

**CDC Cocaine Overdose v2 Parsed**  
**Drug Overdose Surveillance and Epidemiology (DOSE) System Guidance**  
**Syndromic Surveillance Definition Factsheet and Technical Brief**

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**Definition Purpose:** To assist state, local, tribal, territorial, and federal public health practitioners in monitoring emergency department (ED) visits for suspected nonfatal cocaine-involved overdose using syndromic surveillance data.

**New or Revised Definition:** Revision of Cocaine Overdose v1

**Date Added to ESSENCE:** January 2024

**Definition Description:** The CDC Cocaine Overdose v2 Parsed definition was designed to be used to identify ED visits for suspected nonfatal cocaine-involved overdoses of unintentional or undetermined intent. The query relies on data in two fields from ED visit records to identify encounters that meet the definition criteria:

- (1) the chief complaint free text field, which is a processed version of the reported chief complaint and may include terms indicating a cocaine-involved overdose or poisoning, as well as relevant exclusion terms (e.g., terms indicating cocaine withdrawal without acute intoxication, etc., which would exclude ED visit records from this syndrome definition), and
- (2) the discharge diagnosis parsed field, which includes International Classification of Diseases, Clinical Modification, 9th Revision (ICD-9-CM),<sup>1</sup> International Classification of Diseases, Clinical Modification, 10th Revision (ICD-10-CM),<sup>2</sup> or Systematized Nomenclature of Medicine – Clinical Terms (SNOMED-CT)<sup>3</sup> diagnosis codes and may indicate an acute cocaine overdose or poisoning of unintentional or undetermined intent.

Within ESSENCE, the syndrome query is applied to the Chief Complaint Discharge Diagnosis (CCDD) Parsed field, which combines these two fields of interest.

**Use-Cases for Definition:**

Case-finding

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<sup>1</sup> World Health Organization. International Classification of Diseases, Ninth Revision, Clinical Modification. World Health Organization; 1980.

<sup>2</sup> World Health Organization. International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM). World Health Organization; 2015.

<sup>3</sup> National Library of Medicine. SNOMED-CT. Accessed [Dec 5 2023].  
<https://www.nlm.nih.gov/healthit/snomedct/index.html>

- Trend monitoring
- Early outbreak detection

Justification for Development: There have been rapid increases in cocaine-involved overdose deaths during the previous decade<sup>4</sup> and especially from 2019–2020, with the rate of drug overdose deaths involving cocaine increasing by 22%.<sup>5</sup> Previous studies have shown that suspected nonfatal cocaine-involved overdoses and those cocaine overdoses co-involving opioids have followed seasonal patterns, with increased numbers in spring/summer months and declines in fall/winter months.<sup>6</sup> Continued monitoring of nonfatal cocaine-involved overdoses is important for understanding the landscape of the most recent drug overdose trends.

Data Source During Development: ED visits

Development Methods: This is the same logic as for the CCDD Category CDC Cocaine Overdose v1 syndrome definition, but it is adapted to query the CCDD Parsed field, which mainly removes extraneous text from the discharge diagnosis portion of the CCDD field. Because of differences between the CCDD and CCDD Parsed fields, query results may be different between versions 1 and 2 of the cocaine overdose syndrome definitions.

CDC scientists first started developing overdose definitions using lessons learned from jurisdictions funded by CDC's Overdose Data to Action (OD2A) and Enhanced State Opioid Overdose Surveillance (ESOOS) Programs. First, International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9-CM) and 10th Revision, Clinical Modification (ICD-10-CM), and Systematized Nomenclature of Medicine – Clinical Terms (SNOMED-CT) diagnosis codes indicating an acute cocaine poisoning were identified; this was followed by identifying and adding overdose terms that could be presented in the chief complaint free text. Finally, overdose and cocaine terms that appeared in ED visit chief complaint text were iteratively added to the definition syntax and validated.

Validation Methods: Three methods were employed to validate this new definition.

- 1) CDC scientists from the NSSP team used R code to convert the syntax from (A) the previous Cocaine Overdose versions that queried the Chief Complaint Discharge Diagnosis (CCDD) field to (B) syntax that would effectively query the Chief Complaint Discharge Diagnosis (CCDD) Parsed field. These conversions focused on changes to diagnostic code formatting within the syntax. The DOSE team verified that the syntax converted correctly (i.e., did not eliminate codes or terms that were intended to capture cocaine-involved overdose).
- 2) The CDC DOSE team incorporated corrections and improvements to the syntax logic and piloted the draft definition by manually reviewing records that were captured after aforementioned conversion of syntax. This process was done iteratively with the proposed changes and the DOSE team met and discussed visit reviews and incorporated the inclusion and exclusion terms. Terms that were associated with ED visits classified as true suspected overdoses were retained.

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<sup>4</sup> Kariisa M, Scholl L, Wilson N, Seth P, Hoots B. Drug overdose deaths involving cocaine and psychostimulants with abuse potential—United States, 2003-2017. *MMWR Morb Mortal Wkly Rep.* 2019;68(17):388-395.

<sup>5</sup> Hedegaard H, Minino AM, Spencer MR, Warner M. Drug overdose deaths in the United States, 1999-2020. *NCHS Data Brief.* 2021;(428):1-8.

<sup>6</sup> Scholl, Lawrence PhD, MPH; Liu, Stephen PhD, MPH; Pickens, Cassandra M. PhD, MPH. Suspected Nonfatal Cocaine-Involved Overdoses Overall and With Co-involvement of Opioids. *Journal of Public Health Management and Practice* 29(3):p 392-402, May/June 2023.

- 3) The DOSE team evaluated the draft definition by comparing overdose counts and reviewing records that were captured before and after aforementioned conversion of syntax. Overall aggregate counts over time comparing CDC All Cocaine Overdose v1 and CDC All Cocaine Overdose v2 Parsed showed only minimal differences in counts, which were an anticipated outcome of the syntax conversion process.

Definition Fields and Structure: The Chief Complaint Discharge Diagnosis (CCDD) Parsed field is used to query both the diagnosis codes and chief complaint free text with exclusions (as necessary) to develop the syndrome definition.

- Automatic inclusion
  - If a diagnosis code indicating a cocaine overdose/poisoning is present, the ED visit is automatically included in the syndrome.
- Conditional inclusion
  - If the ED visit does not include a diagnosis code for cocaine poisoning, then the visit is not automatically included in the syndrome.
  - The visit is captured only if it includes two components:
    - 1) chief complaint text indicating an overdose, poisoning, or symptoms of a potential cocaine-involved overdose **AND**
    - 2) chief complaint text indicating cocaine involvement **OR** an ICD-10-CM code for cocaine abuse/dependence/use with intoxication (e.g., F14.12).
  - The list of exclusions is applied to the chief complaint text only when a discharge diagnosis code is not present for cocaine overdose.

For Consideration: With the opioid query, CDC identified several non-poisoning ICD-10-CM codes for inclusion in the syndrome definition (e.g., F11 codes). CDC also explored the inclusion of the cocaine F codes (i.e., F14) in this definition. CDC explored these codes and found that, without additional information (e.g., other codes for cocaine overdose; chief complaint terms describing cocaine use and overdose), these ICD-10-CM codes did not always identify visits with acute cocaine-involved overdoses. Because the differentiation between poisoning and intoxication is unclear, CDC chose to consider the specific F-codes that include “with intoxication” in conjunction with cocaine-involved overdose symptoms. The team attempted to identify drug names used for cocaine, such as coke and crack; however, it is likely that some drug names and slang terms should be added to the next version of the definition. It is also important to consider that persons treated for cocaine-involved overdoses in EDs may have co-used other drugs.

Limitations: The nonfatal cocaine-involved syndrome definition was developed to capture suspected nonfatal cocaine-involved overdoses treated in EDs. However, it is subject to both misclassification and under/overreporting for several reasons, including limited point-of-care confirmatory testing to identify the drug(s) involved in the overdose, and reliance on self-report, bystander reports, and/or clinical presentations to determine the drug(s) involved in an overdose. The codes provided in the discharge diagnosis field from the ED visit record do not necessarily represent the final diagnosis of a patient and should be considered preliminary. Additionally, some hospitals may enter all diagnosis codes from a patient’s entire medical history, including codes for previous cocaine-involved overdose visits; the definition may incorrectly capture such encounters that were not for a true cocaine-involved overdose and thus result in overreporting. It is not possible in syndromic data to determine the primary reason for

a patient’s visit, as syndromic data lack a primary diagnosis field. Therefore, all terms and codes are considered equally (i.e., not in any priority) regardless of what order they are in the record. Finally, cocaine-involved overdoses may be more difficult to identify than opioid overdoses and thus reported in chief complaints due to the diverse range of associated symptoms, including some that may overlap with cardiovascular health and mental health-involved ED visits. Future studies where provider triage notes are available may help further validate the use of chief complaints and discharge diagnoses to identify nonfatal cocaine-involved overdose visits in syndromic data.

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### Detailed Definition Components

**Table 1.** Descriptions of discharge diagnosis codes, concepts, and chief complaint terms included or excluded in the CDC Cocaine Overdose v2 Parsed definition.

Variable Type	Automatic inclusion?	Terms	Description (discharge diagnosis codes only)
<b><i>Inclusions</i></b>			
<i>Discharge Diagnosis codes</i>			
ICD-9-CM <sup>1</sup>	Yes	97081	Poisoning by cocaine
ICD-10-CM <sup>1</sup>	Yes	T405X1A	Poisoning by cocaine, accidental (unintentional), initial encounter
		T405X4A	Poisoning by cocaine, undetermined, initial encounter
SNOMED-CT	Yes	296321004	Overdose of cocaine
		216583009	Accidental poisoning caused by cocaine (disorder)
		290545007	Cocaine poisoning of undetermined intent
		296325008	Overdose of crack cocaine
		9982009	Poisoning by cocaine
ICD-10-CM <sup>1</sup> cocaine use/abuse/dependence with intoxication	Conditional, include only if other overdose-related terms are also present AND no exclusion terms	F1412	Cocaine abuse with intoxication
		F1422	Cocaine dependence with intoxication
		F1492	Cocaine use, unspecified with intoxication
<i>Chief Complaint terms</i>			
Cocaine-related terms	Conditional, include only if other overdose-related terms are also present AND no exclusion terms	Speedball, cocaine, coke, crack (and misspellings)	
Overdose-related terms	Conditional, include only if other cocaine-related terms are also present AND no exclusion terms	Poisoning, overdose, snort, ingest, altered mental status, seizure, abdominal pain, heart racing, agitation, heart palpitation, cardiac, chest pain/squeezing/tightness/pressure, heart attack, myocardial, stroke, tachycardia (and misspellings)	

Exclusions		
Chief complaint terms	Exclude if encounter captured from chief complaint terms only (i.e., exclusion terms are applied to the chief complaint text only when the automatic inclusion criteria are not met)	Other uses of "crack", other uses of "coke", terms indicated denial of drug use, common negations of cocaine-related terms or overdose-related terms, and terms indicating withdrawal or detoxification.

<sup>1</sup>ICD-9-CM and ICD-10-CM code punctuation is removed when querying the CCDD Parsed field.

**Table 2.** ESSENCE syntax, CDC Cocaine Overdose v2 Parsed

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,^;97081;^,OR,^;T405X1A^,OR,^;T405X4A^,OR,^;296321004;^,OR,^;216583009;^,OR,^;290545007;^,OR,^;296325008;^,OR,^;9982009;^,OR,(, (^poison^,OR,^verdo[se][es]^,OR,^overdose^,OR,^overose^,OR,^snort^,ANDNOT,(^denie[sd] snort^,OR,^no snort^),OR,^in[gj]est^,OR,^intoxic^,OR,^altered mental status^,OR,^seiz^,ANDNOT,(^denie[sd] seiz^,OR,^no seiz^),OR,^high blood^,OR,^abdominal pain^,OR,^racing^,OR,^agitat^,OR,^aggitat^,OR,(^heart pap^,OR,^palp^),ANDNOT,(^denie[sd] heart palp^,OR,^no heart palp^,OR,^denie[sd] heart pap^,OR,^no heart pap^),OR,^cardi[ao]^,ANDNOT,(^denie[sd] cardi[ao]^,OR,^no cardi[ao]^),OR,^heart attack^,OR,^myocard^,OR,^stroke^,OR,^tach[iy]^,OR,^chest pain^,ANDNOT,(^no chest pain^,OR,^denie[sd] chest pain^),OR,^squeezing in chest^,OR,^chest tight^,OR,(, (^chest pressure^,OR,^pressure in chest^),ANDNOT,(^no chest pressure^,OR,^denie[sd] chest pressure^,OR,^denie[sd] pressure in chest^,OR,^no pressure in chest^),),),AND,(^speedball^,OR,^speed ball^,OR,^coc[ai][ia]ne^,OR,^coccc[ai][ia]ne^,OR,^cocane^,OR,^cocanne^,OR,!coke!,ANDNOT,(^denie[ds] coke^,OR,^denie[ds] coc[ai][ia]ne^,OR,^coke top^,OR,^coke bottle^,OR,^coke can^,OR,^coke case^,OR,^case of coke^,OR,^bottle of coke^,OR,^bottles of coke^,OR,(, (^rum^,AND,^coke^),OR,^jack and coke^,OR,^diet coke^,OR,^coke tea^,OR,^coffee coke^,OR,^delirium tremens coke^,OR,^drink a coke^,OR,^jack coke^,OR,^dirnking coke^,OR,^coke tab^,OR,^scotch coke^,OR,^drinking coke^,OR,^aspirating on coke^,OR,^coke colored^,OR,^drank coke^,OR,^drank a coke^),OR,!crack!,ANDNOT,(^a crack^,OR,^crack in^,OR,^knee crack^,OR,^shoulder crack^,OR,^tooth crack^,OR,^butt crack^,OR,^ankle crack^,OR,^callous crack^,OR,^crack due to^,OR,^pop crack^,OR,^loud crack^,OR,^it crack^,OR,^heard crack^,OR,^felt crack^,OR,(, (^rib^,AND,^crack^),OR,^fell crack^,OR,^snap crack^,OR,^growth plate^,OR,^to crack of^,OR,^crack sidewalk^,OR,^sidewalk crack^,OR,^crack area^,OR,^crack cast^,OR,^back crack^,OR,^crack of^,OR,^crack his^,OR,(, (^lip^,AND,^crack^),OR,^neck crack^,OR,^crack neck^,OR,^my crack^,OR,^glass crack^,OR,(, (^buttock^,AND,^crack^),OR,!crack on!,OR,!crack to!,OR,^foot crack^),OR,^;F1412^,OR,^;F1422^,OR,^;F1492^),),ANDNOT,(^denie[sd] drug^,OR,^deny drug^,OR,^denying drug^,OR,^denie[sd] any drug^,OR,!with draw!,OR,^withdra^,OR,^deto[sxz]^,OR,^dtox^),),)
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