



# Health and Safety Issues for Workers in the Cannabis Industry

**Bradley King, PhD, CIH**

**NIOSH Western States Division**

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# Cannabis and work: Need for more research

John Howard MD<sup>1</sup> | Jamie Osborne MPH, CHES<sup>2</sup>

<sup>1</sup>Office of the Director, National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, US Department of Health and Human Services, Washington DC

<sup>2</sup>Office of the Director, National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, US Department of Health and Human Services, Atlanta, Georgia

## Correspondence

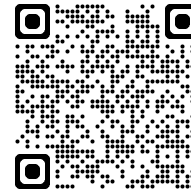
John Howard, MD, Office of the Director, National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, 395 E St. S. W., Suite 9200, Washington DC 20201.  
Email: [jhoward1@cdc.gov](mailto:jhoward1@cdc.gov)

## Abstract

*Cannabis sativa* is one of the oldest and most widely used plants in the world with a variety of industrial, medical, and nonmedical applications. Despite its long history, cannabis-derived products remain a source of controversy across the fields of medicine, law, and occupational safety and health. More favorable public attitudes about cannabis in the US have resulted in greater access to cannabis through legalization by states, leading to more consumption by workers. As more states adopt cannabis access laws, and as more workers choose to consume cannabis products, the implications for existing workplace policies, programs, and practices become more salient. Past workplace practices were grounded in a time when cannabis consumption was always viewed as problematic, considered a moral failing, and was universally illegal. Shifting cultural views and the changing legal status of cannabis indicate a need for research into the implications and challenges relating to cannabis and work. This commentary suggests research needs in the following areas: (a) data about industries and occupations where cannabis consumption among workers is most prevalent; (b) adverse health consequences of cannabis consumption among workers; (c) workplace supported recovery programs; (d) hazards to workers in the emerging cannabis industry; (e) relationship between cannabis consumption and occupational injuries; (f) ways to assess performance deficits and impairment from cannabis consumption; (g) consumption of synthetic cannabinoids to evade detection by drug testing; (h) cannabis consumption and its effect on occupational driving; and (i) ways to craft workplace policies and practices that take into consideration conflicting state and federal laws pertaining to cannabis.

# WHERE WORK AND CANNABIS INTERSECT...

Howard J, Osborne J. Cannabis and Work: Need for More Research (2020). *Am J Ind Med*; 63: 963–972.



# Cannabis Industry Workplace Exposures and Hazards

## Chemical

Butane

Carbon dioxide (CO<sub>2</sub>)

Ozone (O<sub>3</sub>)

Carbon monoxide (CO)

Pesticides

Disinfectants, Cleaning  
Chemicals

Nutrients, Corrosives

Indoor Environmental  
Quality

## Biological

Mold

Sensitizers and  
allergens  
(dermal)

Sensitizers and  
allergens  
(respiratory)

## Physical

Noise

Heat stress

Optical radiation  
(light)

Ergonomics

## Safety

Machine guarding

Confined spaces

Electrical

Working at heights

Walking/working  
surfaces

Compressed gases

Workplace violence

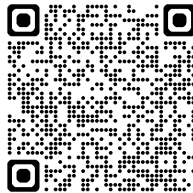
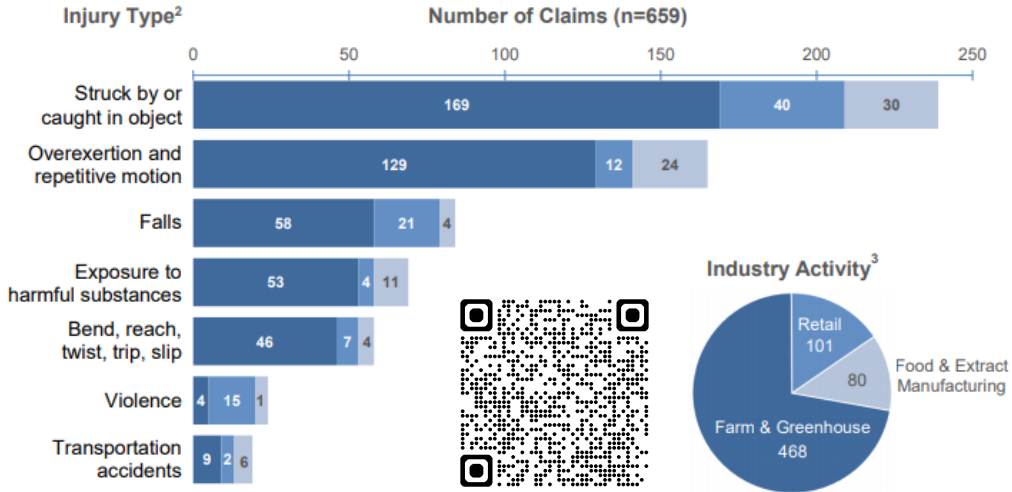
# Cannabis Industry Workplace Exposures and Hazards



## SHARP Stats Cannabis 2020 Update

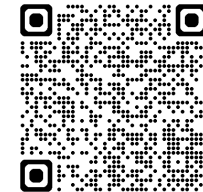
### Injury and Illness in the legal cannabis industry<sup>1</sup>

Washington State Workers' Compensation Claims, July 2014 through December 2018



## Guide to Worker Safety and Health in the Marijuana Industry

Marijuana Occupational Health and Safety Work Group  
January 2017



[colorado.gov/cdphe/marijuana-occupational-safety-health](https://colorado.gov/cdphe/marijuana-occupational-safety-health)

# Cannabis Industry Workplace Exposures and Hazards



## INCIDENT HIGHLIGHTS

**DATE:**  
January 4, 2022

**TIME:**  
12:30 p.m.

**VICTIM:**  
27-year-old flower production technician

**INDUSTRY/NAICS CODE:**  
Other Food Crops Growth Under Cover/111419

**EMPLOYER:**  
Cannabis cultivation and processing, indoors

**SAFETY & TRAINING:**  
Lacked a comprehensive safety and health program and had limited training

**SCENE:**  
Cannabis processing facility

**LOCATION:**  
Massachusetts

**EVENT TYPE:**  
Asthma exacerbation



**REPORT#: 22MA002**

**REPORT DATE:** November 16, 2023

## Cannabis Flower Technician Experiences Fatal Asthma Exacerbation —Massachusetts

### SUMMARY

On January 4, 2022, a 27-year-old flower production technician at an indoor cannabis cultivation and processing facility experienced an asthma exacerbation. She was working with processed cannabis, became short of breath and ultimately stopped breathing and lost consciousness. [READ THE FULL REPORT](#) (p.3)

### CONTRIBUTING FACTORS

Key contributing factors identified in this investigation include:

- Failure to recognize ground cannabis as a potential occupational respiratory hazard
- Failure to adequately control the spread of airborne cannabis dust
- Lack of a comprehensive safety and health program and overall safety training

[LEARN MORE](#) (p.10)

### RECOMMENDATIONS

Massachusetts FACE investigators concluded that, to help prevent similar occurrences, employers should:

- Assess and control hazardous materials in the workplace, including asthmagens.
- Ensure that all workers are properly trained about hazardous materials in the workplace.
- Develop and implement a comprehensive safety and health program that addresses hazard recognition, avoidance of unsafe conditions, and proper use of equipment. [LEARN MORE](#) (p.10)

Morbidity and Mortality Weekly Report

## Fatal Occupational Asthma in Cannabis Production — Massachusetts, 2022

Virginia M. Weaver, MD<sup>1</sup>; Jeremy T. Hua, MD<sup>2</sup>; Kathleen M. Fitzsimmons, PhD<sup>3</sup>; James R. Laing<sup>3</sup>; Wajslan Farah, MBBS<sup>4</sup>; Anne Hart<sup>5</sup>; Trapper J. Braegger<sup>6</sup>; Michelle Reid, MPH<sup>3</sup>; David N. Weisman, MD<sup>7</sup>

### Abstract

Multiple respiratory hazards have been identified in the cannabis cultivation and production industry, in which occupational asthma and work-related exacerbation of preexisting asthma have been reported. An employee working in a Massachusetts cannabis cultivation and processing facility experienced progressively worsening work-associated respiratory symptoms, which culminated in a fatal asthma attack in January 2022. This report presents findings of an Occupational Safety and Health Administration inspection, which included a worksite exposure assessment, coworker and next-of-kin interviews, medical record reviews, and collaboration with the Massachusetts Department of Public Health. Respiratory tract or skin symptoms were reported by four of 10 coworkers with similar job duties. Prevention is best achieved through a multifaceted approach, including controlling asthmagen exposures, such as cannabis dust, providing worker training, and conducting medical monitoring for occupational allergy. Evaluation of workers with new-onset or worsening asthma is essential, along with prompt diagnosis and medical management, which might include cessation of work and workers' compensation when relation to work exposures is identified. It is important to recognize that work in cannabis production is potentially causative.

### Introduction

Studies in the cannabis cultivation and production industry have identified multiple respiratory hazards such as microbial and plant allergens and irritants, as well as chemicals, including pesticides, and allergens specific to the cannabis plant itself (1–3). Employees in some work areas are exposed to large quantities of ground cannabis. Respiratory and skin signs and symptoms, including asthma, allergic rhinitis, and urticaria, have been reported (2,3). Work-related asthma includes occupational asthma (new-onset asthma induced by sensitizers or irritants) and work-related exacerbation of preexisting asthma.

### Case Report

The employee, a woman aged 27 years, began work at an indoor cannabis cultivation and processing facility on May 20, 2021. She worked throughout the facility as a cycle counter, including in areas where the cannabis product was ground (Figure). In late July, she experienced onset of nausea, loss of taste and smell, earache, and cough, and her employer required her to obtain SARS-CoV-2 testing; the results of two tests were negative. Bilateral diffuse wheezing was noted when a physical examination was performed during the evaluation for the second test. The patient's mother later reported that, although her daughter had no previous history of asthma, allergies, or skin rash, she had developed work-related runny nose, cough, and shortness of breath after 3–4 months of employment.

On October 1, the employee moved to flower production, which entailed grinding of cannabis flowers for approximately 15 minutes, three times per day, and preparing cannabis cigarettes (prerolls). These activities resulted in increased dust exposure. Dust from the grinder was collected by a shop vacuum; however, the vacuum had no high-efficiency particulate air (HEPA) filter, and visible dust escaped. Additional dust-generating processes included open handling of ground product (e.g., while transferring product from the grinder and filling prerolls). Other flower production coworkers reported that the employee's cough increased, particularly when the grinder was on. Efforts to reduce her exposure included covering the grinder vacuum with plastic (the outside of which became visibly coated with ground cannabis) and moving her workstation outside the grinder room. She also used her own N95 respirator and wore company-required long sleeves and gloves while working.

On November 9, the employee became acutely dyspneic at work and was transported by emergency medical services (EMS) to a local emergency department (Figure). Enroute to the hospital, she received an albuterol nebulizer, and her dyspnea resolved. She reported that she did not have asthma but stated that she might be allergic to something at work because she had had a cough and runny nose for 3 months. Bilateral

NIOSH Science Blog

## The Cannabis Industry and Work-related Asthma and Allergies

November 17, 2023 by Bradley King, PhD, MPH, CIH; Catherine Blackwood, PhD; Tara Croston, PhD; Angela Lemons, MS; Sophia Chiu, MD, MPH; Michael Grant, ScD, CIH; Rachel Bailey, DO, MPH; Katelynn Dodd, MPH, Reid Harvey, DVM, MPH; and Jacek Mazurek, MD, PhD.

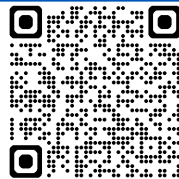
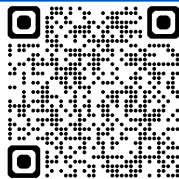
In January 2022, there were about 428,000 people working in the legal cannabis industry across the country.[1] Workers in the cannabis industry face potential workplace hazards, including exposure to:

- Bacteria, mold, and other fungi resulting from high humidity.
- Wet conditions and poor ventilation in work environments.
- Endotoxins (bacterial cell wall components released when certain bacteria disintegrate).
- Organic particulate matter and dust from the plants. This is more likely to occur if cannabis production and processing tasks are not properly controlled.

Sensitization to proteins from cannabis plants may pose a risk for the development of allergic responses.

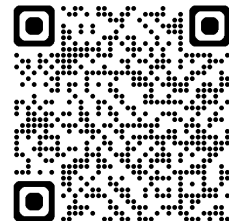
The 2022 death of a cannabis industry worker in Massachusetts sparked concerns about these biological occupational exposures. The Occupational Safety and Health Administration (OSHA) [investigated](#) the incident as a possible work-related asthma death. The Massachusetts Department of Public Health and NIOSH recently published a [Fatality Assessment and Control Evaluation \(FACE\)](#) report. It highlights key contributing factors in the fatality.

In the report, the Massachusetts FACE investigators developed recommendations for employers to prevent similar occurrences. They include:



# NIOSH Cannabis Industry Workplace Exposure Investigations

NIOSH Health Hazard Evaluations (HHEs): <https://www2a.cdc.gov/hhe/search.asp>  
(search 'cannabis')



## COMPLETED:

HHE #1: [Harvesting and Processing Cannabis at an Outdoor Organic Farm](#) (WA, 2017)

HHE #2: [Medicinal Cannabis Manufacturing Facility with an Indoor and Outdoor Grow Operation](#) (MN, 2019)

HHE #3: [Harvesting and Trimming Cannabis at an Indoor Cannabis Cultivation Facility](#) (CO, 2022)

- Identified issues of concern: ergonomic, psychosocial, health symptoms
- Foundations for current and future exposure assessment protocols

## IN PROGRESS:

HHE #4: Massachusetts cannabis facility

## NIOSH Research: “Evaluating Allergic Sensitization among Colorado Cannabis Industry Workers”

**OBJECTIVE:** explore the factors that contribute to allergic sensitization to cannabis-related compounds in an occupational setting

# Cannabis Worker Health and Safety Training: CO Research

## Evaluation of an Occupational Safety and Health Training for Cannabis Cultivation Workers

Carol E. Brown<sup>1,\*</sup>, Erin Shore<sup>1</sup>, Mike V. Van Dyke<sup>1,2</sup>, Joshua Scott<sup>3</sup> and Roberta Smith<sup>4</sup>

<sup>1</sup>Center for Health, Work & Environment, Colorado School of Public Health, University of Colorado Anschutz Medical Campus, 13001 E. 17th Place, Mailstop B119, Aurora, CO 80045, USA; <sup>2</sup>Department of Environmental and Occupational Health, Colorado School of Public Health, University of Colorado Anschutz Medical Campus, 13001 E. 17th Place, Mailstop B119, Aurora, CO 80045, USA; <sup>3</sup>2U Inc., 707 17th Street #2300, Denver, CO 80202, USA; <sup>4</sup>Axion Health, 11001 W. 120th Avenue #315, Broomfield, CO 80021, USA

\*Author to whom correspondence should be addressed. Tel: +303-724-4406; e-mail: [Carol.Brown@cuanschutz.edu](mailto:Carol.Brown@cuanschutz.edu)

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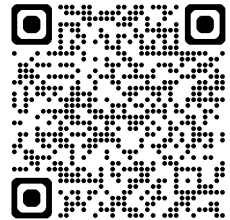
### Abstract

**Objectives:** As the commercial cannabis industry grows, there is an increased need to characterize potentially hazardous workplace exposures and provide training to workers to mitigate these exposures with the goal of reducing accidents and injuries from cannabis cultivation, processing, and manufacturing. Public health and safety stakeholders in Colorado developed a worker-focused training designed to improve hazard awareness, recognition, and controls related to commercial cannabis cultivation. This paper describes the evaluation of this training.

**Methods:** The training was a full day, in-person educational experience directed to workers in the cannabis cultivation industry. Training topics included an overview of occupational safety and health hazards, chemical exposures, slip, trips, and falls, repetitive motion, the application of the hierarchy of control including lockout/tagout, machine guarding, personal protective equipment, among others. Evaluation surveys assessed attendee demographics, perceived job hazards, confidence to change workplace practices, knowledge, training relevancy and quality, intent to change behavior, as well as barriers and resources.

**Results:** A total of 208 people attended the safety trainings. One hundred and thirty-four participants (64%) completed the pre-training survey and 107 (51%) completed the post-training survey. Respondents provided high ratings for the quality and relevance of the training, with 91.3% of respondents rating the training very good or excellent. Before the training, the attendees listed their most concerning safety and health issues as exposure to pesticides and other chemicals (65.7%), absorbing chemicals through the skin (56.7%), slips, trips, and falls (52.2%), and respiratory hazards (50.7%). After the training, they reported the most concerning hazards to be slips, trips, and fall hazards (65.4%), ergonomic problems (64.5%), and respiratory issues (61.7%). There was a statistically

“Public health and safety [partners] in Colorado developed a worker-focused training designed to improve hazard awareness, recognition, and controls related to commercial cannabis cultivation.”



CE Brown, E Shore, MV Van Dyke, J Scott, R Smith. Evaluation of an Occupational Safety and Health Training for Cannabis Cultivation Workers, *Annals of Work Exposures and Health*, Volume 64, Issue 7, August 2020, Pages 765–769.

# Cannabis Worker Health and Safety Training: Methods

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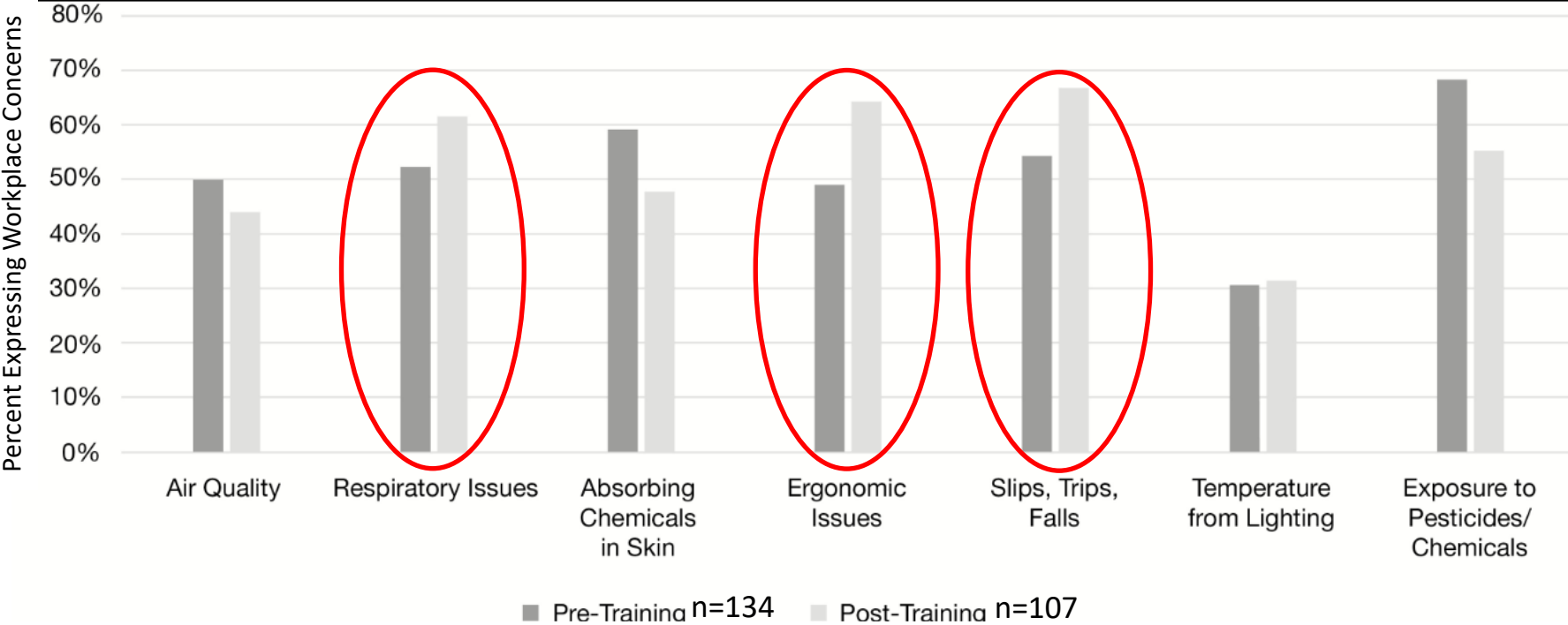
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- Training topics included:
  - an overview of occupational safety and health hazards
  - chemical exposures
  - slip, trips, and falls
  - repetitive motion
  - lockout/tagout
  - machine guarding
  - personal protective equipment (PPE)
- Evaluation surveys administered before and immediately after the training.

CE Brown, E Shore, MV Van Dyke, J Scott, R Smith. Evaluation of an Occupational Safety and Health Training for Cannabis Cultivation Workers, *Annals of Work Exposures and Health*, Volume 64, Issue 7, August 2020, Pages 765-769.



# Cannabis Worker Health and Safety Training: Results



**Figure 1.** Occupational safety and health concerns pre- and post-training. Total trained: 208

CE Brown, E Shore, MV Van Dyke, J Scott, R Smith. Evaluation of an Occupational Safety and Health Training for Cannabis Cultivation Workers, *Annals of Work Exposures and Health*, Volume 64, Issue 7, August 2020, Pages 765-769.

# Cannabis Worker Health and Safety Training: Conclusions

## Evaluation of an Occupational Safety and Health Training for Cannabis Cultivation Workers

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- Cannabis workers:
  - highly interested in receiving training around workplace safety and health.
  - felt training addressed gaps in their knowledge.
  - reported high intent to change safety behavior following training.
- Training allowed attendees to:
  - learn about hazards they're most likely to face.
  - develop ways to address them in their own workplace.
- Workers' concerns of specific hazards shifted to reflect a better understanding of respiratory and musculoskeletal hazards prevalent in the industry.

CE Brown, E Shore, MV Van Dyke, J Scott, R Smith. Evaluation of an Occupational Safety and Health Training for Cannabis Cultivation Workers, *Annals of Work Exposures and Health*, Volume 64, Issue 7, August 2020, Pages 765-769.

# Thank you!

[Bradley.King@cdc.hhs.gov](mailto:Bradley.King@cdc.hhs.gov)

For more information, contact CDC  
1-800-CDC-INFO (232-4636)  
TTY: 1-888-232-6348 [cdc.gov](https://www.cdc.gov)  
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