



Pennsylvania Psychiatric Society (PaPS)
550M Ritchie Highway, #271 | Severna Park, MD 21146
Phone: 800-422-2900 | Fax: 410-544-4640
Email: info@papsych.org | Web: www.papsych.org

Senator Judy Ward
Chair, Senate Aging and Youth Committee
Harrisburg Office
Senate Box 203030
Harrisburg, PA 17120-3030
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HEARING RE: POTENTIAL EFFECT OF LEGALIZATION OF ADULT-USE MARIJUANA* ON CHILDREN AND YOUTHS

My name is Kavita Fischer, M.D., DFAPA and I am a board-certified child and adolescent psychiatrist with more than 15 years of clinical experience since graduating from the University of Rochester school of Medicine and Dentistry in New York. In addition to maintaining a clinical practice in part of one the Pittsburgh area's largest multi-specialty behavioral health groups, I have also worked in community mental health, telepsychiatry and other settings treating children and adults with mental health and substance use disorders.

***Marijuana refers to the dried leaves, flowers, stems, and seeds from the Cannabis sativa or Cannabis indica plant. The plant contains the psychoactive chemical THC and other similar compounds. Often, the terms "marijuana" and "cannabis" are used interchangeably. In this testimony, I will be using the term "marijuana" for both except when discussing "cannabis use disorder."

Today, I am speaking on behalf of the Pennsylvania Psychiatric society (PaPS) where I serve as the upcoming president-elect and the co-chair of a taskforce that recently produced a position statement on the “Pennsylvania Medical Marijuana Program Including Recommendations on Monitoring and Addressing Public Health and Safety Consequences of Legalizing Marijuana.” PaPS, a district branch of the American Psychiatric Association (APA), represents more than 1,400 physicians practicing the medical specialty of psychiatry in Pennsylvania. The goal of the Society is to improve the accessibility and quality of treatment for those individuals suffering from mental illness and substance use disorders.

Adult marijuana use has increased since legalization, as shown from data collected from states that have approved recreational use in adults, but patterns have also risen showing evidence of negative consequences in children and adolescents. Vaping culture blurs the lines between the use of legal and illegal drugs, topped with vaping related lung injury concerns. Accidental ingestion is also a growing problem leading to thousands of ER visits each year in states with legalized marijuana – several of these involving small children. Hospital visits with marijuana induced psychosis in adolescents are also on the rise. However, risk perception around the harms of cannabis is decreasing among young people who are the most vulnerable from birth to young adulthood.

Starting in utero, marijuana use during pregnancy can affect the developing fetus. Substantial evidence shows a link between prenatal marijuana exposure and lower birth weight. The Colorado Pregnancy Risk Assessment Monitoring System reported that maternal marijuana use was associated with a 50% increased risk of low birth weight regardless of maternal age, race, ethnicity, education, and tobacco use. Exposure to marijuana in the fetal brain is also of concern due to the role of how different components of marijuana such as CBD and THC interact with the endocannabinoid system in development (which is involved in regulating processes such as memory and decision making to name a few.) Marijuana may affect the newborn’s brain development and result in hyperactivity, poor cognitive function, and other long-term sequelae. Harmful effects of marijuana use can also be passed on to a newborn through breast milk; THC

has been found in breast milk for up to six days after the last recorded use as well. Additionally, marijuana smoke contains many of the same harmful components as tobacco smoke and effects of this around a baby or young child need to be strongly considered.

Marijuana, is however, the most commonly used illicit drug among pregnant women. A growing number of pregnant women erroneously view marijuana as a safe, natural way to treat nausea and vomiting and states with retail marijuana shops alarmingly continue to promote and advertise this false claim as well. Both the American Academy of Pediatrics and the American College of Obstetrics and Gynecologists (ACOG) disagree. In 2021, ACOG reaffirmed its earlier recommendations from 2015 and 2018 that “because of concerns regarding impaired neurodevelopment, as well as maternal and fetal exposure to the adverse effects of smoking, women who are pregnant or contemplating pregnancy should be encouraged to discontinue marijuana use.”

The perceived low risk of marijuana seen in many adults today has also carried over to our youth. Studies show that 3,300 teens try marijuana in some form for the first time every day, which highlights its clear prevalence among youth. Only about one fourth of people aged 12 or older in 2020 (27.4%) perceived great risk of harm from smoking marijuana once or twice a week. The 2020 National Survey on Drug Use and Health showed that 1 million adolescents aged 12 to 17 initiated marijuana use in the previous year. Only 29% of 12th graders report that regular marijuana use poses a great risk. Almost 40% of high school students have reported trying marijuana, according to the CDC. Strikingly, almost 53% of marijuana users (current or prior) 18 or older report first using marijuana between the ages of 12-17. About 2% of these individuals report that they first used marijuana before the age of 12. At least two studies in *JAMA* have found that more teenagers are vaping marijuana than ever before. 19% of teen drivers have reported driving under the influence of marijuana. Several new concerns emerge when marijuana becomes more prevalent and when individuals of younger ages are introduced/exposed to it.

To understand why adolescents are so vulnerable to this drug, adolescent neurodevelopment must be discussed. In adolescence, the endocannabinoid system undergoes active development which may increase vulnerability to adverse long-term effects of marijuana use before adulthood. The endocannabinoid system is one of the body's molecular systems which is responsible for regulating and balancing several processes of the body and brain. Part of this system involves receptors called cannabinoid receptors type 1 which are found in abundance in brain regions associated with reward circuitry and memory. This receptor also happens to be where THC, which is the highly psychoactive component of marijuana, binds and produces its effects of a "high" feeling or a sense of euphoria. This could disrupt natural occurring endocannabinoids from binding here which play many roles including regulating stress, fear, anxiety, mood, appetite, and pain. Furthermore, in adolescence, the brain undergoes major remodeling, especially in the prefrontal cortex -one of the last areas to mature. This area is especially important because it is involved in planning, decision making, impulse control, maintaining attention, motivation, and working towards goals.

In adolescents who use regular marijuana, the brain has been shown to look different in neuroimaging studies. Differences shown have included: the volume of both the outer and inner parts (called the cortical and subcortical volumes), the integrity of the white matter (where nerve fibers are contained), and functional connectivity (patterns of how different parts of the brain relate to each other). These seem to correlate with cognitive impairments with attention, verbal memory, and poorer executive functioning.

All of this may explain why study after study continue to show a relationship between marijuana use during adolescence and impairments in subsequent academic achievement and education, employment and income, and social relationships. Evidence also exists showing that people who start using cannabis as teenagers risk suffering impaired memory, attention and cognitive function that may not improve with time. Heavy use starting in adolescence has also been associated with significant declines in IQ. A long-term study by an international research team that included Duke University found that people who began regular, persistent marijuana use as teenagers

that continued into adulthood showed an average decline in IQ of eight points. Several studies have specifically shown that starting marijuana use before age 16 compared with later onset is associated with poorer attention, executive functioning, memory performance, and verbal IQ. Early marijuana use increases risk of poor school performance and is linked to externalizing problems such as delinquent and aggressive behavior. Increasing levels of marijuana use before age 21 years was associated with higher unemployment and welfare dependence and lower levels of income and relationship and life satisfaction by age 25 years.

Furthermore, marijuana use in youth can increase risk for mental health disorders and the earlier the age of use the higher the risk. People who use marijuana prior to the age of 12 are twice as likely to develop a mental illness compared to those who first use marijuana at age 18 or older. Frequent cannabis use before age 15 has been associated with increased risk for depression and also with later suicidality. This increased risk has been shown even in the absence of a premorbid condition. Research shows girls (ages 14-15) who used marijuana daily were 5 times more likely to suffer from depression at age 21. Daily use in young women is also associated with a significant increase in the chance of reporting a state of depression and anxiety. In early adolescence linked to earlier onset of psychotic disorders among at-risk populations. Adolescents with regular use also reported higher levels of subclinical psychotic sx such as paranoia and hallucinations and effects persisted despite 1 year of abstinence. The higher potency marijuana found today (with concentrations available from 80- 90% in 2022 compared to single digits of 4-12% in 1995) is especially concerning because this can increase the risk for developing a chronic psychotic disorder. A recent article in the *Lancet* showed that at least 12% of new cases of psychosis could be eliminated if high-potency marijuana were not available.

Substance use disorders also increase with earlier use of marijuana. Early initiation and greater frequency of marijuana use increases the likelihood of developing problem marijuana use. Marijuana use is likely to increase the risk for developing another substance use disorder. Individuals who begin using cannabis before age 18 are four to seven times more likely than adults to develop marijuana use disorder. Cannabis use

disorder is characterized by impaired control over cannabis use and difficulty in ceasing use despite its harms. The National Institute on Drug Abuse cites research that suggests between 9% and 30% of people who use marijuana may develop use disorder, and the risk increases the younger someone starts using. Marijuana use is also associated with a significantly higher rate of initiating prescription opioid misuse.

We have learned much already from states where marijuana has been legalized especially on the impact to children and adolescents. Where marijuana has been legalized, there are studies showing that there is a corresponding increased perception of safety, which in turn increases marijuana use for people under 21 years of age. In Washington state, 2017 data revealed 288 violations for selling marijuana to minors and 136 violations for licensed marijuana business allowing minors access to a restricted area. In Oregon, 66 licensed marijuana retailers underwent random inspection in 2017/18 and 16/66 or 24% were selling to minors per data from the Oregon Liquor Control Commission.

Increased risk of unintentional marijuana overdose injuries exists among children in states where use is legal. Of note, accidental overdose of cannabis has been associated with multiple adverse effects, including reports of seizures among toddlers, which may be because of the toxicity of high dose THC. In Colorado, emergency department and urgent care visits significantly increased among children and adolescents using marijuana since the state legalized recreational marijuana use. In one region of PA, a newspaper reported that a health insurer stated that claims for adolescents diagnosed with cannabis use disorder went up 25% between 2012 and 2018 and that there was also a 100% claim rise in patients aged 19 to 25.

What about *medical marijuana* for children one may ask? Evidence is actually very limited and the only evidence shows some benefit for chemotherapy-induced nausea and vomiting, with increasing evidence of benefit for some epilepsy syndromes. The American Academy of Child and Adolescent Psychiatry does not approve the use of marijuana for any psychiatric disorders in children due to lack of evidence. Of note, A March 2022 randomized clinical trial in JAMA originating from the Boston area showed that immediate acquisition of a medical marijuana card increased

the incidence and severity of cannabis use disorder (CUD) and resulted in no significant improvement in pain, anxiety, or depressive symptoms.

As more states legalize recreational marijuana use and access increases, we must carefully consider the impact on children and adolescents. Legalization of a product with intoxicating properties requires a strong public health-based regulatory framework to minimize related harms. Potential future legalization should be transparent and take into consideration the potential unintended consequences. Such unintended but negative consequences include but are not limited to: the progression of marijuana use along the continuum of substance use with increased risk of adverse outcomes including addiction, social, and economic impacts that can be minimized in the future if we focus on the young people of today.

As more and more states have expanded medical and non-medical uses of marijuana, despite lack of scientific evidence, FDA approval, and regulation, but while introducing access to potential comfort therapies for life threatening and severely debilitating conditions, further increasing access must be weighed against the risks of introducing an addicting substance into a still-developing brain.