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# Poisoning Deaths in a Workshop for Ceremonial Papermaking — China, May 2025

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## Abstract

On May 14, 2025, a county-level Chinese Center for Disease Control and Prevention (China CDC) in southwestern China received a report of the sudden death of four employees of a small workshop for ceremonial papermaking, which was operating without required safety and environmental approvals. The first person who died was a woman who lost consciousness while cleaning a wastewater tank. During the next 20 minutes, three of the woman's family members, also employees, entered the tank to attempt to rescue her. All four persons, including the workshop operator's wife, the workshop operator's son, the workshop operator, and the workshop operator's daughter, died. The county China CDC launched an immediate investigation, and the Intermediate Chinese Field Epidemiology Training Program and provincial and city China CDC staff members conducted a joint, on-site investigation that included identification of cases, analysis of the gas composition, and interviews of residents of the town and physicians to identify the cause of the apparent toxic exposure. Analyses revealed that levels of the highly toxic gases hydrogen sulfide, hydrogen fluoride, and phosphine were several times higher than the maximum allowable concentrations. Clinical signs among the decedents were consistent with poisoning by these gases. Lack of personal protective equipment in a confined space and the presence of toxic gases likely led to the multiple exposures and delayed response by rescue services. Although working in confined spaces with toxic gases is a known exposure risk, these exposures continue to be reported in China and have included deaths in the papermaking industry. These deaths highlight the importance of effective regulations for papermaking workshops and administrative controls, improved supervision, and education for workers.

## Introduction

Ceremonial paper, also known as joss paper, is a traditional item commonly used in Chinese and other East Asian ancestor worship practices. The paper is formed into sheets and effigies that are burned during funerals and festivals to honor deceased ancestors. Ceremonial paper is typically manufactured from low-cost materials, including bamboo pulp, rice paper, or recycled paper, and is often printed with gold or silver foil to resemble currency. During production, the raw material is mechanically pulverized into pulp and then blended into a slurry. Next, water is removed from the slurry; the slurry is then formed, pressed, bleached, and dried into finished joss paper sheets. The pulping and bleaching steps often involve the use of sulfuric acid, sodium sulfate, and sodium hydroxide (*1*). Wastewater from this process, which includes solid particles, is typically discharged into a sedimentation tank for storage, followed by a series of treatments to comply with environmental disposal standards. Hydrogen sulfide gas can be emitted from wastewater through decomposition of sulfur-containing organic compounds and anaerobic sulfate reduction (*2*).

On May 14, 2025, a fatal toxic exposure incident was reported to a county-level Chinese Center for Disease Control and Prevention (China CDC) in southwestern China. Four



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family members, who were employees of a small workshop for ceremonial papermaking, were found comatose in an underground tank (i.e. a confined space[†]) in the workshop; all subsequently died. The first person, a woman, lost consciousness while cleaning the tank. During the next 20 minutes, three family members, also employees, entered the tank to attempt to rescue her. All four persons, including the son, husband (and workshop operator), and daughter of the woman, died. The county China CDC immediately investigated to determine the cause of the incident and to recommend prevention and control measures to prevent future exposures and deaths. This report describes the investigation and response, including the likely cause of the incident and recommendations for preventing future poisonings.

## Investigation and Findings

### Toxic Exposure Event

On May 14, 2025, the workshop operator's wife (aged 54 years) and his son (28 years), the workshop operator (57 years), daughter (31 years), and daughter-in-law (28 years) arrived at the processing workshop. Although the daughter was not an employee, she was present on the day of the incident. During the preceding year, the workshop had been conducting production trials; although some paper was produced and stored on-site, none had been sold. The company had a business license (which was obtained online) but did not have a safety production license, an occupational health preassessment, an environmental assessment documentation, or a firefighting inspection certificate, all of which are required for operation. In addition, the workshop lacked any personal protective equipment (PPE), emergency rescue equipment, or protocols for hazard assessment, including testing for toxic gases. This study was reviewed and approved by Guiyang internal review board.[§] Yuanbao (Tencent, China), an artificial intelligence assistant, was used during the preparation of this manuscript for language editing and translation support. Authors reviewed and approved all edits.

At approximately 5:50 p.m., the operator's wife descended approximately 7.3 ft (2.2 m) by ladder, without PPE, into the underground tank (Figure 1) to perform the first drainage and sediment removal operation in at least 1 year. Because the tank contained no drainage system, she used an electric water pump to extract and discharge the wastewater. Within minutes, she lost consciousness while in the tank. Her son, the operator (her husband), and her daughter attempted to rescue her, also without using any PPE. These three persons also rapidly lost consciousness in the tank. At 6:21 p.m., the operator's daughter-in-law asked a neighbor to call medical emergency

[†] Confined spaces have limited or restricted means for entry or exit and are not designed for continuous occupancy; they are large enough for workers to enter and perform certain jobs. Confined spaces include but are not limited to tanks, vessels, silos, storage bins, hoppers, vaults, pits, manholes, tunnels, equipment housings, ductwork, and pipelines.

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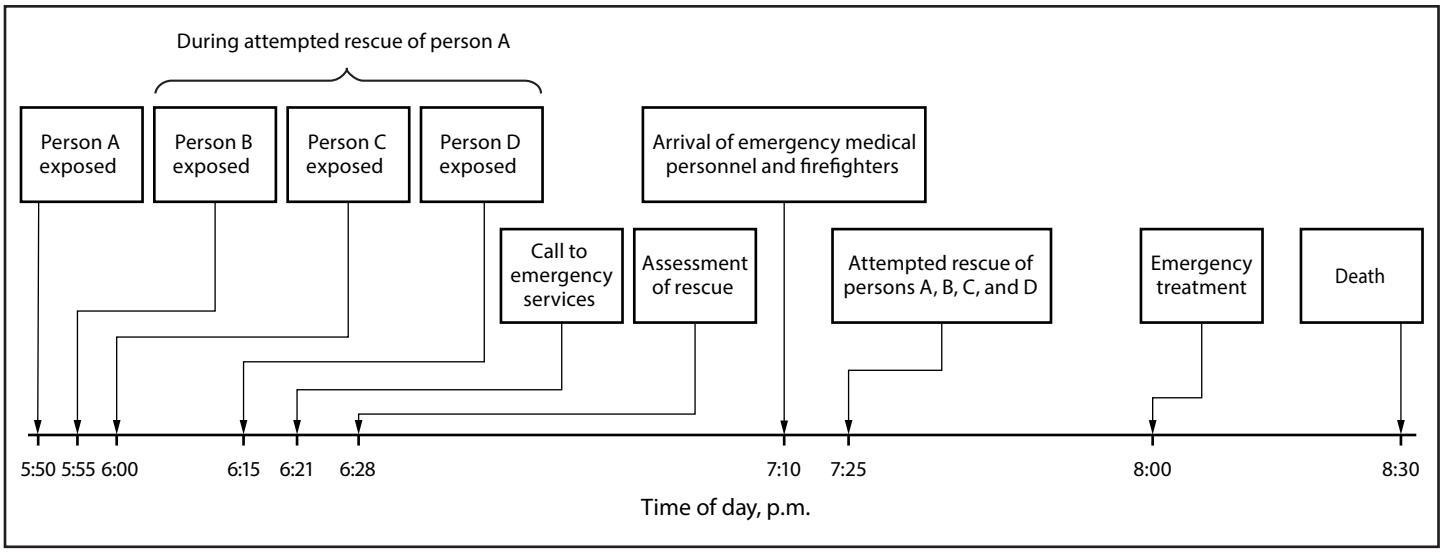
**FIGURE 1. Timeline of events in deadly poisoning of four persons* in a ceremonial papermaking workshop — China, May 14, 2025**




* Person A = workshop operator's wife; person B = workshop operator's son; person C = workshop operator; person D = workshop operator's daughter.

rescue services. Health center medical staff members from the township (the administrative level below county) arrived within 10 minutes; they detected an unusual odor, and because they also did not have PPE, they called emergency rescue services for additional support. At 7:10 p.m., emergency medical personnel from the county People's Hospital and firefighters arrived. By 7:25 p.m., all four persons had been removed from the tank by the firefighters. All were cyanotic, unconscious, and without detectable pulse, respiration, blood pressure, or reflexes. All four patients were transported to the county hospital emergency department, where resuscitation efforts were unsuccessful; all were pronounced dead at 8:30 p.m.

### Assessment of the Workshop

**Workshop characteristics.** The facility consisted of a one-story building that occupied approximately 5,400 sq ft (500 $m^2$) and included four underground tanks (Figure 2), each with an approximate volume of 494 cu ft (14 $m^3$) and a depth of approximately 7.3 ft (2.2 m). At the time of the investigation, the incident tank contained 6.7 in (17 cm) of wastewater; the other three tanks were nearly full. Two points of entry (approximately 5.4 sq ft [0.5 $m^2$] each) provided access to two of the four confined-space underground tanks, all four of which were unventilated and permitted passage, by one person at a time, on a ladder into the tanks. The decedents were standing in the liquid at the time of exposure.

**On-site sampling and testing.** Approximately 22 hours after the incident, occupational health investigators from the provincial China CDC arrived. Wearing PPE (i.e., protective clothing and self-contained breathing apparatuses), they entered the tank to collect gas samples for on-site testing (Table). Testing results showed a mixed exposure ratio[¶] of hydrogen sulfide, hydrogen fluoride, phosphine, ammonia, and other substances of 106:1, indicating that the combined effect of these substances could create a toxic atmosphere that could immediately result in death.**

## Public Health Response

Under China's classification system for public health emergencies, this incident was categorized as a major (level III) public health emergency. The emergency response was initiated within hours and involved emergency management, public health, public security, and environmental protection officials.

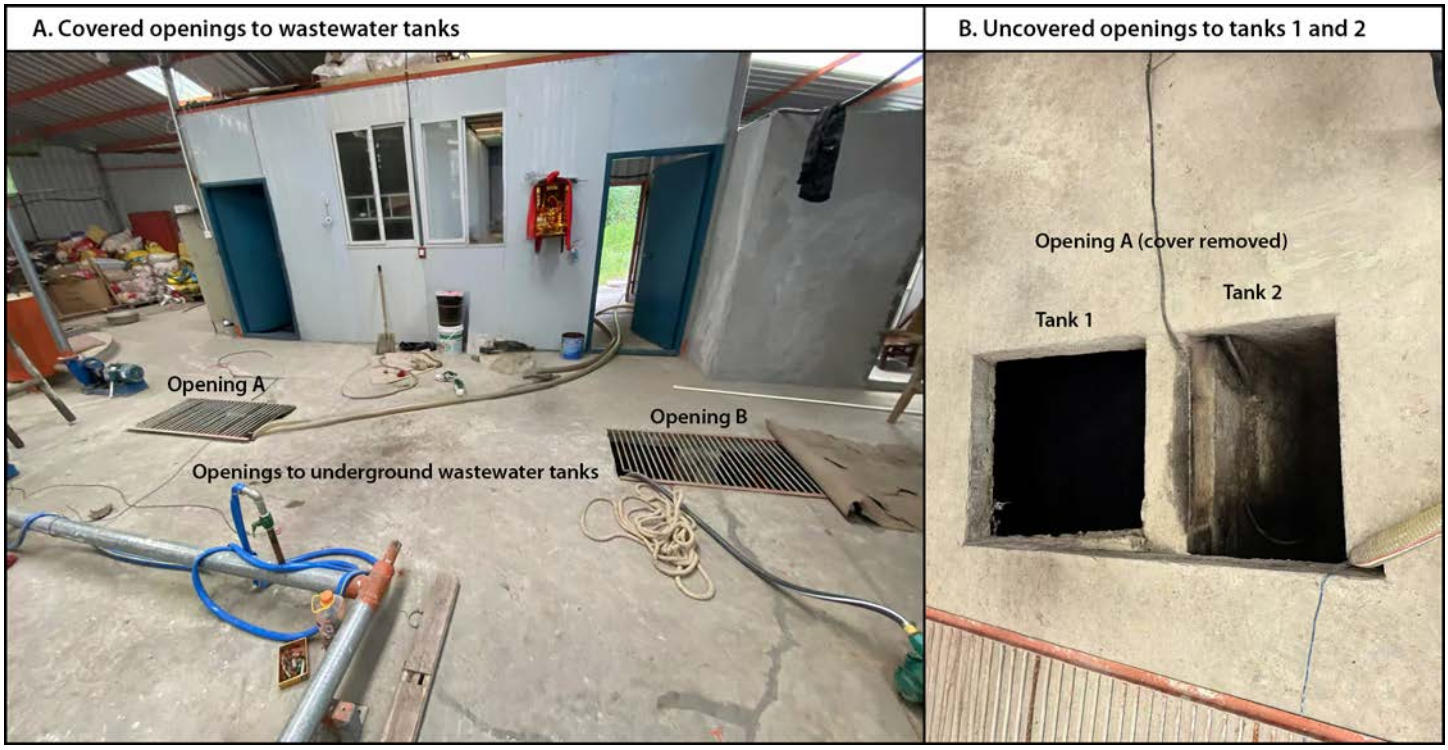
### Local Investigation

Local police immediately closed the workshop to prevent further exposure to the hazardous environment. The county China CDC conducted interviews with all 10 residents of the six households in the village where the workshop was located to gather information about its operations. In addition, a

[¶] The mixed exposure ratio is defined as the sum of the ratios of the actual exposure concentrations of various toxic gases in the workplace to their respective occupational exposure limits. This ratio is typically used to assess the combined effect of simultaneous exposure to multiple hazardous gases (when the combined exposure level of multiple toxic gases is below the occupational exposure limit, this value should be ≤1).

** Immediate danger to life and health refers to atmospheres that pose an immediate threat of death or irreversible health effects or that prevent a person from escaping an area.

**FIGURE 2. Covered openings to underground wastewater tanks (A)* and uncovered opening to tanks 1 and 2 (B) in a ceremonial papermaking workshop — China, May 14, 2025**




* Four wastewater tanks (1, 2, 3, and 4) are located below ground level. Tanks 1 and 2 shared access opening A; tanks 3 and 4 shared access opening B. Tank 2 is the wastewater tank involved in the incident described in this report.

health survey was conducted among the 10 residents to assess the potential impact of toxic gas exposure. The investigation found no evidence of clinical signs or symptoms compatible with exposure among village residents.

### Environmental Investigation

Environmental authorities conducted rapid hydrogen sulfide monitoring inside the tank, at the outlet of the tank, and within the workshop. The tank was identified as the primary source of the gas. Toxic residue was contained and sealed by the local police. Subsequently, the environmental protection department treated the remaining wastewater. Because the residence closest to the workshop was approximately 1/8 mile (200 m) away, and data from the county China CDC household health survey indicated no evidence of exposure to the community, the toxic gas was not expected to have caused any adverse health effects to the surrounding community.

### Regulatory Investigation

China's regulations mandate that legal operation of a papermaking workshop requires possession of a business license and documentation of an on-site safety inspection by emergency management authorities, an occupational health preassessment by qualified institutions, and an environmental impact assessment approved by environmental authorities. The workshop had a basic business license that was obtained online. The workshop had not yet produced any paper for sale but had operated without the necessary permits for at least 1 year. In response to these findings, recommendations were submitted to government officials to improve the regulatory system to 1) prevent oversight failures and 2) strengthen safety supervision and occupational health training for workers within regulated businesses to reduce their potential for exposure to hazardous substances.

## Discussion

In the year leading up to these four deaths, the workshop had been engaged in intermittent trial production and equipment maintenance, resulting in completely full tanks. Workers pumped out excess wastewater before entry, leaving approximately 6.7 in (17 cm) of liquid at the time of investigation.

Because the tank where the exposure occurred had not been cleaned in at least 1 year, toxic gases had accumulated to critical concentrations. On-site gas sampling suggested that the combined effects of multiple toxic gases likely caused these deaths.

Hydrogen sulfide gas is more dense than air and accumulates in low-lying areas. At high concentrations (>800 parts per million),

**TABLE. Gas concentration test results from an underground wastewater tank inside a ceremonial papermaking workshop, by detection (sampling) method — China, May 14, 2025**

| Gas concentration | Detection (sampling) method | |
|---|---|---|
| | Rapid detection testing (portable composite gas detector)* | Routine testing (GBZ/T160.33-2004)† |
| **Ammonia** | | |
| Measured concentration | 8.1 ppm (5.65 mg/m$^3$) | — |
| Maximum allowable concentration | 43.1 ppm (30 mg/m$^3$) | — |
| **Carbon dioxide** | | |
| Measured concentration | 2,135 ppm (3,842 mg/m$^3$) | — |
| Allowable short-term concentration | 10,000 ppm (18,000 mg/m$^3$) | — |
| **Hydrogen fluoride** | | |
| Measured concentration | 10.1 ppm (8.23 mg/m$^3$) | — |
| Maximum allowable concentration | 2.4 ppm (2 mg/m$^3$) | — |
| **Hydrogen sulfide** | | |
| Measured concentration | 30.5 ppm (42.55 mg/m$^3$) | 8.4 ppm (11.68 mg/m$^3$) |
| Maximum allowable concentration | 7.2 ppm (10 mg/m$^3$) | 7.2 ppm (10 mg/m$^3$) |
| **Phosphine** | | |
| Measured concentration | 20.2 ppm (28.13 mg/m$^3$) | — |
| Maximum allowable concentration | 0.22 ppm (0.3 mg/m$^3$) | — |

**Abbreviation:** ppm = parts per million.

* Rapid detection involves use of portable devices to conduct an on-site analysis at a contaminated site to obtain qualitative, semiquantitative, or quantitative data within a few seconds to a few minutes.

† Routine testing refers to a series of Chinese national occupational standards for determining and controlling the presence of sulfides in workplace air, designed for evaluating chemical hazards in the workplace.

hydrogen sulfide rapidly causes olfactory fatigue and respiratory failure, resulting in immediate respiratory arrest and shock (*3*,*4*). National data for China indicate that asphyxiating gases, particularly hydrogen sulfide, account for approximately one half of occupation-related poisoning deaths (*5*). Although the use of sulfate in the papermaking processes from this workshop could not be definitively confirmed, standard papermaking practices suggest that sulfate use was likely. In 2013, a similar instance of hydrogen sulfide poisoning was reported in another papermaking business in China, where five persons were poisoned while working without protective equipment or protective measures in place; all five persons survived, although two experienced pulmonary and cerebral edema (*6*).

The detection of hydrogen fluoride and phosphine was unexpected because these gases are typically not associated with the papermaking process. Certain minerals in the tank (e.g., clays, coal, and rocks) might have reacted with alkaline chemicals (e.g., bleach) added during the papermaking process, thereby generating hydrogen fluoride. Phosphine is typically produced through the anaerobic decay and fermentation of organic matter, which might account for its presence in the tank.

Entering confined spaces in a work environment requires a preestablished work plan. These deaths were likely the result of unsafe work practices. The entry of an untrained employee with no PPE into a confined space with no atmospheric monitoring or ventilation, followed by an attempted rescue by untrained employees with no PPE, is similar to a previous incident (2018) in China, during which a rescue attempt resulted in multiple deaths (*7*).

This case highlights a systemic regulatory failure. The workshop lacked mandatory occupational safety permits and environmental impact assessment approvals. Instead, the employees at the workshop relied on self-reporting the permits that they had applied for, rather than written documentation of receipt of mandated permits and completion of required inspections, which allowed noncompliant operations to continue unchecked without implementation of occupational hazard controls (*8*). In addition, human resource limitations, including insufficient staffing, have hampered the ability of relevant authorities to conduct on-site inspections of small workshops, contributing to the regulatory limitations.

Strengthening the safety approval processes administered by emergency management, environmental protection, and health authorities for businesses that produce potentially toxic byproducts can reduce the safety risks faced by workers. In addition, improving employee education and training on safe work practices, occupational hazards, and personal protective measures could reduce the risk for potential toxic exposures (*9*).

## Limitations

The findings in this report are subject to at least two limitations. First, the laboratory analyses of the toxic gases occurred approximately 1 day after the deaths. This delay might have caused an underestimation in the true value of the concentration recorded at the time of the incident, because the tank cover had been removed for nearly 1 day, resulting in sustained ventilation within the tank. Second, because no autopsies were conducted,

**Summary**

What is already known about this topic?

Toxic gas production is a recognized hazard in the papermaking process. Deaths from occupation-related exposures have been reported in China, especially in small, unregulated papermaking workshops. Inadequate enforcement of licensing and monitoring requirements increases these risks.

What is added by this report?

In May 2025, four employees in an unlicensed southwest China ceremonial papermaking workshop died after being exposed to hydrogen sulfide and other toxic gases in a confined space in the workshop. One woman lost consciousness while cleaning a wastewater tank; three family members, also employees, who attempted to rescue her also died. The workshop had no available personal protective equipment (PPE), atmospheric monitoring, or ventilation.

What are the implications for public health practice?

Improved enforcement of workplace safety licensing and hazard identification training and PPE use are essential for reducing occupational exposure risks among workers.

a documented cause of death could not be obtained. However, the circumstances at the time of death and the clinical findings support the diagnosis of poisoning by toxic gases.

### Implications for Public Health Practice

These poisoning deaths, as well as other documented cases of hydrogen sulfide poisoning deaths among employees and rescuers, highlight the worldwide risk for similar incidents (*10*). These cases expose systemic deficiencies in small business regulation, safety training, ventilation, and atmospheric monitoring. Strengthening licensing, supervision, and operator training can reduce the occurrence of poisoning deaths from toxic gases and overall exposures to toxic gases.

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All authors have completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. No potential conflicts of interest were disclosed.

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# Trends in Emergency Department Visits Involving Cannabis Hyperemesis Syndrome Identified Using a New Diagnosis Code — United States, January 2023–May 2026

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## Abstract

Cannabis hyperemesis syndrome (CHS) is a condition characterized by cyclical nausea and vomiting and is associated with frequent cannabis use. Data from CDC's National Syndromic Surveillance Program were analyzed to examine trends in CHS-involved emergency department (ED) visits before and after implementation of a new, CHS-specific *International Classification of Diseases, Tenth Revision, Clinical Modification* diagnosis code on October 1, 2025. Monthly CHS-involved ED visits per 10,000 all-cause visits were assessed overall and by demographic characteristics. During January 2023–May 2026, a total of 199,565 ED visits involved CHS. During January 2023–September 2025, the proportion of ED visits that involved CHS remained mostly steady. In the first month after implementation of the new diagnostic code, the proportion of CHS-involved ED visits increased from 3.35 per 10,000 ED visits in September 2025 (preimplementation) to 11.26 per 10,000 ED visits in October 2025 (postimplementation). During the first 8 months after implementation of the new code (October 2025–May 2026), average monthly proportions of CHS-involved ED visits were 3.7 times as high as the monthly average during January 2023–September 2025. Higher proportions of CHS-involved ED visits were observed among persons aged 15–24 years and females, with more pronounced impacts among some demographic groups after code implementation. The abrupt, sustained increase might partly reflect improved recognition and coding of CHS rather than a true rise in incidence. These findings highlight a likely underestimated impact of CHS, suggesting the need to strengthen education about the risks associated with frequent cannabis use, expand ongoing surveillance efforts, and improve clinical recognition of CHS through continuing medical education and implementation of routine cannabis use assessment in ED settings.

## Introduction

Cannabis hyperemesis syndrome (CHS) is a syndrome attributed to prolonged, frequent cannabis use, characterized by sudden episodes of severe nausea, vomiting, and abdominal pain (*1*). Reports of suspected CHS increased sharply during 2016–2022, with the largest increase occurring during the COVID-19 pandemic (*2*); the increase also coincided with widespread state-level cannabis legalization in the United States, although cannabis use remains illegal under federal law (*3*). Persons with CHS often seek medical care because symptoms can be severe and debilitating, with outcomes ranging from symptom resolution after cessation of cannabis use to, in rare cases, death (*1*).

Trends in cannabis use might be contributing to the increasing prevalence and recognition of CHS. The prevalence of past-month and daily or near daily cannabis use has been increasing, particularly among young adults and females (*4*). In addition, concentrations of tetrahydrocannabinol (THC), the primary psychoactive compound in cannabis, have increased in cannabis products over time (*5*). Higher THC concentration (>10%) is associated with continued and more frequent cannabis use among adolescents and young adults (*6*). Although THC concentration has not been directly linked to CHS, higher-potency products are associated with more frequent use, the primary risk factor for CHS (*1*,*6*).

CHS is likely underrecognized in both adolescent and adult populations. Clinicians might not routinely assess or document patients' cannabis use; CHS can be misdiagnosed as other gastrointestinal conditions, such as cyclical vomiting syndrome (*7*). To improve clinical identification, a specific *International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM)* discharge diagnosis code for CHS was introduced on October 1, 2025. This report examines trends in CHS-involved emergency department (ED) visits before and after implementation of this code.

## Methods

### Data Source

CHS-involved ED visits were identified using data from CDC's National Syndromic Surveillance Program (NSSP), a collaboration with state and local health departments, CDC, and other partners to provide near real-time electronic health record data. Approximately 7,500 health care facilities covering 50 states, the District of Columbia, and Guam contribute data to NSSP, representing 83% of U.S. EDs. Analyses were

limited to 3,636 (70.0%) of 5,190 ED facilities consistently reporting data for January 1, 2023–May 31, 2026.*

### Syndrome Definition and Data Classification

On October 1, 2025, a new *ICD-10-CM* diagnosis code for CHS (R11.16) was introduced. For ED visits that occurred before introduction of the new code (January 2023–September 2025) CHS was identified using a definition consisting of a combination of codes for cyclical vomiting (R11.15) or nonspecific emesis (R11) in tandem with a code for a cannabis-related diagnosis (F12x or T40.7Xx), as developed and assessed for clinical sensitivity (*2*). For ED visits during October 2025–May 2026, CHS-involved visits were identified using the newly implemented R11.16 code; visits were also included if they met the previous definition (*2*) but did not include the new R11.16 code.

### Data Analysis

Monthly counts per 10,000 all-cause ED visits are analyzed overall and by age group (11–14, 15–24, 25–34, 35–44, and ≥45 years), sex (male or female), and race and ethnicity for the entire study period using the two different syndrome definitions. Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.† Data for children aged <11 years are not reported because of low case count and suppression rules (i.e., fewer than 20 cases per month). During October 2025–May 2026, monthly counts and proportions§ were aggregated and reported overall and by age group, sex, and race and ethnicity. This activity was reviewed by CDC, deemed not research, and conducted consistent with applicable federal law and CDC policy.¶

## Results

During January 2023–May 2026, a total of 199,565 CHS-involved ED visits were identified among 407,326,613 all-cause ED visits. Using a previous definition (*2*), overall proportions of CHS-involved ED visits were 3.19 per 10,000 ED visits in January 2023 and 3.35 in September 2025 (Figure 1), ranging from 2.69 in December 2023 to 3.44 in May 2025. After the new diagnosis code was introduced, the proportion of visits identified increased substantially (from 3.35 per 10,000 ED visits in September 2025 to 11.26 in October 2025). During this period, notable fluctuations occurred in average monthly proportions of CHS-involved ED visits, ranging from 12.05 in November 2025, to 10.96 in January 2026, to 13.10 in May 2026 (Figure 1). During October 2025–May 2026, the average monthly proportion of CHS-involved ED visits was 11.97 (Table), 3.7 times as high as the monthly average (3.19) during January 2023–September 2025.

Before implementation of the new code in October 2025, temporal trends of CHS-involved ED visits per 10,000 ED visits by age group, sex, and race and ethnicity also remained steady during January 2023–September 2025 (Figure 2). During this period, the highest average proportion of monthly CHS-involved ED visits per 10,000 ED visits was identified among persons aged 15–24 years (9.99), females (3.28), and American Indian or Alaska Native persons (4.33). After the new CHS code was implemented, a few differences emerged. Although the period of observations is limited to 8 months, the data suggest a potential increase in average monthly CHS-involved ED visits for persons aged 15–24 and 25–34 years and those who are Hispanic, Black or African American (Black), White, and of multiple or other races. Throughout this period, higher average proportions of monthly CHS-involved ED visits per 10,000 ED visits were identified among persons aged 15–24 years (38.70), Black persons (17.60), and females (12.65) (Table).

## Discussion

The proportion of CHS-involved ED visits remained steady during January 2023–September 2025 until the introduction of a new diagnosis code for CHS in October 2025, after which a marked increase occurred. The abruptness and sustained magnitude of the increase likely reflects, at least in part, improved clinical recognition and coding of CHS rather than a true and immediate rise in incidence. The stability of trends before October 2025, including those across demographic subgroups, further supports the notion that the observed shift is likely driven by changes in coding practices. However, the higher levels after implementation of the new code might represent more accurate estimates of CHS impact in ED settings. These findings underscore the importance of accounting for coding changes when interpreting temporal trends and highlight the potential use of ED data for monitoring CHS and related substance use patterns.

Proportions of CHS-involved ED visits were high in younger age groups, particularly those aged 15–24 years. CHS typically occurs among those with heavy, frequent, and long-term cannabis use (*1*); previous studies have characterized CHS as a condition associated with heavy cannabis use over extended

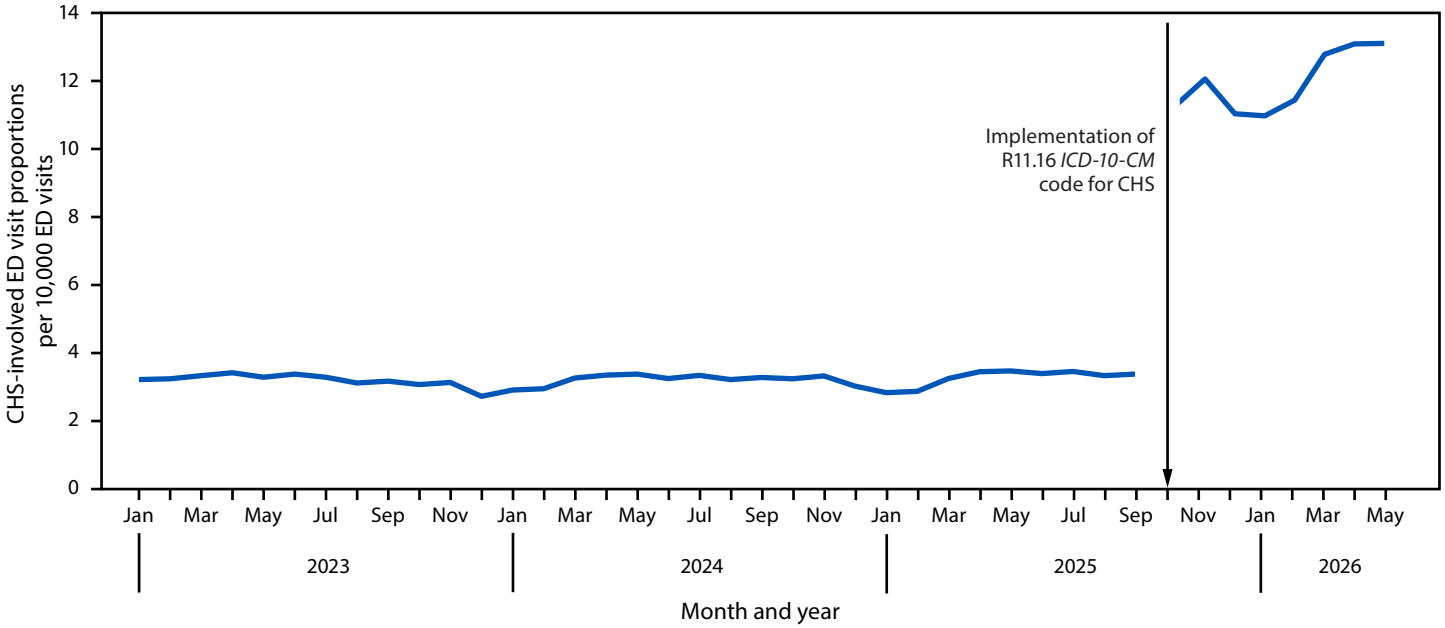
* Two data quality metrics were used: 1) coefficient of variation ≤45% and 2) weekly average discharge diagnosis informative ≥75. This method attenuates the extent of artificial increases when EDs newly report data to surveillance or when the data quality of the diagnosis variable improves.

† The remaining categories included American Indian or Alaska Native; Asian; Black or African American; Native Hawaiian or Pacific Islander; White; and multiple or other races. For analysis, Asian and Native Hawaiian or Pacific Islander were combined into a single category due to low case count.

§ Proportions of CHS-involved ED visits were calculated by summing the total number of visits during October 2025–May 2026, dividing by the total number of all-cause ED visits during October 2025–May 2026, and scaling to 10,000 ED visits.

¶ 45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.

**FIGURE 1. Monthly proportions of emergency department visits involving cannabis hyperemesis syndrome* — National Syndromic Surveillance Program, United States, January 2023–May 2026**




**Abbreviations:** CHS = cannabis hyperemesis syndrome; ED = emergency department; *ICD-10-CM* = *International Classification of Diseases, Tenth Revision, Clinical Modification*.
* During January 1, 2023–September 30, 2025, the CHS case definition included a combination of discharge diagnosis codes for cyclical vomiting (R11.15) or nonspecific emesis (R11) in tandem with codes for cannabis-related diagnosis (F12x or T40.7Xx). During October 1, 2025–May 31, 2026, the new *ICD-10-CM* diagnosis code for CHS (R11.16) was used to identify CHS-involved visits. During this period, visits were also included if they met the definition used during January 1, 2023–September 30, 2025, but did not include the new R11.16 code.

periods (*8*). However, emerging evidence indicates that symptom onset can occur much sooner than was previously estimated, including within the first year of cannabis use (*8*). Some studies have reported delays of several years from symptom onset to diagnosis (*8*), suggesting that CHS might be underrecognized, particularly early in its course. Although data remain limited, high proportions of CHS-involved ED visits among younger age groups might reflect changing patterns of cannabis use behaviors, including earlier age at initiation, increased use of high-potency THC products, evolving methods of use (e.g., vaping or dabbing**), changing perceptions of risk, or increased frequency of use among younger populations (*9*).

The introduction of a specific diagnosis code for CHS in October 2025 represents an important advancement for public health surveillance. Before its implementation, many CHS cases were likely not identified because of frequent misclassification as cyclical vomiting syndrome and reliance on secondary cannabis-related codes (*2*,*7*). The new code enables more consistent documentation and might facilitate clinical recognition and direct case ascertainment, improving the ability to monitor the public health impact of CHS, detect changes in incidence, and understand risk factors across populations.

** Dabbing is the inhalation of highly concentrated tetrahydrocannabinol-based oils that are often heated using a blowtorch.

## Limitations

The findings in this report are subject to at least five limitations. First, the *ICD-10-CM* codes used to identify CHS before October 1, 2025, were nonspecific and imprecise, which might have resulted in misclassification. Even after implementation of the new diagnosis code, CHS-involved ED visits might be underreported or misclassified because identification relies on clinician recognition and documentation. Second, these data only include patients with symptoms severe enough to seek emergency care and therefore likely underestimate the true incidence of CHS. Third, ascertainment of CHS depends, in part, on patient self-report of cannabis use, which might be affected by social desirability or recall bias. Fourth, despite relatively steady ED visit numbers over time, facilities that consistently report data might differ from those with fluctuating data quality and completeness; therefore, data and results are not completely generalizable. Finally, trends observed after implementation of the new diagnosis code should be interpreted with caution, because higher proportions of CHS-involved ED visits might reflect increasing code adoption and improved recognition rather than true increases in CHS incidence.

## Implications for Public Health Practice

These findings highlight the need for increased awareness of CHS among clinicians and the public, but further educational

**TABLE. Total number and average monthly proportions* of emergency department visits involving cannabis hyperemesis syndrome, by age, sex, and race and ethnicity — National Syndromic Surveillance Program, United States, October 2025–May 2026†**

| Characteristic | Total no. of visits for any cause | Average no. of CHS-involved ED visits per month | Average CHS-involved ED visit proportions per month |
|---|---|---|---|
| **Total** | **94,950** | **11,868.75** | **11.97** |
| **Age group, yrs (n = 93,947)§** | | | |
| 11–14 | **711** | 88.88 | 3.19 |
| 15–24 | **34,374** | 4,296.75 | 38.70 |
| 25–34 | **29,653** | 3,706.63 | 28.28 |
| 35–44 | **15,885** | 1,985.63 | 15.89 |
| ≥45 | **13,324** | 1,665.50 | 3.49 |
| **Sex (n = 94,853)¶** | | | |
| Female | **55,258** | 6,907.25 | 12.65 |
| Male | **39,595** | 4,949.38 | 11.13 |
| **Race and ethnicity (n = 92,080)**** | | | |
| AI/AN | **902** | 112.75 | 15.14 |
| Asian and NH/PI | **989** | 123.63 | 5.32 |
| Black or African American | **27,000** | 3,375 | 17.60 |
| White | **43,281** | 5,410.13 | 10.47 |
| Hispanic or Latino | **16,653** | 2,081.63 | 12.08 |
| Multiple or other races | **3,255** | 407 | 9.59 |

**Abbreviations:** AI/AN = American Indian or Alaska Native; CHS = cannabis hyperemesis syndrome; ED = emergency department; NH/PI = Native Hawaiian or Pacific Islander.

* Proportions of CHS-involved ED visits were calculated by summing the total number of visits meeting the case definition, dividing by the total number of ED visits for any cause, and scaling to 10,000 ED visits.

† During January 1, 2023–September 30, 2025, the CHS case definition included a combination of discharge diagnosis codes for cyclical vomiting (R11.15) or nonspecific emesis (R11) in tandem with codes for cannabis-related diagnosis (F12x or T40.7Xx). During October 1, 2025–May 31, 2026, the new *International Classification of Diseases, Tenth Revision, Clinical Modification* diagnosis code for CHS (R11.16) was used to identify CHS-involved visits. During this period, visits were also included if they met the definition used during January 1, 2023–September 30, 2025, but did not include the new R11.16 code (14,988).

§ Children aged 0–10 years were excluded from analysis because of low case count and suppression rules (i.e., fewer than 20 cases per month). Sample sizes (the number of total ED visits for any cause) by age group were as follows: 11–14 years, 2,225,666; 15–24 years, 8,882,394; 25–34 years, 10,485,979; 35–44 years, 9,995,358; and ≥45 years, 38,160,064.

¶ Sample sizes (the number of total ED visits for any cause) were 43,691,253 for females and 35,561,303 for males.

** Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic. Sample sizes (the number of total ED visits for any cause) by race and ethnicity were as follows: AI/AN, 595,866; Asian and NH/PI, 1,857,387; Black or African American, 15,338,697; White, 41,341,916; Hispanic, 13,790,061; and multiple or other races, 3,394,679.

efforts might be needed to prevent the cause of CHS: cannabis use. They also emphasize the importance of implementing evidence-based strategies to prevent cannabis use initiation and mitigate the consequences of cannabis use.

The observed higher proportions of CHS-involved ED visits after the new code was implemented in October 2025 potentially more accurately reflects true impact than previously observed proportions, underscoring the need for preparedness in emergency care settings, including appropriate clinical recognition and management of CHS. Clinicians can consider CHS in the differential diagnosis for patients with nausea, vomiting, and abdominal pain and can routinely assess cannabis use, including frequency, duration, product type, and route of use. Screening for substance use disorders and comorbid psychiatric conditions might also be warranted among patients reporting regular cannabis use (*10*).

Educational materials and communications campaigns should convey that younger age groups had high proportions of ED visits with CHS identification and that CHS might occur after shorter durations of cannabis use than was previously recognized (*7*,*8*). Expanded and tailored messaging might also be needed to raise awareness of CHS and other potential adverse health effects of cannabis use, particularly among younger populations. Communities can identify a wide range of effective substance use prevention and intervention strategies using CDC's ENGAGE: Evidence-Based Strategies to Prevent Youth Substance Use resource for action.

Continued surveillance is important to better understand CHS epidemiology, including the potential role of high-potency THC and hemp-derived products and information on cannabis product characteristics (e.g., potency, type, or route of use) and to observe trends after code implementation to better assess prevalence. Monitoring trends across demographic groups and geographic areas can help identify populations at greatest risk and guide tailored prevention and intervention strategies.

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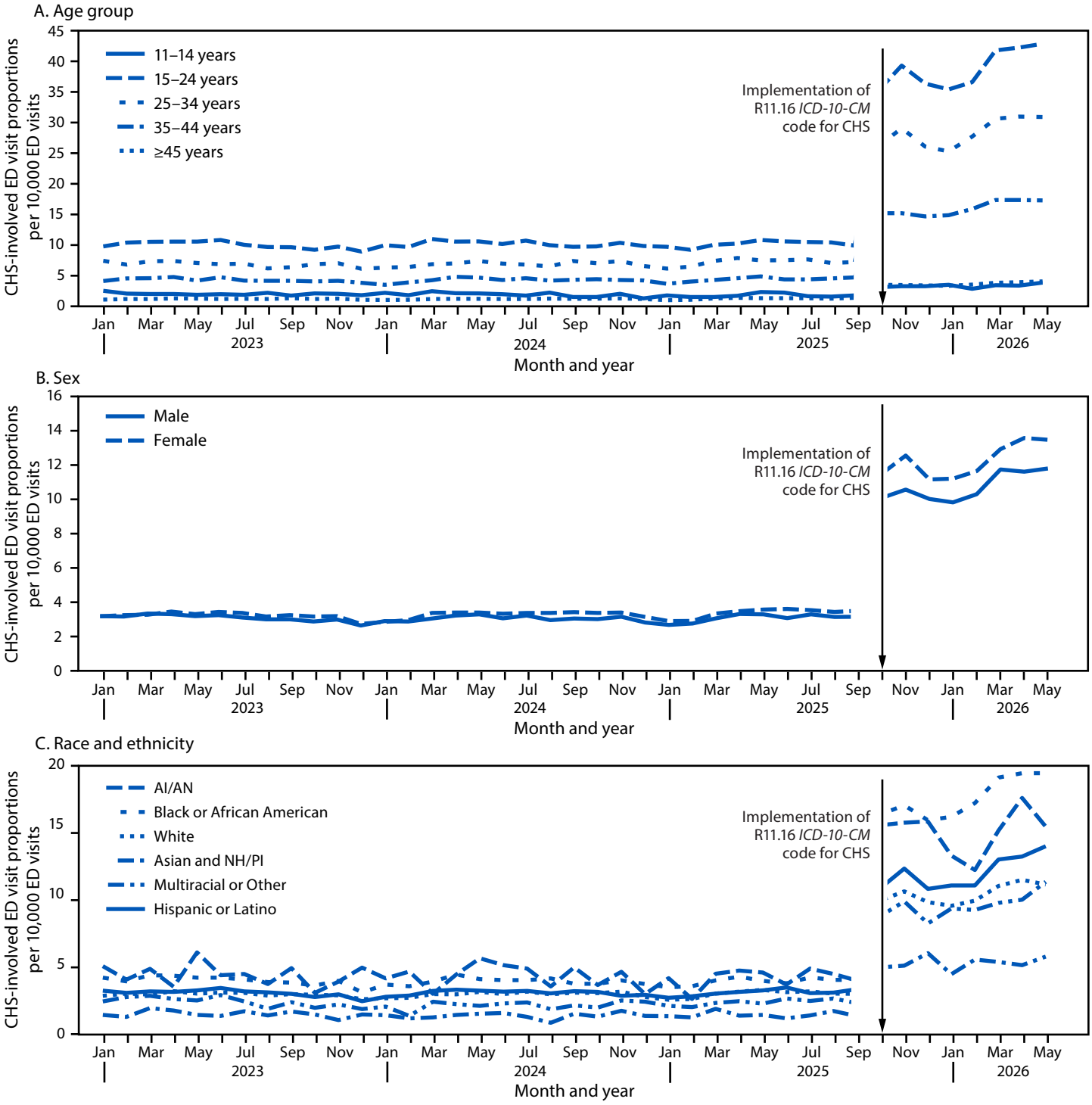
**FIGURE 2. Monthly proportions of emergency department visits involving cannabis hyperemesis syndrome,* by age (A), sex (B), and race and ethnicity (C)† — National Syndromic Surveillance Program, United States, January 2023–May 2026**




**Abbreviations:** AI/AN = American Indian or Alaska Native; CHS = cannabis hyperemesis syndrome; ED = emergency department; *ICD-10-CM* = *International Classification of Diseases, Tenth Revision, Clinical Modification*; NH/PI = Native Hawaiian or Pacific Islander.

* Visits with missing or unknown values for certain variables were excluded from analyses of that variable. A minimal amount of data was missing for each of the demographic variables; age (0.45%), sex (0.22%), and race and ethnicity (5.20%). During January 1, 2023–September 30, 2025, the CHS case definition included a combination of discharge diagnosis codes for cyclical vomiting (R11.15) or nonspecific emesis (R11) in tandem with codes for cannabis-related diagnosis (F12x or T40.7Xx). During October 1, 2025–May 31, 2026, the new *ICD-10-CM* diagnosis code for CHS (R11.16) was used to identify CHS-involved visits. During this period, visits were also included if they met the definition used during January 1, 2023–September 30, 2025, but did not include the new R11.16 code.

† Persons of Hispanic or Latino (Hispanic) origin might be of any race but are categorized as Hispanic; all racial groups are non-Hispanic.

**Summary**

What is already known about this topic?

The prevalence of cannabis hyperemesis syndrome (CHS), a condition characterized by cyclical nausea and vomiting associated with frequent cannabis use, increased sharply in the United States during 2016–2022.

What is added by this report?

The proportion of all-cause emergency department visits that involved CHS were higher after implementation of a new *International Classification of Diseases, Tenth Revision, Clinical Modification* diagnosis code, suggesting improved recognition and previous underestimation of the public health impact of CHS. Higher proportions were observed among younger persons and females.

What are the implications for public health practice?

The new CHS-specific diagnosis code has improved CHS surveillance and estimation of public health impact. However, increased clinical recognition and education about risks of frequent cannabis use are still needed, particularly in younger populations.

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