

Long-term outcomes of people treated for substance misuse in Wales - A data linkage study

 Data Report



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Background

When considering health, crime, family and societal costs, the estimated cost to society of illegal drugs in England and Wales is around £20 billion per year¹. Alcohol harm costs the NHS around £3.5 billion per year, with the cost to wider society estimated at £25 billion². There were around 8,500 individuals admitted into hospital in Wales with an alcohol-specific condition in 2022-23 and around 3,400 for illicit drug use.³

High quality treatment and support is the most effective way of improving outcomes for individuals at risk of harm from substance use.

Substance misuse treatment aims to match individual needs and varies depending on the substance type (including alcohol and/or illicit drugs including opioids, stimulants such as cocaine, crack and amphetamine, cannabinoids and other drugs) and severity including:

- harm reduction services
- community-based programmes and structured psychosocial interventions
- community prescribing delivered through specialist substance misuse teams or GP-led shared care
- Inpatient detoxification and stabilisation programmes and residential rehabilitation for those requiring more intensive and acute

An integrated care approach means that individuals should be able to access a combination of modalities as part of treatment.

To date, no assessment of long-term substance misuse treatment outcomes has been conducted in Wales. Since substance misuse can be a relapsing condition, monitoring outcomes which could indicate a return to harmful substance use for people who have engaged with treatment is essential in assessing the effectiveness of these services in Wales.

This Data Insight presents the findings of a study conducted as part of the BOLD Substance Misuse Demonstrator Pilot (Phase 1) in Wales, which focuses on substance misuse treatment effectiveness. Further information on the BOLD programme can be found here: [Better Outcomes Through Linked Data \(BOLD\)](#)

This research, focussing on long-term outcomes for people treated for substance misuse in Wales, forms part of a wider study examining the predictors of individuals completing or not completing treatment in Wales in order to identify opportunities for improved engagement and more effective substance misuse treatment services.



What we did

Using routinely collected administrative health data from the Secure Anonymised Information Linkage (SAIL) Databank, we identified all individuals aged 10 years and above who had commenced substance misuse treatment in Wales between January 2014 and December 2019, identified in the Welsh National Database for Substance Misuse (WNDSM).

All treatment episodes were examined for each individual, and an overall completion status was assigned based on their treatment history: 'did not complete treatment' if none of their treatment episodes was defined as completed or 'completed treatment' if at least one of their treatment episodes was defined as completed.

Completion status was assigned to each treatment episode based on the reason for exit given by the treatment provider as follows:

- **Treatment completion:**
 - Treatment completed – problematic substance free
 - Treatment completed – client has reached their goals
- **Treatment non-completion**
 - Treatment withdrawn by provider
 - Referred to another service
 - Did not attend or respond to follow-up contact
 - Moved from area
 - Prison/retained in custody
 - Deceased

We then identified the last treatment episode for each individual and linked this data to health data sets to identify subsequent substance use-related health events, hereafter referred to as 'events' which could indicate further harmful substance use. These events were defined as follows (see Appendix A for code list):

- Re-referral into substance misuse treatment services (WNDSM)
- Emergency department attendance with a substance misuse-related diagnosis: alcohol or drug poisoning or chronic alcohol or drug use identified from the Emergency Department Dataset (EDDS)
- Hospital admissions for poisoning by illicit drug use and alcohol-specific conditions, identified from the Patient Episode Dataset for Wales (PEDW)
- Alcohol-specific or drug-related deaths identified from the Annual District Death Extract (ADDE)

We looked for events occurring to the end of December 2021 to ensure follow-up period of at least two years for all individuals. Follow-up time was calculated as the



number of days from treatment end to either:

- a) A substance misuse-related health event or return to treatment
- b) De-registration with a Welsh GP or death from a cause that was not substance misuse specific
- c) End of the study period (31st December 2021), whichever was earliest

We stratified the statistical analysis by the main problem substance during an individual's last treatment episode, as follows:

- Alcohol
- Amphetamines and ecstasy
- Cocaine and crack cocaine
- Cannabis
- Heroin, methadone and other opiates
- 'Other drugs' - this includes prescribed drugs, benzodiazepines, hallucinogens and solvents.

We used statistical methods to calculate the likelihood of people reaching two years and, where possible, five years post-treatment without having an event and to determine whether successful completion of substance misuse treatment affects the time it takes for a subsequent event to occur for each subgroup (Kaplan-Meier estimation and Cox regression).

We also analysed the findings based on a number of socio-demographic factors, including sex, age, age, ethnicity, deprivation level, employment status, accommodation status, parental status and mental health status. In addition, we incorporated a number of treatment-related factors including treatment modality, referral route, treatment duration, number of days drugs/ alcohol were used in the 28 days prior to entering treatment, total number of treatment episodes in the study period and prior history of treatment for a different substance.

What we found

Profile of those in treatment for substance misuse by type of substance.

Of the 29,594 people who started and ended engagement with substance misuse services in Wales between 2014 and 2019:

- the majority (75.5%) completed at least one treatment episode
- one third (33.7%) had more than one treatment episode
- over half (56.5%) reported alcohol as their main problem substance during their last treatment episode.



The most common illicit drug reported as a main problem substance was cannabis (16.9%), followed by heroin, methadone and other opiates (12.1%), and cocaine and crack cocaine (7.4%). Amphetamines and ecstasy and 'other drugs' were least common (3.5% each).

Differences in treatment completion by type of substance

28,875 individuals who started and ended engagement with substance misuse services between 2014 and 2019 were able to be followed up for at least two years, representing 97.6% of the total cohort.

The proportion of individuals who completed at least one treatment episode varied from 80% for those presenting for alcohol treatment to 63.1% for those presenting for heroin, heroin, methadone and other opiates and 'Other drugs'

Longer-term outcomes

Around one-third of people (30%) had a subsequent substance-related event in the two-year period following treatment ending. The most common substance-related event to occur within the two years was re-referral into substance misuse services, recorded in 18% overall. Other outcome events included:

- 14.3% admitted into hospital for an alcohol or drug-specific cause
- 5.6% presented at A&E for chronic alcohol or drug use or overdose
- 2.8% died due to an alcohol-specific or drug misuse death.

A greater proportion of those with no successfully completed treatment episodes had at least one substance misuse-related event in the following two-year period compared to those who successfully completed at least one treatment (36% compared with 29%).

For those with a subsequent substance-related event (see Appendix B), there was no significant difference between those who completed a treatment and those that did not, where the main problem substance was heroin, methadone or other opiates (40.7% completed vs 43.3% did not complete).

However, significant differences were seen where the primary substance treated was:

- alcohol (30.6% vs 37.3%)
- amphetamines and ecstasy (23.6% vs 32.9%)
- cocaine and crack cocaine (21.1% vs 28.4%)
- cannabis (17.4% vs 21.6%)



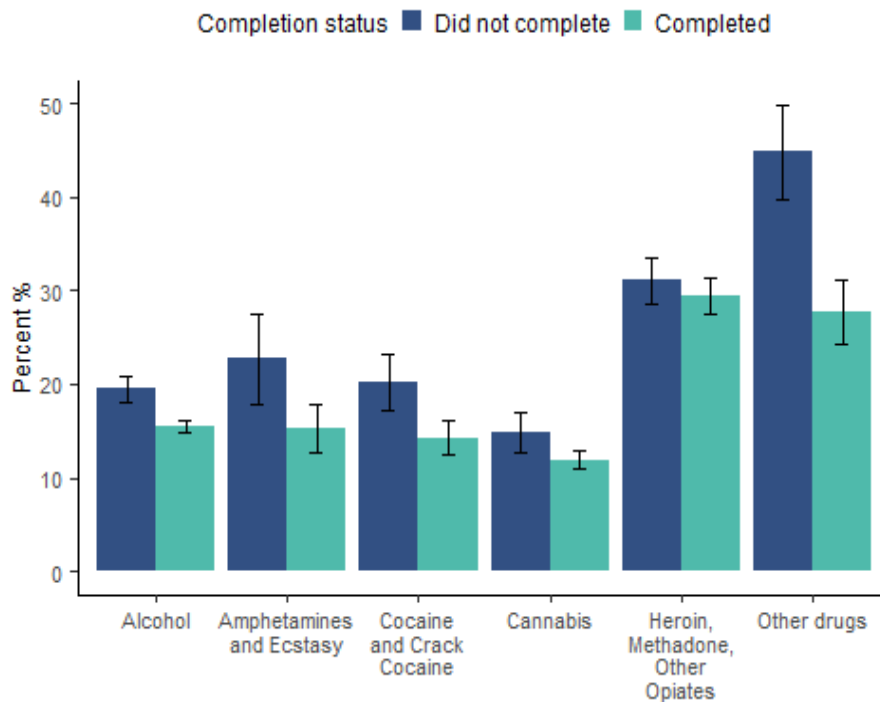
- 'Other drugs' (37.8% vs 56.0%)

Re-referral to substance misuse services

Of those re-referred to substance misuse services, 16.5% had completed at least one treatment episode compared to 22.4% of those who had not.

The highest proportion of re-referrals were for people treated for 'other drugs', with re-referral in 44.8% of those who had not completed treatment previously compared to 27.7% that had. For heroin, methadone and other opiates, the comparable proportions were 31.1% and 29.4% respectively (Figure 1).

Figure 1. Proportion of people who were re-referred to substance misuse services in the two years following their last treatment episode by substance type.



Death was recorded as the first substance use-related event in 10.3% of those not completing treatment for alcohol compared to 4.6% of those who had completed at least one treatment. For heroin, methadone and other opiates, these figures were 9.4% and 4.4% respectively.

Socio-demographic factors influencing likelihood of a substance use-related event following completion of treatment

Factors associated with an increasing chance of substance use-related event occurring by substance type:



Alcohol:

- being unemployed or economically inactive
- older age at the start of the last treatment episode
- not disclosing or having an unknown mental health status

Heroin, methadone and other opiates:

- being unemployed or economically inactive
- having had more than one treatment episode
- being referred into treatment via the criminal justice system
- being female

Cocaine and crack cocaine:

- being unemployed or economically inactive
- having more than one treatment episode
- being female

Other drugs:

- being unemployed or economically inactive
- having more than one treatment episode
- treatment modalities that were only psychological
- being aged 18-34 at the start of the last treatment episode

Cannabis:

- being unemployed or economically inactive
- having more than one treatment episode

Why it matters

Substance misuse treatment services are established to provide high-quality, effective and specialist support for those with drug and/or alcohol issues. It is essential that the effectiveness of these services is monitored and evaluated to ensure best practice in meeting the needs of those affected to reduce or prevent short- and longer-term harms and to optimise opportunities for the individual.

The findings from this study indicate successful treatment completion has subsequent positive impacts including lower re-referral rates to treatment and fewer substance-related health events including hospitalisations and deaths. However, the study highlights a number of areas for concern and focus for improvement.



Rates of treatment completion

Whilst the majority completed at least one treatment episode, over one-third (33.7%) had had more than one treatment episode and one quarter (24.5%) did not complete any treatment episode within the study period.

Treatment completion varied considerably by substance group. Although only 20% of people treated for alcohol had not completed any treatment episodes, this was 36.9% for those who used heroin, methadone and other opiates or 'other drugs' including prescribed drugs, benzodiazepines, hallucinogens and solvents. Further development of low threshold substance misuse services, including outreach and peer mentoring, may support those using opioids and/or a range of licit or illicit prescription drugs including benzodiazepines, analgesics etc and improve retention rates in treatment services to a successful treatment completion.

Enhanced engagement policies within substance misuse treatment services, along with better integration of criminal justice and wider social care services may facilitate longer-term treatment and support in line with individual need.

Subsequent substance-related events

Re-referral into treatment and hospitalisations including emergency department admissions all impact on the individual and present additional resource requirements on services and the NHS. Premature and avoidable drug and alcohol-related deaths represent the most serious impact within the UK rates increasing.

The highest proportion of re-referrals into substance misuse treatment were for people treated for 'other drugs' and heroin, methadone and other opiates at their last treatment episode who had not previously completed a treatment episode (44.8% and 31.1% respectively). Recognising and developing tailored treatment engagement interventions for these groups to maintain engagement in initial treatment contact, as outlined above, may prevent or reduce this need for re-referral, and subsequent potential impact on waiting lists for treatment.

Socio-demographic factors

Our findings support existing evidence that unemployed, economic inactivity, deprivation and lack of opportunity significantly impact on drug and alcohol use, and subsequent substance-related events in the longer term. This was the case for alcohol and all drug categories. Diversionary activities, skills development, education and employment opportunities should form a key part of integrated substance use



and social care policy and service delivery.

Provision of low-threshold, accessible and non-stigmatising services may support and promote earlier engagement and support-seeking behaviour amongst specific groups including women and those using licit and illicit prescription medications.

What next?

Expansion of linked data

In future, it will be possible to link this, or more contemporary cohorts, with the Ministry of Justice data to investigate the impact of contact with the criminal justice system in terms of referral to treatment or as a subsequent substance-related event post-treatment. This will enable greater understanding of the longer-term impacts of treatment alongside existing the health services data utilised in this study.

Address potential bias

Due to possible accessibility issues, fear of stigmatisation or a range of other factors⁵, there is likely bias in the populations who seek referral to, or re-engage post-treatment non-completion, with specialist substance misuse services. Only health data has been used to investigate longer term outcomes of substance use events, which provides only a partial picture.



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Appendices

Appendix A

Codes used definition of events

The International Classification of Diseases 10th Revision (ICD-10) was used to classify substance misuse deaths and hospital admissions as follows:

Drug misuse deaths

Condition	ICD-10 Code
All deaths in which the following conditions are noted as the underlying cause	
Mental and behavioural disorders due to opioids, cocaine, sedatives or hypnotics, cocaine, other stimulants including caffeine, hallucinogens, multiple drug use	F11-F16, F19
All deaths in which the following conditions are noted as the underlying cause AND where codes F11-F16, F19, T40, T424, T436 are also recorded on the death certificate	
Mental and behavioural disorders due to volatile solvents	F18
Accidental poisoning by drugs, medicaments and biological substances	X40-X44
Intentional self-poisoning by drugs, medicaments and biological substances	X60-X64
Assault by drugs, medicaments and biological substances	X85
Poisoning by drugs, medicaments and biological substances, undetermined intent	Y10-Y14

Alcohol specific death

Condition	ICD-10 Code
Mental and behavioural disorders due to use of alcohol	F10
Alcoholic liver disease	K70
Accidental poisoning by and exposure to alcohol	X45
Intentional self-poisoning by and exposure to alcohol	X46
Poisoning by and exposure to alcohol, undetermined intent	Y15
Alcohol-induced pseudo-Cushing's syndrome	E244
Degeneration of nervous system due to alcohol	G312
Alcoholic polyneuropathy	G621
Alcoholic myopathy	G721
Alcoholic cardiomyopathy	I426
Alcoholic gastritis	K292
Alcohol-induced acute pancreatitis	K852
Alcohol-induced chronic pancreatitis	K860
Foetal alcohol syndrome (dysmorphic)	Q860



Excess alcohol blood levels	R780
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Hospital admissions

Condition	ICD-10 Code
Any mental/behavioural condition (NHS Digital definition)	F11-16, F18, F19
Any poisoning by illicit drugs (NHS Digital definition)	T400-T403, T405-T409, T436
Alcoholic liver disease	K70
Accidental poisoning by and exposure to alcohol	X45
Intentional self-poisoning by and exposure to alcohol	X65
Poisoning by and exposure to alcohol, undetermined event	Y15
Evidence of alcohol involvement determined by blood alcohol	Y90
Evidence of alcohol involvement determined by level of intoxication	Y91
Alcohol-induced pseudo-Cushing's syndrome	E244
Degradation of nervous system due to alcohol	G312
Alcoholic polyneuropathy	G621
Alcoholic myopathy	G721
Alcoholic cardiomyopathy	I426
Alcoholic gastritis	K292
Alcoholic induced acute pancreatitis	K852
Alcohol-induced chronic pancreatitis	K860
Foetal alcohol syndrome (dysmorphic)	Q860
Excess blood alcohol levels	R780
Ethanol poisoning	T510
Methanol poisoning	T511
Toxic effect of alcohol, unspecified	T519

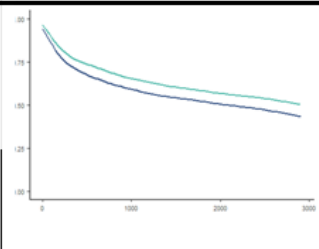
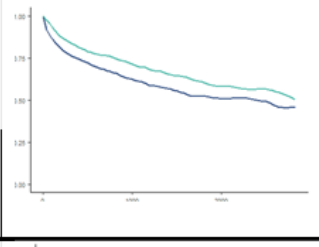
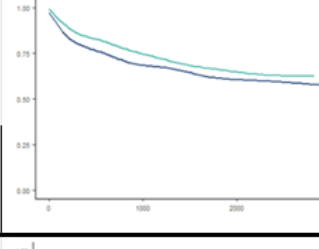
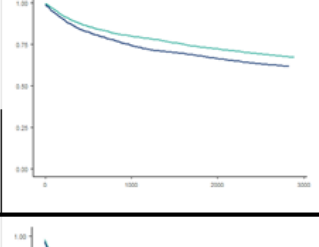
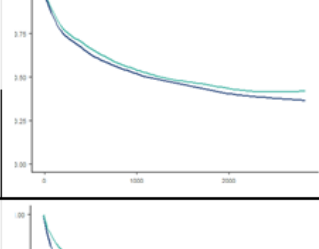
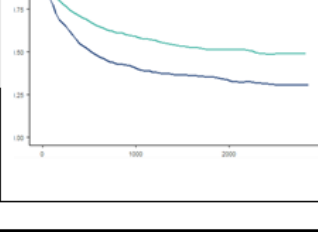
Emergency Department Admissions

Condition	Code
Poisoning or overdose - alcohol	10A
Poisoning or overdose - prescribed drug	10B
Poisoning or overdose - non-prescribed/purchased drug	10C
Poisoning or overdose - illicit drug	10D
Poisoning or overdose - other or unspecified	10Z
Chronic Alcohol Abuse	31A
Chronic Drug Abuse	31B



Appendix B

Kaplan-Meier curves showing time to an event, and estimates of proportion of people with no events after two- and five-years by substance group and completion status

	Time to event curve — Did not complete — Completed	% with no event at two years (95% CI)	% with no event at five years (95% CI)
Alcohol		Completed 70% (69%, 70%)	Completed 58% (57%, 59%)
		Did not complete 63% (61%, 65%)	Did not complete 52% (50%, 54%)
Amphetamines and ecstasy		Completed 76% (73%, 80%)	Completed 61% (57%, 65%)
		Did not complete 67% (62%, 73%)	Did not complete 52% (47%, 59%)
Cocaine and crack cocaine		Completed 79% (77%, 81%)	Completed 66% (63%, 69%)
		Did not complete 72% (68%, 75%)	Did not complete 62% (58%, 66%)
Cannabis		Completed 83% (81%, 84%)	Completed 73% (72%, 75%)
		Did not complete 78% (76%, 81%)	Did not complete 68% (65%, 71%)
Heroin, methadone and other opiates		Completed 60% (58%, 62%)	Completed 45% (42%, 47%)
		Did not complete 57% (54%, 60%)	Did not complete 42% (39%, 45%)
Other drugs		Completed 62% (59%, 66%)	Completed 51% (47%, 56%)
		Did not complete 44% (39%, 49%)	Did not complete 35% (30%, 40%)



Better Outcomes through Linked Data
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