Marijuana Surveillance Brief Report: Diagnosed Cannabis Poisoning and Adverse Effects

Report Date May 4, 2018
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Background

The 2014 legalization of marijuana (MJ) for recreational use represents a policy change that could have implications on the public's health. Not all jurisdictions in Colorado license marijuana stores, but the City and County of Denver has a high density of stores licensed to sell medical and recreational marijuana which may pose an increased risk to Denver residents and visitors.

Public health stakeholders, including local public health agencies and community partners, are responsible for using data to monitor the health of the public including how local policy changes impact health. Denver Public Health (DPH) partners with the Denver Department of Excise and Licenses as well as Denver Department of Public Health and Environment to identify emerging health issues related to marijuana and conduct surveillance activities to monitor health indicators that could be impacted by expanded access and availability of marijuana. This includes exploring how non-traditional data sources such as electronic health records (EHRs) can be used to monitor unwanted health impacts potentially associated with marijuana and identify opportunities to keep our population and visitors healthy.

Novel Methods to Track Marijuana

DPH participates in [Colorado Health Observation Regional Data Service (CHORDS)](#) which provides EHR data to public health stakeholders for surveillance. In response to Denver's focus on marijuana, DPH worked with CHORDS to create reusable structured data requests to monitor marijuana or cannabis-related conditions affecting residents of Denver. Public health stakeholders can use CHORDS structured data requests to ask a specific health question such as "How many Denver adults have been diagnosed with Cannabis Poisoning and Adverse Effects in 2016?"

Three marijuana-related structured data requests were approved to be built: Cannabis Poisoning and Adverse Effects; Cannabis Abuse and Dependence; and Cannabis Use. CHORDS developed a Cannabis Poisoning and Adverse Effects structured data request in 2017 and will develop structured data requests for Cannabis Abuse and Dependence and Cannabis Use in 2018. This report highlights results from the Cannabis Poisoning and Adverse Effects structured data request.

Cannabis Poisoning and Adverse Effects Structured Data Request

To determine which patients had been diagnosed with cannabis poisoning and adverse effects ICD-9-CM and ICD-10-CM diagnosis codes were used. Diagnosis codes are alphanumeric codes used by providers to record information about the patient's condition that was relevant to their treatment and the healthcare encounter. This structured data request used 969.6, E854.1, and T40.7X diagnosis codes. For T40.7X codes, the X indicates exposure categories 1, 2, 3, 4 or 5 for accidental, intentional, assault, undetermined and marijuana derivative exposure (See Appendix 1 for full list).

A case of cannabis poisoning and adverse effects is defined as an individual with at least one cannabis poisoning and adverse effects diagnosis code during a selected time period. Patients have one or more diagnosis codes for any healthcare encounter. Cannabis poisoning and adverse effects diagnosis codes may have been the main reason for the healthcare encounter (the primary diagnosis code) or a secondary reason for the healthcare encounter (secondary diagnosis code).

For more information about CHORDS data, please contact Greg Budney at gregory.budney@dhha.org.

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Results and Implications

A structured data request to assess prevalence of cannabis poisoning and adverse effects among Denver residents in 2015 was submitted in February 2018. Data from 915,845 unique individuals presented for care at a participating CHORDS healthcare provider was used. Less than fifty individuals in Denver (n=48) were diagnosed with cannabis poisoning and adverse effects which equals a prevalence of less than 1% (.02%, or 2 individuals per 10,000 health encounters). When breaking this data down by gender, no differences in prevalence rate between males and females were present. Prevalence was slightly higher among white non-Hispanic individuals and Black non-Hispanic individuals compared to Hispanic individuals.

There are many challenges to tracking and quantifying the health effects of marijuana within EHRs. These results reveal that diagnosis codes identified very few patients with cannabis poisoning and adverse effects. These small numbers suggest that the burden of cannabis poisoning and adverse effects in Denver is low compared to the total number of individuals seeking care for any reason. Small numbers may mean that individuals seeking care for cannabis poisoning are not accurately reporting cannabis use or that providers are not capturing this information through diagnosis codes. This does not mean that individuals are not using cannabis or that negative health consequences related to cannabis use are not occurring.

Limitations

The ability to identify a cannabis poisoning and adverse effects case by diagnosis code is dependent on the medical coder assigning a cannabis poisoning and adverse effects diagnosis code(s) into the EHR based on the notes and clinical data recorded by the provider. Providers may or may not follow the Diagnostic and Statistical Manual of Mental Disorders to screen patients for cannabis poisoning and adverse effects. Indications of cannabis use and associated health consequences may be fragmented in various parts of the patient's medical record making it difficult to identify using a standard algorithm.

Furthermore, experts continue to study how substance-related diagnosis codes are used across care settings and how the absence or presence of these codes can be accurately interpreted.

Next Steps

Denver Public Health will continue to explore how EHR data can be used to measure and understand many health conditions including substance abuse. Two additional cannabis-related structured data requests will be developed in 2018: cannabis abuse and dependence, and cannabis use. A subsequent report that builds upon these findings and includes results from cannabis abuse and dependence, and cannabis use structured data requests will be developed and disseminated.

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Appendix 1:

Condition	ICD-9 Code	ICD-9 Classification
Cannabis poisoning & adverse effects	969.6	Poisoning by psychodysleptics (hallucinogens)
Cannabis poisoning & adverse effects	E854.1	Accidental poisoning by psychodysleptics (hallucinogens)
Condition	**ICD-10 Code**	**ICD-10 Classification**
Cannabis poisoning & adverse effects	T40.7X1	Poisoning by cannabis (derivatives), accidental (unintentional)
Cannabis poisoning & adverse effects	T40.7X1A	Poisoning by cannabis (derivatives), accidental (unintentional), initial encounter
Cannabis poisoning & adverse effects	T40.7X1D	Poisoning by cannabis (derivatives), accidental (unintentional), subsequent encounter
Cannabis poisoning & adverse effects	T40.7X1S	Poisoning by cannabis (derivatives), accidental (unintentional)
Cannabis poisoning & adverse effects	T40.7X2	Poisoning by cannabis (derivatives), intentional self-harm
Cannabis poisoning & adverse effects	T40.7X2A	Poisoning by cannabis (derivatives), intentional self-harm, initial encounter
Cannabis poisoning & adverse effects	T40.7X2D	Poisoning by cannabis (derivatives), intentional self-harm, subsequent encounter
Cannabis poisoning & adverse effects	T40.7X2S	Poisoning by cannabis (derivatives), intentional self-harm, sequela
Cannabis poisoning & adverse effects	T40.7X3	Poisoning by cannabis (derivatives), assault,
Cannabis poisoning & adverse effects	T40.7X3A	Poisoning by cannabis (derivatives), assault, initial encounter
Cannabis poisoning & adverse effects	T40.7X3D	Poisoning by cannabis (derivatives), assault, subsequent encounter
Cannabis poisoning & adverse effects	T40.7X3S	Poisoning by cannabis (derivatives), assault, sequela
Cannabis poisoning & adverse effects	T40.7X4	Poisoning by cannabis (derivatives), undetermined
Cannabis poisoning & adverse effects	T40.7X4A	Poisoning by cannabis (derivatives), undetermined, initial encounter
Cannabis poisoning & adverse effects	T40.7X4D	Poisoning by cannabis (derivatives), undetermined, subsequent encounter
Cannabis poisoning & adverse effects	T40.7X4S	Poisoning by cannabis (derivatives), undetermined, sequela
Cannabis poisoning & adverse effects	T40.7X5	Adverse effect of cannabis (derivatives)
Cannabis poisoning & adverse effects	T40.7X5A	Adverse effect of cannabis (derivatives), initial encounter
Cannabis poisoning &	T40.7X5D	Adverse effect of cannabis (derivatives), subsequent

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adverse effects		encounter
Cannabis poisoning & adverse effects	T40.7X5S	Adverse effect of cannabis (derivatives), sequela