Special Considerations for Drug Overdose

Examining drug overdoses by different coding and data characteristics will inform on measures impacting data quality and provide a broader understanding of the drug overdose data. This section explores measures that may impact drug overdose data quality like completeness of data and measures that describe the cases included and excluded in the drug overdose indicators.

Measures Directly Impacting Data Quality

1. **Frequency distribution of the 5th/6th character of the drug overdose diagnosis code in any diagnosis field**

   Issue/impact: In ICD-10-CM, the 5th or 6th character in the drug overdose diagnosis code is used to identify the intent, or manner, of the injury. The intent of injury character specifies whether the injury diagnosis was unintentional (a 5th/6th character of 1), intentional self-harm (a 5th/6th character of 2), assault (a 5th/6th character of 3), of undetermined intent (a 5th/6th character of 4), due to adverse effect of a drug that has been correctly prescribed and properly administered (a 5th/6th character of 5), or underdosing (a 5th/6th character of 6). The 5th/6th character is required for all drug overdose codes (codes beginning with T36 – T50). The recommended drug overdose case definitions for hospitalizations and ED visits includes records for which the 5th/6th character indicates unintentional, intentional self-harm, assault, or undetermined intent. Prior to applying these case definitions, the analyst should determine the frequency distribution of the 5th/6th character of the injury diagnosis codes to have an understanding about which records might be excluded in the case selection process.

   How to assess:
   a) Select any record with a diagnosis code where the first three characters are T36-T50.
   b) For records where the first four characters are T37.9, T39.9, T41.4, T42.7, T43.9, T45.9, T47.9, and T49.9: Parse the **5th** character from the drug overdose diagnosis code.
   c) For all other records: Parse the **6th** character from the drug overdose diagnosis code.
   d) Determine the frequency distribution of the 5th/6th characters. Note specifically, what percentages intent 5 (adverse effects), and missing intent make up.
   e) Review trends by quarter or month. Does the frequency distribution of the 5th/6th character of the drug overdose diagnosis code, particularly intent 5 and missing intent, change over time?

2. **Frequency of expired cases (i.e. fatal cases)**

   Issue/Impact: The recommended case definitions for drug overdose-involved hospitalizations and ED visits cover nonfatal overdoses only (including those with missing patient status). In order to assure the quality of this aspect of the case definition, the patient status/discharge disposition variable needs to be examined. Patient status variables vary by state, but each dataset should have a data dictionary indicating which values represent "fatal" vs. "nonfatal" vs.

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missing. This analysis will provide a better understanding of which records might be excluded in the case selection process. A high frequency of missing patient statuses will indicate that the "nonfatal" aspect of the case definition is questionable.

How to assess:
a) Identify all records which contain a drug overdose T-code (see indicator definition for "all drug overdoses").
b) Identify the variable which indicates patient status at the time of discharge.
c) Determine the frequency distribution of the patient status variable. In the case of a non-binary patient status variable, the patient status values can be grouped (i.e., group any values with the term "expired", "died", or "fatality" as "fatal" cases, other values as "nonfatal" cases, and any missing values as "missing").
d) Review trends by quarter or month. Does the percent of records missing a fatal/nonfatal value change over time? (i.e. is this a temporary or ongoing issue).

Measures Providing a Broader Understanding of the Drug Overdose Data

3. **Number of drug overdose T-codes in each record**

   Issue/impact: Poly-substance use is a common occurrence. An exploration of how many records contain multiple drug codes will provide a clearer understanding of the frequency of polysubstance poisoning visits in the dataset. This is important when considering the number of patients affected by drug overdoses, as there may be patients experiencing drug overdoses due to multiple drugs or drug interactions. Investigating the frequency of multiple drug overdoses will describe the amount of overlap that exists between the recommended drug overdose indicators.

   How to assess:
   a) Identify all records which contain a drug overdose T-code (see indicator definition for "all drug overdoses").
   b) For each record, count the number of drug overdose T-codes in that record.
   c) Determine the frequency distribution of T-codes per record. (i.e. how many records involve a single drug vs two or more drugs).

4. **Frequency of individual drug T-codes**

   Issue/Impact: Specific codes will identify which classes of drugs are responsible for the most poisoning admissions. The geographic distribution of poisonings due to specific drug types are subject to change based on geographic and legal variation (e.g. availability of licit and illicit opioids, legality of cannabis, and popularity of methamphetamine production). Understanding the variety of drug overdose codes can help to inform public health interventions.

   How to assess:
   d) Identify all records which contain a drug overdose T-code (see indicator definition for "all drug overdoses").

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a) Among these records, identify the frequency with which each group of T-codes appears in the dataset. Each group is differentiated by the first 3 characters: i.e. T36, T37, T38, etc.

b) Note that a T-code could appear in a single record more than once, for example, a single record might contain both T40.1 and T40.5, and in this case, you will count T40 twice. However, a record with T40.1 and T43.6, would count T40 once and T43 once. Both are examples of a record with two drug codes.

Optional Measures for Additional Drug Overdose Analyses

5. **Frequency of Adverse Effects intent for specific drugs**

   Issue/Impact: Some drugs may have a significantly larger proportion of records with adverse effect intent. Adverse effects are assigned when a drug is prescribed and properly administered but the patient experiences an adverse effect. This can be complicated by drugs that are medically recommended but not prescribed. The coding practices around these particular drugs may affect the number of true cases captured in the recommended case definitions. To understand the coding practices and cases potentially excluded it is important to quantify all adverse effects codes and classify them by drug group (first three characters, i.e. T40) to described adverse effects of specific drugs. The drug types need to be identified to see which and how many records might be excluded based on the current case definitions. This optional analysis will provide a better understanding of the data. Jurisdictions may decide based on these finding whether or not adverse effects should be included in their case definitions for specific drugs that cannot be clinically prescribed.

   How to assess:
   a) Identify all records which contain a drug T-code (the first three characters are T36-T50).
   b) Parse the 5th/6th character from each record and identify the frequency with which the adverse effect codes appear [5].
   c) Among the drug overdose-related records, identify the frequency with which each group of T-codes appears in the dataset, as in measure 4, but also INCLUDING adverse effect intent codes [1-5]. Each group is differentiated by the first 3 characters: i.e. T36, T37, T38, etc.
   d) Note that a T-code could appear in a single record more than once, for example, a single record might contain both T40.1 and T40.5, and in this case, you will count T40 twice
   e) Compare total counts (including adverse effects) with counts copied from Measure 4 to see how adding adverse effects codes affects the counts.
   f) Identify patterns in specific drug types where adverse effects may be disproportionately coded.
   g) Repeat this process for the T-codes associated with specific drug indicators as described in the "Injury Indicators- Drug Overdose Indicators" section of the CSTE ICD-10-CM Injury Surveillance Toolkit (Note, drugs without prescription potential, like heroin, do not have an adverse effects option).
   h) Repeat this process for cannabis T code (T40.7)

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6. **Frequency distribution of the 7th character of the drug overdose diagnosis code in any diagnosis field**

    Issue/impact: In ICD-10-CM, a 7th character in the injury diagnosis code is used to identify the type of encounter when the diagnosis was made. The type of encounter character specifies whether the injury diagnosis is related to the initial encounter (a 7th character of A), a subsequent encounter (7th character of D), or sequelae of a previous injury (7th character of S). The 7th character is required for all drug overdose T-codes. For programmatic reasons, the recommended case definitions for drug overdose-involved hospitalizations and ED visits includes records for which the 7th character indicates an initial encounter or where the 7th character is missing. Prior to applying the recommended case definition, the analyst should determine the frequency distribution of the 7th character of the injury diagnosis codes to have an understanding about which records might be excluded in the case selection process.