Nature vs. Nurture: The Impact of Genetics and the Environment on Addiction

Welcome to the National Criminal Justice Training Center webinar, "Nature versus Nurture, the Impact of Genetics on the Environment on Addiction," presented by Dr. Anjali Nandi. My name is Greg Brown. And I will be moderating for you today. Today's presentation is part of a webinar series for the Bureau of Justice Assistance Comprehensive Opioid, Stimulant-- Stimulants, and Substance Abuse Program, and the Indian Alcohol and Substance Abuse Program for Coordinated Tribal Assistance Solicitation Purpose Area 3 grantees and non-grantees, focused on responses to alcohol and substance abuse related crime.

This project is supported by a grant awarded by the Bureau of Justice Assistance Office of Justice Programs US Department of Justice. The opinions, findings, conclusions, or recommendations expressed in this webinar are those of the contributors and do not necessarily reflect the views of the Department of Justice. So with that, let's try our first poll question.

This is an easy one, which of the following best describes your role in the system, victim services or victim advocate, probation community corrections, law enforcement, child advocacy center worker, social worker, mental health worker, or other? So for today, for the participants participating today, I would like to let you know that about 10% of the audience is victim services or victim advocates.

Probation and community corrections represents about 25% of our audience. About 11% of you are in law enforcement. And the largest proportion of the attending audience today is the fourth category, which is child advocacy workers, social workers, or mental health workers. And about 17% of you selected other. I'm pleased to introduce to you our presenter, Dr. Anjali Nandi.

Dr. Nandi is an associate with the National Criminal Justice Training Center of Fox Valley Technical College. She is also the Chief Probation Officer for the 20th judicial district for the state of Colorado Additionally Dr. Nandi is a published author, having co-authored nine books. Kevin Mariano will also be providing his expertise on today's webinar.

Kevin has over 20 years of law enforcement experience and has served as the Chief of Police with the Pueblo of Isleta Police Department for over seven years. Kevin is currently a project coordinator at NCJTC. My name is Greg Brown. And I will be moderating today's webinar. I'm a program manager with the National Criminal Justice Training Center. My background includes a little over 30 years in probation, as well as providing training and technical assistance.

Again, thank you everyone for joining us today. Anjali, the time is now yours.

Thank you so much, Greg. And welcome, everyone. I'm looking forward to this conversation on nature versus nurture. It's sort of in a series that we've been doing. We've had a conversation already about addiction in general. I'll start by covering a little bit about addiction. But then we'll dive into this nature versus nurture question. Greg, where can people find our addiction webinar if they're interested in listening to a webinar focused entirely on addiction?

Great question, Anjali. So we have-- we're in the middle of a series of webinars under this technical assistance award. And those, if you go to NCJTC.org and go to our OnDemand library, you will find this series. And you'll be able to find that particular webinar that Anjali just referenced.

Thank you, Greg. Also I know that these topics are so interesting and we all have so many questions, I've learned in the process of delivering these that your questions actually can really help guide the information that I'm providing. So I will do my best to keep my conversation pretty short and then open things up for questions. So please don't hesitate, as I'm going along, to add questions in the question box.

And we will get to those, either Greg will introduce those questions as I'm talking, or we'll get to them at the end as well. So please don't be shy with your questions. They're extremely helpful. And they convey what's really on your minds, so ask away. So let's start with talking a little bit about addiction in general so that we all sort of have a similar understanding.

And if those of you-- for those of you who attended the addiction webinar that I was referencing, some of this will be a little bit of a review so just hang in there. We know a lot today about addiction and a lot more today than we knew even 15 years ago. And a lot of our understanding of addiction has been fueled by some research on the brain, some research on our reward circuitry, and research on how we changed some really complex behavior.

Addiction is treatable. And it is fundamentally a brain disease. What this means is addiction gets quite complex, because it involves several brain changes that happen. Now, we're talking about addiction. And I just want to clarify that there are people who use substances or even misuse substances. And occasional use or misuse doesn't create the same brain changes that I'm talking about when we actually are talking about addiction.

So addiction means that our homeostasis has shifted. Homeostasis is our sort of level of normal, right, whatever our normal functioning is. So I'll use an example. There might be some of you on the

call who, when you wake up in the morning, you function just fine, right. You wake up in the morning. That's normal. You function well. You get to the gym, or you get to work, or wherever you're going.

And then for other people, life used to be that way. But now, you don't feel normal until you've had that cup of coffee. So normal for you has shifted to being with a cup of coffee or maybe six cups, I'm not sure, versus without, right. So homeostasis has shifted. And I'm not pointing fingers for those of you who are staring at your coffee mug right now. I'm just using that as an example of what I mean by a homeostasis shift.

So we're talking about an addiction where certain brain changes have happened. And homeostasis, or normal, is now with the drug, versus without the drug, or the substance, or whatever we're talking about. It is a chronic condition, meaning it lasts for quite a while. It's not like a flare-up, like a cold, right. It flares up. And then it's done. It's a chronic issue.

And therefore, treatment needs to be on an ongoing basis, as opposed to us thinking about treatment as a one time deal. It recurs. And it's a relapsing illness. And by that, I don't mean that relapse is necessary or that everyone will relapse. What I do mean by that is that it is common to see people relapsing back into their use. And relapse does not mean a failure of treatment, or that the person isn't strong enough.

It just means that something's not working. And we need to support this person in a slightly different way. Addiction is also characterized by intense craving and loss of control over the use of the substance. I'll use a variety of different examples as we're talking. But I imagine that you've all experienced some sort of craving before, this yearning, right, this yearning for whatever it is.

Right outside of where I go to the gym is a place that sells baked goods. And every time I step out of the gym, oh my gosh, I smell delicious baked goods. And immediately, whether I'm hungry or not, I'm craving for yummy, sugary carbs, right, so that craving. But all of us probably on this webinar know what craving for food feels like. Yet craving for drugs is over 100 times that powerful.

So your most powerful craving for food, times that by at least 100, and we're not even still getting close to the intensity of the craving for a substance. Loss of control over the use happens for a variety of different reasons. But one because there's a shift in the way our brain works around having choice over engaging in a particular behavior.

So when we are suffering from an addiction, our normalcy or homeostasis has shifted, where survival requires the drug. And therefore, control becomes a little bit questionable. This behavior persists

despite some pretty heavy duty negative consequences. And we all agree that the behavior, whatever this behavior is, is harmful by some accepted standards.

Now, I work out every day. I really enjoy it. You could say that I'm, in quotes, addicted to it. But my behavior isn't harmful. It's not like I'm working out 12 hours a day. It's one hour a day, right? So we all would say, OK, that's not harmful, even though I'm doing it every single day. So the behavior is harmful by some accepted standards and that I can diagnose it. So those are some of the pieces that form the definition of addiction. Yes, Greg.

I was just going to say Anjali, you know, we've heard the statistics, you know, 70%, 80% of the people involved in the criminal justice system seem to have some kind of substance use or substance abuse disorder, alcohol, drugs, whatever it may be. And the question comes up, are addicted people more criminal? Or does abuse addiction contribute to criminal conduct?

Ah, that's a great question. So yes, there is a high correlation between folks who are in the system who have some kind of an addiction, some kind of substance use disorder. In fact, you said somewhere between 70% and 80%. And that's really accurate. And interestingly enough, that's three times the general population, meaning the rates of addiction among people in the criminal justice system are much higher, 3 times higher, than in the general population.

But you asked an interesting question. You said, does addiction cause crime? No, addiction increases the likelihood that we will engage in certain behavior. So it increases the likelihood that I will engage in, let's say, theft, for example, in order to fund my habit. So just-- I think the causative question we have to be really careful about, right. We have to be careful, I think, about assuming that either all or nothing, all people in the criminal justice system have addiction.

We have to be really careful about assuming that all people with addiction are criminal. That's a really dangerous assumption and is completely untrue. Because I think all of us on the webinar know people who are suffering from addiction and are not in the criminal justice world. However, the point that Greg is making is really important. That we have high percentages of people in the criminal justice world that have come into the criminal justice system for a variety of different reasons.

They've engaged in some kind of an anti-social behavior. And then they have this need that we need to attend to, this-- a treatment issue, right, a behavioral issue that we need to attend to. And it's important for us to make sure to provide the resources to them, so that it decreases their likelihood of engaging in future criminal behavior. So thank you for bringing that up, really important.

So let's talk about the reward circuit. The reward circuit is the circuit in our brain that sits in what we call our limbic system. Our limbic system is in the center of our brain. It is our-- our old brain. Sometimes we call it the lizard brain. It's our reaction system, fight, flight that keeps us safe, all of that. But it also houses our reward circuitry.

And what happens in here is, whatever the addictive substance is, whether it's coffee, I know, I'm teasing some of you right now, or whether it's cocaine, what it does is it stimulates that reward circuit. And then it overloads it. By that, I mean that it increases certain chemicals in our system way more than we can handle. And in particular, the chemical that I'm talking about is dopamine.

Of course, it impacts a whole bunch of other neurotransmitters as well. But dopamine is one of the really important neurochemicals that's implicated in addiction. And if you want to know, again, more about dopamine, we talk a lot about it in the addiction webinar. And I talk about levels of dopamine and what drugs do. So if you're curious about that, definitely listen to that webinar.

But drugs and alcohol or anything taken from the external world and put into our bodies increases dopamine way, way higher than we are able to produce on our own. And so many changes happen as a result of that. So liking a substance becomes wanting a substance, which becomes needing it and needing it to survive. So that's how important it becomes. It shifts in salience in our minds and in our brains to become as important for survival as food and water.

And of course, it affects our judgment. Because it impacts our lizard brain, our limbic system. And our limbic system sort of takes over, gets hijacked. And we are not able to communicate in the same way with our frontal cortex. So the frontal cortex is our wizard brain. And many of you have probably heard me talk about our lizard brain and our wizard brain.

So the lizard brain is the reaction system. It just reacts and responds in the most sort of impulsive fashion versus the frontal cortex, which is able to think things through. So I don't know if any of you heard just now, but I have one of my dogs outside. And she just barked. It's such a great example of coming from our limbic system, our lizard brain.

She sees something. And she immediately reacts. And she reacts with a bark. And then she figures out, oh, it's nothing to bark at. It's just a leaf or something like that, right, at least one hopes that she has a little bit of a frontal cortex. Us, as humans, we have a much bigger frontal cortex. And so our reaction to maybe a rustling or something may not be yelling first. It's, wait a second, is that something I need to yell at?

So that's the connection between the limbic system and the frontal cortex. But if I get stuck in my limbic system, it affects my judgment. It affects my behavior. And it affects impulsivity. So let's talk about impulsivity for just a quick second. Impulsivity has to do with the ability to delay gratification, the ability to think through the consequences. And so if I said to you all on this webinar, would you like $500 today at the end of this webinar or $1,000 next week? What would you take?

And I would imagine that most of you on this webinar would say, I'll take $1,000 next week. That's a no-brainer. I'm doubling my money in a week. I mean, the stock market is not even close to that good. So many of you would say, yeah, I can wait to next week. And so what you've done is you've delayed gratification. But you made that decision using a certain part of your brain. And that's the part of your brain that gets a little disconnected when we're focusing, when we're struggling with addiction.

And so we're not able to delay gratification in that way, meaning if you're struggling with substance use, you would take $500 today over anything tomorrow. You'd take it over your freedom tomorrow. You'd take it over your family. So impulsivity really increases because we lose our ability in our brain to delay gratification. And of course, it persists besides despite negative consequences.

Because consequential thinking, meaning thinking through pros and cons, that happens in our frontal cortex, which is-- and the connection is impaired there. So we're not able to get all the way to thinking through consequences, which is sometimes why when I ask my clients, when I'm working with folks who are struggling with addiction, and I say, you know, what were you thinking?

Or I say, hey, you know, what happened as you were thinking about sort of what you would lose if you did use again? The client very often looks at me and says, I wasn't thinking. Or none of those consequences matter in the moment, right. I'm not even going down that road. I'm not even thinking about it. All they can think about is what's in front of them. And I know that you all have had a similar experience, even if you've never used drugs and alcohol.

I would imagine that you've all struggled with sort of compulsive behavior or not thinking through the consequences. So an example is when you open a bag of potato chips and maybe you know, at least I know, you know, not the best thing for me. And so then I tell myself, I'll only have a few. And then a few becomes the whole bag, right. So we've all experienced sort of that little situation.

I'm noticing that there is a question. And so the question was crime-- I think this is referring back to the crime conversation. So I'm sorry I'm only just seeing it. But it says that crime tends to be driven by a substance use issue. In other words, crimes are engaged in to support the substance use issue.

And that's absolutely right.

I would engage in a crime like theft, for example, or whatever it is in order to support my substance use. Or I might engage in crime as a result of being intoxicated, like driving under the influence or assaulting somebody because I'm intoxicated or high. So yeah, very, very true. So let's examine just a few more things before delving into the nature versus nurture question.

And it's sort of a summary of what we've been talking about. So addiction means craving for something pretty intensely. If you've never been addicted to substances, it's more intense than you can even imagine. It means loss of control over the use and continuing to use, despite whatever the consequences are. It changes the way our brain works. And in particular, it changes the way our reward circuitry works.

And then it starts to disrupt other things, like learning, motivation, consequential thinking, our executive functioning, meaning decision-making, judgment, those kinds of things. And this also relates to not just substance use but other behaviors like gambling, shopping, and sex can get [INAUDIBLE], right. If we do it to a particular extent, where it's becoming problematic, then those can sort of make the same brain changes. And it can result in an addictive process as well.

So let's check in with you all on a poll here. What do you think contributes more to predicting alcohol and drug issues later in life? Is it nature, meaning genetics, what I was born with? Is it nurture, meaning our upbringing, or both equally? Greg, could you help me launch the poll please?

I can. So the question, which do you think contributes more to predicting alcohol drug issues later in life? Nature, nurture, or both equally. So Anjali, for your information and for the audience, nature about 14% of the people selected that as the option for the answer to the question. 22% said nurture. And both equally, 64% of the audience.

Fantastic. Thank you, Greg. And thank you all for responding. I love to ask this question for a variety of different reasons. Because we do know that both matter. And 64% of you said both equally, both definitely matter. What we're learning, though, especially in the past 10 years, what we've learned through a really huge longitudinal study that looked at twins, it looked at adoption issues, all kinds of things, and I'll be more precise about this, that our genetics tells us a lot.

And it tells us slightly more in terms of prediction than our upbringing does, meaning genetics really matters. And genetics are not a determining factor, meaning if my parents were addicted to substances, it doesn't mean that I have no choice about the situation. And I'm definitely going to be

addicted to substances. That's not it. It just really increases the likelihood that I will be.

So nature tends to be a little bit higher than nurture. Both are very, very important. So I will talk about both. But interestingly enough, we're learning that as much as half of our risk for becoming addicted to a substance depends on our genetic makeup. And again, I want to be so, so clear, so I'm sorry that I'm saying this again. It doesn't mean that I will. It just means that I have a higher likelihood.

So let me use cardiac health as an example. I have a lot of cardiac health problems in my family. People tend to die pretty young as a result of heart attack and cardiac issues. Does that mean that I'm going to die young as a result of cardiac issues? No, it just means that I have to be more careful than you, for example. So let's say Greg has no history in his family. But I do.

I need to be a little bit more careful than Greg, meaning I need to make sure I'm eating well, working out, having low stress, all of those things, managing my blood pressure, all of those things. I have to be a little bit more careful. So it just tells us something. Our genetic makeup tells us some really important things. So let's talk about all of these pieces, right.

What is genetics? What are genes? What do they do? Why does it matter? All of these things, let's talk about all of these pieces. So when we talk about genetics, we're talking about our DNA. The way things work are we have several cones within our DNA. And certain things can turn them on or keep them off. So for example, there are some things in our DNA that maybe stress will turn it on. Stress will increase a certain particular thing, right.

So genetics tell us a little bit about what is going to happen to some folks. Now, within our genetic makeup, there are certain givens. And then there are certain things that we need to exert control over. Our givens are the easy ones, right, hair color, eye color, ear lobe attachments, et cetera. All of those things are determined for us, predetermined. And they are determined by our genetic makeup.

The interesting thing about addiction, though, is we have to do something in order to sort of have that part of our genetic makeup matter. And quite simply, one of the things that I have to do is use, right. I'm not going to be addicted to cocaine if I never use cocaine. So it's both. It's behavior. And it's genetics. But genetics tell us about half of-- it will provide us half the risk, so 50% of our risk comes from there.

Our DNA sequences are very, very similar to each other as human beings. 99.9% of our DNA sequences are the same. But that 0.1% accounts for a ridiculous amount of differences, right, a ridiculous amount of differences between you and I. I mean, there are so many little things that

distinguish us, whether it's the way we look, or the way we act, or all kinds of things that distinguish us. So that 1% variation is huge.

They contribute to visible variations like what we can see, our facial structure, eyebrows, eyes, all of that stuff. But then it also contributes to invisible traits, the things we can't see. And some of the things we can't see are some risks. And some of our genetic code gives us protections against things. So I'll give you an example of sort of both the protection and the risk. So hang with me in this example.

There was a study that was done with rats. And then-- and if any of you just suddenly said, OK, I'm not interested in a rat study, just hang in there. Because they can make a correlation with humans as well. But here's what they did. They noticed, they watched rat mothers with their babies. And then with some of the rat-- the mom and baby groups, they separated the moms from the babies. And they wanted to see, what is the impact of having a mom who's nurturing and caring versus a mom who's separated?

Now, in the study, they used rat moms. But I don't mean to say that it's only the moms who matter. I mean, we're talking about caregivers here, right, so just sort of hang in there. I'll tell you the study. And then we can generalize it. So we have rat moms, their babies, being really nurturing with each other and the mom's really nurturing the babies. And then rat babies whose moms were taken away from them.

And they wanted to see, is there a difference in how resilient these babies were to stress? So they were testing levels of cortisol in these babies as the babies were growing up to see how they responded to different stressful situations. And you probably can guess where I'm going, right. The babies who had nurturing moms were more resilient than the other babies, than the babies whose moms had ignored them.

But maybe some of you are saying, that has nothing to do with genes. It has everything to do with the nurturing moms. And you're absolutely right. Except, when these babies grew up and became moms, they pass down the same level of stress resilience to their babies, meaning the rat babies who were nurtured were more stress resilient. But then it shifted their genetic code to pass down that resilience to their babies.

And the ones that didn't have nurturing moms passed down a lower level of resilience, a greater reactivity. And so it shifted their genetic code. And what I'm talking about here is epigenetics, right, really important to be thinking about. So I'm hoping that, as you're thinking about this, you're saying,

wow, if this is true, does this explain a little bit about intergenerational trauma, historical trauma? And it absolutely does.

So we can talk more about that as questions come in. But genetics really matter. And this whole sort of epigenetics that I'm talking about is really alive in the addiction world as well.

Oh and Anjali, we have some questions around exactly what you're talking about, so maybe a nice place to segue. One of the questions has to do with, the person says, I never once had a patient that the only reason they had addiction was because of genetics. All had trauma. Additionally, this can lead to fear that a person is a slave to their genetics.

They gave an example. My son's father's an addict, but he had horribly dysfunctional upbringing that led to the addiction. My son does not have the same dysfunction. My son does not have the same dysfunction because I left. I feel this significantly reduces his chances of having addiction issues and him ever turning to using a substance.

Yeah, great. I so appreciate these examples, right. Because it highlights so many really important things. So Greg, if you can help me make sure that I'm attending to all of the different pieces that this person brought up, because there are several really important things. So we are never a slave to our genetics when it comes to these invisible traits. So I just want to say that again really clearly.

Genetics, in terms of addiction, does not say that I will or I will not. It just increases our likelihood. And what I hope people walk away with, as opposed to, oh my gosh, that means I'm a slave to my genetics. What I hope you walk away with is, wow, I have to be so much more responsible. I have to be so much more careful. It's very similar to diabetes. It's very similar to heart disease, like I was sharing.

It doesn't mean that I will, even though I have a pretty crazy heart disease history, it doesn't mean that my future is written for me, right. It does mean, though, that I have to be a little more careful, that I have to be more responsible. I cannot take the same risks that other people can. And this is important, because it's incredibly empowering. So it really matters how you frame this for a client.

I always frame it as an empowering thing. That yes, there is something pretty tough that you're going to be contending with. But it is in your hands whether you turn that switch on or leave it turned off. And you, client, have to be even more responsible than the average bear, right. To me, that's very empowering. So my hope is that you're not walking away thinking, oh my gosh, this is a disempowering thing or a issue that we're saying, oh client, you have no control over, not at all.

On the contrary, we're saying, your control really matters in this case, so please exercise it. The other piece that the person is bringing up is, does the environment matter? And yes, of course it does. And we will talk about in what way the environment matters. And how strong and how incredible it was that you decided that it is in, if I'm following the example correctly, in your son's best interest for you to reduce the impact of trauma on your son, right, how incredibly strong of you.

Trauma absolutely matters. And we'll talk about that as well. Trauma matters, adverse childhood experiences, modeling the environment, all of that matters. That's the nurture part, which we're going to get to. I promise we're going to get to. But I don't want to get to it without telling you and sharing with you all on this webinar that we do need to pay attention to genetics and that we do need to pay attention to the increased risk that certain people have, meaning the increased risk that they have and, therefore, they have to be even more careful than other folks.

Greg, did I miss anything from their question?

I don't think so. And if you think we're going to come back and talk more about trauma and how it plays into addiction, as well as historical trauma, and if there's any differences to pay attention to there, I think we've covered it for now. Or you can expand on that, either now or later on in the presentation.

Yep. We'll definitely come back to trauma. But folks, if I don't cover it enough, two things, please, one, put it into the question box so I can really answer your question. But we also do have a webinar on trauma. And I answered some questions there as well regarding the relationship between trauma and addiction. So I'm happy to answer it here as well.

Good. OK. So let's talk a little bit more about genetics. And then I'll talk more specifically with you about the study that was done that tells us the importance of paying attention to genetics. And then we'll move to the nurture aspect. So there are certain diseases that cause mutations in the genes. And that's why we have the disease. But addiction is not one of them.

So sickle cell anemia, cystic fibrosis, these are examples of mutations in a gene that then creates the disease in us. But that's not addiction. Addiction, just the genetic code, is an increase of risk. So, again, just making sure that you really kind of shift that thinking in your brain, we're not saying we're a slave to our genetics when it comes to addiction at all. It's just we do have additional risk and, therefore, have to be more responsible about it.

Let's talk a little bit about that study that I was talking about. It's a Harvard study that was conducted

over a period of about 50 years with quite a large number of people that they followed over their lifespan. And what they found was that addiction does have this genetic component, that it provides this increased biological risk. And the way they looked at this, so I'll try and explain it. Hang with me, it's a little bit complicated.

They watched-- they noticed kids, and they researched kids who came from a family, came from a biological parent with addiction. So let's say I'm the biological parent, and I have an addiction. And I give birth to a baby. And then that baby gets adopted out, all right. If that baby gets adopted out into a family with no history of addiction, no trouble with addiction, that baby still has a higher likelihood of developing addiction than if I didn't have any biological history, I gave birth to a baby, and that baby gets adopted into a family that does have addiction.

So I hope you all followed that. But essentially, the biology, the genetic piece, predicted stronger than growing up in a household where there's a lot of sort of addiction. Again, I'm not saying that nurture doesn't matter. It does. But we're talking about averages. We're talking about sort of levels of prediction, right. And of course, you and I can come up with a gazillion individual examples that don't fit this. But all we're talking about is on average.

So kids who are raised by adoptive parents, whether they had addiction or not, had the same levels of developing addiction if the birth parents had no trouble with addiction. The kids whose birth parents struggled with addiction were four times more likely to struggle, regardless of whether the adoptive parents had trouble with addiction or not. So that's the really key piece in this study.

And what they also noticed was, if there's alcohol addiction in the history, in the family history, it increases the likelihood for drug addiction as well, not just alcohol addiction. So something to think about here, right, that people are born, they come into this world with a certain level of tolerance that's determined by our genetics. But now we can increase our tolerance by using.

And as tolerance increases, unfortunately, physical tolerance increases much faster. No matter what my genes are, it increases much faster than mental tolerance. So let me sort of ground that a little bit and give you an example. Let's say I have a higher tolerance for alcohol-- alcohol is an easy example-- then Greg does. And we both go out. We go to the bar. I don't know how many of you have open bars right now, given the pandemic. But let's say we get away with it. And Greg and I are going to the bar.

And I have a higher level of tolerance than Greg does. My physical tolerance will be higher than his.

But our mental tolerance will be the same, meaning our judgment is just as impaired as each other if we drink the same amount. But I will look better. I will look like I'm not impaired. I will be walking a straight line, whereas Greg might be staggering or stumbling around, right. So that's physical tolerance. But mental tolerance is about judgment.

Unfortunately, because I have the higher tolerance, guess who decides to drive, right? If Greg is holding the car keys, I'm going to look at him and saying, hey, no, I am sober. Because I am not staggering and stumbling around, you are. So let me drive. And then it puts me at higher risk for getting a DUI, for example. So the tolerance piece is a really important one to pay attention to.

So let's take a look at the nature and nurture conversation. And so far, what we've said, is it nature or nurture? But I want us to think about nature and nurture, right. That both need to be paid attention to. So let me invite you all back in on this next poll. And this next poll talks about our clients and what you're noticing. So with your clients, what has the most impact on their development of addiction?

Is it their home life? Is it their peers, social issues, like what's happening around them? Or is it all of it? What are you noticing?

Greg, could you help me launch the poll please? Yes, here we go. So the question is, with your clients, what has the most impact on their development of addiction? Home life, peers, social issues, or all of it. Thanks, everyone. So with your clients, what has the most impact on their development of addiction? Home life, 14% from the audience. Peers, 7%. Social issues, 1%. And then 78% said all of that matters.

And you're absolutely right. All of it does matter. So let's look at the environmental factors. Because it's really hard actually to tell which one predicts the most. It's really a conglomeration of all of it. So let's look at some of these environmental factors. And we'll make sure to talk a little bit about trauma here as well. So here's what we're noticing. And I always worry about this genetic conversation.

And then I worry about this first piece, parental engagement. Because I worry that people on the call will take this as blame. And it's absolutely not meant as that. We all do our best with what we have. And parental engagement matters. And by that, I mean that when children grow up in what's called a safe, supportive, and nurturing household, it reduces the likelihood of engaging in substance use.

We're not making any causal statements. So parents who are on the call, and I'm one of you, I'm not saying that if your child has an addiction, that it is your fault, that you caused it. That's not the case at all. It increases the like-- parental engagement, or lack of actually, lack of parental engagement

increases people's susceptibility to addiction, doesn't cause it. Just like our genetics don't cause it, it just increases the likelihood.

So parent engagement is about safe, supportive, nurturing households. It's also about modeling of empathy and modeling of boundaries. So they're finding in the research that boundaries are really important. And I'm noticing this with my teen. She is an expert at finding loopholes in my boundaries. I'm not sure if any of you have had teens or kids who do this with you. But wow, is she good.

I'll make a statement, a really clear statement that I think is such a clear boundary. And then she'll find seven holes in that boundary. So what's really important is the structure, right, having structure so that kids know what they can push against. That's part of the parental engagement piece. Chaotic households are related to increasing the susceptibility of the brain to addiction. By chaotic households, I mean, there's a lot of stress and lack of predictability in the household.

People-- the kids don't know if they're coming or going. Or whoever's in the household doesn't know if they're coming or going. They're moving from crisis to crisis. That-- what it does to a developing brain is it enlarges the limbic system and shrinks the frontal cortex, meaning people who grow up in high stress environments with a lot of chaos in their household have over-developed limbic systems. Because they've had to, right. It's an adaptation that they've gone through.

They have to develop kind of that fight, flight. And so that part of their brain is a little overdeveloped, which increases their susceptibility to impulsive behavior. And addiction is one of them. Or substance use is one of them. Adverse childhood experiences are kind of similar. Adverse childhood experiences include trauma as a child, emotional abuse, physical abuse, sexual abuse, chaos in the household, all kinds of things that happen to children.

And interestingly enough, the greater the ACEs, the adverse childhood experiences, that people have gone through, the greater the likelihood of developing some kind of a substance use issue. Again, this is likelihood not causative. I'm not saying it causes. But it just increases the likelihood that someone will start using. And then, of course, the substance takes over, right. The substance becomes really pleasurable. And we sort of fall into that cycle.

Let's talk about trauma right here. Because we talked a little bit about abuse, let's talk about trauma. So trauma is a very personal experience. And the same event can cause trauma for someone or can be experienced as a traumatic event for one person and not for another, because of where our brains are. Because of the susceptibility that our brains are currently experiencing.

So whether it's sort of something big that happens or something little, trauma impacts the brain. And we know that trauma is actually a neurological impact. Trauma is not just about an emotional response. We can do a functional MRI of people's brains and can see the impact of trauma on the brain. So trauma really matters, impacts the brain and, therefore, increases likelihood for addiction.

But it doesn't just have to be trauma. It can be historical trauma that creates some of this genetic shift. It can be what we call multigenerational trauma. So I don't have to have experienced the trauma in order to have a shift in my brain where I'm more susceptible. I have a slightly bigger limbic system, a weaker connection between the limbic system and the frontal cortex, over-developed limbic system, an underdeveloped frontal cortex. So trauma absolutely plays a huge part in this.

And then it brings up the issue of, are people trying to self-regulate with the use of substances, which is an excellent thing to consider. So are they trying to manage their symptoms, their post-traumatic symptoms, for example, or mental health symptoms for that matter? And we'll talk a little bit about co-occurring disorders here. But are they trying to self-medicate with the use of substances? So it's an important consideration.

After-school activities matter. And these are all sort of things growing up. But then also as adults, exercise matters. And they found that exercise matters particularly between the ages of 10 and 18, in terms of supporting the brain becoming resilient to addiction or trauma for that matter. Of course, exposure, so are my parents using? Or are my friends around me using? Exposure to the substances really matters.

And I think this is what the person who gave us that question was talking about, just exposure. Social norms, meaning does everybody around me believe, and do they tell me, it's OK to use? I mean, part of what we do as a family is we get high, right, those kind of social norms. So maybe I'm with friends who say, yeah, using is cool. So what are my social norms, and how do those impact what I learn?

There's this term called neighborhood disadvantage. Again, doesn't cause but increases the likelihood for developing a substance use issue. And then barriers to treatment increase the likelihood-- or barriers even to interventions, early interventions, increase the likelihood for issues in addiction later on. There's some information that Lynn just posted to the audience that we'll be doing a webinar on ACEs coming up in a little bit in December.

So if you need that information, it's in the chat box as well. Greg, did you want to bring in any questions at this point, or are we good to keep going?

Let's keep going a little bit. I'm putting them together, some long questions in here. So let's keep going. And I think the next slide talk about co-occurring conditions. And we can come back to that, thanks.

OK, fantastic. Thank you. So let's be really specific and share some data on tribal communities and our American Indian and Alaska Native population. Unfortunately, addiction doesn't impact us in the same rates. And this has to do, I think, with a lot of systemic issues that really need to be attended to. So three times as many American Indian and Alaska Natives are diagnosed with substance use disorders compared to white Americans.

Twice as many require treatment for addiction compared to any other racial or ethnic group. The problems we have-- we see the highest rates of alcohol related deaths and opioid mortality rates. And we talked about this in a previous webinar that focused on medication assisted treatments. But medication assisted treatments, which are really supported in the research to kind of help people out of particularly an opiate addiction or an alcohol addiction, the implementation of those are significantly lower than the general population.

So I say all this because I think it highlights some of our systemic issues, systemic barriers maybe, historical trauma issues, poverty, neighborhood disadvantages, all of those pieces, that it becomes even more important for us to understand this topic and to know what to do about it. Let's talk really quickly about co-occurring disorders before we move to talking about sort of what are some treatments, and what are some evidence-based practices. And then we'll open things up the questions.

So co-occurring disorders are where we have both a substance use issue and a mental health disorder. It doesn't matter what the mental health disorder is. But there's some mental health issue, like bipolar disorder or anxiety, depression, et cetera, with a substance use issue. So that's a co-occurring disorder. And in our communities, we have about 8.9 million Americans who currently live with co-occurring disorders. But only about 7 1/2% of them are receiving treatment.

So it's an under-treated population. And when we talk about treatment, what does treatment actually mean? Treatment is a process of supporting people in their own journey. So we're learning that there is no one size fits all. We do have some ideas about what some evidence-based practices might be. But it really is about supporting the individual. And it tends to be a time-limited event over a larger, longer self-change process.

It's a part of this natural recovery process that we're trying to facilitate as a treatment provider.

There are many evidence-based treatments that we know, based on the research, that work. But they can be incorporated into anything that we do. So cognitive behavioral training is about skill training. Motivational interviewing is about really supporting the person's intrinsic or internal motivation.

Contingency management is about making sure that we are providing praise and positive reinforcement for positive behavior and then responding with negative reinforcement for negative behavior. But contingency management is really about behavioral management and behavioral rewards. Community reinforcement approaches are about engaging community support. Social supports are incredibly important when it comes to working our way out of addiction. So social support is key.

Dialectical behavioral therapy is sort of this beautiful combination of both mindfulness and skill training. Pharmacotherapies are medication assisted treatments. And I'll come back to that a couple of slides later. And then making sure that we're attending to both mental health issues and substance use issues. And the mental health issues could be trauma related or depression, whatever it is, really attending to both the behaviors.

There are some common themes that are important when we're talking about how to facilitate a supportive way out of addiction. And it all starts with assessment. Because I would provide different services for somebody new in their substance use journey compared to somebody who has perhaps been using for seven years or 14 years. There's one of my clients struggling with a meth addiction, 14-year meth addiction.

When I conducted his assessment, my engagement with him was very different. What I set up in terms of a treatment plan for him was very different compared to my other client, who was two years into his addiction. So assessment, really important. Developing skills, like we talked about in the previous slide, really attending to the relationship, because the relationship matters and is the strongest driver of change, more than anything else. More than even the intervention that I use, the relationship matters.

And relationship is about empathy. It's also about boundaries and structure, like we were talking about earlier. And then the contingency management piece is incentives and sanctions. And then social support that seems to be really, really important in supporting people change their behavior. So continued positive reinforcement means, or contingency management means that I am making sure to provide rewards and praise as quickly as possible. Because what is most impacted by addiction is our reward circuitry.

So what it does, by me saying, good job, well done, here's a-- you can pick from this fishbowl for a gift card or something like that. Or even just noticing and praising any positive movement that you see, it helps combat some of the intense reward that we get from our substance of choice. Never enough, but it helps. And it stops the interaction of our addictive process within our rewards circuitry.

So I always encourage people to really talk about what's going well for them versus what's negative, right, what that negative process or negative spiral is. So that's that little quote that you see at the bottom. So I promised to talk about medication assisted treatments or therapies. We actually spent a whole webinar on this. And I'm only going to do one slide of it here.

But essentially, medication assisted therapies and treatments are having pharmaceutical medications to actual counseling or behavioral treatment. So it's both. It's not just providing people with medication. And if you're immediately having a really negative reaction to this, and you're thinking, gosh, isn't that just substituting one drug for another, and wouldn't people just sell these drugs for a high?

Or if you're having a lot of these negative questions or responses, great, it's really important to be cautious. And we talk about those very thoughts or misconceptions in the MAT webinar. So I would definitely encourage you to take a look at it. But to answer those questions really briefly, the pharmaceutical medications that we provide, Suboxone is an example of one of them to support an opioid addiction.

It is different from, let's say, heroin use or fentanyl use in the intensity of the drug and the extent, the length, that it lasts. So heroin use, for example, very intense, lasts a short period of time. Suboxone, not intense at all, but attends to sort of that withdrawal and craving and then covers a longer period of time, so really different in what they're trying to do.

So I know I said I wanted to leave enough time for questions. So I'm going to run through these last two slides and then invite some questions. So here are two slides worth of some evidence-based principles for you to think about. No single treatment is appropriate for everyone. It's not a one size fits all situation. We have to figure it out. And we figure it out through assessment.

Ideally, treatment needs to be readily available. And here comes systemic barriers, right, what if it isn't? What do we do? We need to attend to all of the needs of the person, not just their drug use. Folks who use drugs also have other things going on. Let's make sure to focus on those, whether it's stability factors, or mental health issues, or whatever it is.

People need to remain in treatment for an adequate period of time in order for treatment to be effective. So it's not something that they dip their toe in for a day and then get out of there. That treatment needs to have certain pieces in place. And one of them, one of the really important pieces, is that it needs to be culturally informed, so that it aligns with the values of the people that we're delivering these services to.

And that medications are important, particularly with opiate addiction, alcohol addiction to some extent as well. That folks who have coexisting mental health issues need to have both attended to in an integrated way. That detox is only the first step. And actually putting people in detox doesn't change behavior in the long run. So detox is just an event. And then treatment needs to come after that, right, a longer term piece.

That treatment doesn't have to be voluntary to be effective. This was a really cool research finding and keeps us in business, right. Because so many of us have court ordered or court mandated clients that we are attending to. And yes, they might come with their own set of issues and sort of grumpiness that they show up with. As time goes on, we're able to help them find intrinsic or internal motivation.

The drug use needs to be monitored. It's sort of like having a thyroid issue, for example. If I went to my doctor and my doctor said, here, let's try you on 80 milligrams of levothyroxine and then never checked my blood again to see how I'm doing and adjusted my dose based on a whim, that would be problematic. So we need to know if treatment is working by monitoring folks. And that this is a long-term process with several episodes.

So let's do some questions. Let's move to the question and answer portion. Greg, could you facilitate us through that please?

I can. So let's back up a little bit to the co-occuring conditions. And I know that we have a law enforcement audience. And we encourage people to think of the system as an entire system. So one of the questions for Kevin is, can you talk a little bit about the impact on law enforcement when you're required to respond to a call where a person may be suffering from a co-occuring condition and potentially engaging in criminal conduct?

Thank you, Dr Nandi. Really always happy to be part of your presentation here and also learning quite a bit. I asked myself, where were you about 10 years ago in learning all the information that you're presenting with, you know, nature versus nurture? And I'm more and less kind of outlining a curriculum here for training and all that, but a lot of good information on that.

As far as law enforcement services go, you know, the years, I have got to work with three different tribal law enforcement agencies. And I think understanding more of the addiction side of things and, you know, what's available now, if we could take some of back what you have mentioned ten years ago would really, I think, helped out law enforcement, as far as responding to some of the calls that the officers had to respond to.

I can talk in one of the situations that we had with a family where, you know, there was quite a bit of things that was happening within the household. And I think at the time, as law enforcement responded to this particular location, not knowing the insights of addiction itself there and also what was happening, kind of gave an idea about nowadays about what's happening whether they're co-occurring.

Is it something that's repetitive, something that's in a cycle of some sort, you know, it's genetics, genes, and all that. You mentioned that. You know, and understanding more of the addiction side there, what later was found out, you know, that the family went through a very traumatic situation. And a lot of alcohol use was being used in the house and the home and eventually led up to some drug use happening within the house and all that.

And not really knowing and understanding the addition side of things there, there wasn't really any type of treatment services that were obviously available. We just didn't know, as law enforcement goes, to refer individuals into the proper areas of helping these individuals out, so we could kind of minimize the issues that were happening. We know that, as far as all the calls that were coming in, that there was going to be more calls that were going to be coming in.

And sure enough, there was this number, a large number of calls that were coming in to the same location and all that. And it was just you know, very difficult at times to try and understand what was really happening and all that. And listening to Dr. Nandi's presentation, kind of more or less, kind of gives you an insight about what may have been happening. So a lot of this kind of goes back into, I think, the side of understanding what addiction really is all about and all. I hope that answers your question there Greg.

It does, Kevin. Thank you. Anjali, we have a question. It's kind of a chicken or egg question. If a person's suffering from trauma and addiction, can you do both things at once? Do you decide to focus on one before the other? And how might you do that when you're understanding the complexities that a lot of the people that we see in these situations are presenting to us?

That's actually an excellent question. And I love how it was phrased, too. So very frequently you will have people with-- presenting with multiple issues. Most often we have complex clients. And it's our complex clients that make us scratch our heads, right, and try and figure things out. So yes, we do attend to both. But what takes priority is stabilizing the person.

So for those of the therapists on the call, they will relate to this. Delving into traumatic issues can be destabilizing. We still have to do it. But before I do it with-- in a responsible way, I need to make sure that the client is stable enough for us to mess with them, right, to mess with sort of bringing up some pretty tough stuff that leads to some heavy emotion and then sort of leaving our session feeling heavy or feeling a little dysregulated.

If somebody leaves our conversation dysregulated and doesn't have the skills to be able to self-regulate, they will return to-- or they will choose to engage in whatever behavior that they know always regulates that, which, for a lot of people, is substances, right. They're engaging in substance use because it makes them feel good. And so I have to be careful when I am choosing what to focus on.

And always recommend that we start with stability. By that, I mean, make sure people have certain stability factors in their lives, like certain skills that they have, self-regulation skills. And those apply to both trauma and addiction, that they have the ability to reach out. And they have enough social support around them, that they have a safe place. Because if I'm delving into some trauma stuff with somebody who, let's say, is currently in an abusive relationship, I want to be really, really careful about that, right.

So stability comes first. And that applies to anything, whether we're talking about substance use, mental health, or trauma. And a stability issue regarding mental health might be medication, for example.

Thank you. So another rep said he brought up in a question. And I'll read through this. It's long. The rat study in which they isolated rats, in which they had rats in a rat park, quote, unquote, and the clear impact that had on using drugged water-- drugged water for rats, this was purely environmental. The rats in the rat park never used cocaine drugged water addictively. And they never overdosed and died.

In the isolated setting, they used it compulsively and almost always overdosed and died. So as they stated in the Ted Talk that this person watched, the opposite of addiction is not sobriety. The opposite of addiction is connection. That clearly shows a larger nurture factor than nature. Can you respond to

that?

Yes, absolutely, with pleasure. I know exactly the study that this person is referencing. It was a really cool study that shows us the importance of social support. So the study, just to clarify, was not about genetics. The study was how important social issues are, not social issues but social support and sort of having an entertaining environment. So some of the rats were in a really boring environment. The other rats were surrounded by their friends and in a rat park.

The rats who were sort of isolated and in a boring environment kept pushing the lever to consume cocaine, so much so that they overdosed, as the person said. Whereas in the others, yes, they would use cocaine but never to a problematic extent. They would go between water and cocaine, so not sort of-- not compulsive use. And they prioritized being with friends, right.

So just to be clear, what it talks about is the importance of connection, as opposed to the difference between genetics and sort of nature versus nurture, right, just to kind of separate those two. And the Ted Talk that's being referenced is Johann Hari. And you can do a search for it if you'd like, if you're interested. You can search the opposite of addiction is not sobriety, it's human connection. That's sort of his key phrase. But it's a really lovely Ted Talk.

Thanks. Just kind of a related question, which is beyond use, abuse, addiction, what about the culture of being involved with people that use drugs? And when I read this question, I was thinking, you know, there's a whole ritual often that goes on for people around obtaining drugs, who they use with, the planning around it. How do we address that when we're talking about addiction and helping people make different choices?

Yeah, very, very important piece. I mean, the person who's posing the question is bringing up the importance of people, places, and things, right, the people that they're around or sort of influenced by. So we know that craving and relapse is strongly associated with a few things. Craving and relapse is strongly associated with stress, with the knowledge that a substance is available, and with being exposed to the substance, or being exposed to anything that reminds me of the substance.

So that's when sort of social support comes in. And so it becomes really interesting. Because we rely on our social support in so many different ways. And they impact us for better or for worse. So how do we then take somebody who currently uses with their friends and sort of is surrounded by a social structure that really supports use, how do we take that person and start to expose them to other social supports?

Because just telling them, don't hang out with those people is not going to work, right. If you told me not to hang out with my friends, they're the first people I'll go and talk with behind your back, right, about you. So telling people don't do, don't hang out with your friends, is not going to work. What does seem to work is increasing exposure to other opportunities, other potentials, other positive sort of prosocial activities where I could meet other folks who are not currently using.

So really, I mean, that social piece is so important and not easy.

Thanks. We have a question about can you-- and I guess I'll start with you about addressing multigenerational addiction. And maybe Kevin you could talk about your experience in law enforcement and especially policing in small communities and your awareness of this in things that you may have encountered.

Yeah. I mean, the multigenerational addiction speaks to the genetic piece. But I hope you all, again, don't walk away with thinking that, if my parents are addicted, it means I'm going to struggle with addiction. Not the case. If my parents are addicted, it increases the likelihood that if I start using substances-- and there's the big if-- I will end up using in a problematic way. So it increases my risk for sure.

And what that tells us, then, is if we are working with the young ones, right, if we are working with the kids who are living in households where, you know folks are using, they're experiencing both nature and nurture. Because not only is it a biological issue, now it's being surrounded sort of in their environment as well. And those are the folks that we need to really support and pay attention to.

The cool thing that we're learning in the research is that it doesn't-- the positive prosocial person doesn't have to be the primary caregiver. One of the strongest protective factors for teens is a prosocial adult mentor, not a prosocial adult caregiver. So that's a relief, right. That it doesn't have to be, I mean, for my daughter, it doesn't have to be me. What's really important is it could be me.

But it could be some other positive prosocial person who helps her, who's there for her, who she can sort of lean on. So that's the important piece. And for many of us in this field, sometimes we're that person for the teens that we're working with. We are their positive prosocial sort of you know, mentor or prosocial person.

Thanks, Kevin?

Yeah, Greg and kind of using off that example I mentioned earlier about-- with the response to the

household, the home that we-- the officers actually went to and all that, to understand more about what was happening within the house and what was going on in there. It was not-- it seems like generation from the young to the old that was happening just kind of carried over and really not knowing the side of, you know, the officers had no idea as to what was really going on.

Because, obviously, they're not social, behavioral health individuals, you know, in that area there but account service and so forth. But understanding more, as you know, as time was going longer, I think, we kind of slowly started to identify what was really happening within the home there. And looking at, I think, Dr Nandi had a slide on the environmental factors. But the list in there identified with what we were looking at back then.

And a lot of it, obviously, was just carrying over and carrying over through the years. And I think, you know, when we came down to deal with, I believe, it was a grandchild, that we finally were able to identify what was going on with the alcohol and the drug use and so forth. And we were able to actually kind of provide some services. I wish we could have done more. But, you know, at the time, we just didn't really have the information.

That's great, Kevin. And talking about tapping into other expertise around social services or behavioral health that I think is really a helpful guidepost in paying attention to these multigenerational families and the issues they're dealing with and getting them the help that they need, not just the person maybe that's-- that was the cause of the response.

So we have another question. Sounds like addiction is a choice. There needs to be an awareness of the risk. And there is a responsibility to make the right choice decision initially when using the first time. My mother's an alcoholic. And I have an occasional drink. But I do not crave or need alcohol like she apparently did. I believe she used alcohol as an escape, rather than dealing with the issues at hand. Comments on that comment, question.

Oh, that was perfectly said. Yes. I couldn't agree more. It was beautifully put. That it is that choice, right. It's-- and how incredible that you see that and that you can say, you know what? I need to be quite responsible here. And so if-- I don't know if this is true for you, you know, in your life. But when you have that occasional drink, like you said, you're probably acutely aware of it. And you're aware that one drink is one drink.

And you're careful that if you notice yourself starting to get upwards of three drinks, six drinks, it's happening more often, that you know, wow, I need to be really careful right now, right. So you have a higher level of responsibility. So absolutely there's choice involved. So I just want to sort of

complicate this a little bit. Sometimes choice becomes a little problematic when we're talking about some systemic issues. And this is where nurture plays a huge role.

So like the person with the question said, it is about your choice. But now let's take you back and change your story a little bit. You have a greater likelihood. You have a genetic predisposition. But let's also add a whole bunch of other things. Let's say you're surrounded by peers who are using. You're surrounded by no after school activities, so you're bored out of your mind growing up.

A lot of other stuff is going on, and people are using around you. Then again, you're-- the likelihood that you will engage in the substance keeps going up. So I just want to sort of provide a balanced picture there. But yes, beautifully said.

Thanks, Anjali. So we have a question. In Alaska villages, prohibition still exists. There are high rates of alcohol addiction throughout the whole state. I constantly hear that not having something makes you crave and want it more. Is that true? If prohibition was lifted, do you think that slowly their genetics would evolve more towards resilience for alcohol if it were more easily at hand?

So the answer to that first part is yes. And the first part was, does being told you cannot have something increase your desire for it? Yes. And that is called reactants. So it's a psychological issue. We all experience it. It's called reactants. And reactants essentially is that, if you tell me I cannot have something, that something increases in importance in my mind. And we keep thinking about it.

And maybe a lot of you have had this experience. Maybe some of you have decided to give up a certain thing. Maybe you've decided to give up sugar, for example, for a month. Sometimes at my gym we have different challenges and, you know, and give up this or that, or try this and that. And any time we have to give up something, that's all I can think about. And that's just human nature.

So yes, you are absolutely right. And you put it really well. That prohibiting alcohol use or prohibition is not correlated with a reduction in use. So we need something different there.

Thanks. And we have more questions. But I think this is going to be the last question. And then we need to do some wrap-up stuff with the audience. So if a mother experiences continual trauma as a child but does not use alcohol or drugs, does that-- do the changes in the mother's brain that happened when she was younger affect her child's brain to the extent that the child needs to be cautious or be aware of possible addiction?

Yeah, very insightful question. They need to be aware of susceptibility to stress, to addiction, to

trauma, and to moving in the world from one crisis to another. So those are some of the things to just be a little bit more aware of. But yeah, a very insightful question.

Thanks. That is going to close the question and answer portion of our webinar. So thank you, everyone. And thank you, Dr. Nandi. NCJTC is a training and technical assistance provider for Coordinated Tribal Assistance Solicitation Purpose Area 3. Grantees and non-grantee tribal agencies focus on implementing system-wide strategies to address crime issues related to alcohol and substance abuse in tribal communities.

We are also a TTA provider assigned to assist tribal-- assist tribal comprehensive opiate, stimulant, and substance abuse program grantees, focused on developing, implementing, or expanding comprehensive efforts to identify, respond to, treat, and support those impacted by illicit opiates, stimulants, and other drugs of abuse.

TTA services for both programs include customized on-site and virtual training, regional trainings, conferences, webinars, peer-to-peer support, on-site virtual meeting facilitation, written resources, community planning, justice system collaboration, and sharing grantee best practices. For additional information on general TTA services, links to featured offerings, and to request TTA, please visit our program website. And it's shown on the screen for more information.

Please follow the OnDemand link to view upcoming webinars and our robust library of webinars, recordings, and self-paced online training opportunities. Another valuable resource is the COSSAP Resource Center. A screenshot of the COSSAP Resource Center is shown here along with the web link. Featured resources available include funding opportunities, COSSAP grantee site profiles with data visualization tool, information about demonstration projects, peer-to-peer learning and recordings of all previous COSSAP webinars covering a range of substance use disorder related topics and strategies.

Of particular significance is the ability to request training and technical assistance or TTAs whether you are a COSSAP grantee or not. The COSSAP TTA program offers a variety of learning opportunities and assistance to support local, tribal, and state organizations, stakeholders, and project in building and sustaining multidisciplinary responses to the nation's substance abuse crisis. For more information, you can contact COSSAP at COSSAP@IRR.com.

In closing, I'd like to thank you again Dr. Nandi for the excellent presentation today and sharing your time and expertise with us. Thank you for attending and have a wonderful day.