- Lessons from the Field -

Understanding and Preventing Student Marijuana Use

Wednesday, March 22, 2023 | 3:00 – 4:30 PM ET
Transcript

Cindy Carraway-Wilson: Good afternoon everyone, and welcome to our webinar Understanding and Preventing Student Marijuana Use. On behalf of the US Department of Education, we are so pleased to have you with us here today. In fact, over 1,558 people are here with us today. We have people from a variety of different roles and responsibilities within schools and districts, as well as individuals who are coming in from the community to gain more information on what we all can do together to prevent student marijuana use. We're so happy to have you all here today.

This webinar is part of our Lessons from the Field webinar series. This series highlights the effective tools, techniques, and strategies employed by everyday practitioners to address the hot topics that are on the top of educators' minds. You can access recordings of past webinars from the series on the webpage now being shared in chat.

In today's webinar, our speakers will share information about marijuana student use rates and prevention strategies that we might use in our schools and districts to protect young people. As always, if you have additional strategies that are working for you in your community, please reach out to bestpracticesclearinghouse@ed.gov to share what you're doing. We are excited to have everyone come together to share strategies and ideas because together sharing these ideas, we are stronger and we create benefits for students and safer, healthier learning environments. Please note that the content in this presentation does not necessarily represent the policies or views of the US Department of Education, nor does it imply endorsements of the US Department of Education. We hope that you can access resources on the event webpage.

My name is Cindy Carraway-Wilson, and I'm a training specialist at The National Center on Safe Supportive Learning Environments or NCSSLE. NCSSLE is funded by the Office Safe Supportive Schools within the Office of Elementary and Secondary Education. We'd encourage you to visit our website to learn more about NCSSLE and to access a wide range of resources that address school climate and conditions for learning. To give you a sense of what the website looks like, on the right you see a screenshot of our current homepage. On the left, you see a variety of popular resources that you can access on the website. We also share the latest resources and information about upcoming events out coming out of the field via social media, so please do follow us.

Please note that this webinar is being recorded. All materials that you see today, including the slides, referenced resources, the recorded version of this webinar, and information on our speakers will be on the event webpage within this website. In fact, some of these items, including the slides and speaker bios are already posted. Please also note, as I said earlier, you can access previous lessons from the field webinar sessions by visiting the webinar series webpage, which is also listed here and will be posted in the chat.

After the logistics and welcome that we're currently doing, our five speakers will be sharing information about marijuana, including those use rates and various forms that marijuana has taken, potency levels, as well as impacts on health development and learning. The last two web webinar presenters are going to be focusing in specifically on those prevention strategies that we might use with our young people in our communities and our schools.

We will be then doing a closing remark area just about 15 minutes prior to closing, to close the formal content delivery. That last 10 to 15 minutes we are reserving to answer live questions from you, our audience, so please stay around. We will be closing the webinar at 4:30.

Now, I'd like to have you meet our five presenters. We have a wide range of expertise on our webinar today, and the presenters are excited to be sharing the information that they have about marijuana and the things that we need to know in order to best support the health and safety of our young people. Please do remember that as you hear the presentations or as things come to mind, we encourage you to click that Q and A button in your Zoom control panel to post your questions, so that we can respond to some of these questions at the end of the formal presentations.

Now, it's my pleasure to introduce Ms. Helen Hernandez, the Assistant Director of Drug-Free Communities in the Office of the National Drug Control Policy. She's also a partner in our webinar planning committee. Ms. Hernandez.

Helen Hernandez: Good afternoon everyone and Cindy, thank you for that kind introduction. For over a decade, I've had the honor and the privilege to administer the Drug-Free Communities program and to offer support to youth substance use prevention coalitions across the country. These coalitions are focused on changing the

environment in which drug use happens. I have seen firsthand the effectiveness of mobilizing communities and bringing together youth, parents, healthcare professionals, schools, educators, law enforcement, faith-based organizations, and so many others, critical partners together.

The DFC program's recipients have experienced significant reductions in use across middle school and high school students for alcohol, tobacco, marijuana, and prescription drugs. DFC coalitions have mobilized more than 30,000 volunteers to support this shared mission of creating healthy, safe and drug-free communities, so that youth can thrive. It all begins with raising awareness and sometimes even our own awareness. From a public health perspective, we know that as perception of risk for a substance decreases, use of that substance usually increases, and that is why I'm so thrilled to see so many of you participating in this webinar today, to better understand the latest research about marijuana's impact on the adolescent brain, its impact on learning, and effective strategies to prevent youth use of marijuana. The US drug landscape is rapidly changing and we all have an important role to play. I encourage you to engage with a local youth substance use coalition or to create a youth-led prevention coalition within your school community.

I want to leave you with the quote from Vinayak Menon, who is a senior high school from Georgia, and he was the US Youth Form Representative just last week during our United Nations Office of Drugs and Crime Youth Forum 2023. What this forum is, the Youth Forum is an international convening of young people representing 28 different countries, that came together last week to enhance their knowledge and substance use prevention, to engage in interactive discussions, and to learn about best practices being implemented in others countries, and to gain ideas and inspirations for their own. And so, I want to leave you with this quote. He said, "The importance of investing in our generation must not be ignored. We have a responsibility to ensure a safer future for everyone. We know what needs to be addressed and what our needs are. Youth are the present, not just the future. Breaking the cycle of substance use tomorrow requires youth engagement today in prevention."

So let's not underestimate the power of youth leaders in creating positive change throughout their communities. With a little guidance, we can ensure that every child has a supportive and caring adult, helping them remain healthy and working towards reaching their dreams and aspirations.

I want to thank you for the work you do every day and I'm grateful for this partnership. And if I can be of any assistance to you, please do not hesitate to leave a comment or a question and your email in the chat box today. Thank you all for your participation and thanks for having me.

Cindy Carraway-Wilson: Helen. Thank you so much for that welcome and what a wonderful quote, and sounds like it was an amazing event. I'm excited that our last speaker of the day is going to be speaking about how to engage young people in prevention strategies, so thank you for that.

It's now my pleasure to introduce Dr. Brooke Hoots, who is the Cannabis Strategy Unit Lead at the Centers for Disease Control and Prevention, Dr. Hoots.

Brooke Hoots: Thanks so much, Cindy. Thank you so much for having me. I'm going to start with a little bit of background on the cannabis plant. Cannabis is a genus of plants that contains hundreds of compounds that are also known as cannabinoids. The two most well known, are THC and CBD, you've probably heard of those, and the term cannabis encompasses both marijuana, which has high THC, defined as greater than 0.3% Delta-9 THC, the main psychoactive ingredient in cannabis, and low CBD, and it's primarily used to achieve a high.

There are also cannabis plants that are defined as hemp, which has low THC, defined as less than or equal to 0.3% Delta-9 THC and high CBD. These are primarily used for medical purposes rather than to achieve a high, since CBD is not psychoactive. Marijuana is a schedule one substance federally, meaning it's still illegal federally, while hemp is not a controlled substance and was legalized by the 2018 Farm Bill.

As I'm sure you're aware, state cannabis related policy has been quickly advancing, creating a patchwork of cannabis policies across the country. These are just a couple recent headlines related to cannabis policy. They've really created a patchwork of different policies again across the country. Currently, 20 states and Washington DC allow for non-medical adult use of cannabis, which is shown in green on the map. And then, there are 38 states and Washington DC that allow for medical use of cannabis, which are both the green and the yellow states. And then, most of the rest of the states, which you'll see primarily being represented in the south, allow for those products that were legalized by the farm bill, so CBD, low THC product marketplaces.

Here are the past month marijuana use trends over time, broken down by age for the United States from the National Survey on drug use and health from 2016 to 2019. Data on 2020 are available, but the question changed slightly, so the trend was broken, which is why I'm not presenting the most recent data. The recent increase in cannabis use overall is being driven by the increase in past month use for those that are aged 26 and older, which you can see increase from 7.2% in 2016 to 10.2% in 2019. Use among the 12 to 17 year olds is relatively flat, which you can see on the left, although it looks like it might be shifting upwards. However, I do want you to notice that the prevalence of past month use among 12 to 17 year olds is on par with that of those 26 years and older.

Here, I want to call attention to self-reported marijuana use data among middle and high school aged students. These data are from Monitoring the Future, which is an ongoing long-term study that surveys trends, and behaviors, and attitudes around legal and illicit drug use among adolescents and young adults. Monitoring the Future actually began in 1975. It's funded by the National Institute on Drug Abuse and instituted by the University of Michigan. On the left, you can see that in 2022, the blue line, 31% of 12th graders reported past

year use of marijuana, and this dropped from pre-pandemic levels of 36%. Then in 2022, 6.3% of 12th graders on the right were current users, reporting using marijuana daily. They had used marijuana in the past month and these are people among that group who reported using marijuana daily.

These data are from last year's Monitoring the Future report through 2021, and these show additional data on availability of cannabis and perceived risk among those middle and high school students. You can see on the left that the percentage of students reporting that cannabis was easy or very easy to get dropped during the pandemic, and this is likely due to stay at home orders, which kept kids out of school and away from going to parties and other social activities, so they were less likely to be able to get cannabis from their friends. And then if you look on the right, what we've, we've been finding rather alarming, is that perceived risk of cannabis among all grades has been declining rapidly over time.

We don't currently have great national data on mode of use among youth. These are data from the International Cannabis Policy Study on mode of cannabis use among youth from 2018. This study has data from England, Canada, and the US. I want you to focus on the far right, which shows in a small group of US youth who use cannabis currently, defined as in the past 30 days, most reported smoking it, generally without tobacco. Over a third reported vaping it, and almost a third reported eating or drinking it. The bottom line that I want you to take away from this slide, is that there are lots of different types of cannabis products that youth are using, and although not shown here, youth are often using multiple different product types. Not just smoking, but they'll smoke and use edibles, or other types of cannabis products.

And then finally, I want to leave you with information on new products that are causing us concern at CDC that are emerging in the marijuana and hemp marketplaces. Cannabis product manufacturers are very savvy and they found a way to circumvent state laws around cannabis to produce psychoactive products, even in states where marijuana remains illegal. If you remember back to my first slide, I told you at the beginning that hemp is legal in the US and it's defined as cannabis having less than 0.3% Delta-9 THC, so that specific form of THC. CBD from hemp, which is not psychoactive, is being converted by these manufacturers in a lab into other psychoactive cannabinoids, including other forms of THC. You may have heard of things like Delta-8 THC, Delta-10 THC, things like THC O acetate, and other products. Because federal cannabis laws were written only in terms of Delta-9 THC, these products are existing federally in a legal gray area, but it's ultimately leaving states in a place where they have to go back and alter their laws to add these products to make them fall under the same purview as Delta-9 THC in their regulatory law.

If you're in a state where cannabis is legal, to make sure that they have to meet the same testing requirements, the same labeling requirements, you need to modify your law to make sure you're covering all of these new products. And if you're in a state where cannabis is not legal, a lot of these products are just

proliferating, you can find them in hemp CBD stores, gas stations, and youth are able to buy the products because they're sold at places where you can buy CBD and hemp, which is generally legal across the country.

I am going to stop there. Thank you so much again for having me, and I'm happy to answer any questions later on at the end of the discussion. Thanks.

Cindy Carraway-Wilson: Thank you so much for all that information Dr. Hoots. It's amazing just how many different forms of marijuana there are today and how easy it is to access in some forms. Thank you so much for all of that information, and we'll definitely have you back in when we come to these live Q and A's in just moment.

Now, it's my pleasure to introduce Dr. Ruben Baler, who's a health scientist from the National Institute on Drug Abuse, who's going to speak to us a bit about the impacts of marijuana use on the body. Dr. Baler.

Ruben Baler: Thank you very much, Cindy. I really appreciate the invitation. It's a pleasure to join you for this fascinating workshop webinar today. Here's my first slide. We're going to talk about marijuana and the Developing Brain. As you can imagine, there is a lot of information, a wealth of information on our website, the NIDA website, so I choose not to concentrate so much on that information that you can easily avail yourselves of our website and other portals, and focusing instead on giving you a context that I hope will help you to better understand all that wealth of information that is out there. This information is context that is usually not given in the context of these types of webinars and more specifically, in talking about marijuana and the developing brain.

The approach that I'm taking for this webinars now, is to give you a foundation, a basis, a neuroscientific basis, to then understand really not just THC or marijuana, what to the other drugs of abuse and other toxic inferences can do to the developing brain. I think that this type of foundational information is very important to be able to harness the wealth of information that is out there to devise or to design more effective prevention approaches and strategies.

In this context, I'd like to submit to you the idea to understand this brain and the developing brain, the idea that the brain is a product. Addiction and other psychiatric disorders are typically defined by different people as a character flaw, or a moral failure, or even a brain disorder, or a disease of the brain, or a disease of free will. I like to focus on the brain as a product because I think that this gives us an angle of attack to the problem that is much more neutral and less stigmatizing, thinking about the brain as a product and the ways in which this product can fail.

The way the brain is a product designed by evolution that is designed for basically three things. One is for upkeep and maintenance, what we typically call metabolism. The second thing that it is designed for, is information processing,

the thing that we typically call cognition. And finally, if we're interacting with the world, which we typically call behavior. These three modules that have been designed, built into this product that we call the brain, are basically designed... Sorry, the timing is off here. I don't know why. Basically designed for survival, optimizing survival, and reproduction.

Now, this product that we call the brain, like any other product that we are familiar with, can fail and it can fail for three different reasons. It can fail through a design flaw, because of a manufacturing error, or because of extreme conditions. I'll give you examples, brief examples of each of these foundational fundamental forms of flaw or failure.

Design flaw, an example is the way evolution has designed this very soft tissue next to a very cutting edge in our teeth. This is why we so often can bite into our cheeks or our tongue. This, in my view, is a particularly nice example of a design flaw, evolutionary design flaw. Manufacturing errors, one will example is fetal alcohol syndrome, when kids are exposed during the manufacturing, during internal development to excessive levels of alcohol. Extreme conditions, boxing for me is a good example of a situation that the human body has not been designed to withstand.

Design flaws, I'm going to refer to them as evolutionary mismatch, when the product that we're talking about, in this case the brain, no longer matches perfectly what evolution intended. Manufacturing errors will be developmental errors that happen most generally focused on the process, the critical period between childhood and young adulthood. And then, extreme conditions are overwhelming events that they overwhelm the basic control systems that are in charge to optimize the functioning of different thermostats or a feedback mechanisms in the brain. I will very quickly go through examples of these three, as it pertains to at the end, how they impact the relationship between developing brain and marijuana.

Evolutionary mismatch, one of the best examples of this evolutionary mismatch, is the fact that we, through evolution, have evolved to seek the fattest meat, the sweetest fruits, and the most high energy fruits. Why? Because the next farming was always around the corner. In the modern environments, this is what's around every corner in every neighborhood. This disconnect between our evolved biologies and our constantly changing environments, is a main contributor to the obesity epidemic in this country, which is expected to reach a crisis of epic proportions in the next five to 10 years.

Obesity is not the only example of a disconnect between biology and environment. I want to point your attention to this very important disconnect, which I find particularly concerning and painful. The fact that our kids, humans have evolved to be social animals. This is what our kids have evolved to be and to do, but this is what we mostly find them doing in our homes, in our schools, in our social gathering places. Immersed in these new platforms that prevent

them from really doing what evolution intended. That is interacting socially with their peers.

Moving quickly to the developmental levels that can lead to brain failure. We all know that the brain goes through active period of brain development during the vulnerability window between childhood and adolescents and post adolescents. What is this process of brain development? I'd like to use the analogy that this development and explain to, particularly to kids, what this developmental process entails. To explain that I typically use the analogy of a brain computer, the brain as a computer. That what happens during development is really programming the circuits the individual will be relying on to make decisions, to strategize long-term, to ponder the consequences of your actions, to interact socially with our peers, et cetera. All these higher cognitive functions that are so important to ensure healthy trajectories and eventual wellbeing.

What is programming a young brain? If we use this analogy it's important for kids to understand what happens during development. Not just telling them not to use drugs because your brain development is developing, but I think it's important to go down one notch at the level of detail and explaining to them that there are a couple of important pillars that are very dependent, very sensitive to the quality of the life experience that are actually involving in this programming of the young brain. One has to do with the short range connections mainly involving the gray matter. This is has been compared to pruning a hedge, giving shape to those circuits in the brain. The second pillar of brain programming or development it has to do with a long range connectivity mainly involving the white matter that allows information to be transferred very rapidly, very efficiently, from one point in the brain to a more distant point somewhere else in the brain. These are the two foundations.

To summarize, briefly, very complex phenomenon. We can summarize brain development as brain programming. If we focus on this input. This constant play between input and output. Stimulus that is he hitting the brain representing everything that an individual is exposed to on a constant basis, second by second and the output that that brain puts out into the world. This constant play, this ping pong between input and output. The purpose main goal of this process is basically to two fold. One is to optimize and produce meaningful connectivity that has increased increasing levels of information content in the brain circuitry. The second one is increasing the bandwidth. That is the efficiency or the ability of the brain to process increasingly amounts of information on a per unit of time basis. This is what brain programming and brain development contingent upon the quality of the life experience really entails.

Now, I like to push this analogy a little bit further and make you imagine having imagined that this is the keyboard that a young person is using to program his or her brain. If you think that this is what this keyboard is then I can submit to you that every toxic influence that a young person is exposed to from malnutrition, to bullying, sleep deficits, drug use, physical abuse, fear of missing out,

emotional neglect, or chronic pain all the effect of these toxic influences would be like scrambling the letters of the keyboard that the young person is using to program his or her brain.

Now, the important outcome of flip side of this analogy is that the effects of keyboard scrambling will be time dependent. If you scramble the letters of the keyboard once the program is finished, let's say when you are 20, 22, 25 years of age, the error message that we receive will be of this kind. "An error has occurred. Please try again later." Think of a person, a 25-year old that had too much beer drink will be intoxicated, will have the effects of this alcohol ingestion, but that will pass. It will be a transient effect, because the program has been mostly written. If you scramble the letters of that keyboard before the program is finished the type of errors that we are likely to receive will be something like this. "An error has occurred. Try reinstalling the program." The program has been corrupted. Now, this is easier said than done when we are talking about behavioral routines.

This temporal dependency of the effects of keyboards scrambling explain in my mind to a very large degree why adolescence is a peak time for clinical onset of most mental illnesses. Where we are talking about ADHD, anxiety disorders, mood disorders, schizophrenia, substance abuse, or any mental illness they mostly happen a epidemiologically speaking in this window of this critical period of brain development or brain programming.

Now, we can move to the last part of this presentation has having to do with overwhelming event. The third leg of this tool that can explain the three types of failures that can lead to our brain failing in different situations. I want to present we talk about a little bit about thermostats before. These basic control systems really take the form of thermostats. Our brains can be construed as collections of hundreds, thousands, if not millions of different thermostats, each of which is attuned to very specific variables from temperature, to lighting, to stress, what have you. Evolution has had to decide the minimum and the maximum value in these thermostats within a range within which these thermostats will be robust. These compromises are part of the evolutionary process whereby trade-offs have to be made, because you cannot design a product that will be optimally functioning at an infinite range of values. These values have to be picked at some point and these thermostats, these systems will display some fertility when the system moves away either below or above the design values.

Now, we have several thermostats. I can point to you just four of them to introduce the issue of marijuana and THC. For example, the sleep cycles are controlled by values having to do with light levels of or melatonin. The energy balance in our organism is influence mostly by the ratio between ghrelin and leptin to hormones important in those particular behaviors. The reward learning is influenced very strongly by dopamine levels in the reward system. One that we care about in the context of this webinar is neural activity. The important variable of how excited or how inhibited the particular secretaries is majorly

influenced by the levels of endocannabinoids, which are a set of neurotransmitters in the brain that are functioning on demand in a special and temporarily specific fashion to control, exquisitely control the levels of neural activity up or down to dial them up or down.

This is what this endocannabinoid system looks like. This is what a thermostat looks like and they're specifically located throughout the brain to control the level of excitation or inhibition in a particular circuit. The way this system works is we have a presynaptic neuron that releases a neurotransmitter. Let's assume, this could be any neurotransmitter, but mostly we carry in this context about the excitatory neurotransmitter glutamate or the inhibitor neurotransmitter GABA. These are released from a presynaptic neuron, they will bind to the post-synaptic neuron receptors, and thereby sending the signal that allows the network to process a particular type of stimulus or information. Depending on that level, whether that level is too high or too low, this postsynaptic neuron will use lipid precursors to synthesize, to produce endocannabinoids, which will then travel back into the presynaptic neuron to deliver a signal to deliver information. This level is too high or is too low. You should lower or increase the level of neurotransmitter accordingly.

This is what I mean by when I say that the endocannabinoid system is an on-demand control of neuro transmission. This system, and it's something that we don't talk about often enough, is an exquisitely designed system to very carefully control the level of expectation or inhibition, particularly in specific synapses throughout the brain to control brain activity and plastic responses to any given stimulus. The problem is that when THC comes into play the THC can kick out the endocannabinoid from its binding pocket in the receptor and takes its place. Hijacking the entire carefully designed orchestration of this on-demand control neuro transmission. This can happen because the chromo or the business ends of these molecules, the cannabinoids and the THC, which is the psychoactive compound in marijuana can be recognized to a very similar extents by these cannabinoid receptors.

This is important and this is what happens. Essentially, I want to try to go faster. This important because these cannabinoid receptors really are found throughout the brain regulating a huge number of function from memory, and cognition, motivation on the world, appetitive function, immunological function throughout the body, stress responses, movement, pain and analgesia, and even brain development. This is why the THC in marijuana can really wreak havoc or reset a system that is designed by evolution to very carefully dial up or down on demand the levels of brain activity in a special and a temporally specific fashion. This can be reset by the incorporation of THC in the brain.

Now, if you go back to this graph, to the adolescents' vulnerability period, it is not surprising to see that THC the flooding of these carefully designed systems by THC can have a such a huge impact on developmental trajectories. If we look at specific variables, or specific molecules, or component of these systems they show us a dramatic change during this adolescent period. For example, if we

look at the cannabinoid receptors they have these huge fluctuation up and then down during the adolescence. The different cannabinoids, the main ones are anandamide and 2-AG also show critical changes, very huge changes during, when we are entering the lesson period. The dopamine receptors which are in charge or mediate these reward related learning processes also show a major changes during adolescence. It's not surprising that resetting the thresholds of activation of these systems by the incorporation, by the flooding of the brain with THC from the outside with exogenous cannabinoid can have long-term effects on the brain.

What is the overarching neuroscientific lesson for promoting mental health and increased resiliency? I think that we need to keep in mind that when we're looking at behaviors and decision making these are influenced by these three main domains that interact very closely the genes, the developmental trajectory of the brains, and the environment that play very intimate roles in an interacting fashion. This don't happen in the vacuum. We have to keep in mind that the evolutionary processes really shape the way in which this domain is interact. We have a hand on defining how these environments evolve.

I want leave you with the message that these design errors, manufacturing errors, and extreme conditions would be important to keep our eyes to be mindful of these sources of failure for our brain as we think of about prevention strategies to prevent brain failure and allowing or facilitating young brains to thrive as much as they can. When we talk about evolutionary mismatch I would like you to think about ways in which we can be smarter about the way we design our environments. Think about the sleep cycles, how whether or not we respect the chronotypes the amount of sleep that our kids can have at night, during school time. We have to be more mindful about evolutionary mismatch and the ways in which we are taking away what evolution intended for our kids and we are exposing them to a unknown quantities of potentially toxic influences. For example, exposure, problematic exposure of to media or forcing them to be asleep for the first three periods of the school time. Or these very highly central behaviors that are becoming normalized in our society.

When we talk about developmental errors, we have to be far more serious, careful, and committed when it comes to protecting our kids developing brains. We have to use the science. We have to be serious about policy, drafting policy that protects the unborn child from toxic influences like smoking, for example, during pregnancy, normalizing even small amounts of psychoactive substances during childhood and protecting mental health. Thinking about the ways in which we can prevent bullying, for example, in school. These are all errors that can totally be prevented.

Finally, we have to think about the overwhelming events and understand and educate our kids about the fact that we are robust, yet fragile and educate ourselves and our kids accordingly. To be more aware of our strengths and vulnerability in a changing, rapidly changing environment. That's about it. I

know that I probably run out of time, but I'd be happy to answer questions at the end.

Cindy Carraway-Wilson: Thank you so very much for all that information. We greatly appreciate it as always. It's a lot of info. Dr. Baler will be answering questions in our Q&A. Now, I'd like to shift our slides and our conversation over to Dr. Bertha Madras, professor at Harvard Medical School. Dr. Madras.

Bertha Madras: Thank you very much. What I'd like to speak to you about in the next 15 minutes are risky patterns of marijuana use amongst youth. By way of introduction, I have to give you all the bad news first. That the US leads the world in cannabis use disorder amongst 15 to 19 year olds, which is one of the tragedies of our society. It ranks first amongst all the other nations. It's a dubious distinction. The other thing that I would like to highlight before getting into the substance of what I will speak is the critical importance of parents in all our endeavors and in our prevention efforts. One of the things that we published very recently, which included members of NIDA, SAMHSA, and the CDC in this publication is the concept of parents marijuana use and offspring drug use. That's what will introduce the whole topic with. We're going to look at the youth marijuana use and the risks, new forms of marijuana and associated risks, and new patterns of use amongst adolescents, and try to summarize what all of this means in terms of how we approach prevention.

We now find that more people, 18 to 25 year olds are using marijuana since 2002. This increase in spike is a rise primarily in adults of childbearing and child-rearing ages. We can see that the percent that harbor a cannabis use disorder or marijuana use disorder is highest amongst this age group, but the 26-year olds and the 12 to 17 year olds are quite similar in terms of their harboring this brain disorder.

Parents have an inordinate influence of marijuana use. I cannot give you all the data on this, because it's just too extensive. Let's take one quick look at a study that we published with Beth Han, and Wilson Compton, Chris Jones, and Eleanor McCance-Katz just recently showing that if children live in the same household with a mother or father, that these children are 12 to 17 year olds and their parents never used lifetime use, use less than 52 days, or more than 52 days, the children were much more likely to use marijuana in those households where parents used. The same thing is true for offspring 18 to 30 years old who are living in the same household, as well. The frequency of parent marijuana use is directly related to whether or not their children use.

Now, what does that mean in terms of the risks for youth marijuana use? The developing adolescent brain, as we've heard so eloquently has enormous changes. It increases gray and white matter, it prunes critical connections to make the brain work more efficiently. It strengthens some connections, it changes function regionally. Here are some of the ways in which cannabinoids working in our brains have an effect on brain development. They have an effect during almost every stage of brain, from the beginning of a single cell up to the

80 billion nerve nerve cells that we have and close to a trillion other cells that support these nerve cells.

During brain development in utero, the endocannabinoids have an effect on forming new nerve cells in birth they are active in forming connections, during infancy, during childhood, during adolescence, and even during adulthood. They have many, many roles to play. Among those roles, they're, as I said, they're critical for brain development. They are important for forming new cells, for directing which cell types are going to form connections with others, they help direct how the cells migrate from one part of the brain to the other, and they regulate the transmission of signals between cells, and they are also very critical for pruning of cells.

Cannabinoids regulate brain development, the ones that are occurring in our own brains. What about THC? THC, which is the most critical component of marijuana accumulates in the brain. It's released into the bloodstream five days to weeks after, and during and after regular heavy use. Neurodevelopmental effects may persist weeks to years after use. Marijuana can affect brain development, can affect how the circuits are formed, can affect the proportions of gray and white matter, and it can affect brain function and impair it.

What are the consequences in terms of function to young people? The first consequence, which is really quite disturbing, is that a adolescents are an increased risk of developing a marijuana or cannabis use disorder. As an example, this is data coming from our NSDUH, our National Survey on Drug use in Health, children who use marijuana steadily, these are 12 to 17 year olds, in the first year, they, about 10.9% have a risk of developing a cannabis use disorder. This is the percent of those who do. If they continue to use each year the percent that have a cannabis use disorder increases, as well. In the fourth year, it's about 20.6%. That doesn't even take into account these new forms of marijuana, which are extremely potent and are used more frequently. For the adults, it's far less it's about half the risk compared to the adolescent. Again, the risks are going to be higher when we have more data on potent forms of marijuana, which are emerging in the commercial field.

What are some of the other risks for teen marijuana use? Depending on whether or not they never used or they used up to 400 times during their adolescence they are more likely as a function of how much they used to not develop, to not gain a diploma from college. They're more likely to be on welfare and unemployed. This is a correlation between how much they used during adolescence and subsequently.

A young high school student did this study and he showed that marijuana use before the age of 18 reportedly is the highest risk for opioid use disorder. Marijuana use before 18 is a higher risk than mental illness, than drug seller encounter, than age, health income, education, and so on. All these other factors are of less importance than the use itself. Adolescent marijuana uses associated with increased risks of depression and suicidality later in life. The

number of suicides positive for marijuana have increased quite dramatically in certain states that legalized marijuana early on. The risks of having other mental health disorders, depression, suicidal ideas, and suicide attempts are correlated with use of marijuana.

What about other problems later in life? This is a longitudinal study of children between 15 and 35 year and by their mid 30s, young adult, adolescent onset, regular users are more likely than minimal or non-users to have used other illicit drugs, 20 times more likely to be a high risk alcohol drinker, 3.7 times to smoke daily, seven times to be less likely to be in a relationship. And so the most important factor in all of this is not to use, especially during the period of brain development. Adolescent cannabis use is associated with increased risk for psychosis later in life. This is one of many studies. This was a meta-analysis and a systematic review of all the literature. Adolescent cannabis use increases the risk for psychosis by about 70%. It predicts an earlier age of onset, but some of the modifiers are how frequently they used, the exact age at which they used, whether or not they're exposed to childhood trauma, whether or not they use other substances and genetic factors, all these modified.

But the take home message is that early use of marijuana increases the risk for psychosis later on. What about new forms of marijuana? The old forms of marijuana, the 1960s and 70s and 80s were just about 3%, and most of them were herbal marijuana, the natural plant, which may have been concentrated into hashish or resin, which increased the THC by about 4%. And now we have much higher potency marijuana, 14 plus percent, it's up to on average about 17 to 20% and marijuana concentrates. Most of this movement was catalyzed by the loosening of regulations, loosening of resolve in regulating marijuana in the marketplace. And we have many products that currently appeal to young kids, Keef Kat and Oeo's, all of them borrowing from conventional sweet treats. But these are infused with marijuana as well as marijuana drinks. So what's happened over the past few years? We find that marijuana went from three to 3.5, to five to eight, to 30 to 90%, which produces a greater high, more tolerance, more addiction, more users, and more profit.

I saw a number of questions about vaping in kids in high schools, and one of the things we should point out that the manufacturers, again, because profit is the motive, have developed a number of ways of disguising vaping pens for kids in the form of writing pens, in the form of backpacks where the vapes can be sucked out of a tube, in the form of hoodies where they can be hidden, in the forms of a vape pen inside smart watches or iPhones or USB sticks. All of these have been developed recently because of our lax attitude towards marijuana amongst youth. And these are atomic vape pens that can be ordered online and they're used primarily for children less than 14 years old. Higher potency marijuana products are associated with more rapid progression to marijuana, cannabis use disorder, more past year addiction in adolescence, more anxiety and psychotic disorders, more memory impairment, more social problems with family and friends, more emergency care in terms of acute intoxication,

overdose, pediatric exposure, more cannabinoid hyperemesis syndrome, which means vomiting, more cannabis withdrawal.

All of these things are happening under our very eyes. What about emerging risky patterns of use? What we have to recognize is that the effects of marijuana are driven by a number of factors inside embedded within the drug itself, the dose, the percent THC, and the absolute amount of it, and the ratio with other cannabinoids. The frequency of use, if it's used one time daily or daily or weekly or monthly or yearly, or five or six times a day, how it's delivered, inhaled versus vaping or smoked or edibles, all of these things govern what the effects of cannabis will be and whether or not, for example, with edibles, there's more episodes of psychosis in emergency departments. With inhale, there is more problems related to in coordination and traffic accidents and so on. And the age of onset is the critical, whether or not the infant is exposed prenatally in the uterus, early adolescents, later adolescents, adulthood, all of these factors can drive the effects of marijuana.

What we're seeing now is that more youth are using marijuana daily and at higher potencies. What we are seeing now is that more adolescents are vaping high potency marijuana. That is a trend. These two trends are very disconcerting for the future of this problem. So adolescent use of high potency marijuana is associated with a greater risk of regular marijuana use, of marijuana use problems, of use of other listed drugs, of tobacco dependence and alcohol use disorder. That's one consequence that we know of.

Another consequence is that edibles and vaporized marijuana are associated with increased symptoms in adolescence, which includes psychiatric symptoms of conduct problems, depression and anhedonia, which means not feeling any joy at all and sensation seeking. The effects of adolescent cannabis use on physical health. This was just published about a month ago, and that shows that there are enormous effects that can be documented on lung injury, possibly acute cardiovascular effects like even a heart attacks, cannabis hyperemesis syndrome, which is rare but can occur if there's heavy use, ongoing use, frequent use, also nausea and stomach pain, hormonal changes, disruption of normal cortisol function, decreased stress reactivity, a lower body mass index and sleep disorder, sleep problems.

Cannabis use is associated with coughing and wheezing and shortness of breath in adolescence, rare and serious as I said, cyclic vomiting, cardiovascular offense, and acute lung injuries. So what can we say? Adolescent marijuana users are more susceptible to brain changes in terms of function, anatomy and molecular changes because their brain is undergoing dramatic development and the cannabinoid system is dysfunctional because of the introduction of THC. Adolescent marijuana users are more susceptible to addiction, which is higher in teens. They're more susceptible to cognitive deficits in terms of learning, memory, school performance, they're more susceptible to amotivation. They have higher school dropout rates and lower educational achievement and employment. They are susceptible to more psychiatric symptoms in terms of

psychosis, anxiety, suicidality, disordered sleep, and they're more susceptible to functional and health deficits, impaired motor coordination, facial recognition, and others as well. Thank you.

Cindy Carraway-Wilson: Thank you for the depth of that presentation Dr. Madras. Again, you're emphasizing the distinct differences between adolescent risks and the risk that might be happening with adults as well. So we greatly appreciate that. And now that we know a lot about marijuana and the risks and things like that, we'd like to shift now to the prevention side. I'd like to introduce Ms. Courtney Esparza, who's a public health advisor with the Substance Abuse Mental Health Services Administration. Courtney.

Courtney Esparza: Thank you. Hello. So today what I want to do is try to help you figure out how you can take all this wonderful information you just learned, organize it in some way and put it into action. So I'm going to give you a snapshot of as many prevention tools as I can fit into my 15 minutes. And then you're going to have access to these resources and the information you've heard today to do a deeper dive. So over time, there's been a shift in how we perceive health and how we think about optimizing our health. And we're seeing this concept come to play in prevention where there's a push to be more holistic and less siloed approach. When we talk about prevention in general, we're talking about building and strengthening protective factors and mitigating or eliminating risk factors. And the research is showing more and more that there's a lot of overlap in these factors when it comes to looking at prevention in general, not just substance use.

So on the left side, you'll see what we call the socio ecological model. And really what this is, is just shows the interplay between various personal and environmental factors. And in each of these levels, there's both protective factors and risk factors. Today we're really just going to focus on the individual, the family, and the school community. The factors on this chart are focused in particular on marijuana, but you're going to see that they could be applied to a lot of other substances or prevention in general. As we go through these, I want you to think about again what we've heard today looking at the social determinants of health taking account the broader social and community context of the marijuana use across each of these levels. So at the individual level, the protective factors, our confidence in self, being involved in activities, which we're going to talk a little bit more about and then again, focus and hope for future goals.

And individual risk factors have to do with genetics, which we heard a lot about today, thrill seeking or aggressive type behaviors. And then youth thinking that their peers are using marijuana also plays into their decision whether to use or not. And right now, most data is still showing that the perceived level of peer use among students is greater than the actual rate of use among peers. And then on the flip side, peer disapproval can be a protective factor. When we look at the family level, the protective factors are fostering a supportive family environment, identifying with one's parents or caregivers, maternal affection

displayed toward children and perceived parental trust. And then home environments that are characterized by family conflict and poor relationship with parents and caregivers tend to be risk factors. And then as you just heard from the previous presenter, parental use and beliefs about marijuana are really strong influence on youth's behavior.

And then when we look at this third level, this community or school level, the protective factors really it's if you have an authoritative school environment, but characterized by fair disciplinary practices, if there's mutual respect between the teachers and students. This type of environment has shown lower levels of marijuana use among students. And on the flip side, less predictable school environments where the rules are not clearly articulated or not consistently enforced or have very punitive types of disciplinary procedures, that's where we're seeing higher rates of use. And in the level of connectedness, students feel to their school, to their fellow students and to their academics is very important. And research is thinking that the greater school connectedness really creates this shared identity and this belonging that reduces the role of marijuana use in the youth's life. And we're going to talk a little bit more about this later. And then lastly, again, back to a student's involvement in school activities such as clubs and sports also a protective factor, which overlaps again with this individual factor.

Just wanted to quickly show you a couple of other risk factors that have come up on our and the SAMHSA 2021 National Survey of Drug Use and Health. Again, just wanted to point out, a couple of them in particular are looking at, the one on the far right, on the one in four youth participated in one or fewer activities. So again, gives us sort of information that some of these risk factors are definitely things that we need to pay attention to. So the traditional substance use prevention strategies are based on a public health approach. It starts with a broad and comprehensive framework for prevention that aims to reduce the likelihood of harm, injury, or disease in a whole population. And this is what we call universal prevention. And then there are strategies focusing on those who are particularly susceptible to engaging in substance use or developing addiction.

And these are more called selected or selective strategies. And then we have the indicated strategies, and these are for those that are already involved in some type of risk. And so the prevention efforts are focused on preventing progression of the use and on reducing harm. SAMHSA's recently put out an evidence-based resource guide series about preventing marijuana use among youth. And I think that we've just put that in the chat. This guide that's looking at preventing marijuana use among youth ages 12 to 17. And what this guide does is helps stakeholders, communities, yourself develop a strong prevention plan and helps you be able to select what are the different community-based programs and environmental strategies across these three different categories that can reach youth with different risk levels and really ensure a comprehensive approach.

So this is an ugly slide, but a snapshot from our guide. Again, SAMHSA conducted a comprehensive environmental scan and collaboration with subject matter experts to try to find out and identify marijuana prevention specific programs and strategies. I guess the bad news is there is limited research available, but there is a handful of programs that met the criteria we were looking for being promising and preventing marijuana use among youth. Also, programs that are not too cost prohibitive. So if you see on the left-hand side, this is about three programs that I wanted to mention that you'll find in the guidebook. The one in the middle I want to just highlight, which is a Stanford Cannabis Awareness and Prevention toolkit, which is a free resource. There's a lot of information on their website, so wanted to draw your attention to that.

And then on the right is environmental strategies, which again hit upon some today already. But that's looking at things like increasing taxes, limiting the number of retailers, banning marijuana products with added synthetic flavors, rules around marketing, those types of things. And the majority of evidence-based, like I said, there's limited research on marijuana specific. So the majority of our evidence-based substance use and prevention programs are more general. These are interventions that focus on positive youth development, building social emotional refusal and self-efficacy, similar building self-confidence, these kind of skills. And most of these kind of programs are meant to be school-based programs. So the two places where you can find a list of all these evidence-based general programs is the Blueprints for Healthy Youth Development and the Surgeon General's report on alcohol, drugs, and health. And I think both of those links are put in the chat.

So there's a lot of challenges to implementing these effective strategies. I think a lot of these, we've actually already heard from previous speakers, things I'm looking at that have happened around public, greater public acceptance, declining perception of risk. So I'm not going to go through all these for sake of time, but I did want to highlight the bottom one. As I've just mentioned, the body of research around youth prevention with marijuana related outcomes in specifically it's growing, but there's still very limited evidence in particular with well-designed randomized control trials. So the field would benefit from more research, I think, on youth marijuana use, prevention programs and environmental strategies, and also the effectiveness of those strategies across diverse populations.

So I want to shift gears and talk a little bit. We've been talking about the traditional school and community-based prevention programs, which are effective and necessary, but in my opinion, there not sufficient to address and prevent substance use and addiction. So I think it's important to keep their traditional approaches, but look at fortifying it with broader efforts. So again, substance use prevention today is mainly focused on adolescence, which makes sense with all the information we just talked about today. But I also want us to remember that with experiences in infancy and early to middle childhood, set the stage for how children will fare as they age. And even though this seems like a huge thing that might be outside of the scope of prevention, research in the

field of early childhood and youth development shows that even small interventions can successfully shift the course of a child.

So I would like to propose that we think about by intervening earlier and more broadly, we can prevent substance use and its negative consequences. I think that substance use prevention and healthy youth development are almost like two sides of the same coin. And I think there's a great opportunity for substance use prevention specialists to work more collaboratively with individuals and organizations that address healthy youth development.

So I want to switch gears and talk about what I think are really the most two most important prevention assets that you have in your toolkit, and that's yourself and youth. So we're going to start with youth and why is it important to even engage young people in our prevention efforts? Well, one is beneficial to them. We've just talked about all the protective factors that are involved when you are working with youth. It's also more effective prevention programming when you work with young people. And then there's a third piece, which is sort of this workforce development piece. It might spark an interest in young people to pursue careers in this field. You're going to hear from the speaker next that has done a great job of youth engagement, and so you'll get to hear more about that in a moment.

This is, the ladder is from Roger Hart's Ladder and level of engaging youth. I think this is just a good model to look at about looking at authentic youth engagement. The bottom is ways that we sometimes include youth in our prevention programming that are not really authentic engagement. And the top has more to do with really co-designing and including youth in a meaningful way. I also want to introduce the idea of service learning as a possible way to think about engaging youth in prevention efforts. Being that the community learning has to do with, the service learning is basically substance use prevention.

And then this is another framework. It's called the Developmental Assets Framework. And it's used often in positive youth development. But I like this model because what it does is strengthens the service learning model and then also improves developmental outcomes for young people. It intentionally integrates positive youth development principles into this whole idea of service learning and gives a framework to be able to put these things together and measure them. It's like protective and risk factors concept, meaning that the more assets young people experience, the less likely they are to engage in high risk behaviors. And this model's been really successful in looking at groups of youth that they studied across different racial and ethnic backgrounds, different communities of all sizes, and different socioeconomic backgrounds, as well. And then I want to switch to the tools, which is yourself and people who are around youth on a regular basis. We talked a little bit about this idea of connectedness as a protective factor. And again, I think it's just really important to look at that students' beliefs that their peers and adults in school support, value, and care about their individual wellbeing, as well as their academic progress.

And then this next slide is just some strategies from the CDC on looking at ways to do school connectedness. I think the takeaway on here, again, you'll see the service learning opportunities, and looking at these ways to engage young people in substance use prevention, I think is important. And then this next tool is from the National Council and the CDC, and they developed this communication and messaging around substance use toolkit, if you will. I think it's a really great tool. It was designed for actual providers, but I think it works for anyone working with young people. And I like it because it was developed and tested with youth. This communication pathway just shows you the steps or building blocks on ways to have authentic discussions with young people. Again, starts with establishing trust, gathering insights, again, talking to them and understanding what's important to them, framing the communication, making the case, and then it gives some different suggested actions.

I want to take a minute and talk about the framing the conversation because I think this is really important, and this is what they found in their research and putting this toolkit together. But it's also ... validates a lot of the other concepts that we've heard today, and some of the protective and risk factor concepts that I just talked about. The two things, when they looked at what motivated for change, the two concepts that resonated the most with youth across both middle and high school age was focus on the future and the risk of addiction. And so again, it is important to young people that they don't want to mess up their future, and understanding all of the information that we've heard today about addiction, and what some of the risks are, are things that are still motivating to them.

And then the last part of this shows both relationships, activities, and self-affirmation. These were, again, a close second when it comes to looking at things that motivated young people. And then I'm just going to skip this slide, and then just let you know we've got ... And then at the end, I just have some tips on looking at, again, just things to think about when you're communicating with young people. Again, this is information that'll be in the slide deck, as well as the resource in the getting candid toolkit. And that is it for me.

Cindy Carraway-Wilson: Excellent. Thank you so much. Great prevention strategies. And now we're going to build on these strategies by welcoming in Dr. Charlene McGunn who is with the Chippewa Valley Coalition for Youth and Families. Dr. McGunn?

Charlene McGunn: Hello. Thanks, everyone. Wonderful information that proceeded, and I'm going to try to share some of what we're doing with our coalition. We are, by the way, a school community coalition in mid Macomb County, Michigan. We're a bedroom community with some light industrial business, and the school district, Chippewa Valley Schools, is a fairly large district of 15,000 plus students. We have two large high schools, one has 3,000 students. And the coalition developed, actually, in a unique way from the school district in that it was part of a steering committee that managed a grant 30 years ago. So I hope I can lend some long longer term observations about strategy with marijuana, particularly with an emphasis on youth.

I'm going to talk very briefly about the general strategies that we've used over the course of time, and perhaps infuse a little bit of some experience with them. I think with any community based coalition that is focused on any social issue, focused on any issue that is galvanizing and complex, it's important to first of all create a broad range of connection with key stakeholders in the community. We have worked very extensively with our churches. We have an interfaith partnership with 21 churches, and they are a broad dissemination network. They're very helpful to school districts if they partner because they can get information out.

We created local part partnerships with youth serving agencies that bring in intervention efforts into our schools. And we've also been part of broad regional and statewide partnerships. With an issue as comprehensive and difficult as marijuana, it really requires that, I believe, the school district engaged in a broad partnership. This broad partnership provides dissemination networks through health departments, through, again, our churches. All of this allows us to create information on the risk factors for marijuana and youth, and to get those out broadly.

Just a word about what we've learned in the process of community based education on marijuana and it's dangers for youth. We've learned we have to start with potency, and you've heard a lot about potency today. That's a very misunderstood idea among adults and youth. And so the idea of making clear the increase in potency is a very important aspect. Teen brain development, which was discussed, is also extremely important. We've learned that teens are captivated, actually, by their brains, and when they are explained in a comprehensive way what is actually happening with marijuana use, it is engaging to them.

We've also learned that for parents, and other adults, and school staff, focusing on academic performance and the relationship between marijuana use and declined performance is extremely important. We survey our youth every two years, and across the board, our data over decades has shown that those that use marijuana and other substances are much more likely to promote ... it's much more likely to promote declined academic performance.

Addiction is another message that resonates, and yes, it resonates with youth and with adults. And so providing information in a comprehensible way is really important. The public safety aspect, which really condenses to two issues, we have found, at least in our area, and that's car crashes. We've had dramatic increases in car crashes since the commercialization of recreational marijuana four years ago. Car crashes, as well as ER admissions, is data that is compelling to adults.

Since COVID and the focus on mental health issues, we've learned we have to connect the dots on mental health and marijuana use. My fear, actually, is that we're losing a little traction here as schools focus tremendously on mental health, and very rightly so. But we're attempting to interject further the very

real connection of marijuana and mental health issues. And you've heard some of those.

We've learned to consider our audience with social norming and that is presenting for adults the concerning high levels of use of substances, including marijuana, but flipping the narrative with youths and helping them understand that actually not everybody uses. We have learned to work with social media, launching different social media campaigns, and I'll talk a bit about one of them shortly. And then we've learned we have to train our adult coalition members on advocacy to promote their ease in stepping forward to address the issues in the community, whether it's with government or with meetings with our legal system. They need to be made comfortable to do that. And then, I want to emphasize most extensively youth as a resource for marijuana prevention education.

We have the novel experience, and I've come to understand it as novel because we have high youth membership in our coalition. Our two high schools have between them 172 youth members. We actually have more youth members than we do adult members. We established Coalition Teen Councils 12 years ago and we've never come to appreciate them more since the onset of recreational marijuana, and their ability to state the case to government, to law enforcement, to parents, in other words, to educate on the issues of youth and marijuana. Our Coalition Teen Councils are independent groups that work also together. They're organized into school clubs that have graduation pins that are very much a presence in their schools. And we identify these students very early because our Coalition Teen Councils go in for prevention education in our middle schools. We begin to identify at the seventh and eighth grade level prospective CTC or Coalition Teen Council members.

The CTCs serve an amazing service in their schools in that they do, I think, what we traditionally think of as activities in high schools, and that is prom, graduation, and all of those sorts of things. But because they receive leadership training, they integrate into other organizations, student governments, student activities, choir. And they bring a no use message into those groups and create an alliance with those groups so that it maximizes the activities within the building.

The Coalition Teen Councils assist us with messaging. They, for instance, told us not to use the term cannabis, that that's a, quote, adult term, to talk with kids about THC and to still use marijuana. They give us access to youth networks. They educate us on social media. They're extremely technologically astute, so they're very helpful to the less astute of us adult coalition members. I'm leaving today to go to a middle school transition program where our Coalition Teen Council panel will present on transition to ninth grade, and they'll be carrying a drug free message and the importance of remaining substance free.

This takes a lot of work, however, to create meaningful youth groups. We have to educate them. They need to be the primary resource in their building among

their youth, other youth, on the drug effects, on the understanding of what the consequences are of marijuana and other drug use. We are arranging leadership training. We had a weekend leadership training in March. We have a summer program that incorporates training. It's all youth run. Our Coalition Teen Councils, by the way, are moderated groups, and they're moderated by our student assistance personnel. They're trained in advocacy versus lobbying, and we prepare them to carry the youth message to print and broadcast media. We've held press conferences on alcohol and marijuana, and they present and then speak to media.

And finally they're organized as ... because they're organized as separate units that attend coalition meetings. In other words, it's a very reciprocal kind of relationship, and we fund, our coalition does, their activities. They are very much in charge of their own programming. I'm going to end with an online resource that's available to you. I think it's in the resource packet. This is a toolkit. It is on our coalition website, and it has lessons for health classes for middle and high school, a wealth of materials to conduct prevention campaigns. With that, thank you very much.

Cindy Carraway-Wilson: Thank you so much for all that information, Dr. McGunn. Sorry that it was a little tight on timing. We so appreciated hearing about the young people that you have engaged. I am still floored at 172. That's spectacular. We'd like to quickly close out the webinar. I think we'll have time for one or maybe two questions. They have been coming in hot and heavy. We will share the questions with the Department of Ed and our speakers so that we can use them to guide future webinars for you. We greatly appreciate that participation level. Thank you for that.

We want to make everyone aware that we have three webinars coming up in April. We have two lessons from the field, one on April 12th focusing in on student nutrition and physical movement, and one April 26th focused on full service community schools. We also have a webinar from our human trafficking series, which will be offered April 19th, focusing in on the forced criminality side of human trafficking. I want to remind everybody to click the link to provide that feedback to us. We really do use that feedback to create new content and to be able to produce other products for you to help you create safe, supportive learning environments.

And now I'd like to ask the speakers to come back on. We have just a minute or two to answer a couple questions. So I'm going to pull a couple questions here based on what I'm seeing that have come into our Q&A area. One area that people are interested in is around the question of hemp and what kind of health risks are associated with that. It came up a couple of times, and there's a couple of questions based on that. So, Dr. Hoots, do you want to start there, perhaps, or someone else can jump in if you'd like?

Brooke Hoots: Sure. So we are behind in the research on the health effects of CBD products. We do know that they have strong drug interactions with other medications. So

if you're taking medications, you need to be very careful taking CBD products. SAMHSA recently put out a health notice on CBD products, which I'll put in the chat. I think I can share with the group or have...

Cindy Carraway-Wilson: Yes.

Brooke Hoots: Which has some good information about what we currently know about health effects around hemp and CBD products.

Cindy Carraway-Wilson: Excellent. And now I'd like to jump to another question. I'm just going to pop it out to the audience because I think it's relevant to the prevention side. What do you think is the single most important message that you'd want to get out to students to help them hear about the importance of avoiding marijuana use or to help them resist using if they're offered it in their peer group? So the single most important message.

Courtney Esparza: Again, I think tailoring the message and hearing what it is specifically that the young person has in mind. But I think these general themes that seem to resonate have to do with looking at really their future. And I think that it is important to them is what research is showing, again, about messing up their future. And then, again, I think understanding in a way that they can understand, and not in an old school scare tactic way, but really understanding the effects of it on their brain, and addiction, and understanding how these things work so that they can make informed decisions around what they want to do.

Cindy Carraway-Wilson: Excellent. And, Dr. McGunn, I saw you also try to jump in there. You want to add to that?

Charlene McGunn: We've actually asked, we've done focus groups every two years with three grade levels across both high schools, and they corroborate that. What is it that you believe? What message would you believe would be most powerful? And it really is consider what your future is and understand that the decision made now will influence that. We've used some of their actual messaging in informational pieces and presentations we've got out to them. So yes, I would very much agree.

Cindy Carraway-Wilson: Excellent. Thank you. And again, we can probably go on, and on, and on, on this webinar, but we are at time. So I do want to thank all of our speakers for the valuable information that we've offered. All the resources and information that have been shared with you today will be posted on the web page for this event. Several of you have asked for Dr. Madras' slides, and she will be sending us a version without those animations so that they're useful for you to be able to see, and review, and think about, and those that will be posted with the main slide deck.

We want to thank all of you for your participation and the questions. We will stay here for five minutes, an additional five minutes, so that you can get the feedback link. You can continue to post questions. Those questions will go out to everybody, our speakers, and to the planning team, and to the Department of Education to guide future resources. Thank you all so very much, and have a wonderful rest of the day.