Deaths associated with substance use

Premature mortality and life-years lost due to drug and alcohol use

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1 Number of deaths associated with drug use

- The ONS classifies death related to drug poisoning according to ICD-10 codes.
- Certain ICD-10 codes classify a death as a "drug misuse death".[1]
- Each of these requires a specific substance (e.g. heroin) or substance category (e.g. opioids) to be indicated either in the ICD-10 code or on the death certificate.
- There are deaths each year where the ONS holds no information on the substance(s) involved (see table 1).

[1] The criteria for this classification are described in `Box 2` of the `Definition` tab of the latest release of *Deaths related to drug poisoning, England and Wales*. Available here.

Year of death registration	All drug poisonings	Number of deaths without substance information	Percentage without substance information
2023	5448	1245	22.9
2022	4907	1239	25.2
2021	4859	1219	25.1
2020	4561	1050	23.0

Table 1: Number of drug poisonings deaths without substance information.

- Some of these will be classified as related to drug misuse where an ICD-10 code indicates mental and behavioural disorders due to drug use (excluding alcohol and tobacco) without a specific substance (e.g. F19 "multiple drug use and use of other psychoactive substances").
- Others, coded as accidental/intentional self-poisonings or self-poisonings of unknown intent, will not be classified as related to drug misuse unless a controlled drug under the Misuse of Drugs Act 1971 was mentioned on the death record.
- The data linkage between ONS mortality and NDTMS allows some of those deaths to be identified indirectly as related to drug misuse where the person that died had had contact with the drug treatment.

1.0.1 Explanation of Data Processing Steps

Take drug poisoning deaths from ONS-NDTMS data linkage dataset provided by EAT (~300k rows) and deaths in treatment data (~30k rows) and aggregate them into one summary dataset at national level.

1.0.2 Step 1: Process the Drug Poisoning Deaths Data

1. **Filter the data**:
    - Only includes deaths from the year **2022**.
    - Focuses on deaths recorded as "Total Deaths" (not broken down by substance).
    - Keeps only cases flagged as drug misuse (or cases with no record of contact with the treatment system if they are not flagged as misuse).

Where cases are **not** flagged as drug misuse but there **is** a record of contact with the treatment system those deaths are assigned the label "additional poisoning deaths":

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2. **Adds meaningful labels**:
    - Labels deaths as either:
        - **"Initial poisoning deaths"**: Cases recorded as drug misuse.
        - **"Additional poisoning deaths"**: Cases not flagged as misuse but with no treatment system record.
3. **Groups and counts the data**:
    - Groups deaths by any specified categories (e.g., by region or age group). In this case, no additional grouping is applied.
    - Calculates the number of deaths in each category.

This results in a summary dataset where each row represents a specific combination of grouping variables (e.g., year, death category), with a count of deaths for that combination.

1.0.3 Step 2: Process the Deaths in Treatment Data

The function `process_deaths_in_treatment` processes data about individuals who died during or after receiving treatment for substance abuse (file path: `deaths_in_treatment_file`). Here's what it does: 1. **Filters the data**: - Only includes records from **2022**. - Exclude alcohol-specific deaths

2. **Groups the data**:
    - Groups deaths by:

  - **Year** (2022).
  - **Treatment status**: Whether the person was still in treatment or had been discharged (e.g., died within a year after leaving treatment).

3. **Counts the data**:

   - Summarises the number of deaths in each group.

This creates a summarised dataset where each row represents a combination of year and category of death, with the total number of deaths for that group.

1.0.4 Step 3: Combine the Two Processed Datasets

The function `combine_national_data` merges the two processed datasets: 1. **Aligns the data**: - Standardises the naming. e.g: - Drug poisoning deaths are categorised as **"Initial poisoning deaths"** or **"Additional poisoning deaths"**. - Treatment-related deaths are categorised by treatment status (e.g., "Died in treatment").

2. **Combines the data**:

   - Stacks the rows from the two datasets together, creating a single dataset.
   - At this point the categories of deaths are mutually exclusive, so rather than merging the data we can just stack the rows.

1.0.5 Step 4: Relabel Death Categories

The function `relabel_national_data` refines the death category labels in the combined dataset: 1. **Adds more descriptive labels for plots** : - Initial poisoning deaths - Additional poisoning deaths - Non-poisoning deaths: Died in treatment - Non-poisoning deaths: Died within a year of discharge - Non-poisoning deaths: Died one or more years following discharge

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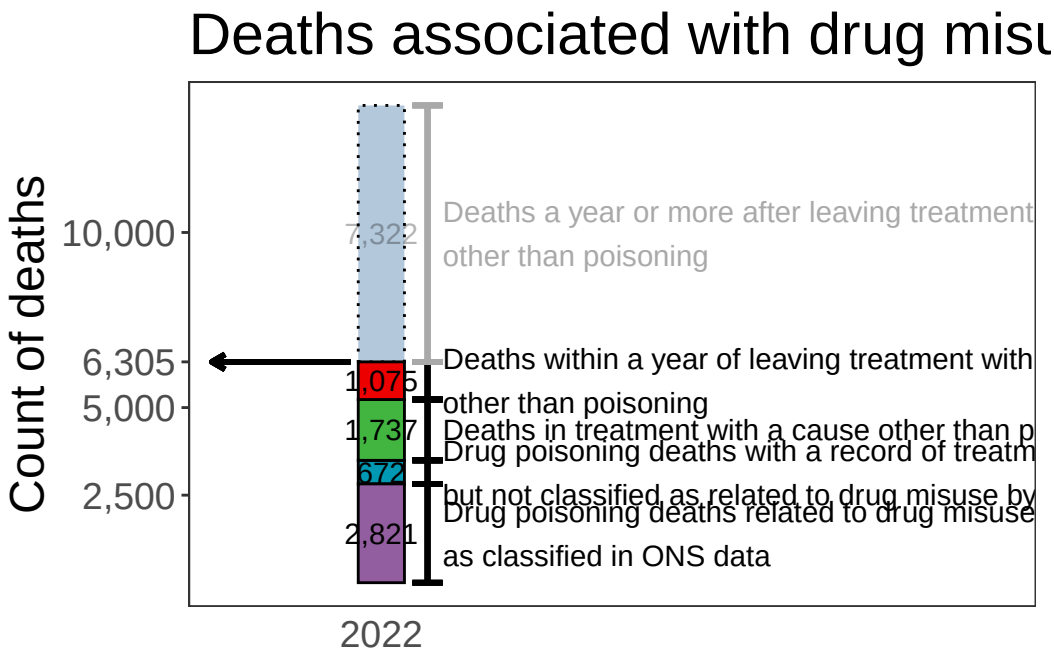
1.0.6 Final Dataset (`national_data`)

After these steps, the `national_data` dataset is an aggregated summary:: - Each row represents a unique combination of: - **Year**: Always 2022 in this example. - **Death Category**: E.g., "Initial poisoning deaths," "Non-poisoning deaths: Died in treatment." - Each row includes a **count** of deaths for that category.



2 Years of life lost due to substance use

- Years of life lost (YLL) is a measure of the impact of premature mortality, helpfully defined by Public Health England here.
- Chudasama et al. (2022) investigated five methods for estimating YLL.[2] The first two methods are feasible with the available data for YLL from drug use and alcohol-specific deaths. Only the drug-related YLL could be segmented by geographical estimates of deprivation.

[2]Chudasama, Y.V., Khunti, K., Gillies, C.L., Dhalwani, N.N., Davies, M.J., Yates, T., & Zaccardi, F. (2022). Estimates of years of life lost depended on the method used: tutorial and comparative investigation. *Journal of Clinical Epidemiology*, 150, pp. 42–50. Available at: https://doi.org/10.1016/j.jclinepi.2022.06.012 [Accessed 6 Nov. 2024].

- All five methods are detailed in the supplementary PDF here.

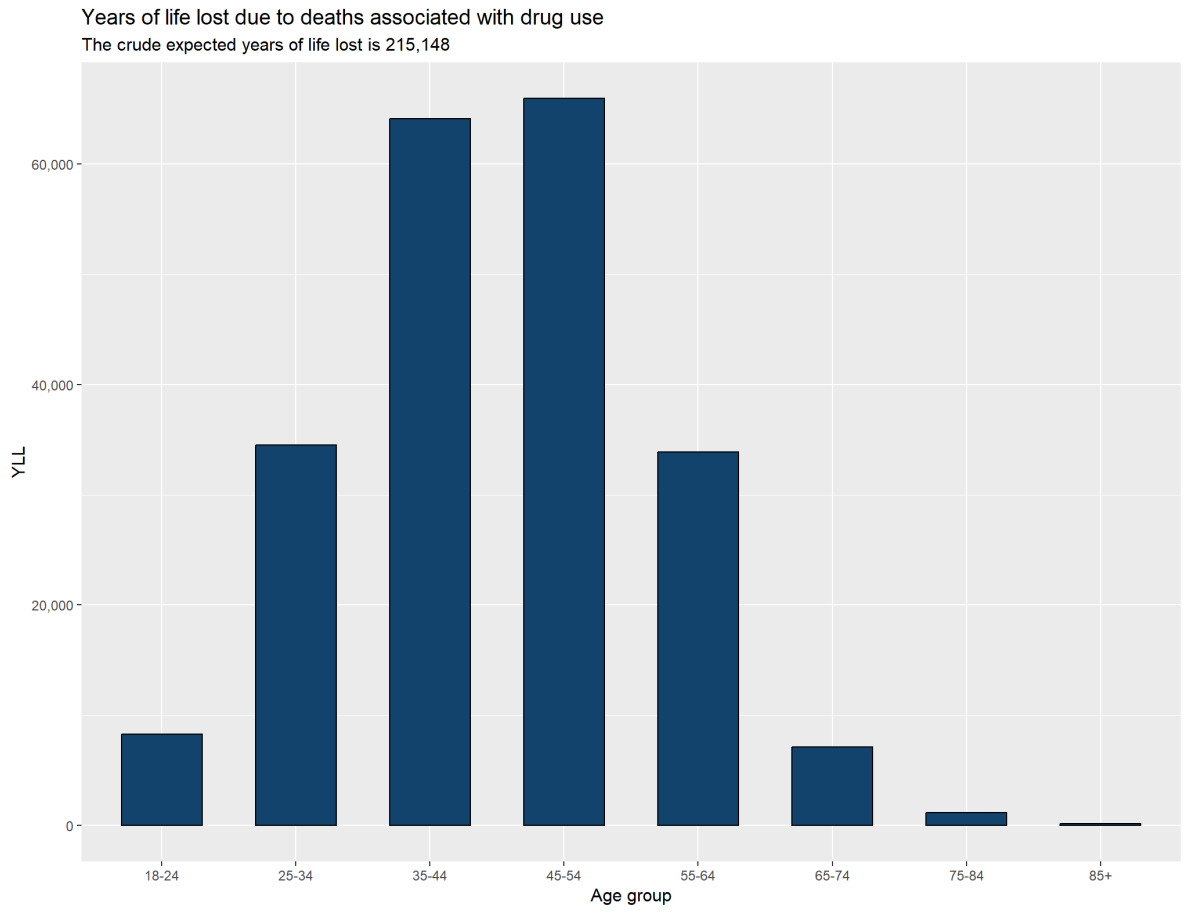
The crude expected years of life lost is:

$$YLL = (D_x)(e_x^s)$$

Where (D_x) is the number of deaths and (e_{x}^s) is the standard age of death from the external life expectancy.

- Total YLL associated with drug use was **215,148**.
- For comparison, Heald et al. (2024)[3] estimated the impact of obesity on YLL in England at 791,689 in 2019.
- Deaths at ages between 35 and 54 accounted for 60% of the YLL.

[3]Heald, A., Stedman, M., Fryer, A.A., Davies, M.B., Rutter, M.K., Gibson, J.M., & Whyte, M. (2024). Counting the lifetime cost of obesity: Analysis based on national England data. *Diabetes, Obesity and Metabolism*, 26(4), pp. 1464–1478.



2.0.1 References