

# Primary Care Service Utilization Among People at High Risk of Fatal Opioid Overdose: A Short Communication on an Autopsy Study

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## Abstract

**Objectives:** We sought to explore the sociodemographics and primary care service utilization among people who died from opioid overdose and to assess the possibility of using this information to identify those at high risk of opioid overdose using routine linked data. **Methods:** Data related to decedents of opioid overdose between January 1, 2012 and December 31, 2015 were linked with general practitioner (GP) records over a period of 36 months prior to death. **Results:** Of  $n = 312$  decedents of opioid overdose, 73% were male ( $n = 228$ ). Average age at death was 40.72 (SD 11.92) years. A total of 63.8% of the decedents were living in the 2 most deprived quintiles according to the Welsh Index of Multiple Deprivation. Over 80% ( $n = 258$ ) of the decedents were recorded as having at least 1 GP episode during the 36-month observation period prior to death. The median number of episodes per decedent was 75 [38–118]. Overall, 31.8% ( $n = 82$ ) of decedents with at least 1 GP episode received a prescription for a proton pump inhibitor and 31% ( $n = 80$ ) were prescribed a broad-spectrum antibiotic. According to their GP records, less than 10% were referred to or receiving specialist drug treatment ( $n = 24$ , 9.3%); or were known to be drug dependent ( $n = 21$ , 8.14%), or a drug user ( $n = 5$ , 1.94%). In all, 81% were recorded as smokers ( $n = 209$ ) and 10.5% as ex-smokers ( $n = 27$ ). **Conclusions:** The majority of decedents of opioid overdose were in contact with GP services prior to death. GPs are either often unaware of high-risk opioid use, or rarely record details of opioid use in patient notes. It is possible that GP awareness of high-risk opioid use could be increased. For example, awareness of the risks associated with opioid use, and the relationship between the sociodemographic and clinical characteristics of opioid overdose decedents could be raised using educational materials prominently displayed in waiting areas. Clinicians in primary care may be in an excellent position to intervene in problematic opioid use.

## Keywords

behavioral health, community health, health promotion, primary care, access to care

Date received: 28 January 2020; revised: 20 April 2020; accepted: 20 April 2020.

## Introduction

Fatal opioid overdose is a growing public health problem in the United Kingdom with opioids accounting for more fatalities by overdose than any other drug.<sup>1</sup> It is important therefore that people at high risk of opioid overdose are identified before fatal overdose can occur and receive an appropriate intervention. We sought to explore the sociodemographics and primary care service utilization among people who died from opioid overdose and to assess the possibility of using this information to identify those at high risk of opioid overdose using routine linked data.

## Methods

Mortality data belonging to decedents of opioid-related deaths (ORD) between January 1, 2012 and December 31, 2015 were linked with general practitioner (GP) records over a period of 36 months prior to death. Mortality data

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**Table 1.** Mortality Coding.

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Underlying cause of death:
F11-F19 = Mental and behavioral disorders due to psychoactive substance use
X40-44 = Unintentional poisoning by and exposure to narcotics and psychodysleptics
X60-69 = Intentional self-poisoning by and exposure to narcotics and psychodysleptics
X85 = Assault (homicide) by drugs, medicaments, and biological substances
Y10-19 = Poisoning by and exposure to narcotics and psychodysleptics (undetermined intent)
Main injury:
Substance
T40. = Opium
T40.1 = Heroin
T40.2 = Other opioids (morphine, oxycodone, hydrocodone)
T40.3 = Methadone
T40.4 = Synthetic opioids excluding methadone (fentanyl, propoxyphene, meperidine)

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were identified from the Office of National Statistics (ONS) birth, deaths, and marriages dataset and were coded using the ICD-10 (International Classification of Diseases, 10th Revision) framework. We sought only to include decedents of opioid overdose and to avoid decedents of ORD who may have died under circumstances where opioid drugs were ingested, but where cause of death could primarily be attributable to another type of drug or injury. This was to be sure our sample were representative of high-risk opioid users. Therefore, only decedents whose mortality records described an opioid drug as the object of main injury and recorded an underlying cause of death as indicative of opioid poisoning or overdose were included. The coding framework used is detailed in Table 1.

GP records were captured from the GP Audit+ dataset, which is one of the “core” SAIL (Secure Anonymised Information Linkage) databank datasets. The GP Audit+ dataset includes data from GP practices in Wales and the data are presented in Read code format. Read coding refers to a hierarchical system of clinical terminology (including diagnoses, symptoms, tests, medication), which has been in use in primary care settings in Wales and the rest of the United Kingdom since the mid-1980s. The Read coding system has undergone several revisions and is expected to be replaced by the internationally recognized SNOMED (Systematized Nomenclature of Medicine) clinical terminology system in Wales over the next decade. Individual records were linked by the NHS Wales Informatics Service (NWIS) and were analyzed in the secure SAIL gateway.<sup>2,3</sup>

In order to understand the sociodemographic profile of people at high risk of opioid overdose who are also in contact with GP services, we captured data on age, sex, and social deprivation. In order to understand service usage patterns, we captured data on the number of GP “episodes”

recorded, including the top 1% of Read codes used to describe episodes in the dataset. The rationale for returning the top 1% was based on a lack of resources necessary to interrogate the entirety of the data returned, which was extensive due to the nature of the Read coding framework. This is further expanded upon in the discussion section. We also captured data specifically related to drug misuse by searching for Read codes associated with illicit drug and alcohol use problems.

The matching algorithm used to link these data was devised at NWIS and applies deterministic and probabilistic routines in a logical sequence. This approach to linkage allows for consistently accurate matching, demonstrating high specificity (>99%) and sensitivity (>95%).<sup>2</sup> Additionally, we used an algorithm developed by Atkinson et al<sup>4</sup> to gather data about smoking status from GP records. We captured social and economic deprivation (in terms of income and access to employment, health care, and education services) data in relation to registered addresses for decedents present in the GP data. Deprivation was measured using the Welsh Index for Multiple Deprivation (WIMD), which is a Welsh government standard measure of deprivation assigned to small geographical areas which are largely contiguous with a postcode areas and have populations of around 1500 people. These areas are known as Lower Super Output Areas (LSOA). We were able to allocate a WIMD score to each decedent by matching the LSOA which the decedent’s recorded place of residence was situated with the corresponding WIMD score. The Welsh government WIMD data were accessed via the publicly available WIMD Archive.<sup>5</sup>

## Results

We identified  $n = 312$  decedents of opioid overdose. These decedents represented 0.24% of the 128 277 people who died in Wales over the observation period. Our sample were mostly male ( $n = 228$ , 73.08%) and on average were 40.72 (SD 11.92) years of age, with 81.74% of decedents aged between 25 and 55 years. A total of 63.79% of the decedents were living in the 2 most deprived quintiles according to WIMD. Over 80% ( $n = 258$ ) of the decedents were recorded as having at least 1 GP episode during the 36-month observation period prior to death. The median number of episodes per decedent was 75 [38-118]. These data are summarized in Table 2.

The most frequently recorded 1% of Read codes attached to the entire dataset of GP episodes for all participants described the following 11 procedures: 71.3% ( $n = 184$ ) of decedents were given smoking cessation advice; 68.9% ( $n = 178$ ) underwent a routine blood investigation; 67.4% ( $n = 174$ ) had a blood pressure reading; 66.3% ( $n = 171$ ) had their weight recorded; 64.3% ( $n = 166$ ) had a telephone encounter; 58.9% ( $n = 152$ ) had their body mass index measured; 55.8% underwent a case review; 45.4% ( $n = 117$ ) had their height recorded; 39.9% ( $n = 103$ ) underwent

**Table 2.** Decedent Characteristics and GP Service Usage (N = 312).

	N	%
Decedents' age	14	4.49
16-24 years		
25-34 years	90	28.85
35-44 years	110	35.26
45-54 years	55	17.63
55-64 years	28	8.97
≥65 years	15	4.81
Female gender	84	26.9
≥1 GP episode in		
36 months	258	82.69
24 months	253	81.09
12 months	245	78.53
≤1 month	213	68.27
WIMD		
Quintile 1	129	41.35
Quintile 2	70	22.44
Quintile 3	47	15.06
Quintile 4	25	8.01
Quintile 5	26	8.33
No WIMD data	15	4.81

Abbreviations: GP, general practitioner; WIMD, Welsh Index for Multiple Deprivation.

a medication review; 31.8% (n = 82) received a prescription for a proton pump inhibitor; 31% (n = 80) were prescribed the broad-spectrum antibiotic amoxicillin.

Less than 10% of the decedents were recorded as having been referred to, or to be undergoing drug addiction therapy (n = 24, 9.3%); or of being known to be drug dependent (n = 21, 8.14%). Less than 4% were coded as receiving medication-assisted therapies such as methadone detoxification (n = 9, 3.48%). Less than 2% were coded as being a drug user (n = 5, 1.94%). However, slightly over 10% (n = 27, 10.47%) were coded as misusing alcohol. A total of 66.98% of the decedents were smokers (n = 209) at the time of their death, and close to 9% were ex-smokers (n = 27, 8.66%).

## Discussion

Primary care services in Wales have undergone changes in terms of practice size, number of practices, and in opening times over the observation period for our study. The average number of patients per practice increased steadily over the observation period from 5804 in 2013 to 5976 in 2015. At the same time the number of practices fell, and the number of GPs remained constant. The number of practices open between 08:30 and 18:30 hours every weekday also increased. It is helpful to bear in mind the effects of the changing landscape of primary care services in Wales when making sense of our results, as promoting awareness of risk of death from specific causes in specific demographics may

be more challenging when GPs are seeing more patients and working longer hours.<sup>6</sup>

Although no data related to average consultations per primary care patients in Wales are available to help contextualize our data, a comprehensive and extensive retrospective analysis of primary care consultations in England using routine data found that on average NHS primary care patients consult with their GP 5 times a year.<sup>7</sup> In comparison, our data suggest that people at high risk of fatal opioid overdose are in contact with GP services comparatively often.

The top 1% of GP episodes in our datasets described routine procedures which were not indicative of any specific problem or diagnosis. However, we did find that over a third of decedents were prescribed a proton pump inhibitor medication (omeprazole). This represents around a 2-fold increase on period prevalence estimates of PPI prescribing in the general population.<sup>8</sup> We also found that a similar proportion of decedents were prescribed amoxicillin (500 mg). The frequency of proton pump inhibitor and amoxicillin prescribing may indicate that high-risk opioid users are especially prone to gastrointestinal complaints, such as indigestion or hyperchlorhydria, or to bacterial infection. However, it may be the case that these medications are prescribed often for nonspecific symptoms in a broad range of patients, encompassing high-risk opioid users, but not specifically associated with this demographic.

Public Health England data show that opioid users are rarely referred to drug treatment services by their GPs.<sup>9</sup> We found surprisingly few drug misuse related codes in the GP records, suggesting that low referral rates may be due to a lack of awareness amongst GPs of high-risk opioid use in primary care patients. Indeed, a large-scale study carried out in America found that primary care patients are rarely screened for drug or alcohol use problems.<sup>10</sup> This is despite the fact that evidence from both America and Europe suggest that primary care settings are optimal for the management of opioid use disorder.<sup>11,12</sup> A qualitative study based in the United Kingdom found that lack of experience and time pressures may make GPs less likely to enquire about patient's drug issues. In addition, GPs often expressed hesitancy in recording drug-related problems in electronic patient records for fear of adverse consequences for the patient or for the patient-physician relationship.<sup>13</sup>

Additional factors that may help us understand the lack of drug service-related coding in our dataset are lack of available services, and low uptake of existing services. First, the shift from NHS control over specialist drug services to third sector control in 2012 has been associated with funding cuts and decreasing access to services.<sup>14</sup> Second, currently unpublished data from research carried out by members of the study team, along with research funded by Public Health Wales suggests that less than half of high-risk opioid users make contact with specialist drug services.<sup>15</sup>

When compared with ONS estimates that approximately 15% of adults in the UK are current smokers,<sup>16</sup> our data suggest that high-risk opioid users are significantly more likely to smoke than the general population. This assertion is supported by previous research concerned with the prevalence of smoking among opioid users compared with the general public.<sup>17</sup>

Our study suffered from limitations related to data quality. GP data were recorded using the second version of the Read codes framework. This framework is expansive and variable, and a plethora of terms may exist to describe similar, identical, or closely aligned events. GP episodes can refer to a number of events ranging from GP visits to administrative tasks and incidents of communication such as letters and phone calls—and so we cannot draw conclusions about the number of “meaningful” contacts that took place in this time period, for example, face-to-face or telephone consultations involving a patient and a clinician versus automated letter dispatch.

To conclude, clinicians in primary care appear to have ample opportunity to intervene in cases where a patient is at risk of opioid-related death. However, our findings suggest that GPs are often unaware of patients with high-risk opioid use; or that they are unlikely to record details of opioid use in patient notes, or both. Further research is needed to understand to what extent GPs are unaware of high-risk opioid use among patients, and how to increase this awareness if warranted. The factors that govern whether or not GPs record the existence of problematic opioid drug use in patient notes along with the factors that govern GP decisions to refer high-risk opioid patients to specialist treatment services when they are aware of the problem should also be further investigated.

### Acknowledgments

Data scoping, capture, and linkage was carried out by SAIL (Secure Anonymised Information Linkage).

### Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was funded by the Wales Centre for Primary and Emergency (including Unscheduled) Care Research (PRIME).

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