methadone-implicated DRDs.
- **Cocaine:** implicated in 34% (241) of methadone-implicated DRDs.

2.2 Buprenorphine implicated in drug-related deaths

In 2020 there were 97 deaths where buprenorphine was implicated, accounting for 7% of all DRDs. This represents an 18% increase on 2019 (82 deaths). There has been a general upward trend over time, with a 169% increase since 2017 (36 deaths).¹⁴ Due to the smaller number of buprenorphine-related deaths, data is available at a less granular level and it is not possible to robustly determine the geographic or demographic breakdown of buprenorphine-related deaths.

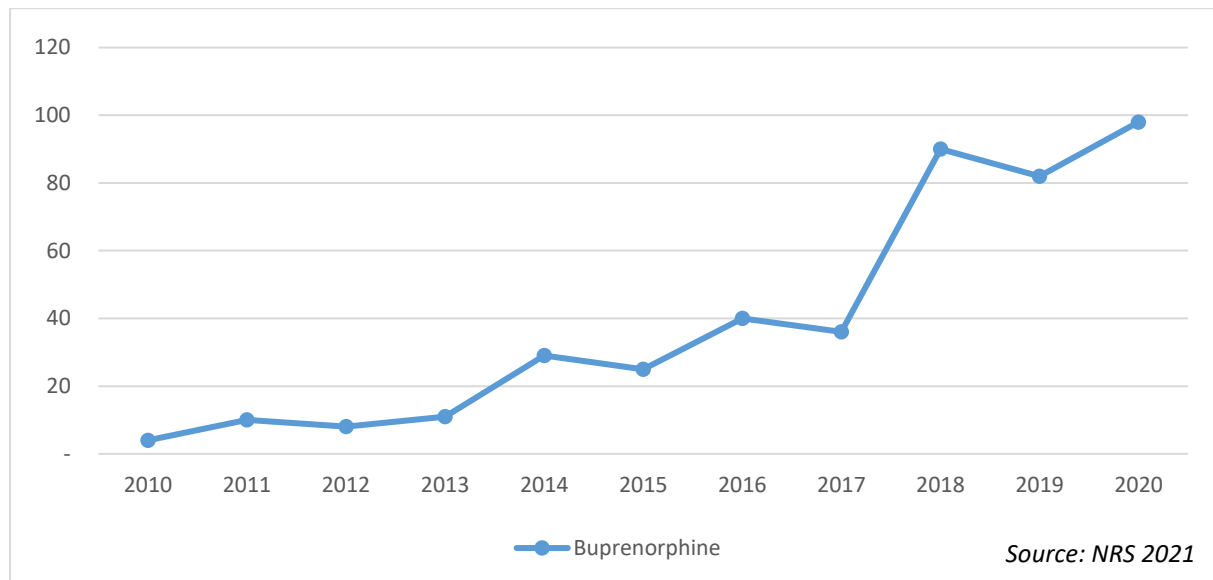
The number of buprenorphine deaths is smaller than the number of methadone-implicated deaths. However, far fewer individuals are prescribed buprenorphine and it is therefore less available than methadone. Patient estimates suggest the number

¹⁴ These figures are based on deaths using the ONS wide definition given in table Y of the NRS report. Using the same definition there were 710 methadone deaths.

of people prescribed methadone is approximately four times higher than the number prescribed buprenorphine¹⁵.

While numbers remain small, the percentage of all drug deaths where buprenorphine was implicated has increased dramatically, from 0.6% of all DRDs in 2010 to 7% in 2020. This is a greater increase than with methadone, and is partly a result of the increase in buprenorphine prescribing over the period.

Figure 5. Number of buprenorphine-implicated deaths, 2010-2020

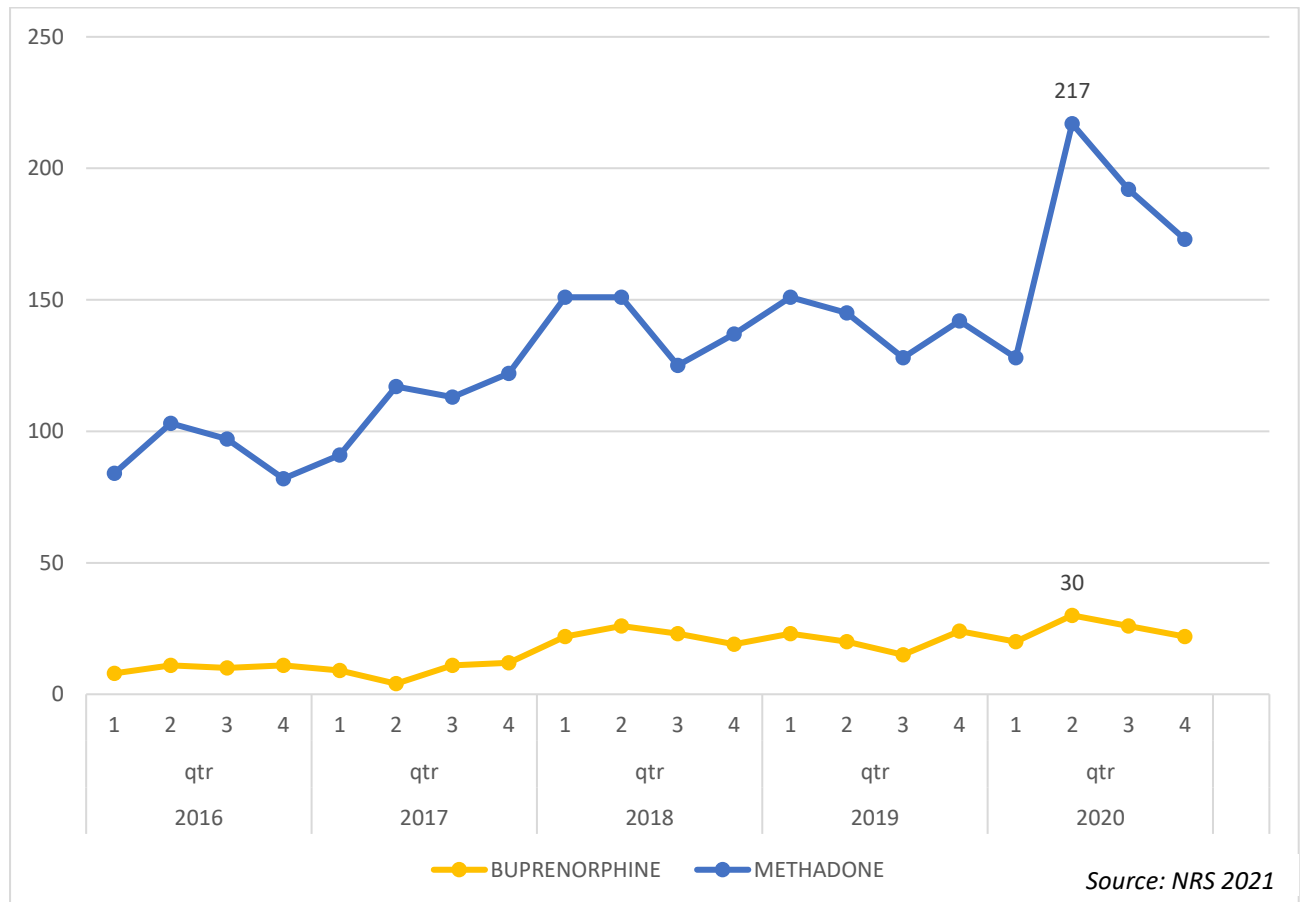


2.3 OST implicated deaths: quarterly trends

Figure 6 below presents methadone and buprenorphine implicated deaths by quarter and calendar year from 2016 to 2020. The chart shows the overall increasing trend is evident at the quarterly level over the time series, with quarter two of 2020 having the highest deaths from both substances over this time series.

¹⁵ Based on estimates from PHS and published on ScotPHO (2021). Available at: [Treatment for drug misuse - ScotPHO](#).

Figure 6. Methadone and Buprenorphine-implicated deaths, Q1 2016 to Q4 2020



2.4 Source of OST implicated in death

While it is clear that there has been an increase in deaths where methadone and/or buprenorphine was implicated it is not possible to determine from NRS data alone whether the decedent was prescribed the OST or whether they obtained it illicitly.

The National Drug Related Deaths Database provides more detail around the background and circumstances of DRDs.¹⁶ The most recent analysis uses data from 2015/2016 and shows that over one third of people who died from a DRD (37%) were prescribed an OST drug (mainly methadone) at the time of death. The percentage of people prescribed an OST at the time of death has steadily increased since 2009. Contributing factors to this rise include the ageing cohort of problem drug users and an overall increase in the number of problem drug users (particularly older drug users) in treatment.

¹⁶ ISD (2018). Available at: [The National Drug-Related Deaths Database \(Scotland\) Report.](#)

3. Understanding prescribing practices

3.1 Number of people prescribed OST

OST patient estimates and prescribing data are available on the Scottish Public Health Observatory.¹⁷ In the most recent estimates in 2020/21, OST was prescribed to a minimum number of 29,416 people in Scotland. Estimates have been in the range of approximately 29,250 to 29,750 people prescribed OST each year since 2016/17. In 2020/21, the local authorities where the highest number of people prescribed OST lived were Glasgow City (5,993); City of Edinburgh (3,143); and Fife (1,756). NHS Board areas where the highest number prescribed OST lived were NHS Greater Glasgow & Clyde (8,932), NHS Lothian (4,888) and NHS Grampian (2,821).

In 2020/21, methadone 1mg/ml solution was prescribed to a minimum of 24,128 individuals in Scotland. This figure is a decrease from 2011/12, when the estimate was 26,197, although data should be treated with caution due to the variable quality of the underlying data.¹⁸

Conversely, the estimated number of patients in receipt of buprenorphine has increased over the same time period. In 2020/21, buprenorphine was prescribed to a minimum of 6,312 individuals, while in 2011/12 the estimate was 2,375, an increase of 166% over the time series.

Annual data on OST drug prescribing and defined daily doses also demonstrate the shift from methadone to buprenorphine. The percentage of OST defined daily doses associated with methadone decreased from 97% in 2011/12 to 88% in 2020/21. Over this time period, there were changes in the OST treatments offered by NHS boards in Scotland, with an increase in prescriptions for medications containing buprenorphine. The percentage of OST defined daily doses that were associated with buprenorphine (either buprenorphine and naloxone combined (Suboxone) or buprenorphine) increased from 3% in 2011/12 to 11% in 2020/21¹⁹. PHS continue to make improvements to OST data collection to improve surveillance and oversight.

3.2 Changes to prescribing and dispensing practice in response to the pandemic

In response to the COVID-19 pandemic Scottish Government ensured that OST (and injecting equipment provision) remained essential services. This was underlined in a letter from the Public Health Minister and Interim Chief Medical Officer to ADPs, HSCPs and Joint Boards in April 2020.²⁰

However, challenges exist in balancing risk of death from overdose in absence of medication against the risks posed by COVID-19, particularly while accounting for the risks to all vulnerable patient groups using pharmacies and pharmacy staff. At the start of the first lockdown in March 2020, community pharmacies implemented

¹⁷ ScotPHO (2021). Available at: [Treatment for drug misuse - ScotPHO](#).

¹⁸ This is because these figures are aggregate estimates based on Community Health Index (CHI) capture rates, which can vary, and are therefore treated as management information.

¹⁹ ScotPHO (2021). Available at: [Treatment for drug misuse - ScotPHO](#).

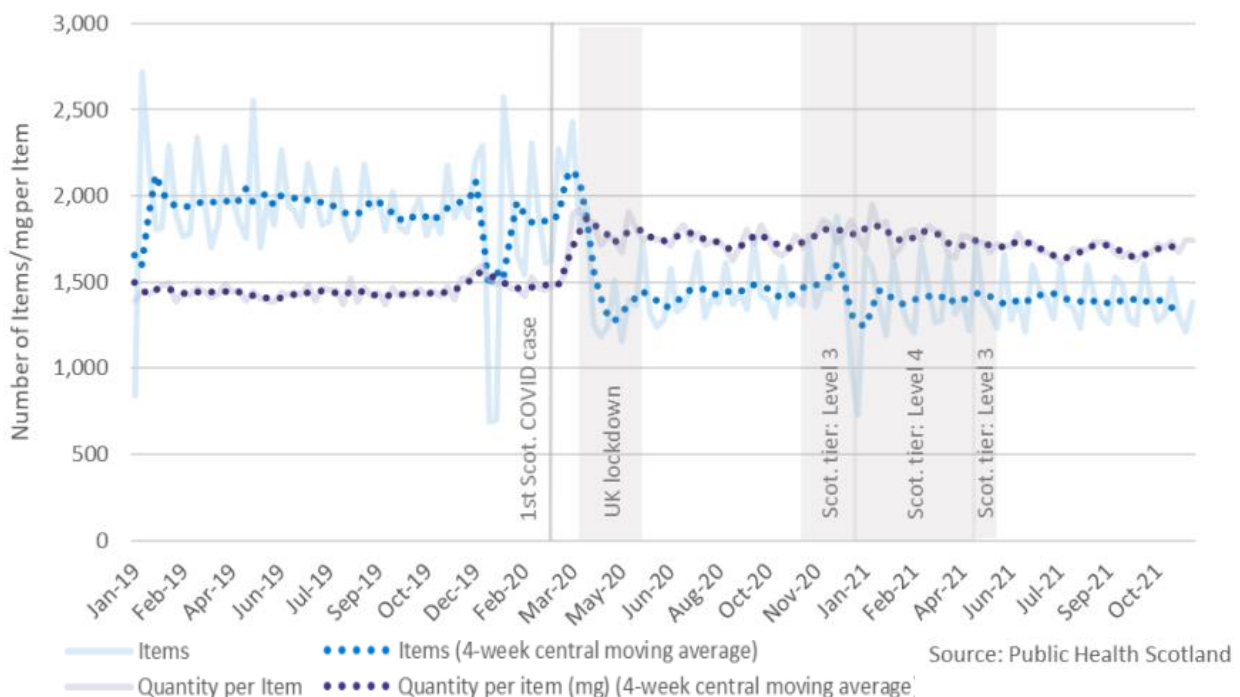
²⁰ Scottish Government (2020). Available at: [Minister for Public Health](#).

social distancing measures to manage customer throughput and minimise contact risk for COVID-19 for all patients, customers and staff. For people prescribed an OST medication, subject to risk assessment, this included moving some patients from daily supervised dispensing within pharmacies. Alternatives included a move to take home supply; an increase of take home supply (to reduce the frequency of attendance) and doorstep delivery of OST (particularly for vulnerable/shielding patients).

Guidance on this move and other COVID-19 contingency planning was published by Scottish Drugs Forum in collaboration with the Sexual Health and Blood Borne Virus Prevention Leads Network, co-ordinated by the Scottish Health Protection Network with advice from the Drug Deaths Task Force MAT subgroup.²¹

The move away from supervised dispensing is evident from prescribing data which suggest that OST prescribing continued in similar quantities throughout the COVID-19 lockdown period. However dispensing arrangements – modified following the introduction of social distancing measures – led to a reduction in the number of items prescribed. Figure 7 and Figure 8 below show a clear switch in April 2020, with an increase in the quantity per item and decrease in number of items prescribed. This shift has largely persisted since.

Figure 7. Methadone 1mg/ml Oral Liquid: Number of Items and Quantity per item by month (Scotland; January 2019 to October 2021)



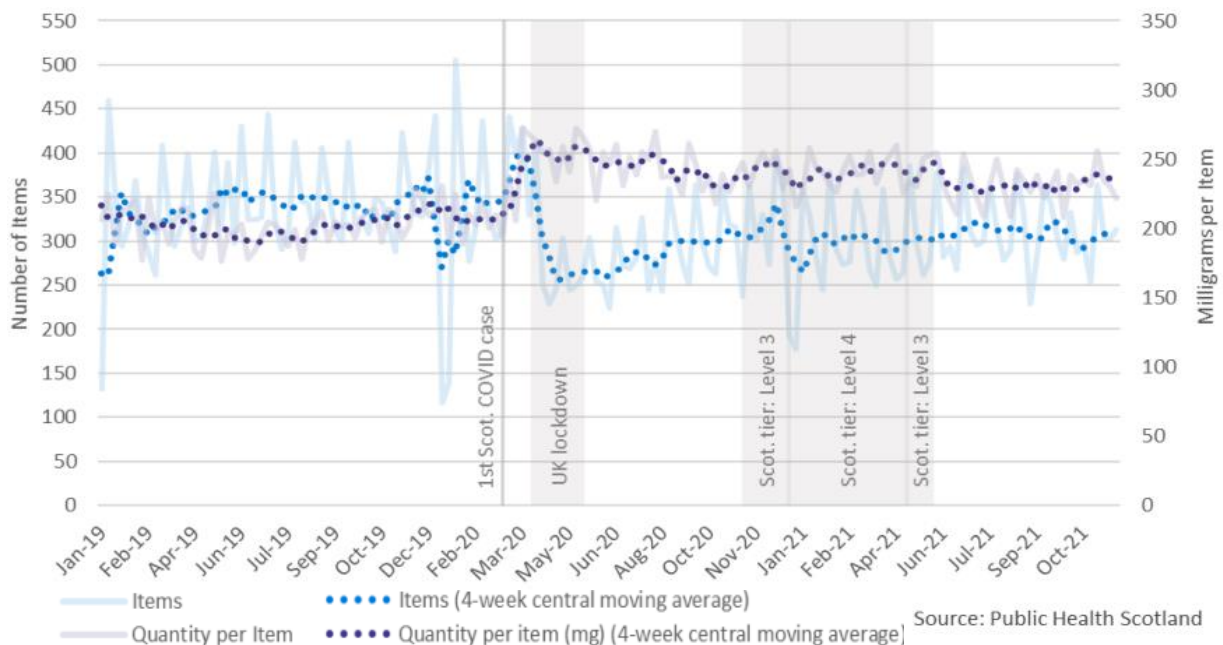
OST prescribing data are now available on the PHS Covid wider impact dashboard where it can be explored in more detail with regional breakdowns.²²

²¹ Scottish Drugs Forum (SDF) (2020). Available at: [Guidance on contingency planning for people who use drugs and COVID-19.](#)

²² Public Health Scotland (PHS) [2022]. Available at: [COVID-19 wider impacts dashboard.](#)

Robust evidence surrounding the impacts of take home supply and remote prescribing practices for OST patients in Scotland and elsewhere, particularly in the context of the pandemic, remains extremely limited and it is important to note the complexity of establishing a correlation in the context of multiple confounding factors.

Figure 8. Buprenorphine 2mg, 8mg & 16mg prescribing: Number of Items and Quantity per item by month (Scotland; January 2019 to October 2021)



A limited number of UK-based and international studies relating to take home supply have explored potential implications for patients, including risk of increased mortality, the attitudes and perceptions of providers and risk of prescription diversion. For example, a 2020 evidence review outlined a number of possible harms associated with take home prescribing during the pandemic, namely that larger dispenses may increase the risk of overdose; that people were likely to have difficulty taking medication as prescribed; that people may face pressure to sell or share their supply; and that people experiencing homelessness were unlikely to have safe storage options.²³ In multiple studies, providers surveyed reported concerns around patient safety and the impact of unsupervised dispensing on delivering person-centred care, while others were broadly supportive.²⁴

A 2006 study evidenced positive outcomes for take home supply, including increased treatment retention rates and increased patient satisfaction.²⁵ The authors' recommendations to increase options for take home supply were broadly echoed in a more recent US-based study that found no evidence of increased harms as a result of remote prescribing during the pandemic, although videoconferencing was

²³ Mongan et al. (2020). Available at: [Impact of COVID-19 on drug services in four countries: An evidence brief.](#)

²⁴ Madden et al. (2021). Available at: [Treatment provider perceptions of take-home methadone regulation before and during COVID-19.](#)

²⁵ King et al. (2006). Available at: [A 12-month controlled trial of methadone medical maintenance integrated into an adaptive treatment model.](#)

used to supervise consumption on a regular basis.²⁶ However, there remains little consensus, and a paucity of evidence, on the benefits and harms of take home supply. Understanding the potential impacts of changes in prescribing practices for OST patients constitutes an important line of enquiry in understanding the rise of methadone-implicated deaths.

4. Proposal for further work

The data presented in this paper outline some of the key trends in OST prescribing and the implications for drug-related deaths. It also outlines the complexities and challenges of understanding the impact of changes in prescribing practice. Public Health Scotland will take forward a further programme of work as more data becomes available to better understand and learn from the experiences of 2020. This work will comprise two elements: further research, and improving prescribing through the MAT Standards.

4.1 Further analysis

Work is already underway to further inform and evaluate changes in prescribing practice. Initial findings have been presented to the Drug Deaths Taskforce and with Alcohol and Drug Partnerships, and further consultation is being undertaken with prescribing leads to help identify further routes of enquiry. Key questions that warrant further exploration include: whether those who had an OST implicated death had prescriptions or obtained it illicitly; how regional variation in OST implicated deaths relates to changes in prescribing practice; and, importantly, whether changes in prescribing practice present learning opportunities.

PHS will design a programme of work that will include analysis of existing datasets as they become available, and exploration of the potential for data linkage to further examine these questions. Consideration will also be given to the potential for further qualitative data to understand the experience of service users. Pandemic related changes to prescribing and dispensing also occurred in England and a number of other international settings. PHS will review the available published and grey literature to identify relevant themes for consideration in the Scottish context.

4.2 Improving prescribing through the Medication Assisted Treatment Standards

PHS proposes to use the learning about changes to systems, process and practices to deliver outputs that support safe and effective prescribing within the wider context of the MAT Standards. In particular they further develop resources and systems which support the implementation of MAT Standards, and focus on methadone and buprenorphine prescribing in the context of a recovery-oriented system of care.

PHS intends to continue the co-production approach already adopted as part of the MAT Standards development work. This approach necessitates the participation of key stakeholders, building on the learning generated as part of the implementation of

²⁶ Brothers et al. (2021). Available at: [Changes in methadone program practices and fatal methadone overdose rates in Connecticut during COVID-19.](#)

the MAT Standards one to five, as well as the additional actions described in 4.1.²⁷
The intended objectives of this further work are to:

- I. Co-produce a definition of the key dimensions of quality prescribing in a recovery oriented system of care;
- II. Develop an indicator set that can be used at a local level or at a national level to assess prescribing quality;
- III. Influence changes in the system, processes and protocols that support quality prescribing within the context of a recovery oriented system of care.

²⁷ Scottish Government (2021). [Medication Assisted Treatment \(MAT\) standards: access, choice, support.](#)

Appendix 1. DRDs and Methadone-implicated death by local authority and NHS Health Board, 2020.

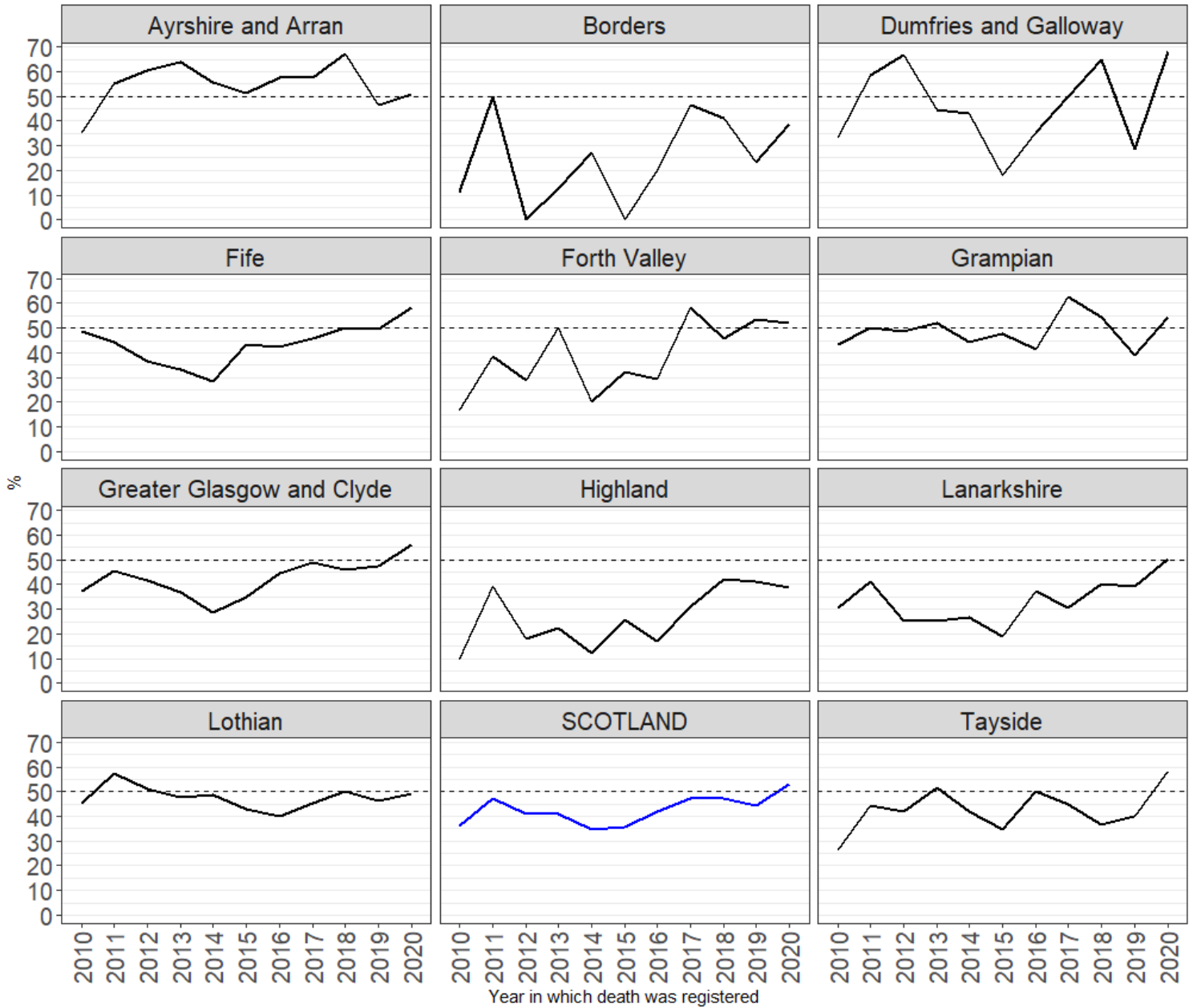
Table. 2. DRDs by council area, 2020

Council area	All DRDs	Methadone-implicated	%
Aberdeen City	56	35	62.5
Aberdeenshire	33	13	39.4
Angus	14	6	42.9
Argyll & Bute	16	7	43.8
City of Edinburgh	92	51	55.4
Clackmannanshire	9	3	33.3
Dumfries & Galloway	22	15	68.2
Dundee City	57	30	52.6
East Ayrshire	36	19	52.8
East Dunbartonshire	14	6	42.9
East Lothian	14	7	50.0
East Renfrewshire	10	5	50.0
Falkirk	37	19	51.4
Fife	65	38	58.5
Glasgow City	291	177	60.8
Highland	33	12	36.4
Inverclyde	33	16	48.5
Midlothian	21	10	47.6
Moray	10	6	60.0
Na h-Eileanan Siar	3	0	0.0
North Ayrshire	39	21	53.8
North Lanarkshire	94	40	42.6
Orkney Islands	3	0	0.0
Perth & Kinross	34	25	73.5
Renfrewshire	67	27	40.3
Scottish Borders	18	7	38.9
Shetland Islands	4	1	25.0
South Ayrshire	31	14	45.2
South Lanarkshire	91	53	58.2
Stirling	31	18	58.1
West Dunbartonshire	29	17	58.6
West Lothian	32	10	31.3
Scotland	1,339	708	52.9

Table 3. DRDs by NHS Health Board, 2020

NHS Health Board	All DRDs	Methadone-implicated	%
Ayrshire & Arran	106	54	50.9
Borders	18	7	38.9
Dumfries & Galloway	22	15	68.2
Fife	65	38	58.5
Forth Valley	77	40	51.9
Grampian	99	54	54.5
Greater Glasgow & Clyde	444	248	55.9
Highland	49	19	38.8
Lanarkshire	185	93	50.3
Lothian	159	78	49.1
Orkney	3	0	0.0
Shetland	4	1	25.0
Tayside	105	61	58.1
Western Isles	3	0	0.0
Scotland	1,339	708	52.9

Appendix 2. Methadone-implicated deaths as a proportion of all DRDs by NHS Health Board, 2010-2020



Source: NRS
 Note: Orkney, Shetland and Western Isles Health Boards are omitted from this chart due to small numbers



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