

What is the Societal Impact of Legalized Marijuana?

In Colorado, we are asking ourselves, “Now that recreational marijuana is legal ... how do we prepare ourselves for the social outcomes that are not part of the marijuana marketing scheme?” Our goal is to be a model. Models present lessons learned that become best practices. What are the best practices other states will benefit from in watching Colorado’s efforts?

Below are some items that we in Colorado are either already facing – or will be facing in the days ahead. This is food for thought, for those considering the same:

What does substance abuse cost employers?

According to the Substance Abuse and Mental Health Services Administration (SAMHSA):

- Substance abusers are 2.5x more likely to be absent from work 8 or more days a year
- Substance abusers are 1/3 less productive on the job
- Substance abuse costs employers \$7,000/month annually in lost revenue
- Approximately 40% of all Worker’s Compensation claims are related to substance abuse
- 80% of drug abusers self-report that they steal from their workplaces to support their habit
- 90% of current, full-time workers with alcohol or illicit drug dependence work for small businesses that are less likely to enforce employee screening policies
- Drug use costs U.S. businesses upwards of \$100 billion annually

Employees who test positive for marijuana use have 55% more industrial accidents and 85% more injuries, according to U.S. Dept. of Health and Human Services (Burlington).

It is clear that estimating healthcare-related costs that are a direct result from marijuana use can and will be staggering in the years ahead. Mechanisms are not yet in place to specifically track this data due to lack of funding strategies or responsible agencies that could potentially serve as a clearinghouse for maintaining appropriate documentation.

In a 2010 study by the National Drug Free Workplace Alliance, employees testing positive for marijuana have an absentee rate of 75% higher than those whose test results were negative (National Drug-Free Workplace Alliance).

Colorado’s Amendment 64 states, “Nothing in this section is intended to require an employer to permit or accommodate the use, consumption, possession, transfer, display, transportation, sale or growing of marijuana in the workplace or to affect the ability of employers to have policies **restricting** the use of marijuana by employees (Vicente).”

Essentially, this protects the employer’s right to enforce their drug policies; however the marijuana industry representatives have made proposals to overturn employer’s rights through legal efforts that will play out in the court system. This will cost employer’s untold expenses in defending their safe

and drug free workplace policies against those who intend to create new precedents in favor of employee drug use (Ryan).

Social costs to the community

Tobacco is legal and regulated. Its use is also our nation's No. 1 cause of preventable death. Tobacco use costs our country at least \$200 billion annually — which is about 10 times the amount of money our state and federal governments collect from today's taxes on cigarettes and other tobacco products (CDC)

Alcohol is legal and regulated. Its use is our nation's No. 3 cause of preventable death, behind diet-related illness. Alcohol use costs our country at least \$185 billion annually — which is also roughly 10 times the amount of money our state and federal governments collect from today's taxes on the substance (HHS)

Marijuana: According to the 2010 **National Study on Drug Use and Health** (NSDUH)

- *Marijuana accounted for 4.5 million of the estimated 7.1 million Americans dependent on or abusing illicit drugs*
- In 2009, approximately 18 percent of people aged 12 and older entering drug abuse treatment programs reported marijuana as their primary drug of abuse
- 61 percent of persons under 15 reported marijuana as their primary drug of abuse

We cannot currently estimate the costs of legal recreational marijuana when it comes to prevention, addiction, treatment and recovery. Best practices are not yet known, no medications help with treatment, we have many years ahead of us before we know what works and we will spend millions of dollars before we figure it out.

In fiscal year 2012, the State of Colorado collected \$5.4 million in sales tax on “medical marijuana” purchases. This sounds great — until you consider that Colorado also experienced a \$5.7 million budget shortfall because of medical marijuana regulation (Gallagher).

The budget shortfall meant a great deal of regulation simply didn't happen. Though Colorado policymakers agreed 55 full-time state employees would be sufficient to regulate medical marijuana, the state received revenues to employ only 15 full-time employees.

Barbara Brohl, executive director of the Colorado Department of Revenue, stated, “The funding model just didn't work. And, as a result, the division wasn't able to perform the regulatory and oversight functions it was created to do.”

A growing trend that OBGYN providers are seeing is wide-spread marijuana use amongst pregnant women to treat nausea. Studies show that cannabis easily crosses the placental barrier to the fetus. Babies can test positive for marijuana up to 3 weeks after birth. Cannabis is excreted in breast milk, and can interfere with fetal brain development. For children who were exposed to marijuana in

utero, we see hyperactivity disorder at 10 years of age (Jaques). At 12 years of age, children who were exposed in utero struggle with higher cognitive processes and suffer early onset depression, mental illness (Goldschmidt). These issues will contribute to further social costs for treatment and special education needs.

Another social cost we face is the increased number of applications for public assistance. It is not simply the individual who tests positive for marijuana and is fired, Colorado has seen a significant spike in out-of-state transfers who cannot find work. In other words, Colorado is attracting those who move to the state in order to use recreational marijuana legally, but without secured jobs, the Colorado Department of Human Services has been deluged with requests for public assistance that one employee called “a crushing load”. Food banks are preparing for a burden like they have never seen in the state’s history.

Additionally, local law enforcement agencies are strapped for funding to provide road side sobriety testing that includes blood draws for marijuana impairment. Consider that drivers have a two-fold risk of crashes while driving marijuana impaired. In a recent national Healthy Kids survey, 11% of kids say they have driven impaired in the last week (NIDA). In both Colorado and Washington, law enforcement reports that marijuana impairment is on the rise, however they do not have the resources to test or track numbers – therefore the data is incomplete as to the social impact, direct burden and related costs.

Yet another item of concern is the regulatory costs pertaining to safe products. Whether this refers to grow operations, edibles, safety packaging or promoting products to adolescents, marijuana is not currently subject to the same standards as tobacco or alcohol and is without any oversight jurisdiction. The Food and Drug Administration is not responsible for safe marijuana products at the federal level, so what are the states to do? In Colorado it is the Department of Revenue that has oversight of recreational marijuana. What does the Department of Revenue know about such issues as inspection for molds, pesticides, herbicides and additives or child-proof packaging laws? Since there is not a plan for recreational marijuana to generate funding for these issues, it is incumbent upon the state budget office to create solutions from the General Fund, effectively taking needed monies from schools, road improvement projects, parks, public safety, etc. Again, it will take years to understand the social and fiscal impact to the state.

Direct healthcare costs

We must consider the long-term outcomes of healthcare associated costs with increased marijuana consumption. In a 2014 public health symposium sponsored by Denver Public Health, a few highlights included the following concerns (these are not comprehensive):

Marijuana Users & Cancer Risks (Bowles) (Mehra) (Callaghan) (Marks)

- Smoke contains hundreds of combustion products that increase risk of cancer among users
- Marijuana users are at risk for increased lung cancer
- Increased oral and tongue cancer risks persists for those who smoke marijuana

Marijuana Use & Heart Disease, Stroke & Lung Disease (Mittleman) (Frost) (Wolff) (Barber)

- Acute increases in heart rate and blood pressure; myocardial infarction risk within first hour after use
- Cerebral narrowing increases risk of stroke
- 2x risk of bronchial disease and chronic obstructive pulmonary disease (COPD), lung cancer
- Decreased lung function

Marijuana Use & Mental Health (Burns) (Meier, Persistent cannabis users show neuropsychological decline from childhood to midlife) (Lev-Ran) (Moore) (Hayatbakhsh) (VanLaar)

- Early onset of schizophrenia for adolescents – 2-3x higher
- Shortened time to psychosis and psychotic episodes – 40% higher (all users)
- Structural brain changes to hippocampus long-term (adult and adolescent)
- Neuropsychological decline, cognitive decline (adolescents), IQ loss
- 17% increased risk for depression – all users
- Increased anxiety and depression for all users

Unintentional Exposure in Children (Want) (Wang)

- Marijuana poisonings amongst children has spiked for ER visits to Children's Hospital Colorado.
- 1-3 children/month since 2009 – total 985 exposures
- Symptoms show up 2-24 hours after exposures and last from hours to 4 days
- Edibles are greatest risk factor. We set lowest standards for packaging possible by law
- Only states with legalized medical marijuana have had child exposures

Future Costs

Studies show that when young people perceive less risk involved in an activity, their participation in that activity increases. According to the Monitoring the Future Survey of 2013, 60% of high school seniors say that marijuana is not harmful. Directly related to social messaging that marijuana is “safe”, 1/3 of high school seniors report smoking marijuana in the past year and 6.5% of high school seniors report they smoke marijuana daily. For the first time, marijuana use is higher than tobacco use amongst teens in the U.S (Johnston).

MRI scans of the corpus callosum, the bundle of fibers connecting the two brain hemispheres, allowing the two hemispheres to communicate and work in a coordinated way have been compared among young adult males who smoked marijuana daily (and started at an average age of 15 yrs) along with age-matched non-users (Arnone).

The scan of the daily user shows thinner corpus callosum fibers than the scan of the non-user indicating that there are white matter integrity issues for the daily user. This means structural changes to the brain. Structural changes to the brain: These changes in brain structure (especially the hippocampus) in people exposed to marijuana during adolescence are significant to long-term success.

Ultimately, what does this mean? Persistent, dependent use before age 18 causes lasting harm to intelligence, attention and memory. For example, poorer communication across different parts of the brain that need to work together for proper cognitive may cause cognitive disorders such as schizophrenia.

Adolescents who use marijuana before the age of 18 are 2-4 times more likely to develop symptoms of psychosis in early adulthood than those who do not. This finding has been replicated at least eight times and persists after controlling for many possible confounding variables, such as family history, other substance use and socioeconomic status. These studies have involved thousands and thousands of people over generations and in several populations and countries.

Longitudinal studies in Amsterdam have shown that chronic adolescent use of marijuana may result in as much as 8 points of IQ loss that are not re-gained throughout the individual's lifetime. While 8 IQ points may not sound like a lot ... on a scale where 100 is the mean, a loss from an IQ of 100 to 92 represents a drop from being in the 50th percentile to being in the 29th. Higher IQ correlates with higher education and income, better health and a longer life. Somebody who loses 8 IQ points as an adolescent may be disadvantaged compared to their same-age peers for years to come (Meier, Persistent cannabis users show neuro-psychological decline from childhood to midlife).

Consider these findings for the impact of marijuana on adolescent users:

- Early onset of schizophrenia for adolescents is 2-3x higher
- Shortened time to psychosis and psychotic episodes is 40% higher
- Neuropsychological decline and cognitive decline that is not recovered
- 17% increased risk for depression and anxiety
- Less school achievement and increased high school drop-out rates
- Increased risky sexual behaviors, such as not using a condom
- Psychologically and physically addictive with 1 in 6 adolescents developing marijuana dependence syndrome
- Aggression and withdrawal frequently including restlessness, nervousness, agitation and insomnia
- Accidents are the leading cause of death for adolescents, and marijuana use predicts an increased risk of accidents by 30%, particularly when driving
- Marijuana has acute, sub-acute and long-term effects on cognition and memory

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