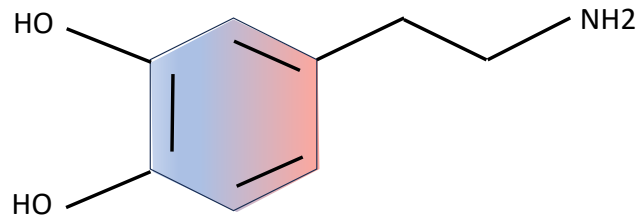


Stimulant Misuse Prevention



New Mexico Statewide Epidemiological Outcomes Workgroup White Paper Series

Image: Dopamine neurotransmitter molecule, J. Gremore.



Produced by Coop Consulting, Inc.

Prepared by Jesse Gremore on behalf of the New Mexico Statewide Epidemiological Outcomes Workgroup

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Mission: New Mexico's Statewide Epidemiological and Outcomes Workgroup (SEOW) reviews and disseminates data about substance abuse and misuse and their consequences. It also identifies best practice information about evidence-based prevention strategies, policies and practices that can lead to successful outcomes for New Mexicans. The purpose of this two-fold work is to inform communities so that they can better target behaviors and risk factors that can be positively impacted by the implementation of well-chosen, evidence-based prevention approaches that are appropriate for the population. The important work of the SEOW is directed by the Office of Substance Abuse Prevention (Behavioral Health Services Division, Human Services Department) and supported by federal funding from the Center for Substance Abuse Prevention, Substance Abuse and Mental Health Services Administration.

Statewide Epidemiology and Outcomes Workgroup (SEOW) Members

BHSD Office of Substance Abuse Prevention

Antonette Silva-Jose, Prevention Executive
Manager, NPN & SEOW Director
Allen Dominguez, Staff Manager
Pamela Espinoza, Program Manager
Jay Quintana, Program Manager
Jennifer Guhl, Program Manager

Behavioral Health Services Division (BHSD)

Nick Boukas, Director
Stanford Kemp, SUD Manager, Treatment and
Prevention
Melissa Heinz, State Opioid Treatment
Authority

Department of Finance and Administration

Julie Krupcale, DWI Bureau Chief

Children Youth and Families Department, Behavioral Health Services

Hilary Stim

Coop Consulting, Inc., Project Staff

Michael Coop
Jesse Gremore
Tanya Henderson
Grey Goode
Jennifer Espinoza-Ruiz
Leonel Diaz

Pacific Institute for Research & Evaluation (PIRE),

NM State Level Evaluator

Liz Lilliott
Dave Currey
Marissa Elias
Lei Zhang
Marie-Elena Reyes

DOH Epidemiology and Response Division

Kathryn Lowerre, Overdose Prevention Section Head

Dan Green, Epidemiologist

Dylan Pell, Epidemiologist

Luigi Garcia-Saavedra, Substance Use Epidemiology Section Supervisor

Jim Davis, Epidemiologist

Hayley Peterson, Epidemiologist

Sangam Shrestha, Epidemiologist

Malinda Gowin, Epidemiologist

Nora Holzinger, Epidemiologist

Kay Simon, Epidemiologist

*Community preventionists across the state attend and contribute using the SEOW as a resource for work in the larger New Mexico prevention system. For more information, contact Antonette Silva-Jose at antonette.jose@hsd.nm.gov or Michael Coop, michael@coopconsultinginc.com.

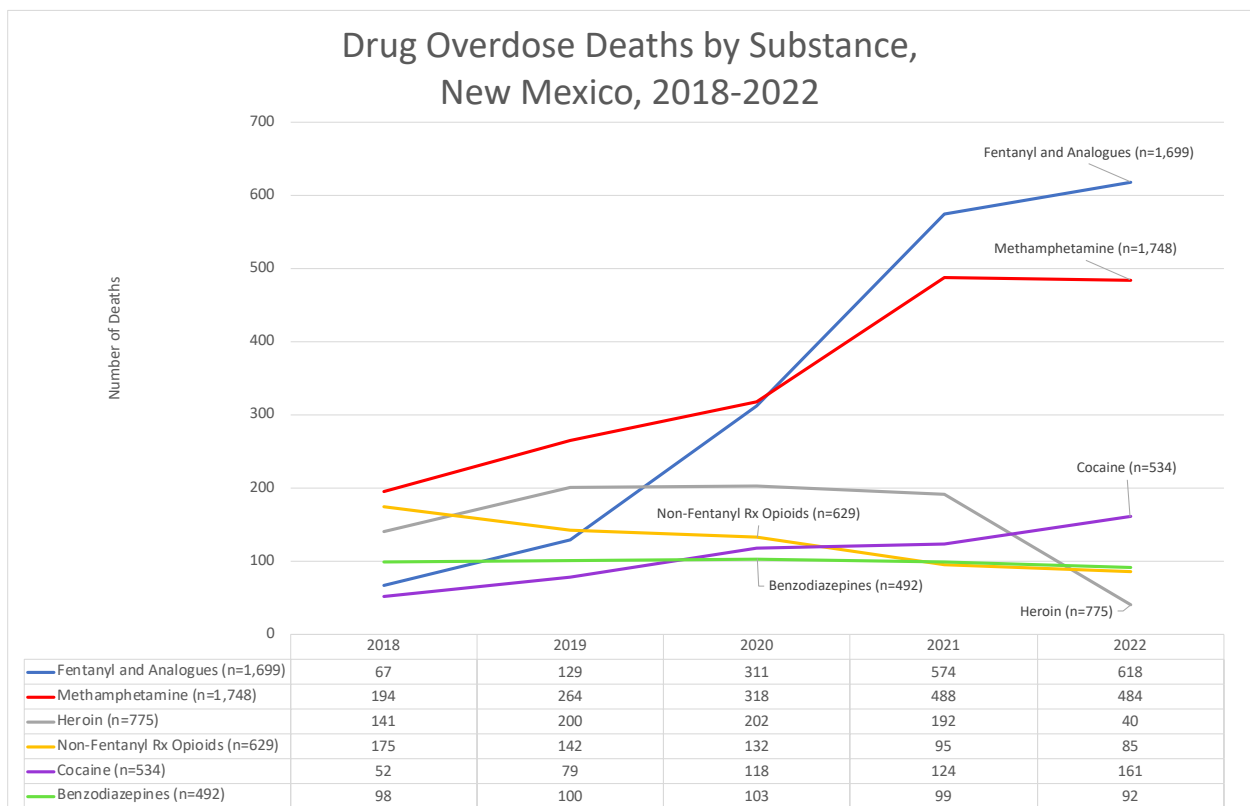
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Introduction

Stimulant use has become a major global health issue. Between 2018 and 2022, in New Mexico, methamphetamine, a potent and widely available psychostimulant, was the substance identified most frequently in overdose deaths (Figure 1)ⁱ. Stimulants include legal substances such as caffeinated beverages, nicotine, and pseudoephedrine. Additionally, stimulants include legally prescribed psychostimulant medications, such as amphetamine (Dexedrin, Adderall), methamphetamine (Desoxyn) and methylphenidate (Concerta or Ritalin). Illicit stimulants include cocaine, MDMA, illicitly manufactured methamphetamine, and other novel psychoactive stimulants. For more information about specific psychostimulants, see the 2022 SEOW *Psychostimulants* White Paper.

Figure 1: The line graph below shows the five-year trends that produced these totals, and the dramatic increases in two of the categories, fentanyl and its analogues, and methamphetamine. Between 2018–2022, methamphetamine was the substance identified most frequently in drug overdose deaths in New Mexico (n=1,748). Fentanyl and its analogues were the second most identified in the same period (n=1,699), followed by heroin (n=775).



Source: NM DOH Bureau of Vital Records and Health Statistics death files; UNM/GPS population estimates

This white paper advocates rethinking how we approach stimulant prevention, emphasizing the progression from casual use of legal stimulants by youth to using more potent ones with severe consequences as young adults. The paper underscores the importance of interventions that cover the entire spectrum of stimulants, aiming to prevent the risk of transitioning to more dangerous stimulants, especially methamphetamine and future iterations of powerful, illicit stimulants. To

effectively prevent methamphetamine use, and related deaths, it is crucial to shift away from focusing solely on methamphetamine to a broader strategy that addresses misuse of all stimulant-class drugs.

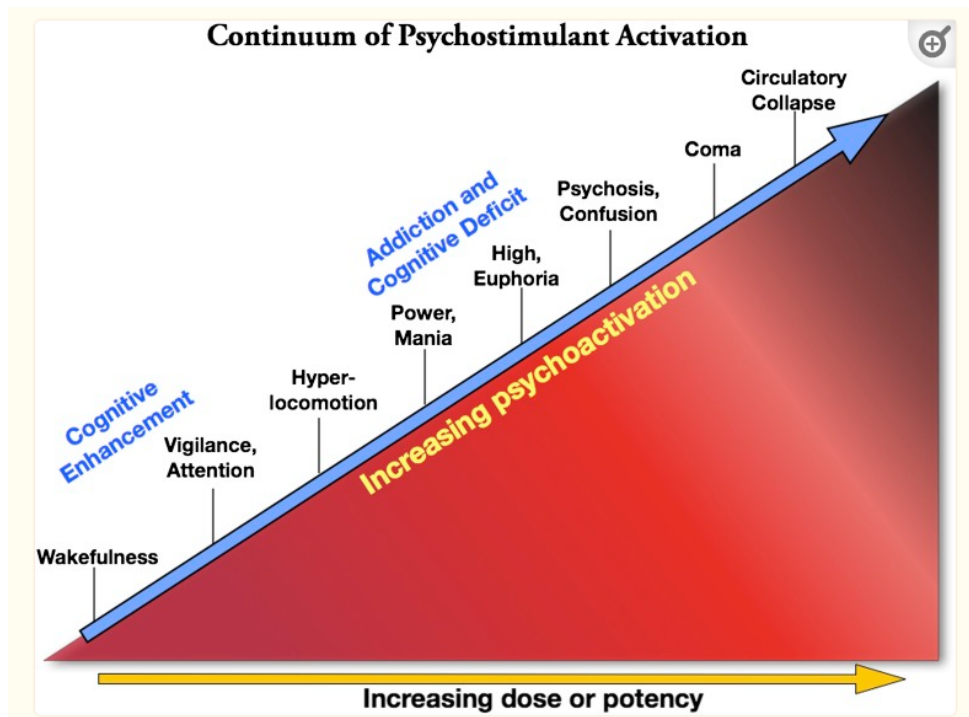
Dopamine

Stimulants, a diverse class of substances, exert their effects by elevating dopamine in the brain. Dopamine is a crucial neurotransmitter involved in learning, motivation, and behavior^{ii.iii}. Some stimulants activate dopamine release, while others hinder its removal, contributing to dependence and tolerance over time^{iv}. Additional important neurotransmitters involved with psychoactive stimulant effects include norepinephrine and serotonin.^v

These psychoactive effects of stimulants range on a continuum from mild to severe, with stronger doses causing more pronounced changes in perception, cognition, and behavior (see Figure 2).^{vi} Mild effects that are associated with casual caffeine and nicotine use include increased energy, elevated mood, and improved concentration^{vii}.

Moderate psychoactive effects, stemming from larger doses or concentrated substances, lead to increased sociability, heightened energy, and reduced need for sleep or food^{viii}. Severe psychoactive effects, often linked to illicit stimulants like methamphetamine, result in euphoria, confusion, cognitive deficits, and severe potential health risks such as strokes or heart attacks^{ix}. Psychoactivation increases with dose and or potency of the stimulant.

Figure 2: Psychostimulant Activation Continuum: Psychoactivity is dependent on dose or potency, ranging from mild cognitive enhancing effects to severe psychosis, to cardiovascular failure. Psychoactive effects are associated with the neurotransmitters dopamine, serotonin, and norepinephrine.



Source: Wood, 2013

Dopamine imbalances are linked with several medical conditions^x. Low dopamine is associated with substance use disorders, depression, schizophrenia, attention deficit hyperactivity disorder (ADHD), attention deficit disorder (ADD), bipolar disorders, and restless leg syndrome^{xi, xii}. Additionally, Parkinson's and Huntington's disease are also associated with low dopamine levels. High dopamine levels have been linked to mania, bipolar disorders, schizophrenia, and substance-induced psychosis^{xiii}.

All stimulants share the ability to elevate dopamine levels^{xiv}. Dopamine dysregulation is associated with several medical conditions, suggesting that stimulant use, or substances that increase dopamine, in some contexts may be a form of self-medication^{xv}. Understanding the continuum of psychoactivity and the neurological effects of different stimulants can reshape how we approach prevention of their misuse.

General Risks of Stimulant Misuse/Abuse

Stimulant misuse poses various risks to both physical and mental health. One overarching concern is the potential for dependence and abuse, where individuals develop a compulsive pattern of use despite negative consequences^{xvi}. The repeated release of neurotransmitters like dopamine, norepinephrine, and serotonin can lead to the rewiring of the brain's reward system, reinforcing the desire for continued stimulant use^{xvii}.

Physical health risks include elevated heart rate and blood pressure, which may contribute to cardiovascular problems, such as heart attacks or strokes^{xviii}. Hyperthermia, or overheating, is also a commonly reported, potentially lethal risk. Chronic stimulant misuse can lead to sleep disturbances, malnutrition, and weight loss due to reduced appetite^{xix}. Respiratory and oral issues may arise, especially in cases of smoking stimulants.

Early deaths from cardiovascular emergencies, accidents, and opioid-stimulant polysubstance overdoses are driving the increase in methamphetamine-related deaths^{xx}. Existing evidence demonstrates that deaths resulting from stimulant-only use are frequently associated with prolonged, cumulative exposure to cardiotoxic substances that gradually induce cardiovascular dysfunction, rather than being associated with an immediate state of intoxication, or stimulant overdose^{xxi}.

Mental health risks of stimulant misuse involve heightened anxiety, paranoia, and aggression. Prolonged stimulant use may contribute to psychiatric disorders like memory issues, hallucinations, delusions, or mood disorders^{xxii}. Additionally, the "crash" following stimulant use can result in fatigue, depression, and irritability^{xxiii}. Awareness of these risks may influence behavior.

Stimulant and Opioid Polysubstance Use

Opioid and stimulant co-use is a complex and multifaceted phenomenon. Individuals engaging in opioid and stimulant polysubstance use may do so for a variety of reasons, and understanding these patterns is crucial for devising effective intervention and harm reduction strategies.

Motivations for intentional opioid and stimulant co-use can vary widely with geographical variation^{xxiv}. Some individuals may use stimulants to counteract the sedation induced by opioids, allowing them to maintain alertness and functionality^{xxv}. Others may engage in co-use as a strategy for self-medication, attempting to alleviate the negative side effects or withdrawal symptoms associated with one substance by using the other^{xxvi}.

Of New Mexico’s 2,177 polysubstance deaths between 2017–2021, non-fentanyl prescription opioids and methamphetamine were involved in 37.0% of the deaths, heroin and methamphetamine were involved in 21.2% of the deaths, while fentanyl and methamphetamine were involved in 19.8% of the deaths^{xxvii} (see Table 1). Stimulant and opioid deaths are generally caused by respiratory depressant effects of opioids. Methamphetamine stimulation does not protect against opioid overdose. Naloxone is the opioid overdose reversal medicine, and it can effectively prevent opioid and stimulant polysubstance deaths when combined with rescue breaths and other opioid overdose recognition and response skills.

Table 1: Methamphetamine and Opioid involvement in New Mexico’s overdose deaths between 2017-2021*.

| New Mexico | State Deaths | |
|------------------------------------------------|---------------------|------------------|
| 2017-2021 | n | Rate per 100,000 |
| Overdose Deaths | 3,447 | 34.3 |
| Polysubstance Deaths | 2,177 | 21.8 |
| Meth + Non-fentanyl Prescription Opioid Deaths | 806 | 8.3 |
| Meth + Heroin Deaths | 461 | 4.7 |
| Meth + Fentanyl Deaths | 430 | 4.5 |

Source: NM DOH Bureau of Vital Records and Health Statistics death certificate files; NM DOH SUES
 *Polysubstance deaths are not mutually exclusive as multiple substances may be involved.

Unintentional adulteration of stimulants with opioids is also a concern. One important study published in partnership with the University of New Mexico identified that crystalline forms of methamphetamine and cocaine were significantly less likely to be contaminated with fentanyl than the powder forms^{xxviii}. The study found that of 718 lab samples obtained from 77 national harm reduction sites between May 2021 and June 2023, approximately one-in-ten illicit stimulant samples checked contained fentanyl.

Understanding the nuanced patterns and motivations of opioid and stimulant co-use is essential for developing targeted prevention and treatment approaches to address the specific challenges associated with polysubstance use.

Poly-stimulant Use

Poly-stimulant use, or combining multiple stimulants, such as caffeine and nicotine, can amplify psychoactive effects^{xxix}. Alcohol and cannabis are generally considered depressants; however,

they act as stimulants to activate the dopaminergic pathway at low doses. While casual use of caffeine, nicotine, alcohol, or cannabis may have mildly stimulating effects when used alone, their combined use in most arrangements may lead to increased psychoactive effects associated with dopamine increases^{xxx,xxxi,xxxii}.

Co-use of alcohol and energy drinks is a common polysubstance combination among youth and college aged adults, and researchers recommend that this behavior should be considered “high risk”, as studies demonstrate this combination has been associated with increased risky alcohol consumption compared to drinking alcohol only^{xxxiii,xxxiv}. Moreover, the risk of increased tolerance use may rise when these substances are used together regularly^{xxxv}.

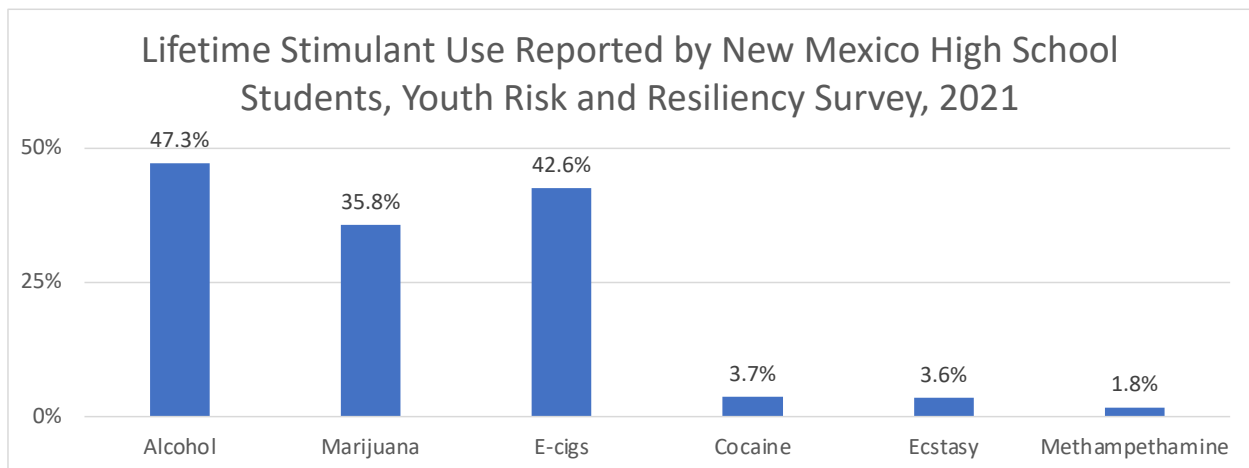
Combining powerful ADHD stimulant medications with other stimulants, or altering their administration in ways not prescribed, poses significant health risks^{xxxvi}. Such misuse can result in heightened blood pressure, irregular heartbeats, and potentially lead to cardiovascular events or seizures^{xxxvii}. Alternative routes of administration, including snorting, smoking, or injecting these medications, can exacerbate these health issues and contribute to the overall risk associated with their misuse^{xxxviii}. It's crucial for both medical professionals and individuals prescribed these medications to be aware of these potential dangers and adhere to proper usage guidelines.

Because psychostimulant activation is dose and potency dependent, combining stimulants, especially prescription medications, with other stimulants can exacerbate risks, leading to tolerance and potentially life-threatening outcomes^{xxxix}.

Youth Stimulant Use

New Mexico’s Youth Risk and Resiliency Survey (YRRS) asks students across New Mexico about substance use, physical health, mental health, and personal safety. It is administered every other year in accordance with the national Center for Disease Control’s version of the Youth Risk Behavior Surveillance System survey.

Figure 3: Self-reported lifetime stimulant use by New Mexico’s high school students. Refer to following text for additional information about stimulant properties of these substances.



Source: New Mexico Youth Risk and Resiliency Survey: High School Survey Results, 2021

The survey includes questions related to the use of several potent psychostimulants: cocaine, ecstasy, and methamphetamine, in addition to alcohol, marijuana, and nicotine, which is widely used in the e-cig or vape form (Figure 3). In 2021, 3.7% of high school students across New Mexico self-reported ever using cocaine, while 3.6% reported ever using ecstasy, and 1.8% reported ever using methamphetamine^{xi}. These illicit stimulant numbers are likely under-reported for a variety of reasons, including that the students who may be at highest risk for illicit psychostimulant use, such as cocaine, ecstasy, and methamphetamine, are not in school due to more frequent absences and often are not enrolled due to withdrawal.

Tobacco use is also assessed in the YRRS. Tobacco contains nicotine, which is a psychostimulant. In 2021, 42.6% of New Mexico's high schoolers ever reported using an e-cig^{xli}. One prominent study asserts that people with a nicotine use disorder are three to four times more likely to have a second substance use disorder^{xlii}.

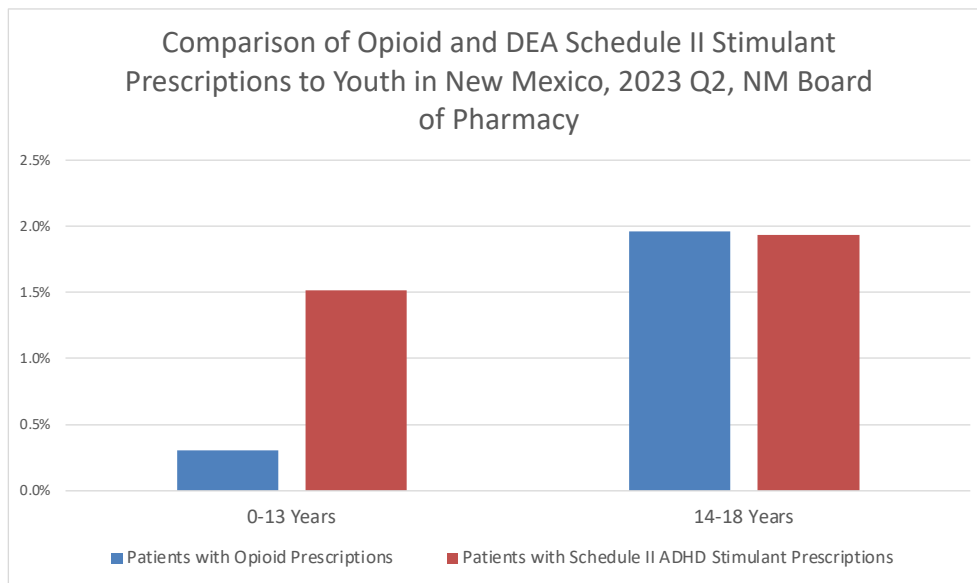
Cannabis use questions are included in the YRRS survey. Cannabis use activates the dopaminergic reward pathway, producing stimulating psychoactive effects^{xliii}. However, cannabis is less stimulating than more potent stimulants. In 2021, 38.5% of New Mexico's high school students reported ever using cannabis. When cannabis is concurrently used with alcohol, nicotine, or another psychostimulant, such as cocaine, the experience is additively stimulating and lasts longer than if either substance were used alone.^{xliv}

The YRRS also includes questions about alcohol use. Alcohol produces both stimulating and sedating effects. The stimulating effects associated with dopamine increases appear with low alcohol blood levels while higher levels are associated with sedating effects.^{xlv} In 2021, 47.3% of New Mexico's high school students reported ever using alcohol. Alcohol is commonly used with other substances, notably producing synergistically rewarding effects when combined with cannabis and nicotine^{xlvi}.

Prescription stimulant medications, such as Adderall or Ritalin, are frequently prescribed to children for the treatment of ADHD and are generally perceived as safe within a medical and therapeutic context. The YRRS does not include questions about prescription stimulant misuse, but it does ask questions about prescription opioid misuse. In New Mexico's youth population, for each opioid prescription to a youth between 0–13 years, there were 5 controlled prescription stimulants^{xlvii}. In the 14–18-year-old population, there was an approximately one-to-one ratio of controlled stimulant and opioid prescriptions. (See Figure 4)

National estimates indicate that 12% to 26% of adolescents with stimulant prescriptions engage in diversion, which is defined as illegal distribution or abuse of prescription drugs for the purpose not intended by the prescriber^{xlviii}. This illustrates that stimulant prescriptions are accessible in schools. The diversion of and misuse of these medications remains a common concern for medical prescribers.

Figure 4: New Mexico’s Prescription Monitoring Program collects data on controlled substances. In 2023, Q2, 0–13-year-olds received five schedule II prescription stimulants for each schedule II opioid prescription.



Source: NM Board of Pharmacy Prescription Monitoring Program Data; UNM/GPS Population Estimates

Youth engagement in stimulant misuse is driven by a myriad of motivations, reflecting the complex interplay of individual, social, and environmental factors. One prominent incentive is the pursuit of euphoria, as potent stimulants can induce intense feelings of pleasure and energy^{xlix}. Additionally, the desire for heightened sexual pleasure may influence some adolescents to experiment with stimulants, as these substances are perceived to enhance arousal and intimacy^l. Peer pressure, weight loss, and broader social factors, such as cultural trends and media influences, contribute to shaping the landscape of stimulant misuse among the youth^{li}. Understanding these diverse motivations is crucial for developing targeted prevention and intervention strategies that address the complex drivers of stimulant experimentation in this demographic.

Alcohol, Cannabis, and Tobacco

Combining alcohol, cannabis, and tobacco not only elicits a multifaceted psychoactive experience but also impacts the same dopaminergic reward pathway in the brain as other stimulants. Each of these substances independently influences dopamine release, albeit through different mechanisms^{lii}. Alcohol increases dopamine levels indirectly by enhancing the activity of the neurotransmitter in certain brain regions associated with reward and pleasure. Cannabis contains cannabinoids that interact with cannabinoid receptors in the brain, indirectly modulating dopamine release. Nicotine, found in tobacco, directly stimulates the release of dopamine in the brain's reward pathway.

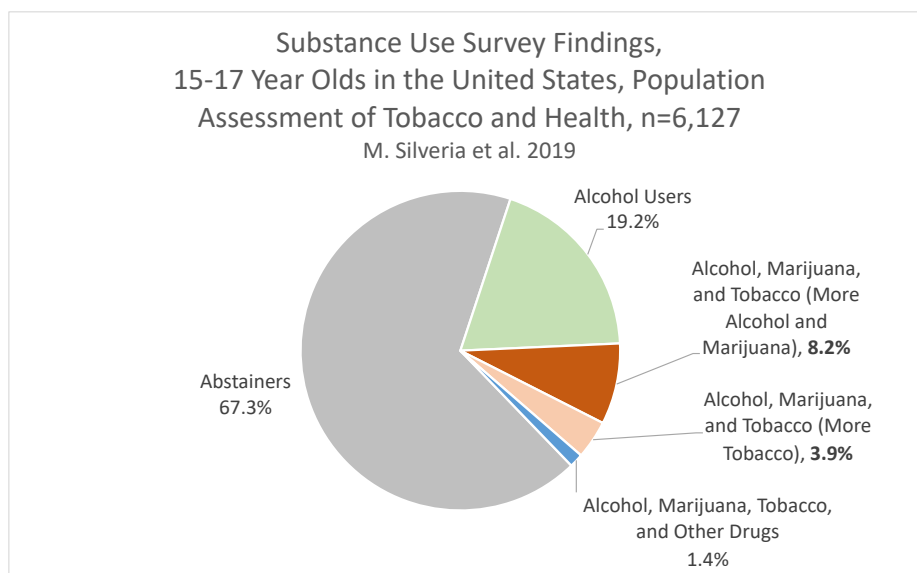
When consumed together, these substances synergistically amplify dopamine release, creating a potent reinforcing effect that contributes to their addictive potential^{liii}. This heightened activation of the dopaminergic system reinforces the desire to continue using this trio of substances, potentially

leading individuals to seek stronger stimulants to achieve similar or heightened effects, thereby increasing the risk of transitioning to more dangerous substances. Understanding how the combined effects of alcohol, cannabis, and tobacco impact the dopaminergic reward pathway is crucial for designing comprehensive prevention strategies aimed at mitigating stimulant misuse and its associated harms.

One study published in 2019 looked at youth polysubstance use self-reported from a nationally representative Population Assessment of Tobacco and Health (PATH) survey (see Figure 5)^{liv}. Between 2013 and 2014, 6,127 15–17-year-olds in an ongoing longitudinal PATH study answered several questions about polysubstance use. Latent class analysis was used to identify patterns using socio-demographic correlates. Five substance use classes were identified: 1. Abstainers (67.3%), 2. Alcohol Users (19.2%), 3. Alcohol, Marijuana, and Tobacco (Alcohol and Marijuana Dominant, 8.2%), 4. Alcohol, Marijuana, and Tobacco (Tobacco Dominant, 3.9%), and 5. Alcohol, Marijuana, Tobacco, and Other Drugs (1.4%). For more information about the classes revealed in this analysis, refer to the 2021 SEOW *Polysubstance Use* White Paper, Appendix D.

The latent class analysis further described these classes of users using socio-demographic correlates. Class 3, the alcohol, marijuana, and tobacco class (alcohol and marijuana dominant class, 8.2%), was found to be more female and had “high severity of problem externalization (behavior or conduct) and internalization.” Class 4, the alcohol, marijuana, and tobacco class (tobacco dominant class, 3.9%), was found to be more male, more non-Hispanic White, less likely to include racial/ethnic minorities, more likely to be a sexual or gender minority, more likely rural, and less likely to have diagnosed mental health conditions.

Figure 5: Substance use classes of 15–17-year-olds in the United States. The second largest class of substance users, after alcohol users (19.2%), is described as alcohol, marijuana, and tobacco polysubstance users (12.1%). Within this class, there were two distinct groups identified. 1. Alcohol and Marijuana Dominant (8.2%), and 2. Tobacco Dominant (3.9%). Population Assessment of Tobacco and Health, 2013-2014.



Source: Silveria, 2019

Understanding alcohol, cannabis, and tobacco polysubstance use is imperative for designing comprehensive prevention efforts targeting stimulant use. These substances, when combined, create an additive psychoactive experience that prepare the dopaminergic reward pathway to respond positively to more potent stimulants in the future. Future research investigating alcohol, cannabis, and tobacco polysubstance use patterns would likely produce interesting findings if it included caffeinated beverages and was repeated as part of the longitudinal study with discussion of future stimulant use.

Caffeine

Excessive caffeine consumption among youth, particularly through the intake of large doses in energy drinks, poses significant health risks^{lv}. Caffeine is a stimulant that affects the central nervous system. While the Food and Drug Administration recommends limiting caffeine intake to 400 mg a day for adults, the developing bodies and brains of young individuals may respond differently^{lvi}.

Table 2: Caffeine content and serving size of some caffeinated over-the-counter products.^{lvii}

| Caffeine Content of Beverages and Over-the-counter Drugs | | |
|----------------------------------------------------------|--------------|---------------------|
| | Serving Size | Milligrams Caffeine |
| Decaffeinated coffee | 8 oz | 2 |
| Green Tea | 8 oz | 28 |
| Coca-Cola | 12 oz | 34 |
| Black Tea | 8 oz | 47 |
| Espresso | 1 oz | 63 |
| Redbull Energy Drink | 8.4 oz | 80 |
| Coffee | 8 oz | 92 |
| Monster Energy Drink | 16 oz | 160 |
| Over the counter caffeine pill | 1 tablet | 200 |
| Reign Body Fuel | 16 oz | 200 |
| Bang | 16 oz | 300 |
| C-4 | 16 oz | 300 |
| Redline Xtreme | 8 oz | 316 |
| Liquid Caffeine | 1 oz | 500 |
| DynaPep | 1 oz | 714 |

Source: Center for Science in the Public Interest, 2022

Consuming more than 100 milligrams of caffeine per day can lead to adverse physical health effects in youth. According to the American Academy of Child and Adolescent Psychiatry, in youth under the age of 12, caffeine consumption is not recommended^{lviii}. Youth between the ages of 12 and 18 should limit their caffeine intake to less than 100 mg daily.^{lix} Elevated heart rate, increased blood pressure, and disturbances in sleep patterns are common consequences of youth caffeine use.

There is a growing body of research suggesting a link between excessive caffeine consumption in youth and an increased likelihood of engaging in risky behaviors, including substance misuse.^{lx,lxi} The stimulating nature of caffeine can create a desire for heightened arousal and stimulation, potentially serving as a gateway to experimenting with co-use of other substances that produce similar effects on the central nervous system.^{lxii}

Regular, high-dose caffeine intake may contribute to the development of tolerance, requiring increased amounts to achieve the same stimulating effects.^{lxiii} This phenomenon can set the stage for a pattern of seeking psychoactivation. When nicotine and caffeine are used together, a unique psychoactive effect of increased alertness and heightened arousal is produced. The two stimulants produce a synergistic dynamic. This is a popular combination for individuals seeking wakefulness and concentration. However, both substances are associated with tolerance, requiring more stimulation to achieve desired effects. Some individuals combine legal stimulants, such as caffeine or nicotine with prescription medications or illicit substances to satisfy the escalating need for arousal^{lxiv}.

The cultural acceptance and prevalence of energy drinks can contribute to a social environment where excessive caffeine consumption is normalized among youth. Many energy drink products skirt federal limits on caffeinated beverages by labeling products as “supplements.”^{lxv} There are countless energy drink products marketed to youth that contain caffeine doses that are two to four times the recommended daily caffeine intake for youth (see Table 2). Peer influence and marketing strategies targeting young audiences may further contribute to patterns of risky behavior, including the potential transition to other substances^{lxvi,lxvii}.

Addressing the risks associated with excessive caffeine consumption in youth requires a multi-faceted approach. Educational initiatives should focus on raising awareness about the potential health consequences of large caffeine doses and promoting healthier alternatives for maintaining energy and focus.^{lxviii} Facilitating a supportive environment that encourages open communication about substance use and mental health can contribute to resilience against the development of risky behaviors in the future.

Not everyone who uses caffeine is at risk of developing a substance use disorder^{lxix}. Caffeine is a legal and widely available substance. Its use does not necessarily correlate with seeking out more harmful substances. Caffeine can produce many positive effects if used in moderation. To understand who may be at risk of developing substance misuse behaviors, it is important to consider individual response to caffeine’s psychostimulant effects; underlying hormonal imbalances, unaddressed mental health concerns, such as those associated with low dopamine levels like ADHD, and individual, family, community, and social-level risk factors all may increase susceptibility to seeking stimulation^{lxx,lxxi}.

Underlying Mental Health Conditions

Unaddressed, underlying mental health conditions have been associated with stimulant misuse. Medical conditions associated with dopamine imbalances are at high risk of co-morbidity with stimulant use. While there are several mental health conditions associated with stimulants,

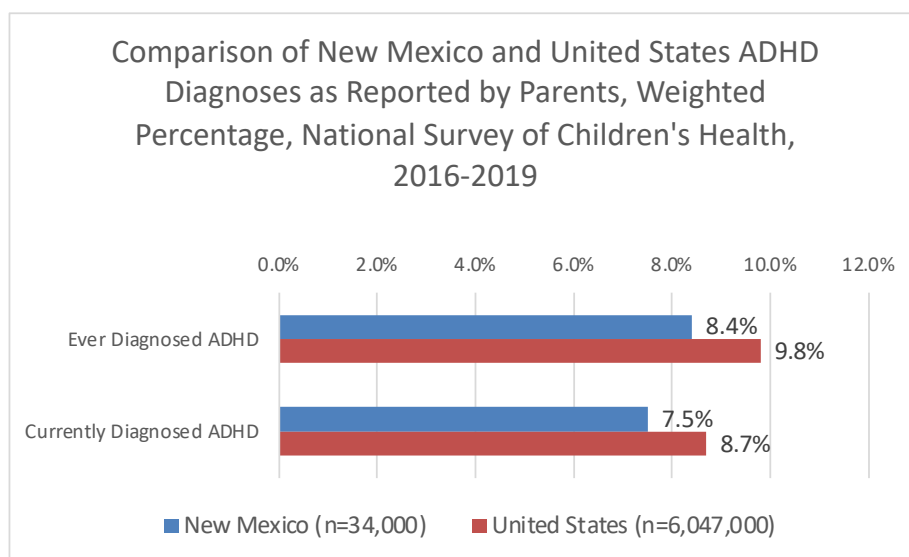
ADHD and depression are two important diagnoses to consider due to their link to low dopamine.^{lxxii}

Individuals with ADHD often experience difficulties with attention, impulse control, and hyperactivity^{lxxiii}. People with ADHD often experience stigma because of these difficulties. When ADHD remains untreated, symptoms persist as individuals may look for ways to self-manage their symptoms, leading to an increased risk of stimulant misuse. Stimulants have demonstrated their effectiveness in temporarily improving focus, attention, and impulse control for those with ADHD, along with other successful cognitive-behavioral interventions^{lxxiv}. There are several effective treatment options for individuals with ADHD. People with untreated ADHD may use stimulants as a form of self-medication to alleviate their ADHD symptoms^{lxxv}.

One important study demonstrated that that individuals with both cocaine use disorder and ADHD significantly reduced cocaine use after improvement of ADHD symptoms with either long-acting stimulants or non-stimulant treatments such as atomoxetine^{lxxvi}. Untreated ADHD is associated with increased risk of substance use disorders later in life^{lxxvii}. Treatment of ADHD is associated with decreased risk of substance use disorders later in life^{lxxviii}. According to a 2016-2019 National Survey of Children’s Health study, New Mexico may be underdiagnosing, and consequently undertreating ADHD compared to the rest of the United States. (Figure 6).

Unaddressed depression may also be linked to stimulant misuse^{lxxix}. Depression is characterized by feelings of fatigue, low energy, persistent sadness, and lack of motivation. Because stimulants increase alertness, energy levels, and improve mood, individuals with untreated depression may use stimulants to improve daily functioning^{lxxx}.

Figure 6: A comparison of current and lifetime diagnosis of ADHD between New Mexico and the United States from the 2016-2019 National Survey of Children’s Health^{lxxxii}. New Mexico has a lower estimate of both diagnoses than the United States, suggesting New Mexico may be underdiagnosing ADHD.



Source: Danielson, 2022

The YRRS does ask about mental health and include questions about feeling sad or hopeless and frequent mental distress, which are characteristics of depression. In 2021, 44.2% of New Mexico's high school students reported feeling sad or hopeless^{lxxxii}. Of the students reporting sadness or hopelessness, 51.9% were female. Furthermore, 39.0% of New Mexico's high school females reported frequent mental distress, characterized as 14 or more self-reported mentally unhealthy days in the past 30 days, as compared to 18.7% of New Mexico's high school males^{lxxxiii}.

Some individuals may resort to self-medicating with stimulants if they lack access to mental health treatment, if there are barriers to accessing care, or if there is high stigma in their community towards mental health treatment^{lxxxiv}.

Stimulant Use Disorder Treatment

The treatment landscape for stimulant use disorders presents unique challenges, as there is currently no FDA-approved medication specifically designated for this purpose^{lxxxv}. Unlike other substance use disorders where pharmacological interventions are available, stimulant use disorder lacks a recognized pharmaceutical remedy. Consequently, the primary evidence-based therapeutic approach for individuals struggling with stimulant misuse involves contingency management^{lxxxvi}.

Contingency management focuses on positively reinforcing abstinence at by providing tangible rewards, thereby reshaping the brain's dopaminergic reward system^{lxxxvii}. It is noteworthy that this absence of pharmacological options for stimulant use disorder highlights a disparity among substance use disorders, where several others benefit from effective medical treatments. As research progresses, addressing this gap and developing targeted medications remains an important avenue for enhancing comprehensive and effective treatment options for individuals grappling with stimulant use disorders.

Recommendations

Methamphetamine-related deaths are on the rise, underscoring the critical need for targeted, evidence-based programming dedicated to preventing stimulant misuse. Effectively tackling this issue demands a collaborative effort, bringing together stakeholders from public health, education, policymaking, and community prevention.

To reduce stimulant and opioid deaths, extend opioid overdose response and recognition training to stimulant users. Educate stimulant users about their opioid overdose risks and equip them with naloxone and items needed to reduce risk of transmission of communicable diseases. Additionally, refer stimulant users to contingency management programs, as it is the most effective treatment available for stimulant users wishing to reduce or stop stimulant use.

Central to stimulant use prevention is robust public health surveillance data collection. However, current surveys about youth stimulant use are limited. While New Mexico's Youth Risk and Resiliency Survey addresses alcohol, methamphetamine, cocaine, and tobacco use, it overlooks crucial topics that are relevant to stimulant use prevention, such as questions about excessive

caffeine use and prescription stimulant misuse. These questions could be part of a latent class analysis to characterize polysubstance use behaviors among youth to gain insight into substance use initiation pathways involving alcohol, nicotine, and cannabis, along with other risky behaviors.

A possible question to assess the impact of excessive caffeine use in the context of the YRRS could be “Within the past 30 days, how often did you consume products or substances for increased energy, focus, or performance, including but not limited to energy drinks, caffeinated shots, or caffeine pills?” Another question to assess prescription stimulant misuse in the YRRS could be “In the past month, how often have you taken prescription ADHD medications such as Adderall, Concerta, or Ritalin without a doctor’s prescription or in a way not prescribed to you?”

The New Mexico Board of Pharmacy collects data on controlled prescription stimulants, yet these indicators often go unconsidered in substance use prevention planning. Performing exploratory research to understand how to use this data to support prevention efforts would also be beneficial. Augmenting traditional data sources with insights from focus groups involving educators, parents, and youth could significantly enhance surveillance of stimulant misuse initiation.

Evidence-based preventive strategies for stimulant misuse remain sparse. Effective educational curriculum programming could center on raising awareness about potential risks linked to excessive caffeine use, poly-stimulant consumption, addressing stigma related to mental health treatment, and fostering open dialogues about legal and licit stimulants to define misuse behavior. Additionally, resiliency programming that teach healthy alternatives to dopamine regulation, such as exercise or meditation may be helpful.

Environmental strategies designed to prevent youth opioid misuse, alcohol use, and tobacco use could be adapted to include prevention of stimulant misuse. Raising parental or guardian awareness of the issue, including prescription stimulant information in parent handbooks, decreasing social and retail access to prescription stimulants and excessively caffeinated energy drinks, distribution of medication lock bags, and promoting stimulant prescription take-back programs are effective evidence-based environmental strategies that could potentially influence stimulant misuse behaviors.

Addressing scarce mental health treatment access and high community stigma towards treatment of mental health conditions are key components of an effective plan to prevent stimulant misuse. Any plan to prevent and reduce stimulant misuse would be diminished if it excluded strategies to promote timely, equitable, affordable, and effective mental health treatment access, particularly for ADD/ADHD and depression.

Law enforcement intervention strategies could also be a valuable intervention. The Law Enforcement Assisted Diversion (LEAD) program in New Mexico, designed to identify and refer low-level offense individuals with opioid use disorder for treatment, could also be potentially adapted to include screening and referrals for those with untreated ADD or ADHD. As it was funded, the LEAD program excluded people who use methamphetamine. The City of London implemented a pilot program in May 2023 that screens and refers incarcerated individuals for

ADHD treatment. The goal of the program is to address the root of low-level offenses that are linked to substance dependence^{lxxxviii,lxxxix}.

In the realm of policy, a proven primary prevention tool for various substances, there is an opportunity to draw lessons from successful interventions with alcohol and tobacco. Some researchers and medical advocacy groups propose the taxation of excessively caffeinated drinks marketed to youth as a deterrent to risky behaviors, including substance use^{xc,xcii}. Countries such as Lithuania, Denmark, Norway, and Poland have moved to ban or restrict sales of energy drinks containing over 150 mg/L of caffeine due to concerns about youth consumption^{xcii}. Championing policies aligned with scientific understandings of neurobiology and prioritizing the well-being of youth emerges as a crucial facet of prevention activities.

Conclusion

Emphasizing the critical need for interventions that encompass the entire spectrum of stimulants, this white paper strives to provide a path for New Mexico to prevent the perilous shift toward more hazardous stimulants, particularly methamphetamine. The core proposition involves moving beyond the conventional focus on preventing the use of specific substances and redirecting efforts toward the broader goal of preventing stimulant misuse. In doing so, we unravel promising opportunities to preclude the onset of methamphetamine use and its devastating repercussions.

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