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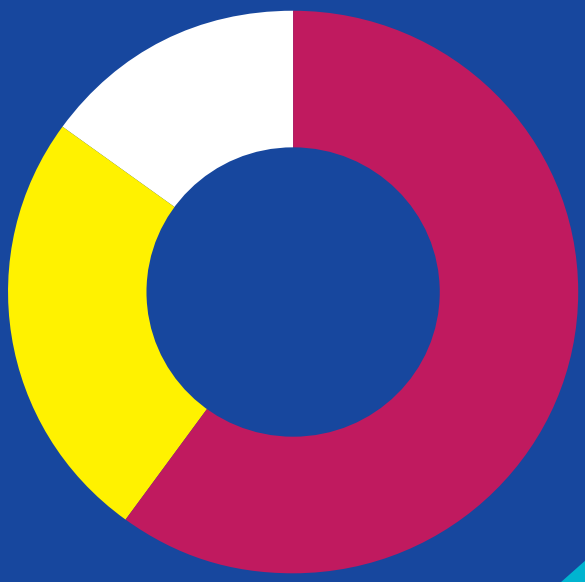
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Prevalence of problematic opioid use in Ireland, 2020–2022

HRB Health Research Board





Michael T Hanrahan,
Seán R Millar, Deirdre Mongan,
Suzi Lyons, and Brian Galvin

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Prevalence of problematic opioid use in Ireland, 2020–2022

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List of abbreviations

AIC	Akaike information criterion
CHO	Community Healthcare Organisation
CI	confidence interval
CTL	Central Treatment List
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
EU	European Union
EUDA	European Union Drugs Agency
GP	general practitioner
HIPE	Hospital In-Patient Enquiry
HRB	Health Research Board
HSE	Health Service Executive
NDTRS	National Drug Treatment Reporting System
OST	opioid substitution treatment
PPI	public and patient involvement
PULSE	Police Using Leading Systems Effectively
RDATF	Regional Drug and Alcohol Task Force
RHA	Regional Health Area
UCC	University College Cork

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Executive summary

Overview of the study

This report presents the findings from a study that aimed to estimate the prevalence of problematic opioid use in Ireland from 2020 to 2022 utilising a four-source capture-recapture methodology. The analysis incorporated three data sources from opioid substitution treatment (OST) records obtained from the Central Treatment List (CTL), which includes clinics, general practitioners (GPs), and prisons. The fourth data source was provided by the Probation Service.

Key findings

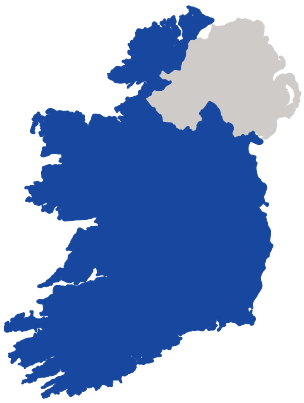
Table 1 presents a summary of the study's main results, stratified by County Dublin versus the rest of Ireland, as well as by age group and sex. In 2022, it was estimated that there were approximately 19,460 individuals in Ireland with problematic opioid use (95% confidence interval (CI): 19,348–23,158), which equates to a prevalence rate of 5.79 per 1,000 population (95% CI: 5.76–6.89). A significant majority of these individuals were male (67.9%), and more than two-thirds (75.3%) fell within the older age group of 35–64-year-olds. There were an estimated 11,100 problematic opioid users (95% CI: 10,684–13,761) in County Dublin in 2022, reflecting a rate more than three times higher than that in the rest of Ireland (11.17 per 1,000 population (95% CI: 10.75–13.85) compared with 3.53 per 1,000 population (95% CI: 3.46–4.37)).

Additional insights

This report also includes estimates for prevalence rates across Regional Health Areas (RHAs), Community Healthcare Organisation (CHO) areas, Regional Drug and Alcohol Task Force (RDATF) areas, and selected cities. Data on the prevalence of problematic opioid use for the years 2020 and 2021 are also presented to illustrate trends over time. Although there was a slight decrease in the overall number of problematic opioid users between 2020 and 2022, this decrease was not statistically significant. Notably, however, the prevalence of problematic opioid use among 15–24-year-olds appears to be decreasing.

Table 1: Total estimated number of problematic opioid users, by location, age group, and sex (2022)

Variable	Known	Estimate	95% CI	Rate per 1000 population	95% CI
County Dublin	7828	11100 (57.0%)	10684–13761	11.17	10.75–13.85
Rest of Ireland	4891	8360 (43.0%)	8189–10346	3.53	3.46–4.37
15–24 years	264	527 (2.7%)	524–627	0.82	0.81–0.97
25–34 years	2304	4283 (22.0%)	4258–5097	6.82	6.78–8.12
35–64 years	10151	14650 (75.3%)	14566–17434	7.02	6.98–8.35
Male	8989	13218 (67.9%)	13142–15730	7.96	7.91–9.47
Female	3730	6242 (32.1%)	6206–7428	3.67	3.65–4.37
Total	**12719**	**19460**	**19348–23158**	**5.79**	**5.76–6.89**

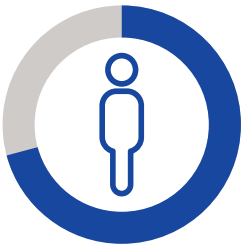


In total, there were an estimated

19,460

problematic opioid users in Ireland in 2022





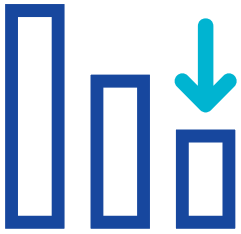
The majority of problematic opioid users were male **(67.9%)**

There were an estimated

11,100

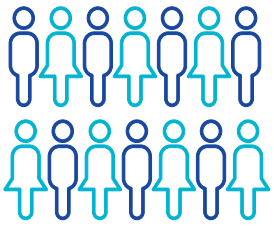
problematic opioid users in County Dublin in 2022

Three-quarters **(75.3%)** of problematic opioid users were in the older 35–64-year-old age group



The prevalence of problematic opioid use among younger age groups (15–24-year-olds and 25–34-year-olds) appears to be in decline

Estimated number of problematic opioid users by age group



527 15-24 years

4,283 25–34 years

14,650 35–64 years

Introduction

Introduction

Problematic opioid use

Problematic (or high-risk) drug use is defined by the European Union Drugs Agency (EUDA) (formerly the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)) as "recurrent drug use that is causing actual harm (negative consequences, including dependence, but also other health, psychological or social problems) to the person or is placing the person at a high probability/risk of suffering such harms".[1] Problematic opioid use is a significant problem in Ireland and around the world.[2,3] Opioids – which include heroin, morphine, methadone, codeine, hydrocodone, fentanyl, and tramadol – are addictive, sedating narcotic drugs. While some of these drugs have valid medical purposes, their misuse as 'street drugs' can lead to many health and social issues for users and society.

Within the Irish context, the primary opioid misused is heroin.[4] The National Drug Treatment Reporting System (NDTRS) is a national epidemiological database coordinated by the Health Research Board (HRB) on behalf of the Department of Health that provides data on treated drug and alcohol misuse in Ireland. Data from the NDTRS show that 33.1% of people accessing drug treatment services in 2022 were treated for problematic opioid use, with heroin misuse comprising the majority (86.6%) of these cases.[5] The proportion of people accessing drug treatment services who reported opioids as their main problem drug decreased from 47.8% in 2015 to 33.1% in 2022.[4,5] Data from the NDTRS also show that in 2022, 28.1% of those treated for problematic opioid use reported injecting as their primary route of administration. Other common routes of administration for cases entering treatment for problematic opioid use were smoking (56.2%), followed by eating/drinking (12.5%).[6] While synthetic opioids like methadone, buprenorphine, and fentanyl are used less often than heroin, their misuse may be on the rise.[3,7] However, the non-medical use of prescription opioids in Ireland remains relatively low.[3,7]

Prevalence of problematic opioid use in Ireland

Just 0.3% (95% confidence interval (CI): 0.1–0.5%) of respondents to the 2019–20 Irish National Drug and Alcohol Survey reported lifetime use of heroin, with 0.0% reporting heroin use in the last year or the last month.[7] This represents a decrease from the previous survey conducted in 2014–15, when 0.9% of respondents reported ever using heroin in their lifetime.[7] In addition, 1.8% of respondents reported using opioid pain relievers in a non-medical way in the 12 months prior to the 2019–20 survey.[7] Given that so few respondents reported recent or current heroin use, data from the Irish National Drug and Alcohol Surveys emphasise the fact that traditional surveys are not suitable for estimating 'hidden' populations of at-risk drug users.

Measuring the prevalence of problematic opioid use is, therefore, challenging. Given the nature of this population, a simple head count is not feasible, as some problematic opioid users may have no fixed abode or contact with any service providers. Because drug users fear stigmatisation and are often marginalised in society, the EUDA recommends the use of indirect approaches (such as capture-recapture analysis or the multiplier method) in order to estimate the prevalence of problematic (high-risk) drug users.[1]

To date, one regional and four national capture-recapture studies have been conducted in Ireland to estimate the prevalence of problematic opioid use. These studies provided estimates for the years 1996, 2000–01, 2006, 2011–2014, and 2015–2019.[2,8-11] The 1996 regional study examined opioid use in Dublin only and used three data sources: the Health Service Executive (HSE) Central Treatment List (CTL), Hospital In-Patient Enquiry (HIPE) scheme data from four Dublin hospitals, and the An Garda Síochána arrest database.[10] The 2000–01 and 2006 studies were three-source capture-recapture studies that used national data from the CTL, the HIPE scheme, and the An Garda Síochána PULSE (Police Using Leading Systems Effectively) database.[9,11] The 2011–2014 and 2015–2019 studies both used four national data sources: the CTL data were divided into three sources (treatment clinics, general practitioners (GPs), and prison data), and the Probation Service was the fourth data source.[2,8]

The most recent estimates of problematic opioid use in Ireland were produced by the authors of this report.[8] In 2019, there were an estimated 19,875 (95% CI: 19,522–21,608) problematic opioid users in Ireland.[8] Comparing these data with 2014 prevalence estimates (18,988 (95% CI: 18,720–21,454)) suggests that the scale of the problem has remained relatively stable and that the number of young opioid users in Ireland (aged 15–24 years) is in decline.[2] However, there was evidence of an ageing cohort effect, as the proportion of those in the older age group (those aged 35–64 years) has increased since 2014.[8] It should be noted that these estimates of the number of problematic opioid users are high, with comparable international studies conducted at around the same time suggesting that the rates of problematic opioid use in Ireland were among the highest in Europe.[12]

National drugs strategy and role of the HRB

The national drugs strategy, *Reducing Harm, Supporting Recovery: A health-led response to drug and alcohol use in Ireland 2017-2025,* is a health-led approach to protecting individuals, families, and communities against the harms associated with problem drug use and empowering individuals to improve their health and well-being.[13] One of the five strategic goals within the strategy is to "develop sound and comprehensive evidence-informed policies and actions".[13] The strategy is also closely aligned to the *EU Drugs Strategy 2021-2025*.[14]

As the Irish National Focal Point to the EUDA, the HRB oversees the commissioning of research and the monitoring of projects on behalf of the Department of Health. The EUDA provides factual, objective, reliable, and comparable information concerning drugs and drug addiction and their consequences and monitors the drugs situation and responses to drug-related problems in Europe. Problematic drug use is one of the five key epidemiological indicators that the EUDA uses to assess the prevalence of drug use in Europe. In 2021, the HRB contracted the School of Public Health, University College Cork (UCC), to conduct a fifth national study on the prevalence of problematic opioid use in Ireland for the period 2020–2022, the results of which are presented here. Specifically, the objectives of this research were to estimate the number of problematic opioid users in Ireland by age group, sex, and region (Regional Health Area (RHA), Community Healthcare Organisation (CHO) area, Regional Drug and Alcohol Task Force (RDATF) area, and selected cities) for the years 2020, 2021, and 2022, and to compare the findings with previous estimates.

Methods



Methods

Problematic opioid use definition

Appropriate reporting on the prevalence of problematic opioid use requires a clear case definition. As this study used capture-recapture methodology, the case definition depends heavily on the case definitions used in the contributing data sources. Using the EUDA definition for problematic drug use, this study aimed to identify problematic opioid users who are harmed or who are at high risk of harm secondary to opioid use.[1] This case definition is intended to best identify those in need of treatment and intervention and is not intended to include experimental and occasional drug users.

Study population

This study estimated the number of problematic opioid users aged 15–64 years in Ireland during the period 2020–2022. The main estimates are presented for each RHA, CHO area, and RDATF area; for selected cities (Dublin, Cork, Galway, Limerick, and Waterford); and for County Dublin versus the rest of Ireland. A description of the counties included in the different RHAs, CHO areas, and RDATF areas is included in the Appendix.

In order to report consistent estimates that can be presented according to the geographical divisions described above, we used 20 subunit areas for the analysis (Figure 1).

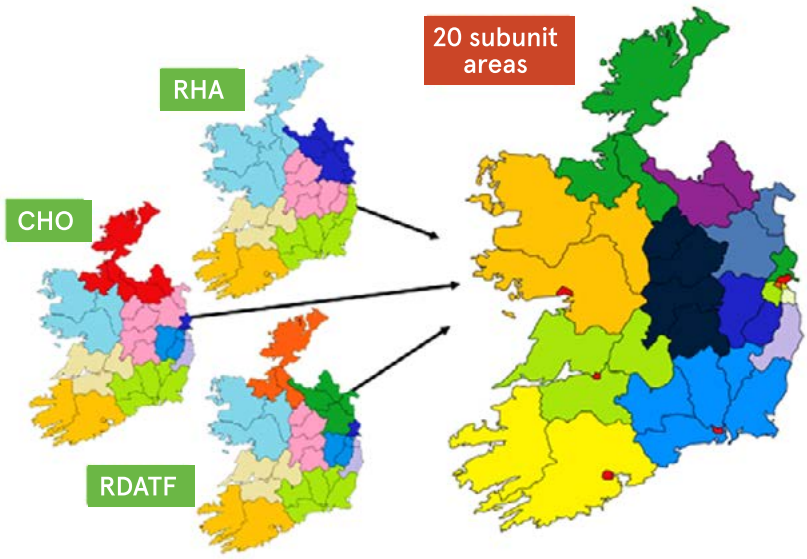


Figure 1. Illustration of how Ireland was divided into 20 subunit areas in order to allow for reporting by RHA, CHO area, RDATF area, and city

Data sources

The same data sources utilised in the 2011–2014 and 2015–2019 opioid prevalence studies were used for this research.[2,8] The four sources used for capture-recapture analysis were the CTL (split into three sources based on data collected by treatment clinics, GPs, and prisons) and the Probation Service.

The Central Treatment List

The CTL contains data on all patients who are receiving opioid substitution treatment (OST) in Ireland. The CTL is a well-maintained national database that distinguishes between patients who are treated through clinics, through their GPs, and in prison and can, therefore, be divided into three separate data sources.

The Probation Service

Data were compiled by the Probation Service through a data scraping exercise using agreed terms on databases that make up the Probation Service Case Tracking System. A list of terms that indicate opioid use (including "opioid", "opiate", "methadone", "Oramorph", "oxycodone", "fentanyl", "heroin", "tramadol", "codeine", and "oxy") was used for the data scraping process on five separate databases to extract the information.

The extracted raw data were processed by the Probation Service statistician in an Excel spreadsheet using SAS software. The statistician reviewed the data to ensure that a person was counted only once for each year of study and that there were no missing data. These data were then provided by the Probation Service through a secure channel.

Capture-recapture method

Capture-recapture analysis is useful for estimating the size of hidden populations, such as problematic opioid drug users. It generally requires the use of two or more lists of known drug users. The degree of overlap between these lists allows models to be created that can predict the size of the uncaptured population. This is one of the methods that the EUDA recommends for estimating the prevalence of problematic opioid use in European countries.[1]

Figure 2 illustrates the principle behind the capture-recapture method for a four-source model. The overlap between the four sources creates 11 distinct areas of overlap and four areas with no overlap. Poisson log-linear models are then fitted to the data to estimate the number of individuals who are not present in any data source.

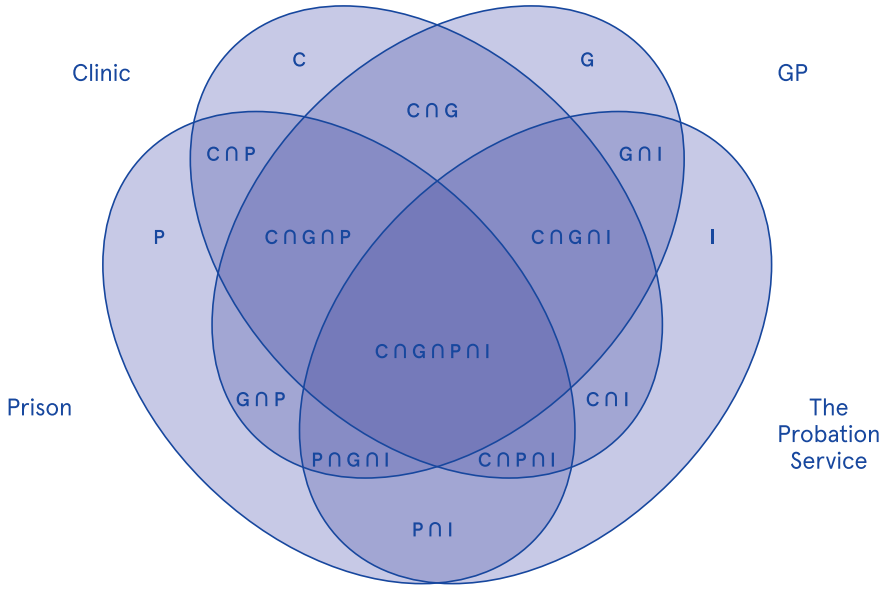


Figure 2: Venn diagram illustrating the overlap and non-overlap of data sources used for our capture-recapture analysis

Note: "∩" denotes the intersection between two or more sources.

C = Clinic CTL data source

G = GP CTL data source

P = Prison CTL data source

I = The Probation Service data source

Matching

The following information was required in order to match cases between lists and to stratify data: name, date of birth, sex, and address. We cleaned the datasets for consistency, and unique identifiers were generated based on initials, date of birth, and sex. Unique identifiers were sorted and exact duplicates were removed. Cases were matched between source lists. All exact matches were considered a match and fixed in the combined dataset. Near matches were also considered to account for errors in data entry. Near matches included those with ±1 or ±10 in the day, month, or year fields and reversal of day/month order for identifiers with the same initials, sex, and address. We considered other near matches that included variations in the spelling of names that resulted in different initials or inconsistent classification of sex between data sources.

We designated an age for individuals based on a mid-year (30 June) capture date. The geographical location of individuals was designated according to the area of their most recent capture or their most likely correct address. This was based on the completeness of the address (i.e. a specific address was preferred to those who gave their address as "no fixed abode"), as well as the frequency with which an address recurred across data sources. Prisoners were assigned the address on their treatment record (for most prisoners, this was their home address, and for those with no fixed abode, it was the prison address). Individuals with no address provided were assigned to the location where they received OST.

Ethical considerations

Ethical approval to conduct this project was obtained from the Clinical Research Ethics Committee of the Cork Teaching Hospitals. Consent declaration was obtained from the Irish Health Research Consent Declaration Committee because, given the nature of the research, it was not possible to retrospectively collect individual consent.

Public and patient involvement

Public and patient involvement (PPI) for this project included engaging with UISCE, an advocacy group representing individuals and families affected by substance misuse. Leaflets describing the research study were distributed by UISCE among their service users. A summary of the research proposal was also advertised online (on the HRB and UCC websites and social media accounts) to publicise that the research was taking place and to provide an opportunity for individuals to ask about how their data were being used.

Data governance and analysis

Formal data-sharing agreements were put in place between UCC and the data controllers for the CTL and the Probation Service. Identifiable data were encrypted and stored on a single computer. As soon as data cleaning and matching between data sources was completed, the identifiable information was deleted, as per the data-sharing agreement.

We conducted data analysis using the R statistical package (https://www.R-project.org/). Employing the capture-recapture method, Poisson log-linear models were applied to the overlapping data to find the model with the best fit in order to estimate the hidden population not identified by any of the data sources. Source-by-source interaction terms were tested by adding them to the base model in all possible combinations.[15] The best model for estimating the size of the hidden population was determined by comparing the deviance to the χ^2 distribution and the Akaike information criterion (AIC) value.[16] The simplest model with the lowest AIC value that provided a credible estimate was used.

For each subunit area, a capture-recapture analysis was performed on unstratified data, data stratified by sex, data stratified by age group, and data stratified by both sex and age group (Figure 3). Each model was checked in order to determine which provided the most credible estimates. This involved comparing the model fit and consistency of unstratified estimates with the sum of age- or sex-stratified estimates. Preference was given to the age- and sex-stratified estimates, with other models being used if the age- and sex-stratified estimates did not provide a good model fit.

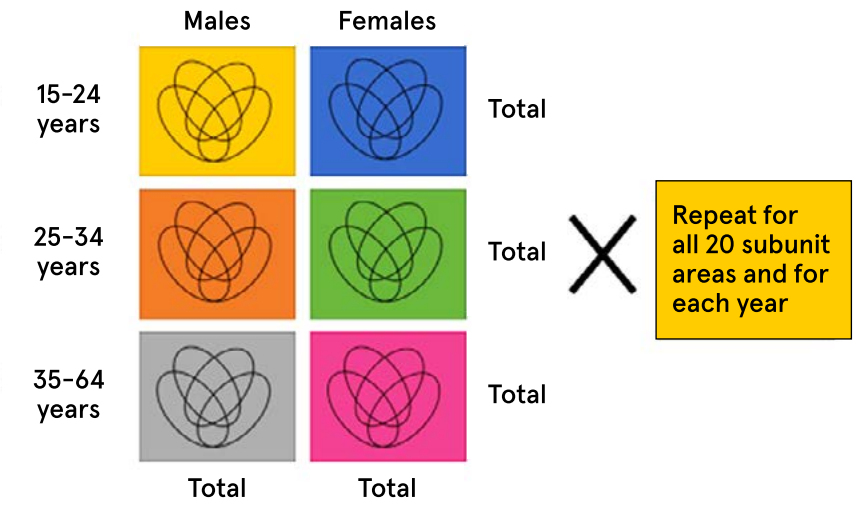


Figure 3: Illustration depicting how six capture-recapture models were used in order to provide sex and age group estimates for each subunit area

Once a model was selected, the point estimates of the stratified models were used in order to determine the estimated proportion of individuals in each stratum. These proportions were applied to the overall 95% CIs to derive the stratified 95% CIs. The main estimates in each subunit area were then added together to provide prevalence estimates for larger areas. The 95% CIs for areas where the estimate was determined as the sum of smaller subunit areas were calculated using a method described by Gemmell *et al.*[17] This involved using simulation methods to generate CIs for the summed estimates. One million random deviates of a log-normal distribution of the intercept from the Poisson regression model (which represents the unknown population) and the standard error of the intercept were generated as part of the simulation. The CIs for the sum of subunit areas were calculated by summing the stratified log-normal distributions and deriving the 2.5 and 97.5 centiles. Rates per 1,000 population were calculated using population estimates for 2020 and 2021, as well as actual population data from the 2022 Census.[18]

Results

Results

Known problematic opioid users

A total of 12,719 individual problematic opioid users were identified from the combined CTL and Probation Service data. This figure represents the known number of problematic opioid users from which subsequent estimates were derived. Table 2 provides details on the age, sex, and regional distribution of these individuals. Notably, the majority of problematic opioid users were in the older age group of 35–64 years (79.8%) and were predominantly male (70.7%). Additionally, most problematic opioid users lived in the east of Ireland (in the HSE Dublin and North East, HSE Dublin and Midlands, and HSE Dublin and South East RHAs).

Table 2: Summary of the known number of problematic opioid users aged 15–64 years (2022)

Variable	n (%) N=12719	Variable	n (%)* N=12719
Age group		**RHA**	
15–24 years	264 (2.1%)	HSE Dublin and North East	4228 (33.2%)
25–34 years	2304 (18.1%)	HSE Dublin and Midlands	4072 (32.0%)
35–64 years	10151 (79.8%)	HSE Dublin and South East	2483 (19.5%)
Sex		HSE South West	967 (7.6%)
Male	8989 (70.7%)	HSE Mid West	575 (4.5%)
Female	3730 (29.3%)	HSE West and North West	394 (3.1%)

*Due to rounding, the percentages in this column do not add up to 100%.

A total of 7,107 unique individuals were identified on the CTL–Clinics list, 4,540 on the CTL–GPs list, 692 on the CTL–Prisons list, and 1,220 on the Probation Service list.

Estimated number of problematic opioid users

In 2022, it was estimated that there were 19,460 problematic opioid users aged 15–64 years in Ireland (95% CI: 19,348–23,158) (see Table 3). This translates to an estimated prevalence rate of 5.79 per 1,000 population (95% CI: 5.76–6.89).

The majority (75.3%) of problematic opioid users were aged 35–64 years, exhibiting an estimated prevalence rate of 7.02 per 1,000 population (95% CI: 6.98–8.35). In contrast, only a small percentage of problematic opioid users were aged 15–24 years (2.7%), with an estimated prevalence rate of 0.82 per 1,000 population (95% CI: 0.81–0.97).

The prevalence of problematic opioid use was notably higher among males, with an estimated rate of 7.96 per 1,000 population (95% CI: 7.91–9.47), compared with a rate of 3.67 per 1,000 population (95% CI: 3.65–4.37) among females.

Table 3: Total estimated number of problematic opioid users, by age group and sex (2022)

Variable	Known	Estimate	95% CI	Rate per 1000 population	95% CI
Total	12719	19460	19348–23158	5.79	5.76–6.89
Age group					
15–24 years	264	527 (2.7%)	524–627	0.82	0.81–0.97
25–34 years	2304	4283 (22.0%)	4258–5097	6.82	6.78–8.12
35–64 years	10151	14650 (75.3%)	14566–17434	7.02	6.98–8.35
Sex					
Male	8989	13218 (67.9%)	13142–15730	7.96	7.91–9.47
Female	3730	6242 (32.1%)	6206–7428	3.67	3.65–4.37

Table 4 presents the regional distribution of problematic opioid users. The highest number of problematic opioid users was in the HSE Dublin and North East RHA, while the highest rate per 1,000 population was in the HSE Dublin and Midlands RHA.

Table 4: Estimated number, rate per 1,000 population, and proportion of male and female problematic opioid users aged 15–64 years, by RHA (2022)

RHA	Known	Estimate	95% CI	Rate per 1000 population	95% CI	Male	Female
HSE Dublin and North East	4228	6299	5844–8589	7.95	7.38–10.84	65.6%	34.4%
HSE Dublin and Midlands	4072	6115	5816–7856	8.49	8.08–10.91	68.7%	31.3%
HSE Dublin and South East	2483	3972	3735–4870	6.35	5.97–7.78	68.8%	31.2%
HSE South West	967	1348	1252–1681	2.81	2.61–3.51	69.1%	30.9%
HSE Mid West	575	960	856–1300	3.62	3.23–4.91	68.4%	31.6%
HSE West and North West	394	766	630–1281	1.60	1.32–2.68	73.1%	26.9%
Total	**12719**	**19460**	**19348–23158**	**5.79**	**5.76–6.89**	**67.9%**	**32.1%**

Figure 4 illustrates the estimated prevalence of problematic opioid use (rate per 1,000 population) in Ireland among those aged 15–64 years by subunit area in 2022. The areas with the highest rates per 1,000 population include the east of Ireland, cities, and the Midlands region. The HSE West and North West RHA had the lowest overall prevalence of problematic opioid users. The point estimates used to inform Figure 4 are included in the Appendix.

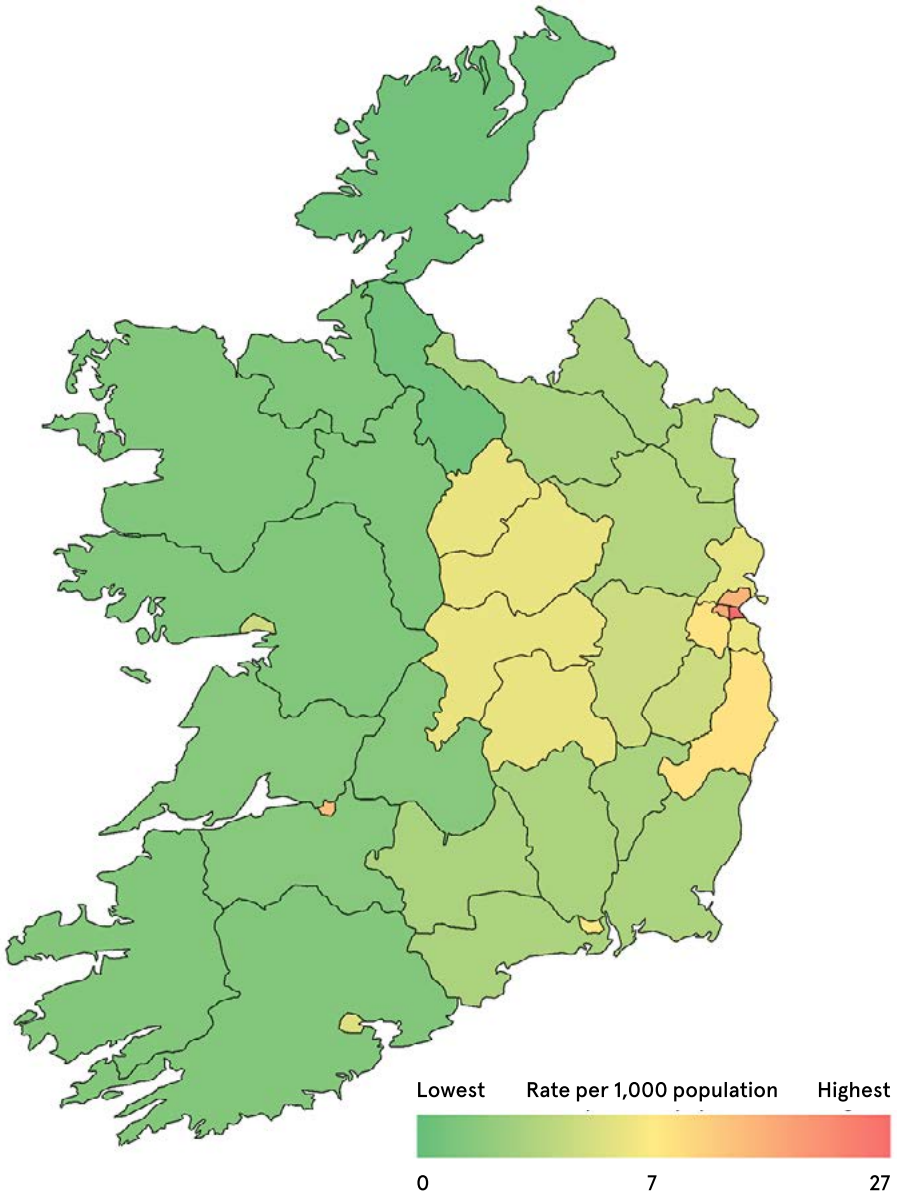


Figure 4: Estimated prevalence of problematic opioid users (rate per 1,000 population) in Ireland among those aged 15–64 years, by subunit area (2022)

Estimated number of problematic opioid users, by age group

Table 5 shows that across all RHAs, 15–24-year-olds made up the smallest proportion of problematic opioid users (range: 2.2–6.5%) and 35–64-year-olds made up the largest proportion of problematic opioid users (range: 61.4–79.1%).

Table 5: Proportion of problematic opioid users, by RHA and age group (2022)

RHA	15–24 years	25–34 years	35–64 years
HSE Dublin and North East	2.2%	18.7%	79.1%
HSE Dublin and Midlands	2.3%	19.9%	77.8%
HSE Dublin and South East	2.7%	24.4%	72.9%
HSE South West	6.5%	32.1%	61.4%
HSE Mid West	2.5%	29.9%	67.6%
HSE West and North West*	3.4%	25.9%	70.8%
Total	**2.7%**	**22.0%**	**75.3%**

*Due to rounding, the percentages in this row do not add up to 100%.

Table 6 provides estimates for problematic opioid use among individuals aged 15–24 years in different RHAs in 2022. The HSE Dublin and Midlands RHA had the highest estimated number of problematic opioid users, while the HSE Mid West RHA had the lowest. The overall estimated number of problematic opioid users aged 15–24 years for all RHAs combined was 527 (95% CI: 524–627). The rate of problematic opioid users per 1,000 population varied across RHAs, ranging from 0.28 to 1.03.

Table 6: Estimates of the number and rate per 1,000 population of problematic opioid users aged 15–24 years, by RHA (2022)

RHA	Known	Estimate	95% CI	Rate per 1000 population	95% CI
HSE Dublin and North East	53	140	130–191	0.92	0.86–1.26
HSE Dublin and Midlands	66	143	136–184	1.03	0.98–1.33
HSE Dublin and South East	60	107	101–131	0.90	0.85–1.10
HSE South West	53	87	81–108	0.96	0.89–1.19
HSE Mid West	18	24	21–33	0.46	0.40–0.63
HSE West and North West	14	26	21–43	0.28	0.23–0.46
Total	**264**	**527**	**524–627**	**0.82**	**0.81–0.97**

Table 7 provides estimates for problematic opioid use among individuals aged 25–34 years in different RHAs in 2022. The HSE Dublin and Midlands RHA had the highest estimated number of problematic opioid users, while the HSE West and North West RHA had the lowest. The overall estimated number of problematic opioid users aged 25–34 years for all RHAs combined was 4,283 (95% CI: 4,258–5,097). The rate of problematic opioid users varied across RHAs, ranging from 2.51 to 8.47 per 1,000 population.

Table 7: Estimates of the number and rate per 1,000 population of problematic opioid users aged 25–34 years, by RHA (2022)

RHA	Known	Estimate	95% CI	Rate per 1000 population	95% CI
HSE Dublin and North East	629	1179	1094–1608	7.40	6.86–10.09
HSE Dublin and Midlands	556	1217	1157–1563	8.39	7.98–10.78
HSE Dublin and South East	488	969	911–1188	8.47	7.96–10.38
HSE South West	347	433	402–540	5.11	4.74–6.37
HSE Mid West	187	287	256–389	6.30	5.62–8.53
HSE West and North West	97	198	163–331	2.51	2.07–4.19
Total	**2304**	**4283**	**4258–5097**	**6.82**	**6.78–8.12**

Table 8 provides estimates for problematic opioid use among individuals aged 35–64 years in different RHAs in 2022. The HSE Dublin and North East RHA had the highest estimated number of problematic opioid users, while the HSE West and North West RHA had the lowest. The overall estimated number of problematic opioid users aged 35–64 years for all RHAs combined was 14,650 (95% CI: 14,566–17,434). The rate of problematic opioid users varied across RHAs, ranging from 1.77 to 10.89 per 1,000 population.

Table 8: Estimates of the number and rate per 1,000 population of problematic opioid users aged 35–64 years, by RHA (2022)

RHA	Known	Estimate	95% CI	Rate per 1000 population	95% CI
HSE Dublin and North East	3546	4980	4620–6790	10.35	9.60–14.11
HSE Dublin and Midlands	3450	4755	4522–6109	10.89	10.36–14.00
HSE Dublin and South East	1935	2896	2723–3551	7.37	6.93–9.04
HSE South West	567	828	769–1033	2.73	2.53–3.40
HSE Mid West	370	649	579–879	3.89	3.47–5.26
HSE West and North West	283	542	446–906	1.77	1.45–2.95
Total	**10151**	**14650**	**14566–17434**	**7.02**	**6.98–8.35**

Estimated number of problematic opioid users, by CHO area

Nine CHOs in Ireland deliver primary and community-based services in response to the needs of local communities. Table 9 provides estimates of the number of problematic opioid users aged 15–64 years by CHO area for 2022, along with rates per 1,000 population. CHO 9 had the highest estimated number of problematic opioid users, at 5,149 (95% CI: 4,634–7,126) and a rate of 11.03 per 1,000 population (95% CI: 9.93–15.27), followed by CHO 7, with an estimated 4,876 problematic opioid users (95% CI: 4,584–6,541) and a rate of 9.45 per 1,000 population (95% CI: 8.89–12.68). In contrast, CHO 1 had the lowest estimated number of problematic opioid users, at 406 (95% CI: 326–1,192), corresponding to a rate of 1.57 per 1,000 population (95% CI: 1.26–4.61).

Table 9: Estimates of the number and rate per 1,000 population of problematic opioid users aged 15–64 years, by CHO area (2022)

CHO area	Known	Estimate	95% CI	Rate per 1000 population	95% CI
CHO 1	197	406	326–1192	1.57	1.26–4.61
CHO 2	319	642	504–1154	2.08	1.63–3.74
CHO 3	575	960	856–1300	3.62	3.23–4.91
CHO 4	967	1348	1252–1681	2.81	2.61–3.51
CHO 5	882	1306	1192–1515	3.73	3.40–4.32
CHO 6	1601	2666	2436–3520	9.68	8.84–12.78
CHO 7	3432	4876	4584–6541	9.45	8.89–12.68
CHO 8	1174	2107	1894–2615	4.78	4.30–5.93
CHO 9	3572	5149	4634–7126	11.03	9.93–15.27
Total	**12719**	**19460**	**19348–23158**	**5.79**	**5.76–6.89**

Table 10 provides estimates of the number of problematic opioid users in Ireland in 2022 by CHO area and age group. CHO 9 and CHO 7 had the highest estimated numbers in all age groups, particularly among those aged 35–64 years, with an estimated 4,123 problematic opioid users aged 35–64 years in CHO 9 and 3,971 problematic opioid users aged 35–64 years in CHO 7. CHO 1 consistently had the lowest estimates across all age groups.

Table 10: Estimates of the number of problematic opioid users aged 15–64 years, by age group and CHO area (2022)

CHO area	15–24 years			25–34 years			35–64 years		
	Known	Estimate	95% CI	Known	Estimate	95% CI	Known	Estimate	95% CI
CHO 1	5	9	7–26	51	117	94–344	141	280	225–822
CHO 2	10	19	15–34	79	175	137–315	230	448	352–805
CHO 3	18	24	21–33	187	287	256–389	370	649	579–879
CHO 4	53	87	81–108	347	433	402–540	567	828	769–1033
CHO 5	38	71	65–82	261	406	371–471	583	829	757–962
CHO 6	22	36	33–48	227	563	514–743	1352	2067	1889–2729
CHO 7	45	110	103–148	365	795	747–1066	3022	3971	3733–5327
CHO 8	36	69	62–86	310	583	524–724	828	1455	1308–1806
CHO 9	37	102	92–141	477	924	832–1279	3058	4123	3711–5706
Total	**264**	**527**	**524–627**	**2304**	**4283**	**4258–5097**	**10151**	**14650**	**14566–17434**

Table 11 provides estimates of the rate per 1,000 population of problematic opioid users in Ireland in 2022 by CHO area and age group. CHO 9 had the highest rates in the 15–24 years and the 35–64 years age groups, with 1.16 and 15.03 users per 1,000 population, respectively. CHO 6 had the highest rate in the 25–34 years age group (10.10 per 1,000 population). CHO 1 had the lowest estimated rates in all age groups.

Table 11: Estimates of the rate per 1,000 population of problematic opioid users aged 15–64 years, by age group and CHO area (2022)

CHO area	15–24 years		25–34 years		35–64 years	
	Estimate	95% CI	Estimate	95% CI	Estimate	95% CI
CHO 1	0.18	0.14–0.53	2.80	2.25–8.23	1.67	1.34–4.91
CHO 2	0.32	0.25–0.57	3.37	2.63–6.06	2.28	1.79–4.10
CHO 3	0.46	0.40–0.63	6.30	5.62–8.53	3.89	3.47–5.26
CHO 4	0.96	0.89–1.19	5.11	4.74–6.37	2.73	2.53–3.40
CHO 5	1.07	0.98–1.23	6.92	6.32–8.03	3.68	3.36–4.27
CHO 6	0.69	0.63–0.92	10.10	9.22–13.33	12.33	11.27–16.27
CHO 7	1.11	1.04–1.49	7.22	6.78–9.68	12.95	12.18–17.38
CHO 8	0.80	0.72–0.99	7.83	7.03–9.72	5.20	4.68–6.46
CHO 9	1.16	1.05–1.61	8.81	7.93–12.19	15.03	13.53–20.80
Total	**0.82**	**0.81–0.97**	**6.82**	**6.78–8.12**	**7.02**	**6.98–8.35**

Estimated number of problematic opioid users, by RDATF area

There are 10 RDATFs in Ireland. These RDATFs were developed in order to combat problematic drug use throughout the country via the area-based partnership approach adopted by the statutory, voluntary, and community sectors. Table 12 provides estimates of problematic opioid users in 2022 by RDATF area. North Dublin had the highest estimated number (5,149) and the highest rate per 1,000 population (11.03) of problematic opioid users, followed by the South Western (4,876 problematic opioid users; 9.45 per 1,000 population) and East Coast (2,666 problematic opioid users; 9.68 per 1,000 population) RDATF areas. The Northwest RDATF area had the lowest estimates, with 124 problematic opioid users and a rate of 0.73 per 1,000 population.

Table 12: Estimates of the number and rate per 1,000 population of problematic opioid users aged 15–64 years, by RDATF area (2022)

RDATF area	Known	Estimate	95% CI	Rate per 1000 population	95% CI
East Coast	1601	2666	2436–3520	9.68	8.84–12.78
Mid West	575	960	856–1300	3.62	3.23–4.91
Midland	640	1239	1063–1604	6.07	5.20–7.85
North Dublin	3572	5149	4634–7126	11.03	9.93–15.27
North Eastern	656	1150	1010–2020	3.53	3.10–6.21
Northwest	75	124	114–143	0.73	0.67–0.84
South East	882	1306	1192–1515	3.73	3.40–4.32
South Western	3432	4876	4584–6541	9.45	8.89–12.68
Southern	967	1348	1252–1681	2.81	2.61–3.51
Western	319	642	504–1154	2.08	1.63–3.74
Total	**12719**	**19460**	**19348–23158**	**5.79**	**5.76–6.89**

Estimated number of problematic opioid users, by city

Table 13 shows the prevalence of problematic opioid users in 2022 in the cities of Dublin, Cork, Galway, Limerick, and Waterford. Dublin city had a significantly higher prevalence of problematic opioid users, at 17.05 per 1,000 population (95% CI: 15.90–21.94), than the other cities. Galway city had the lowest prevalence of problematic opioid users, at 4.76 per 1,000 population (95% CI: 3.28–8.90).

Table 13: Estimates of the number and rate per 1,000 population of problematic opioid users aged 15–64 years, by city (2022)

City	Known	Estimate	95% CI	Rate per 1000 population	95% CI
Dublin	5172	7240	6752–9318	17.05	15.90–21.94
Cork	610	859	774–1079	5.59	5.04–7.02
Galway	148	289	199–540	4.76	3.28–8.90
Limerick	350	581	493–807	13.67	11.60–18.98
Waterford	172	272	226–407	7.53	6.25–11.26

Estimated number of problematic opioid users, by County Dublin versus the rest of Ireland

Table 14 and Figure 5 show that in 2022, almost 6 in 10 problematic opioid users lived in County Dublin and that the prevalence rate per 1,000 population was significantly higher there than in the rest of Ireland (11.17 versus 3.53).

Table 14: Estimates of the number and rate per 1,000 population of problematic opioid users, by County Dublin versus the rest of Ireland (2022)

Location	Known	Estimate	95% CI	Rate per 1000 population	95% CI
County Dublin	7828	11100	10684–13761	11.17	10.75–13.85
Rest of Ireland	4891	8360	8189–10346	3.53	3.46–4.37

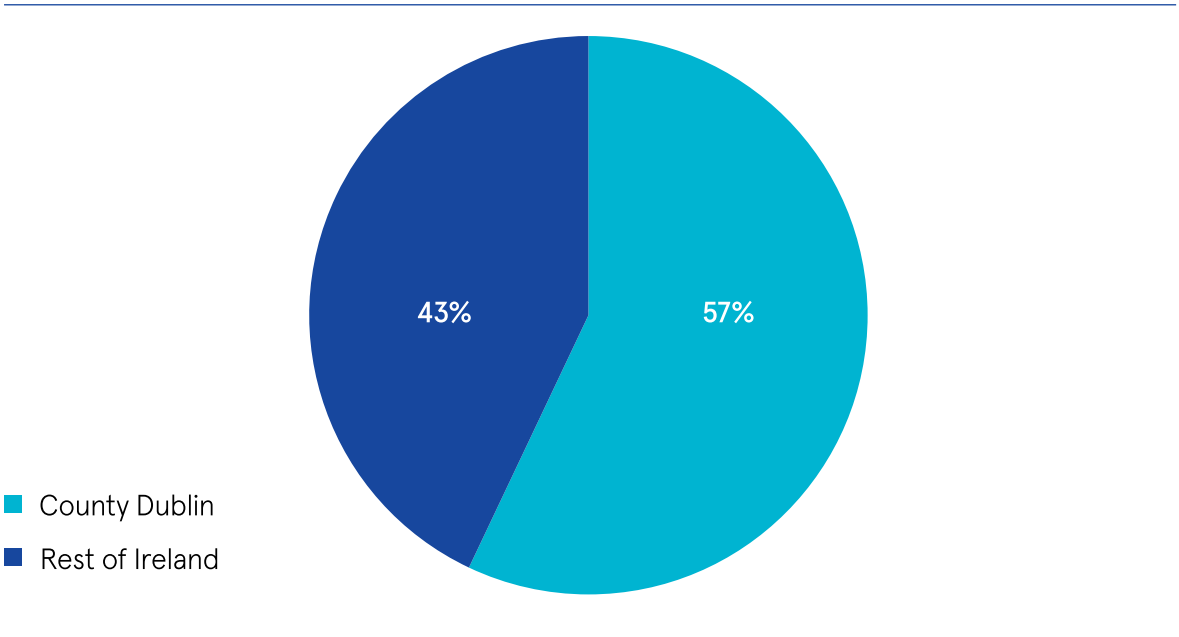


Figure 5: Proportion of estimated problematic opioid users, by County Dublin versus the rest of Ireland (2022)

Trends in problematic opioid use over time

Tables 15 and 16 show how the estimated number of problematic opioid users changed between 2020 and 2022. The overall estimated number of problematic opioid users remained stable between 2020 and 2022, as indicated by overlapping 95% CIs. However, the estimated number of problematic opioid users aged 15–24 years decreased, from 685 (95% CI: 673–779) in 2020 to 527 (95% CI: 524–627) in 2022, a statistically significant decrease. No notable changes in the other age groups were observed.

Table 15: Comparison of estimated number of problematic opioid users over time, by age group (2020–2022)

	2020			2021			2022		
Age group	**Known**	**Estimate**	**95% CI**	**Known**	**Estimate**	**95% CI**	**Known**	**Estimate**	**95% CI**
15–24 years	420	685	673–779	368	645	637–744	264	527	524–627
25–34 years	2781	4772	4686–5425	2627	4240	4185–4889	2304	4283	4258–5097
35–64 years	9537	15528	15248–17653	9899	15557	15354–17937	10151	14650	14566–17434
Total	**12738**	**20985**	**20606–23857**	**12894**	**20442**	**20175–23569**	**12719**	**19460**	**19348–23158**

Table 16: Comparison of estimated rate of problematic opioid users per 1,000 population over time, by age group (2020–2022)

	2020		2021		2022	
Age group	**Rate per 1000 population**	**95% CI**	**Rate per 1000 population**	**95% CI**	**Rate per 1000 population**	**95% CI**
15–24 years	1.07	1.06–1.22	1.01	0.99–1.16	0.82	0.81–0.97
25–34 years	7.60	7.46–8.64	6.78	6.69–7.82	6.82	6.78–8.12
35–64 years	7.67	7.53–8.72	7.57	7.48–8.73	7.02	6.98–8.35
Total	**6.38**	**6.26–7.25**	**6.16**	**6.08–7.10**	**5.79**	**5.76–6.89**

Discussion

Discussion

Summary of findings

The research described in this report assessed the prevalence of problematic opioid use in Ireland during the years 2020–2022. It is estimated that there were 19,460 problematic opioid users in Ireland (95% CI: 19,348–23,158) in 2022, which equates to a prevalence rate of 5.79 per 1,000 population (95% CI: 5.76–6.89). The majority of problematic opioid users lived in County Dublin, were male, and were aged 35–64 years.

Comparison with previous studies

This study represents the third national capture-recapture study in Ireland to utilise four data sources: clinics, GPs, prisons, and the Probation Service. When comparing summary findings from previous studies with those shown in this report (Table 17), a stable overall estimated number of problematic opioid users was observed in Ireland between 2014 and 2022. There has been a slight decrease in the estimated number of problematic opioid users in County Dublin; the estimated number of problematic opioid users living in the rest of Ireland outside of County Dublin has increased from 5,530 (95% CI: 5,406–8,023) in 2014 to 8,360 (95% CI: 8,189–10,346) in 2022.[2] However, these differences were not statistically significant based on overlapping 95% CIs. Notably, there was a significant decrease in the estimated number of problematic opioid users aged 15–24 years and aged 25–34 years, accompanied by a significant increase in the estimated number of problematic opioid users aged 35–64 years, between 2014 and 2022.[2] These data also show that there was no significant change in the proportion of male or female problematic opioid users during this period.

Table 17: Comparison of the estimated number of problematic opioid users in Ireland, 2014, 2019, and 2022

	2014		2019		2022	
Variable	**Estimate**	**95% CI**	**Estimate**	**95% CI**	**Estimate**	**95% CI**
County Dublin	13458	12564–14220	11729	11298–12944	11100	10684–13761
Rest of Ireland	5530	5406–8023	8146	7885–9160	8360	8189–10346
15–24 years	1092	1076–1234	730	717–794	527	524–627
25–34 years	6672	6578–7539	4650	4567–5055	4283	4258–5097
35–64 years	11224	11065–12681	14495	14238–15759	14650	14566–17434
Male	13022	12838–14713	14370	14115–15623	13218	13142–15730
Female	5966	5882–6741	5505	5407–5985	6242	6206–7428
Total	**18988**	**18720–21454**	**19875**	**19522–21608**	**19460**	**19348–23158**

The estimates in this report are consistent with data from the NDTRS, which show a steady decrease in the number of problematic opioid users aged 15–24 years and aged 25–34 years receiving treatment, alongside an increase in the number of those aged 35–64 years, over time.[19] The observed ageing cohort effect may reflect improved harm reduction services allowing problematic opioid users to live longer. Additionally, changes in drug use behaviours are evident, with problematic opioid users initiating opioid use later in life, reducing injection practices, using opioids less frequently, and seeking treatment at later stages.[20]

European comparisons

Comparing our estimates of problematic opioid use in Ireland with those from other European Union (EU) member states is challenging due to differences in methodologies and study years. However, the EUDA reports that national rates of high-risk opioid use in the EU range from less than 1 to nearly 10 users per 1,000 population aged 15–64 years.[21] Based on the most recent European Drug Report from 2022 and our data, Ireland would rank sixth highest in the EU for problematic opioid use according to upper 95% CI estimates.[21] EU member states with higher estimates include Denmark (4.0–9.6 per 1,000 population), Finland (6.9–8.6 per 1,000 population), Italy (7.2–7.9 per 1,000 population), Latvia (4.6–7.0 per 1,000 population), and Portugal (3.0–7.0 per 1,000 population).[21] The United Kingdom also has high estimates, with rates of 8.1–8.6 per 1,000 population reported in 2018.[22] Notably, our findings align with trends in other EU member states, where the majority of opioid users are male, and an ageing cohort effect is observed.[21,23]

Changing attitudes towards heroin

The decrease in problematic opioid use among younger age groups in Ireland remains speculative. Heroin is the primary opioid misused in Ireland, but qualitative research in Dublin indicates that many young people now view heroin extremely negatively.[4,24] Furthermore, even among adolescents engaged in extensive polydrug use, a significant number avoid heroin.[25] Similar trends in other European countries suggest that younger individuals may be wary of opioid use after witnessing its harmful effects on previous generations.[23,26] Additionally, the availability of prompt and accessible treatment may reduce the number of active heroin users, thereby decreasing the chances of others being introduced to the drug. A recent Irish study found that adolescents with heroin dependence gradually reduced their use during the first year of treatment, with one-half achieving complete abstinence by the twelfth month of treatment.[27] Since opioids are unlikely to be the first illicit drugs used by most individuals seeking treatment, interventions targeting other forms of illicit drug use may also help prevent the progression to problematic opioid use.[20]

However, when interpreting the findings of this report, it is important to consider recent data from the 2019–20 Irish National Drug and Alcohol Survey, which showed an increase in the use of stimulant-type drugs (e.g. cocaine, ecstasy, and amphetamines) in Ireland since 2014–15.[7] This increase was particularly notable among younger age groups. A similar trend is evident in Irish treatment data, where cocaine has become the most common primary drug of concern among new treatment entrants.[4] Additional research indicates a rise in the use of non-prescribed benzodiazepines and sedative-hypnotic drugs (known as 'street tablets') among young people, with their use being normalised in some communities due to easy availability and low cost.[28] Consequently, the observed trends in opioid use among younger age groups may reflect a shift towards other more accessible and inexpensive drugs that are perceived to be less harmful than opioids.[23]

Potential impact of the COVID-19 pandemic

Before the COVID-19 crisis, long waiting lists for OST often hindered access to care, particularly among people experiencing homelessness.[29–31] However, experiences during the COVID-19 pandemic demonstrated the system's ability to increase access, have shorter waiting times, and have fewer barriers to treatment (including remote care and supervision), which were particularly effective in rural areas, thus reducing drug-related harm.[32–34] As a result, access to OST increased during the pandemic, with a peak in the number of people accessing treatment in April 2020, 41% of whom had no prior treatment experience.[34] However, this increase in starting or re-entering OST was not sustained.[34] Additionally, it should be recognised that the COVID-19 pandemic may have made it more difficult for some people who had never been assessed for treatment before to enrol in services, leading to their underrepresentation in our data sources and, consequently, a potential underestimation of some groups in this report. It should also be noted that there was less overlap between data sources in this study compared with previous studies, potentially due to lower dropout rates observed during the pandemic, and this may also have influenced the accuracy of our estimates.[34] While the models used to produce these estimates showed a good fit to the data, the 95% CIs are wider compared with previous studies, suggesting greater uncertainty in the estimates.

Strengths

This research has several strengths that enhance the validity, reliability, and comparability of its findings. First, it utilises comprehensive national datasets that provide robust data sources for capture-recapture analysis. The use of data sources consistent with those used in the 2011–2014 and 2015–2019 opioid prevalence studies is another significant strength; this methodological consistency ensures continuity in approach, allows for meaningful comparisons, and supports the analysis of changes in the prevalence of problematic opioid use in Ireland from 2011 to 2022.

Additionally, this study employs methods recommended by the EUDA, which are well-supported by peer-reviewed literature.[1] Capture-recapture analysis – a recognised and validated method for estimating the prevalence of hidden or hard-to-reach populations, such as problematic opioid users – is a key component of this study.[1] Notably, this report contributes to the literature by providing a more detailed account of the methods used in order to produce these estimates when compared with other published works using similar methodologies.[2,8,10,11]

Limitations

Despite the strengths outlined above, this study also has limitations that warrant consideration. In particular, it is necessary to consider the inherent assumptions of capture-recapture analysis. These assumptions can be summarised as follows:

1. **Closed population:** Achieving complete closure in human capture-recapture studies is challenging due to possible inward and outward migration and the occurrence of deaths during the study period. In order to minimise this issue, we used 1-year sampling frames.
2. **Individual matching:** The data sources used are not explicitly designed for research or capture-recapture analysis. Individuals lack a unique identifier in the source data, and errors may have occurred upon data entry, leading to unintentional matching errors.
3. **Independence of captures:** Complete independence between captures in different data sources is unlikely, as problematic opioid users exhibit diverse drug use behaviours. Long-term OST patients may be less likely to appear in multiple data sources, while those with numerous acute treatment episodes may appear in several sources.
4. **Homogeneity of capture probabilities:** Capture probabilities may not be consistent across all individuals in the population, further complicating the analysis.

To address these limitations, our study accounted for migration between counties by considering captures across different regions within Ireland. However, the method used to classify addresses could have led to either over- or underestimation of problematic opioid user prevalence in certain subunit areas. It is also important to recognise this study's reliance on the overlap between data sources, especially when dealing with small numbers of individuals. Even slight differences in these numbers can significantly affect estimates, particularly for subgroups with fewer known problematic opioid users, such as the 15–24-year-old age group, females, and regions with low prevalence rates. Therefore, the point estimates presented in this report should be interpreted with caution.

Nevertheless, despite these constraints, this study provides valuable insights into the prevalence of problematic opioid use in Ireland, which may help inform strategies to address this significant public health issue. Ongoing efforts in terms of data collection, model refinement, and collaboration among relevant agencies will be crucial in improving the accuracy and effectiveness of future capture-recapture studies on problematic opioid use.

Conclusion

Conclusion

In conclusion, the results from this study indicate that the overall number of problematic opioid users in Ireland remained stable from 2020 to 2022, but with a significant decrease observed in the 15–24-year-old age group. This decrease is a positive development, given the harmful and addictive nature of opioids. Ongoing research in this area will be crucial for effective service planning and to allow policy-makers to evaluate the impact of strategies aimed at reducing drug-related harms. Further targeted interventions may be needed to enhance the response to opioid misuse in Ireland, leading to better outcomes for affected individuals and communities.

Appendix

Appendix

Table A1: Regional Health Area definitions

Regional Health Area (RHA)	Description
Health Service Executive (HSE) Dublin and North East	Cavan (excluding West Cavan), Louth, Meath, Monaghan, and North Dublin
HSE Dublin and Midlands	Laois, Longford, Offaly, Dublin South West, West Dublin, Dublin South City, Kildare, West Wicklow, and Westmeath
HSE Dublin and South East	Carlow, Kilkenny, South East Dublin, South Tipperary, Waterford, Wexford, and East Wicklow
HSE South West	Cork and Kerry
HSE Mid West	Clare, Limerick, and North Tipperary
HSE West and North West	Donegal, Leitrim, Sligo, West Cavan, Mayo, Galway, and Roscommon

Table A2: Community Healthcare Organisation area definitions

Community Healthcare Organisation (CHO) area	Description
CHO 1	Cavan, Donegal, Leitrim, Monaghan, and Sligo
CHO 2	Galway, Mayo, and Roscommon
CHO 3	Clare, Limerick, and North Tipperary
CHO 4	Cork and Kerry
CHO 5	Carlow, Kilkenny, South Tipperary, Waterford, and Wexford
CHO 6	South East Dublin and East Wicklow
CHO 7	Dublin South West, West Dublin, Dublin South City, Kildare, and West Wicklow
CHO 8	Laois, Longford, Louth, Meath, Offaly, and Westmeath
CHO 9	North Dublin

Table A3: Regional Drug and Alcohol Task Force area definitions

Regional Drug and Alcohol Task Force area (RDATF)	Description
East Coast	East Wicklow and South Dublin
Mid West	Clare, Limerick, and North Tipperary
Midland	Laois, Longford, Offaly, and Westmeath
North Dublin	North Dublin city and county
North Eastern	Cavan (excluding north-west Cavan), Louth, Meath, and Monaghan
Northwest	Donegal, Leitrim, Sligo, and north-west Cavan
South East	Carlow, Kilkenny, Waterford, Wexford, and South Tipperary
South Western*	South-west Dublin, West Wicklow, and Kildare
Southern	Cork and Kerry
Western	Galway, Mayo, and Roscommon

*Also known as "Substance Use Regional Forum"

Table A4: Prevalence of problematic opioid users (rate per 1,000 population) in Ireland among those aged 15–64 years, by subunit area (2022)

Subunit area	Rate per 1000 population
Sligo, Leitrim, and Donegal	0.73
Galway (excluding Galway city), Mayo, and Roscommon	1.42
Cavan and Monaghan	3.17
Limerick (excluding Limerick city), Clare, and North Tipperary	1.70
Cork (excluding Cork city) and Kerry	1.50
Galway city	4.76
Waterford (excluding Waterford city), Kilkenny, South Tipperary, Carlow, and Wexford	3.29
Louth and Meath	3.67
Kildare and West Wicklow	4.78
Fingal	5.91
Dún Laoghaire–Rathdown	6.13
Westmeath, Laois, Longford, and Offaly	6.07
Cork city	5.59
Limerick city	13.67
Waterford city	7.53
East Wicklow	8.53
South-west Dublin	8.26
Dublin city (south-east)	26.92
Dublin city (north)	15.59
Dublin city (south-west)	17.01

References

1. European Monitoring Centre for Drugs and Drug Addiction (2013) *PDU (problem drug use) revision summary*. Luxembourg: Publications Office of the European Union.
2. Hay G, Jaddoa A, Oyston J, Webster J, Van Hout MC and Rael dos Santos A (2017) *Estimating the prevalence of problematic opiate use in Ireland using indirect statistical methods*. Dublin: National Advisory Committee on Drugs and Alcohol.
3. European Monitoring Centre for Drugs and Drug Addiction (2019) *European drug report 2019: trends and developments*. *Annual report*. Luxembourg: Publications Office of the European Union.
4. Kelleher C, Condron I and Lyons S (2022) *2015 - 2021 drug treatment data*. Dublin: Health Research Board.
5. O'Neill D, Lyons S and Carew AM (2023) *National Drug Treatment Reporting System 2022: drug treatment demand*. Dublin: Health Research Board.
6. Health Research Board and Irish National Focal Point to the European Monitoring Centre for Drugs and Drug Addiction (2024) *Focal Point Ireland: national report for 2023*. Dublin: Health Research Board.
7. Mongan D, Millar SR and Galvin B (2021) *The 2019–20 Irish National Drug and Alcohol Survey: main findings*. Dublin: Health Research Board.
8. Hanrahan MT, Millar SR, Phillips KP, Reed TE, Mongan D and Perry IJ (2022) *Problematic opioid use in Ireland, 2015–2019*. Dublin: Health Research Board.
9. Kelly A, Carvalho M, Teljeur C, et al. (2003) *Prevalence of opiate use in Ireland 2000-2001: a 3-source capture recapture study*. Dublin: National Advisory Committee on Drugs.
10. Comiskey C (1998) *Estimating the prevalence of opiate drug use in Dublin, Ireland during 1996*. Dublin: Department of Health and Children.
11. Kelly A, Teljeur C, Carvalho M and National Advisory Committee on Drugs (2009) *Prevalence of opiate use in Ireland 2006: a 3-source capture recapture study*. Dublin: National Advisory Committee on Drugs.
12. European Monitoring Centre for Drugs and Drug Addiction (2018) *European drug report 2018 trends and developments*. Luxembourg: Publications Office of the European Union.
13. Department of Health (2017) *Reducing harm, supporting recovery. A health-led response to drug and alcohol use in Ireland 2017-2025*. Dublin: Department of Health.
14. Dillon L (2021) Publication of EU Drugs Strategy 2021–2025. *Drugnet Ireland*, 1–6.
15. Jones HE, Hickman M, Welton NJ, De Angelis D, Harris RJ and Ades A (2014) Recapture or precapture? Fallibility of standard capture-recapture methods in the presence of referrals between sources. *Am J Epidemiol*, 179(11): 1383–1393.

16. Anderson D, Burnham K and White G (1994) AIC model selection in overdispersed capture-recapture data. *Ecology*, 75(6): 1780–1793.

17. Gemmell I, Millar T and Hay G (2004) Capture-recapture estimates of problem drug use and the use of simulation based confidence intervals in a stratified analysis. *J Epidemiol Community Health*, 58(9): 758–765.

18. National Health Intelligence Unit (nd Population tables - Health Atlas Ireland. *National Health Intelligence Unit*. Available from: https://www.healthatlasireland.ie (accessed 30 July 2023).

19. HRB National Drugs Library (2022) National Drug Treatment Reporting System (NDTRS) online interactive tables. Health Research Board. Available from: https://www.drugsandalcohol.ie/tables/ (accessed 30 July 2023).

20. Carew AM and Comiskey C (2018) Rising incidence of ageing opioid users within the EU wide treatment demand indicator; the Irish opioid epidemic from 1996 to 2014. *Drug Alcohol Depend*, 192: 329–337.

21. European Monitoring Centre for Drugs and Drug Addiction (2022) *European Drug Report 2022: trends and developments*. Luxembourg: Publications Office of the European Union.

22. Public Health England, Home Office, Welsh Government, et al. (2020) *United Kingdom drug situation: Focal Point annual report 2019*. London: Gov.UK.

23. European Monitoring Centre for Drugs and Drug Addiction (2021) Opioids: health and social responses. *European Monitoring Centre for Drugs and Drug Addiction*. Available from: https://www.emcdda.europa.eu/publications/mini-guides/opioids-health-and-social-responses_en (accessed 30 July 2023).

24. Saris A and O'Reilly F (2010) *A dizzying array of substances: an ethnographic study of drug use in the Canal Communities area*. Dublin: Canal Communities Local Drugs Task Force.

25. Smyth BP and McCarney G (2020) Treatment of adolescent heroin dependence: the end of an era. *Ir Med J*, 113(1): 2.

26. Nordt C and Stohler R (2006) Incidence of heroin use in Zurich, Switzerland: a treatment case register analysis. *Lancet*, 367(9525): 1830–1834.

27. Smyth BP, Elmusharaf K and Cullen W (2018) Opioid substitution treatment and heroin dependent adolescents: reductions in heroin use and treatment retention over twelve months. *BMC Pediatr*, 18(1): 1–12.

28. Duffin T, Keane M and Millar SR (2020) *Street tablet use in Ireland. A trendspotter study on use, markets, and harms*. Dublin: Ana Liffey Drug Project.

29. Delargy I, Crowley D and Van Hout MC (2019) Twenty years of the methadone treatment protocol in Ireland: reflections on the role of general practice. *Harm Reduct J*, 16: 1–10.

30. O'Carroll A, Duffin T and Collins J (2021) Harm reduction in the time of COVID-19: case study of homelessness and drug use in Dublin, Ireland. *Int J Drug Policy*, 87: 102966.

31. Van Hout MC, Crowley D, McBride A and Delargy I (2018) Optimising treatment in opioid dependency in primary care: results from a national key stakeholder and expert focus group in Ireland. *BMC Fam Pract*, 19: 1–8.

32. Crowley D and Delargy I (2020) A national model of remote care for assessing and providing opioid agonist treatment during the COVID-19 pandemic: a report. *Harm Reduct J*, 17(1): 49.

33. Health Research Board and Irish National Focal Point to the European Monitoring Centre for Drugs and Drug Addiction (2023) *Focal Point Ireland: national report for 2022 – harms and harm reduction*. Dublin: Health Research Board.

34. Durand L, Boland F, Harnedy N, et al. (2023) Impact of changes to the delivery of opioid agonist treatment, introduced during the COVID-19 pandemic, on treatment access and dropout in Ireland: an interrupted time series analysis. *J Subst Use Addict Treat*, 149: 209029.