

CANNABIS AND PUBLIC HEALTH



► February 2020

A CDC Plan to Monitor and Address Use of and Exposure to Cannabis and Associated Health and Social Effects

Purpose

This document outlines a strategy for the Centers for Disease Control and Prevention (CDC) to monitor and address use of and exposure to cannabis [including marijuana and hemp, addressing delta-9-tetrahydrocannabinol (THC) and cannabidiol (CBD)] and associated health and social effects. The plan outlines a vision for the next 3 to 5 years. Current activities that are supported by existing appropriations for established CDC programmatic areas are highlighted, and activities that could be conducted if new resources were to become available are proposed. The Division of Overdose Prevention (DOP) in the National Center for Injury Prevention and Control (NCIPC) serves as the collaborating unit for cannabis activities across the agency and fostered the development of this strategy. Activities reflect engagement of Centers, Institutes, and Offices (CIOs) across the agency, and are anchored to CDC's niche in promoting and protecting public health. The plan was drafted in collaboration with representatives across CDC (Appendix) and serves as an update and expansion to the 2016 CDC plan to address emerging public health concerns related to marijuana.

Background and Justification

Cannabis is a genus of flowering plants that contains hundreds of compounds ("phytocannabinoids") that have a wide range of effects on the body and brain, with significant public health importance. Cannabis includes both marijuana (with THC and CBD, primarily used to achieve a "high") and hemp (with CBD, primarily used for medical purposes).*

While marijuana remains a Schedule I controlled substance federally, as of 2019, 33 states and the District of Columbia (DC) have legalized marijuana for medical use, and 11 states and DC have legalized marijuana for adult, nonmedical use (www.ncsl.org/research/health/state-medical-marijuana-laws.aspx). Marijuana is the most commonly used federally illicit substance in the United States. In 2018, an estimated 43.5 million people aged 12 and older (16% of the population) reported using marijuana in the past year. Among populations more vulnerable to harm, the



Strategies

CDC seeks to pursue the following strategies to foster a public health approach, improve messaging, and secure dedicated resources to address the health risks of cannabis:

-  Monitor trends
-  Advance research
-  Build state, tribal, local, and territorial capacity
-  Support health systems and healthcare providers
-  Partner with public safety, schools, and community coalitions; and
-  Improve public knowledge and awareness.

*Marijuana, also known as weed, pot, or dope, is a Schedule I controlled substance regulated by the Drug Enforcement Agency. It contains delta-9-tetrahydrocannabinol (THC) in levels exceeding 0.3% (as well as other cannabinoids, CBD) and produces a "high" when consumed. Hemp is a variety of cannabis that has high amounts of cannabidiol (also known as CBD) but not more than 0.3% THC; it is not a controlled substance but regulated by the US Department of Agriculture. CBD is not intoxicating or habit forming but is thought to have therapeutic effects. CBD can be hemp-derived or marijuana-derived.

National Survey of Drug Use and Health reports about 1 in 8 adolescents aged 12 to 17 reported use in the previous year, and an estimated 4.8% of pregnant women reported using marijuana in the past 30 days (1). Data from the Youth Risk Behavior Surveillance System shows that approximately 1 in 5 high school students reported using marijuana in the past 30 days in 2017 (2). Adult use and frequency of use has steadily increased, while adolescent use has remained unchanged since 2002. Perceived risk of harm has decreased among adolescents and adults, including pregnant women, however, and high THC-containing products are increasingly available, with the concentration of THC increasing approximately three-fold in marijuana between 1995 and 2014, raising concern about the potential for increased health-related harms (1, 2, 3, 4).

Marijuana use, particularly long-term use, has been associated with harmful effects (5). Effects range from short-term problems with attention, memory, learning, to longer-term problems such as psychosis, anxiety, substance use disorder, and depression. Smoking cannabis regularly can lead to respiratory symptoms, with greater risk of bronchitis and cough. Developing brains, like those in adolescents, are especially susceptible to the adverse effects of marijuana. Heavy marijuana use has been associated with injury-related outcomes specifically, including development of substance use disorder involving other drugs (e.g., opioids) and increased incidence of suicidal ideation and attempts. Marijuana leads to slower reaction times and ability to make decisions, impaired coordination, and distorted perception, increasing risk for crash when driving while impaired. And, smoking marijuana during pregnancy is linked to impaired fetal growth and lower birth weight in babies (5). A recent multi-state outbreak of severe lung injury has been associated with vaping of THC- and CBD-containing products (6).

Poisoning is of concern particularly with illicit synthetic cannabinoid (SC) use (7). Illicit SCs, also known as “spice” or “K2”, are man-made chemicals that were designed to simulate the effects of marijuana by stimulating the same receptor that THC acts on in the brain. Illicit synthetic cannabinoids are NOT cannabis. They have no potential medical use, can cause severe adverse health effects if used, including death, and continue to be an emerging drug threat.

In 2018, the Farm Bill was passed, legalizing hemp. Hemp is a variety of cannabis that has high amounts of cannabidiol (also known as CBD) but not more than 0.3% THC. Hemp is no longer a controlled substance; it is regulated by the US Department of Agriculture, with shared state and federal regulatory oversight of cultivation and production. CBD derived from hemp is legal, if the production of the hemp from which the CBD was derived complies with the Farm Bill. FDA has regulatory authority of products containing CBD under the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act. The recent explosion of CBD product availability raises the importance of understanding implications for public health; little is known about public perceptions, use, and health and social effects.

Cannabis use, including use of THC- (marijuana) and CBD-containing products, may help symptoms for some health problems, such as certain types of seizures, chemotherapy-induced nausea, and some types of chronic pain. While some states have legalized the use of medical marijuana, the FDA has not approved marijuana containing THC as medicine. FDA has approved one product that contains CBD (Epidiolex) as well a synthetic form of THC (Marinol) and a synthetic analog of THC (Cesamet) for specific conditions (e.g., seizures, nausea associated with chemotherapy). Conclusions from cannabis



treatment studies involving the full cannabis plant and constituents are limited given methodological weaknesses such as narrow testing of products and conditions and limited follow-up. Further, health harms associated with marijuana use, particularly long term, are an important consideration when balancing medical benefit (5).

While some associations have been found between cannabis use and health effects as noted above, conclusive evidence on the benefits and harms of cannabis remains elusive, as identified in an extensive review of the literature by the National Academy of Science, Engineering, and Medicine, supported by CDC and other stakeholders (5). Among recommendations for improving research, the NASEM committee also called for improved surveillance. In tandem, a report to the Health and Human Services Behavioral Health Coordinating Committee (BHCC) outlined existing surveillance efforts and policy tracking, identifying significant needs for improvement in succinct, valid, and reliable measures integrated into federal surveys; syndromic surveillance; and detailed policy tracking (8).

CDC Strategic Priorities

The primary goal of the CDC strategy is to monitor and address use of and exposure to cannabis (including marijuana and hemp, addressing THC and CBD) and associated health and social effects. Because synthetic cannabinoids are NOT cannabis, they are not considered within this strategic plan (but are covered in other strategic plans; e.g., Division of Overdose Prevention, NCIPC strategy to address emerging drug threats). It is important that cannabis and synthetic cannabinoids are considered independently given the different nature of the substance, regulatory considerations, and associated health effects.

CDC seeks to pursue the following **strategies** to foster a public health approach, improve messaging, and secure dedicated resources to address the health risks of cannabis:

- Monitor trends
- Advance research
- Build state, tribal, local, and territorial (STLT) capacity
- Support health systems and healthcare providers
- Partner with public safety, schools, and community coalitions; and
- Improve public knowledge and awareness.

Specific **activities** within each of these strategic pillars have been identified as possible for implementation.



Expansive Strategic Vision

This strategic plan is intended to spur a vision for potential CDC investment over the next 3 to 5 years (i.e., what CDC should do with infusion of resources if they become available).

The strategy includes a comprehensive focus on populations and outcomes of primary interest to the agency overall. Cannabis as a topic area is unique to other public health concerns addressed by CDC, given its expanded scope of relevance across almost every Center, Institute, and Office (CIO) in the agency. Areas of interest where cannabis primarily connects with programmatic activities in CIOs across the agency are reflected below:



- Division of Overdose Prevention (DOP)/National Center for Injury Prevention and Control (NCIPC): Cannabis Strategy Unit agency coordination [transition support from Deputy Director for Non-Infectious Diseases (DDNID)]; polysubstance use and use disorder (esp., with regards to opioids and pain management), poisoning/overdose, lung injury, substance use disorder, policy evaluation
- Division of Injury Prevention (DIP)/National Center for Injury Prevention and Control (NCIPC): Impaired driving, policy evaluation
- Office of Smoking and Health (OSH)/National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP): Smoking/vaping, second hand smoke exposure, policy evaluation related to tobacco (e.g., smoke free laws)
- Division of Reproductive Health (DRH)/National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP): Use in pregnant and postpartum persons, association with health outcomes in the reproductive years (e.g., substance use disorder, mental health), maternal and infant outcomes (e.g., complications of pregnancy and preterm birth)
- Division of Nutrition, Physical Activity and Obesity (DNPAO)/National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP): Use among breastfeeding women
- Division of Birth Defects and Infant Disorders (DBDID)/National Center on Birth Defects and Developmental Disabilities (NCBDDD): Use during pregnancy and among persons of reproductive age, pregnancy-related risks (maternal, infant, and long-term effects) including birth defects, developmental disabilities, neurocognitive/neurobehavioral effects, screening, and treatment
- Division of Laboratory Sciences (DLS)/National Center for Environmental Health (NCEH): Biomarkers, second hand exposure, product analysis
- Division of Environmental Health Science and Practice (DEHSP)/National Center for Environmental Health (NCEH): Contaminants and environmental exposure, use in people with asthma
- National Institute for Occupational Safety and Health (NIOSH): Worker health and safety
- Division of Adolescent and School Health (DASH)/National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention (NCHHSTP): School-based primary prevention
- Center for State, Tribal, Local, and Territorial Support (CSTLTS): State policy surveillance
- National Center for Health Statistics (NCHS): Surveillance systems, statistical support and consultation
- Office of the Associate Director for Policy and Strategy (OADPS): State policy research, analysis, and evaluation
- CDC Washington (CDCW): Authorization and appropriations

The strategies should function as an accordion that are flexible and can adapt to a constantly changing landscape. Resource allocation to support public health activities related to cannabis are uncertain. Further, state policy related to cannabis is a constantly changing landscape (adult use, medical use, decriminalization). There will be a need to regularly revisit the strategic plan and capacity, and to prioritize and re-prioritize activities. Thus, strategies are framed such that activities could be expanded should additional resources become available; similarly, there is the ability for activities to be more contracted in times of limited resources.

More specific action plans could be developed at the division and office levels based on this strategic plan to identify specific activities for implementation in the next 1 to 2 years that are practical based on available capacity and resources (i.e., what we will do right now). Given currently available resources, efforts will require that action plans focus primarily on the intersection of cannabis with programmatic areas with appropriations (e.g., injury, occupational safety and health, reproductive health, birth defects and developmental disabilities, chronic disease, environmental health and laboratory, etc.). This entails leveraging existing surveillance, research, and programmatic activities for joint impact, within current staffing and funding levels. Activities highlighted

with a yellow box and marked with an asterisk in the plan are supported by existing appropriations for established CDC programmatic areas (e.g., injury, reproductive health, occupational safety and health, environmental health, chronic disease, etc.); other activities are included as a vision for what could be conducted if new resources (with appropriation) were to become available. It is not expected that action plans could address every strategy and activity included in the strategic plan currently based on available resources.

The strategic priorities identified serve CDC's unique role and strengths. In comparison to other HHS OPDIVs (e.g., SAMHSA, FDA, NIH), CDC holds unique roles within surveillance, building STLT capacity, navigating the public health/clinical medicine chasm, public education, and applied research that directly addresses questions of interest to STLT practitioners in formulating policy and practice. CDC often has more flexibility and adaptability than other agencies to address emerging priorities, such as by engaging in emergency response activities and modifying surveillance systems more quickly. In contrast, other HHS OPDIVs concentrate more heavily on substance use disorder treatment and youth-based prevention (e.g., via standing block grants), regulation of cannabis and cannabis-derived products, and more basic research focused on cannabis and development of generalizable knowledge.

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CDC Cannabis Strategy



GOAL: Monitor and address use of and exposure to cannabis (including marijuana and hemp, addressing THC and CBD) and associated health and social effects.

Associated health and social effects include, but are not limited to:

- Initiation, use (including mode and product type, medical/nonmedical use), problematic use, and polysubstance use
- Substance use disorder and addiction vulnerability
- Poisoning
- ED visits, EMS calls, and deaths
- Mental health conditions and symptoms (e.g., acute psychosis, depression, anxiety); co-occurring and effects
- Cardiopulmonary symptoms and conditions secondary to use (e.g., lung injury, COPD, cancer)
- Motor vehicle injury
- Occupational illness and injury and other work-related issues
- Environmental exposure
- Prenatal and pregnancy complications, fetal growth and development, infant and child outcomes (e.g., cognitive and behavioral)
- Social and behavioral effects (e.g., norms, health behaviors, relationships, academics, employment)

Vulnerable and susceptible populations and health disparities have a special focus, and include the following:

- Adolescents, young adults, older adults
- Pregnant and postpartum persons
- Infants and children
- Workers
- Individuals in poor health or with chronic conditions (e.g., immunocompromised, with asthma, chronic pain, mental health conditions, substance use disorders)
- Racial and ethnic minorities



CDC Cannabis Strategy



Monitor trends



Partner with public safety, schools, & community coalitions



Build state, local, and territorial (STLT) capacity



Support health systems and healthcare providers



Advance research



Improve public knowledge and awareness

Specific activities within each of these strategic pillars have been identified as possible for implementation.



Activities highlighted with a yellow box and marked with an asterisk are supported by existing appropriations for established CDC programmatic areas.



1. STRATEGY: Monitor Trends

1.1 Analyze existing data sources (e.g., BRFSS, YRBS, HCUP, NSDUH, MTF, Porter Novelli Styles, NYTS, PRAMS, NPDS, FARS, NAVIPPRO, NDI, NHANES, NAMCS, NHCS, SUDORS, National Alcohol Survey) to monitor adult and youth medical and nonmedical cannabis use and exposure (including marijuana and hemp; THC/CBD) and associated effects.*

Analysis Examples:

- Cannabis-associated ED visits with HCUP data (DOP/NCIPC).
- Mode of cannabis use with 2016 BRFSS data (DDNID, OSH/NCCDPHP).
- Age of initiation of cigarette, alcohol, and marijuana use and nonmedical use of prescription opioids with state YRBS data (DASH/NCHHSTP; DOP/NCIPC).
- Marijuana use, mode, and reasons for use, before, during, and after pregnancy (DRH/NCCDPHP, DOP/NCIPC, DDNID).
- Substances used in electronic vapor products among adults and youth, including marijuana (OSH/NCCDPHP).
- Polysubstance use (including marijuana) among women of reproductive age and pregnant women (DBDID/NCBDDD).
- Polysubstance use (including marijuana) among pregnant women receiving treatment for opioid use disorder with data from MAT-LINK (MATernal and Infant Network to Understand Outcomes Associated with Treatment for Opioid Use Disorder During Pregnancy) (DBDID/NCBDDD).
- Marijuana use among women in the month before through their third month of pregnancy within the National Birth Defects Prevention Study and the Birth Defects Study to Evaluate Pregnancy exposures (DBDID/NCBDDD).

1.2 Identify sources and methods for syndromic surveillance to monitor use and associated effects of cannabis (e.g., NSSP, NPDS).*

Examples:

- Updated syndromic surveillance query for cannabis use available in NSSP/ESSENCE/Biosense (DOP/NCIPC).
- Use routine algorithms in NPDS to detect new and emerging formulations, chemical contaminants, and associated health effects (DEHSP/NCEH).

1.3 Improve ICD-10-CM coding for cannabis and synthetic cannabinoids to better distinguish associated public health burden.*

Example: Proposal submitted to NCHS, co-chair of the ICD-10 Coordination and Maintenance Committee to add synthetic cannabinoid codes (DOP/NCIPC).

1.4 Track state cannabis policies and analyze components with specific relevance to public health (e.g., ingredients, testing, concentrations, taxation, advertising).*

Examples:

- Quarterly informal updates to policy elements related to public health (e.g., possession limits, taxation, local control, and product approval, labeling and testing) catalogued for Adult Use states (DOP/NCIPC).
- Passive surveillance of marijuana state policy actions (DDPHSIS/CSTLTS).

1.5 Develop laboratory methods to detect cannabis biomarkers and assess cannabis product aerosol emissions.*

Examples:

- Methods for detection of cannabis active ingredients and excipients in biosamples and aerosol emissions in support of the lung injury investigation, in collaboration with federal, state, and NGO partners (DLS/NCEH).
- Methods for detection of second-hand marijuana smoke exposure (DLS/NCEH).

1.6 Work with federal, state, and NGO partners to identify surveillance priorities, needs, successes, and opportunities within agency niche.*

Example: Quarterly calls with federal partners (e.g., NIH, SAMHSA, FDA) and NGOs (e.g., ASTHO, APHL, NCSL, CSTE) to identify surveillance needs and catalogue key indicators (DOP/NCIPC).

1.7 Improve existing data sources (e.g., with cognitive testing of key indicators, addition of questions to self-report surveys) to improve monitoring of adult and youth medical and nonmedical cannabis use and exposure and in mother-infant dyads (including marijuana and hemp; THC/CBD) and associated effects (e.g., BRFSS, YRBSS, HCUP NEDS, NSDUH, MTF, Porter Novelli Styles, SET-NET, YouGov, NPDS, NYTS, PRAMS, NHANES, NHIS, NAMCS, NHCS, Worker's Compensation claims data), working with partners for systems sponsored outside CDC, improving standardization of questions.

Example: Cognitive testing of questions for the National Youth Tobacco Survey to better assess mode of marijuana use with regard to e-cigarettes (OSH/NCCDPHP).



1.8 Develop new surveillance systems to monitor youth and adult cannabis use, exposure, and associated effects (e.g., nationally representative survey of persons who use cannabis, lung injury case reporting).

1.9 Identify innovative ways to use and improve toxicology/laboratory data to conduct surveillance (e.g., LabCorp, NHANES biospecimens, lung injury-related laboratory data, exposure biomarkers, environmental assessment or biomonitoring, licit and illicit product analysis, in collaboration with states).

1.10 Improve quality and timeliness of state policy surveillance in collaboration with partners by improving detailed, up-to-date state cannabis policy trackers, including medical and nonmedical legalization and decriminalization, to support surveillance, STLT capacity, and policy evaluation (e.g., NIAAA Alcohol Policy Information System cannabis policy tracker).



2. STRATEGY: Advance Research

2.1 Connect with federal partners (e.g., NIH, AHRQ, NHTSA, FDA, ASPE) and academic partners (e.g., research centers) and other research stakeholders (e.g., PCOR Trust Fund, clinical organization research networks) on research priorities, needs, successes, and opportunities within agency niche, including holding expert meetings, and furthering efforts to improve access to product for testing (e.g., product availability through NIH, state retail product use).*

Example: Quarterly calls with federal partners (e.g., NIH, SAMHSA, FDA) (DOP/NCIPC).

2.2 Evaluate the impact of state cannabis policies and strategies (including marijuana and CBD) for medical and nonmedical use on drug overdose risk factors and health outcomes to inform evidence-based state policy (including evaluating the impact of policies and strategies aimed at preventing other substance use, such as alcohol use, on cannabis use and health outcomes).*

Example: Evaluate the impact of state medical marijuana laws on opioid prescribing (DOP/NCIPC).

2.3 Apply data science tools, methods, and techniques to social media and other nontraditional data to assess cannabis use patterns, risk factors, and harms (including THC and CBD products).*

Example: Assess the temporal trends in vaping of cannabis products with analysis of Reddit posts OSI/DOP NCIPC).



2.4 Identify the impact of cannabis use during pregnancy and postpartum on maternal, birth, and developmental/behavioral outcomes.*

Examples:

- Support of the Birth Defects Study to Evaluate Pregnancy exposures (BD-STEPS) (NCBDDD) to examine the association between cannabis use during pregnancy and structural defects.
- Examination of the association between cannabis use during pregnancy with birth outcomes (DRH/NCCDPHP).
- Examination of cannabis use post-partum and breast feeding, including perceptions of safety and provider confidence in counseling pregnant women and women post-partum on cannabis use (DRH and DNPAO/NCCDPHP).
- Expert meeting among federal, clinical, and academic partners to identify research gaps and priorities for addressing the effects of cannabis on maternal and child health (NCBDDDD, DRH/NCCDPHP).

2.5 Conduct worksite evaluations to identify health and safety concerns associated with growing, processing, and manufacturing of cannabis products, and second-hand exposure to cannabis smoke in occupational settings.*

Example: Health hazard evaluations focused on worker direct exposure (e.g., sensitization, allergens, musculoskeletal disorders) and second-hand smoke exposure (e.g., workers in concert venues) (NIOSH).

2.6 Identify factors that increase or decrease risk for cannabis use, polysubstance use, and trajectories of nonmedical use (e.g., reasons for use, perceptions of harm, where products are accessed, price, availability, marketing exposure, potency, labeling, regulatory frameworks), especially among vulnerable populations (e.g., youth, pregnant women), and associated health and social effects (e.g., substance use, impaired driving); in particular, to inform evidence-based state policy efforts.*

Example: Extramural research to identify the risk and protective factors for driving while simultaneously impaired by alcohol and marijuana (DIP/NCIPC).

2.7 Identify risk and protective factors for early initiation of nonmedical cannabis use (including marijuana and hemp; THC/CBD; e.g., adverse childhood experiences, social norms) to identify opportunities for integration within CDC STLT program support.

2.8 Identify issues and relevant interventions for the general worker population, such as cannabis use burden/ trends, toxicity and impairment, drugged driving, detection (including drug testing), employment policies, Workers' Compensation, workplace safety, and hazards to law enforcement personnel and crime lab technicians.

2.9 Describe characteristics of medical cannabis use, healthcare utilization, and associations with health conditions (e.g., conditions that may be a consequence of cannabis use, such as respiratory illness, or are associated with use for medical purposes, such as chronic pain) and associations with use of prescription medications (e.g., opioids, benzodiazepines) to identify opportunities for integration within CDC public health/health system collaborative efforts.



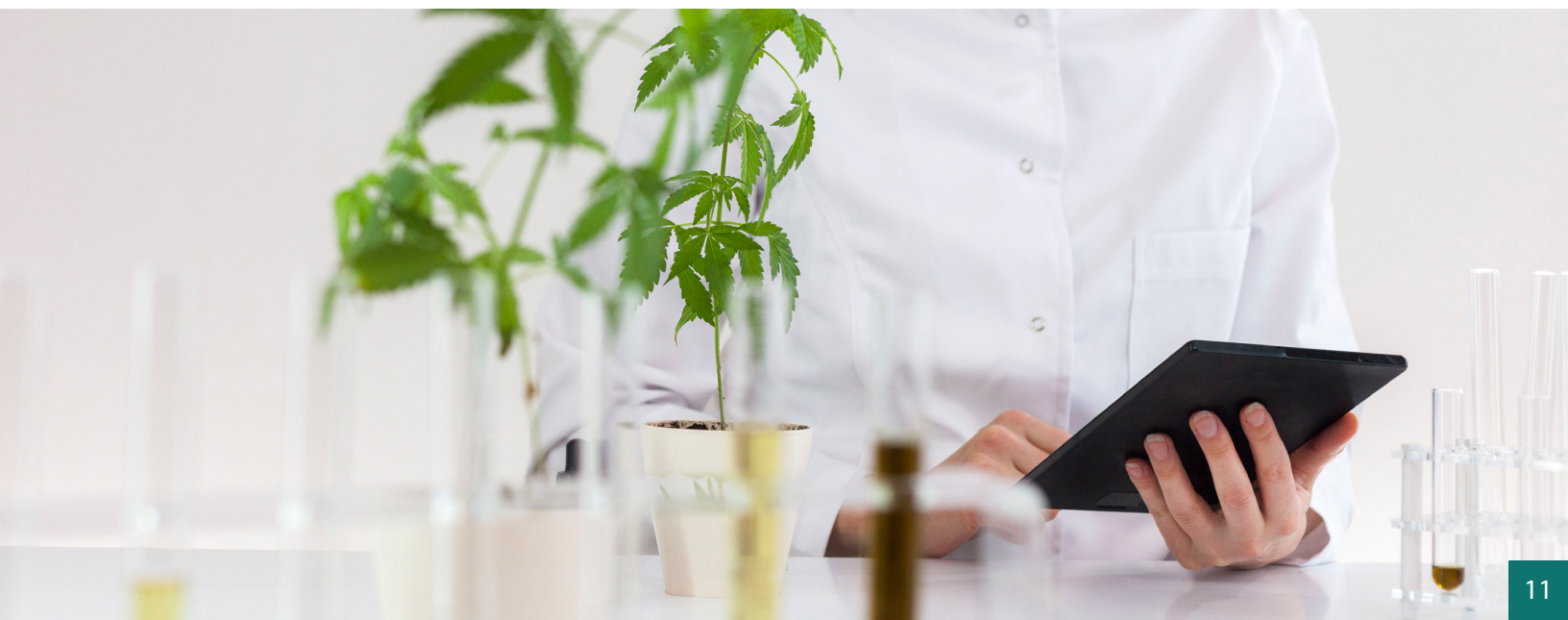
2.10 Identify healthcare provider knowledge and beliefs about medical and nonmedical cannabis use, and implementation of screening for illicit cannabis use and linkage to care to inform clinical guidelines and health system practices (e.g., for primary care, family medicine, occupational medicine, emergency physicians, pain specialists, pediatricians, obstetricians and gynecologists).

2.11 Assess second hand exposure (e.g., through monitoring air quality and exposure biomarkers) and identify impacts of cannabis smoke and second-hand smoke on air quality, heart and lung health (e.g., asthma exacerbations and related respiratory disease), reproductive and pregnancy outcomes, and developmental outcomes in infants and children (animal and human studies).

2.12 Conduct laboratory testing to identify ingredients in cannabis products that could have harmful health effects (e.g., excipients).

2.13 Collaborate with federal partners to improve longitudinal studies' ability to examine the effects of cannabis use on health (e.g., NIH's ABCD and HBCD studies).

2.14 Provide support for regular updates to the NASEM report on *The Health Effects of Cannabis and Cannabinoids*, in collaboration with state partners.





3. STRATEGY: Build STLT capacity

3.1 Facilitate technical assistance among STLTs on cannabis state-based surveillance, policy, and practice (prevention and response), and obtain insights from states to CDC on opportunities, challenges, and public health successes.*

Example: Support of a multi-state collaborative on public health and cannabis (DOP/NCIPC).

3.2 Deploy staff to STLT jurisdictions in response to Epi-Aid requests and lead formal Incident Management Structures to respond to urgent threats associated with cannabis (including THC and CBD products).*

Example: 2019 Lung Injury Investigation; WI/IL Epi-Aid (DOP/NCIPC, OSH/NCCDPHP, DLS/NCEH, CSTLTS, IMS).

3.3 Participate in workgroups with federal partners (e.g., HHS OPDIVs, NHTSA) and non-governmental organizations (e.g., CSTE, NGA, APHL, NCSL, ASTHO, NACCHO, Big Cities Coalition, CADCA), including those that might not traditionally see themselves as having a stake in addressing cannabis (e.g., tobacco/chronic health partners, AAAI, ASHA, NASN) that assist with state capacity building and engage in education efforts (e.g., webinars) to share science-based information about the public health considerations associated with cannabis use (including marijuana and hemp, encompassing THC and CBD); identify state needs in the areas of surveillance, policy, and prevention; and connect states to federal and NGO partners.*

Examples:

- Quarterly calls with federal partners (e.g., NIH, SAMHSA, FDA) and NGOs (e.g., ASTHO, APHL, NCSL, CSTE) to identify STLT needs (DOP/NCIPC).
- NGA Webinar on the current landscape of cannabis and public health (DOP/NCIPC).
- NGA Webinar on marijuana use and driving (DIP/NCIPC).

3.4 In collaboration with states, federal partners (e.g., NIAAA, NIDA), and NGOs (e.g., NCSL), provide states with detailed, up-to-date state cannabis policy tracking on including medical and nonmedical legalization, including decriminalization.

3.5 Identify and describe components of a public health framework within state legislation on medical and nonmedical cannabis use (including decriminalization), share existing practices across STLT jurisdictions and from states to CDC, with lessons learned from states with longer histories of legalization and the international experience, and develop toolkits.



3.6 Support non-governmental organizations (e.g., CSTE, NGA, APHL, NCSL, ASTHO, NACCHO, Big Cities Coalition) to convene STLT health departments and state agencies involved in cannabis regulation and oversight, and develop products and toolkits on surveillance, policy, and practice (prevention and response).

3.7 Fund STLT health departments to engage in surveillance and prevention activities related to cannabis.

3.8 Provide support to state laboratories to improve and standardize toxicology testing to better assess cannabis-impaired driving.

3.9 Develop and offer standing operating procedures (SOPs) to STLTs on cannabis laboratory biomonitoring and product analysis, including training on SOPs, in collaboration with partners (e.g., APHL).

3.10 Provide support to STLT health departments and to state and local education agencies to collaborate and enhance and enable implementation of evidence-based substance use prevention strategies in schools addressing cannabis use (among other substances).



4. STRATEGY: Support health systems and healthcare providers

4.1 Conduct scientific synthesis of the benefits and harms of medical cannabis use (including THC, CBD, FDA medications).*

Example: Review the evidence on the effectiveness of cannabis as a treatment for pain within the AHRQ systematic reviews sponsored to inform an update to the CDC Guideline for Prescribing Opioids for Chronic Pain (DOP/NCIPC).

4.2 Identify healthcare screening tools for cannabis use and integrate screening protocols into electronic health records to enhance implementation.*

Example: Develop screening tool to identify polysubstance use (including marijuana) among pregnant persons, and direct to appropriate brief intervention, with integration into the electronic health record (DBDID/NCBDDD).

4.3 Develop healthcare provider education and tools (e.g., continuing medical education, online training, assessment tools) on the benefits and risks of medical and nonmedical cannabis use (including THC, CBD cannabinoids, FDA medications) based on available science (e.g., for pain management, related to emerging health threats such as lung injury) (e.g., for primary care, family medicine, occupational medicine, emergency physicians, pain specialists, pediatricians, obstetricians and gynecologists, etc.).

4.4 Develop clinical recommendations, guidelines, and health system reforms for improving screening, behavioral interventions, and linkage to treatment for cannabis use disorder, such as from emergency departments, primary care practices, and obstetrics and gynecology clinics.

4.5 Identify ways to enhance implementation of recommended clinical practices related to illicit drug use (e.g., USPSTF recommendations on screening and interventions, including during pregnancy) in the context of state legalization efforts and evaluate effectiveness.

4.6 Partner with clinical groups (e.g., ASAM, AAFP, ACOG, AAP, SGIM, ACEP, SMFM, AAPCC, ACOEM) to ensure practice statements and messaging for healthcare providers on medical and nonmedical cannabis use are science-informed and consistent across federal-clinical partners (e.g., through funding meetings and collaborative activities in partnership with non-governmental organizations such as ASTHO/CSTE, sponsoring communication channels through quarterly calls).

4.7 Identify opportunities to educate budtenders offering cannabis within states to improve understanding of health effects and concerns with vulnerable populations (e.g., pregnant women, workers in the cannabis industry).



5. STRATEGY: Partner with public safety, schools, and community coalitions

5.1 Identify opportunities to engage with substance use prevention community-based coalitions to assess risk and protective factors for cannabis use, conduct training, and implement evidence-based prevention strategies at the local level, leveraging partnerships among public safety, schools, youth serving organizations, and other stakeholders.*

Example: Identify opportunities for engaging in leadership forum and training institutes of the ONDCP/SAMSHA Drug Free Communities Program and the Community Anti-Drug Coalitions of America (DOP/NCIPC).

5.2 Identify public health – public safety data sharing models to improve response protocols for public health threats associated with cannabis (e.g., THC vaping products), including surveillance and laboratory data.



5.3 Identify lanes of influence for public health and public safety and opportunities for collaboration related to the regulated state marketplace and illicit/black market supply, as well as impaired driving enforcement.

5.4 Partner with DEA to support access to products in states (state regulated and illicit) to enable cannabis product testing and research to identify potential health harms.

5.5 Identify evidence-based protocols for collaborations among public safety, schools, and child protective services to improve prevention efforts and address driving factors for cannabis use, such as adverse childhood experiences, leveraging partnerships with key stakeholder groups (e.g., ASHA, NASN, AAP).

5.6 Support systematic or Community Guide reviews to inform evidence-based prevention strategies addressing cannabis use (among other substances) for implementation by public safety, schools, and community coalitions.



6. STRATEGY: Improve public knowledge and awareness

6.1 Develop and maintain communication materials to educate the public on benefits and harms of cannabis (marijuana and hemp, encompassing THC and CBD).*

Examples:

- Maintain www.cdc.gov/marijuana (DOP/NCIPC).
- Develop web pages and fact sheets on worker health and safety related to cannabis (NIOSH).

6.2 Connect with federal (e.g., FDA, SAMHSA, NIH) and state partners on messaging needs, successes, and campaign efforts.*

Example: Calls with FDA and SAMHSA on cannabis-related campaign initiatives (DOP/NCIPC).

6.3 Conduct message testing to identify best ways to communicate about the benefits and risks of cannabis use and improve public knowledge and awareness, with attention to special populations (e.g., youth and young adults, parents and guardians, pregnant persons and those breastfeeding, women of reproductive age, non-English speakers) and disseminate effective communication messaging to STLTs, federal agencies, and other partners.



6.4 Identify the utility of promoting the use of quit lines/national poison control center lines (e.g., AAPCC) to link the public to cannabis-related treatment and improve adverse event reporting.

6.5 Systematically identify lessons learned from state campaign efforts, identifying effective and ineffective messaging approaches.

6.6 Conduct message testing and expand public awareness campaigns originally focused on the dangers of prescription opioids to polysubstance use, including nonmedical cannabis (marijuana) use [e.g., related to understanding of different THC and CBD products; perceptions of risk of harm, norms, what is “problematic” use; attending to issues pertaining to licit and illicit use and associated harm; attending to emerging drug threats such as lung injury].

6.7 Develop a cannabis communication resource exchange to house cannabis data and resources, including messaging for media and social media, and content from federal and state communication campaigns (related to THC and CBD).

6.8 Fund states to evaluate communication campaigns related to cannabis with accompanying data collection for evaluation to assist in developing the evidence base.



Acronyms of Surveys and non-CDC Entities

AAAI: Academy of Allergy, Asthma, and Immunology

AAFP: American Academy of Family Physicians

AAP: American Academy of Pediatrics

AAPCC: American Association of Poison Control Centers

ABCD: Adolescent Brain and Cognitive Development study

ACEP: American College of Emergency Physicians

ACOEM: American College of Occupational and Environmental Medicine

ACOG: American College of Obstetricians and Gynecologists

AHRQ: Agency for Healthcare Research and Quality

APHL: Association of Public Health Laboratories

ASAM: American Society of Addiction Medicine

ASHA: American School Health Association

ASTHO: Association of State and Territorial Health Officials

BRFSS: Behavioral Risk Factor Surveillance System

CADCA: Community Anti-Drug Coalitions of America

CSTE: Council of State and Territorial Epidemiologists

DOSE: Drug Overdose Surveillance and Epidemiology

FARS: Fatality Analysis Reporting System

FDA: Food and Drug Administration

HBDC: Healthy Brain and Child Development Study

HCUP: Healthcare Cost and Utilization Project

MTF: Monitoring the Future

NACCHO: National Association of County and City Health Officials

NAMCS: National Ambulatory Medical Care Survey

NASEM: National Academy of Sciences, Engineering, and Medicine

NASN: National Association of School Nurses

NAVIPPRO: National Addictions Vigilance Intervention and Prevention Program

NCSL: National Conference of State Legislatures

NGA: National Governor's Association

NHANES: National Health and Nutrition Examination Survey

NHCH: National Hospital Care Survey

NHIS: National Health Interview Survey

NHTSA: National Highway Traffic and Safety Administration

NIAAA: National Institute on Alcohol Abuse and Alcoholism

NIDA: National Institute on Drug Abuse

NIH: National Institutes of Health

NPDS: National Poison Control Data System

NSDUH: National Survey on Drug Use and Health

NSSP: National Syndromic Surveillance Program

NYTS: National Youth Tobacco Survey

PRAMS: Pregnancy Risk Assessment and Monitoring System

SAMHSA: Substance Abuse and Mental Health Services Administration

SET-NET: Surveillance for Emerging Threats to Mothers and Babies Network

SGIM: Society of General Internal Medicine

SMFM: Society for Maternal-Fetal Medicine

STLT: State, Local, Tribal, and Territorial

SUDORS: State Unintentional Drug Overdose Reporting System

YRBS: Youth Risk Behavior Surveillance System

Appendix:

CIO/Division	Primary Representative(s)
NCIPC/DOP	Tamara Haegerich, Ryan Tapscott, Yamile Underwood, Gillian Schauer (contract consultant)
NCIPC/DIP	Erin Sauber-Schatz
NCCDPHP/OSH	Michael Tynan, Katrina Trivers
NCBDDD/DBDID	Lucinda England
NCCDPHP/DRH	Sarah Haight, Jean Ko
NCEH/DLS	Cliff Watson
NCEH/DEHSP	Amy Cordero
NCHHSTP/DASH	Heather Clayton
NCHS	Steven Frank
NIOSH	Bradley King
OD/OADP	Richard Puddy, Val Carlson (facilitator)
OD/CDCWO	Jennifer Greaser, Cristi Schwarcz
OD/CSTLTS/DDPHSIS	Donald Benken
DDNID/OD	Althea Grant

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