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Leader's Introduction to Legal Epidemiology
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Welcome to Leaders introduction to legal epidemiology. My name is Murlean Tucker, and I'm running this dialogue4health web forum with my colleague Kasey Deems. Thank you to our partners for today's event, The Center for Health Leadership and practice, the National Leadership Academy For the Public's Health and the public health law program. Now, let's meet today's moderator, Dr. Carmen Rita Nevarez. Dr. Nevarez is the director of the California opioid safety network and the National Overdose Prevention. She's a public health's institute vice-president of external relations and preventive medicine, director for the -- and the director of Dialogue4Health. Welcome, Carmen.

>> Good morning. Thank you so much, Murlean, and good morning or good afternoon to all of you out there and our listening audience. It is really a pleasure to get this second part in our series on public health law practice in order to really think a little bit about how do we understand opportunities for using the law in order to achieve the greater social good that we are trying to achieve.

I am absolutely pleased to say that we have a great partnership with the CDC, the public health law program, and I want to thank them for all of their support in putting this together, their support and their inspiration, really, in putting this together. So without further ado, I'd like to go ahead and introduce our first speaker, first we will hear from Tara Ramanathan Holiday, she is a staff attorney in health equity law with the public health law program at the Centers For Disease Control and Prevention. She has used law extensively to address emerging public health issues, and has developed many of the core methods and guides for the field of legal epidemiology and is an important author in this area. And I want to also add that I think it's important that she began her career in public service as a peace

Corps volunteer supporting community development in Senegal, West Africa. So thank you so much for joining us, Tara, and I'm going to turn over the mike to you.

>> Thank you, so much, this is Tara Ramanathan Holiday, can you all hear me? All right. So I'm going to go ahead and get started. So it is a real pleasure to be with you all today. My talk really concerns the background and the history behind legal epidemiology and its connection to public health law, particularly at the public health program. The earlier slide had my credentials -- I am, unfortunately, not your health law equity law expert. I am the team lead for translation in the program. I oversee our legal epidemiology portfolio and all of the attorneys who work on various topics related to pretty much every area of public health within it. I've given this presentation so many times and I just in the last 50 or 60 times, maybe, I found people come up to me afterwards and say things like, "I didn't know I was a legal epidemiologist." And so for me, I consider this sort of a -- it is about educating you in sort of what the field is and what it means, but I hope you find something of relevance to your own practice, your own public health work and maybe pull from aspects of that work to understand how this field can actually help you. So I've been with the public health law program for about 11 years now, and most of that time, I was working in legal epi in some way or other. I have to provide you at the beginning our disclaimer just to say, you know, I'm a lawyer. I am not your lawyer. These materials are for instructional use and really for education. They don't represent any single determination or position of CDC or any federal agency. If you aren't familiar with the health law program, I have a couple of things I just wanted to bring up. The first is, you know, we have a bunch of material, probably on many of the issues you all work in and spend your days on, and they exist here on our public health law program website. Our mission is to advance the use and understanding of law as a public health law tool. To me, one of the things that I think folks can really take away from that mission is, regardless of where you sit, at which level of government, at which part of this country or another country, you are probably all practitioners and users of law in some way, either law or policy, you know, depending on how you define each. I think that really resonates with a lot of people, because what we're being asked to do more and more as public health practitioners is work with those tools of law and policy, and legal epi for scientists is usually a great way to get involved. The other thing I will tell you is that, you know, the public health law program itself does a bunch of work in this area. We are joined by many academic partners. Our mission is really to support governmental public health

agencies. So state, travel, local and territorial. Health agencies and their leadership and their practitioners. And so that makes us a little bit unique and some of the materials, some of the things I'll introduce to you today are from some of our work with our partners in the field who do legal epi, but the way that we approach the field is much more applied, whereas, you know, you'll see the same kinds of types of work done in academic centers and so on, which is really empirical work. And I encourage you all to kind of look at both, because they have different uses. So for everybody, I think, at this point in time, this makes sense. So the types of law that affect our law I think are really foundational and fundamental to understanding what we can then do with them. This framework comes from an article by Burs and others. They call it infrastructural, intentional and incidental public health laws. Laws that build and maintain our social, economic and physical worlds. They're incidental. Things like housing and education law. Things that we know that haven't been written with health outcomes in mind, but truly have fundamental impact on our health and the health of the public. And so everybody knows about these, and if you haven't seen the first webinar of this series, I highly encourage you to go to that. My boss, Matthew Penn and my colleague, who is our expert really laid it out there about how law in different fields and really in different ways can affect sort of our determinants of health as we know them. And so I encourage you to see that. The second bullet is very interesting for me. It says, laws are defined structures, the infrastructural law, those that determine what can be done at different levels, how those kinds of infrastructures play with each other, home rule whether or not a locality can have certain authorities because of how the state designates its powers. And so I really find this is maybe -- it's an emerging area of study in some ways. Although if you talk to political scientists, they'll say things like, what we've been doing for years and years. So I encourage them to also think about legal epi in this way. And then the last bullet is really the thing that most of us know that icon is a smoking van, interventional public law, the ways that we can institute certain programs or institute certain incentives or disincentives to control some kinds of behaviors and environments. And so I hope this resonates with many of you in thinking about how law impacts your world but, moreover, how you might consider the impacts it has on your public health activities wherever you might sit. This next slide I really love. This is kind of a historical perspective on what we just ended with, so the tobacco example. It's really tough to know for many scientists how laws and policies really are working. It's hard to tease out here in this chart of smoking rates at what point the legal intervention that you see

at the far right there, the federal cigarette tax doubling, at what point that was the driver of the smoking rates going down, or was it really a combination of some of those other interventions that happened or after World War II, you know, the Surgeon General's report, the education campaign, the nonsmoker rights' movements. Are those activities that led to that? It's lagged, but significant decrease in smoking. It's a really interesting concept, how we tease out where the law and policy are drivers of health outcomes, but, again, we're asked to do this more and more. More and more health departments are being challenged in their use of certain authorities, in taxation and cigarette warning labels, things like that. They're being really asked to justify very small details about why the policies or the laws need to look a certain way in order to have them continue to stand. And so, you know, there's a lot of challenges to our public health law work around the country and that we see today, and it's just something to remember that we really need to have strong justifications for that. And yet, we find more and more that the public health issues that we're dealing with really require sometimes complex and certainly nuanced legal solutions. So I use this example of, you know, pollution. How many different kinds of laws can potentially impact air quality for populations? You know, is it transportation laws, is it zoning laws, is it housing, infrastructure, what is it that really contributes to pollution and then how do you change the law or address the public health issues through the law in all of those different areas to make a holistic and workable solution. Same thing, emergencies and outbreaks. We're seeing it right now. It's not one, you know, federal law that makes the change that we see that can really impact our health and well-being during this time. It's a patchwork of state and local laws, and I'll come back to that. Of course, we also know that everyone wants to know how to create livable, walkable, you know, healthy living environments and complete streets, and this is, you know, one of the questions we get a lot: How do we improve our sort of existing local infrastructure? And I use this example because it's not -- you don't change one thing about a community and the laws that govern it in order to create a system of healthy communities. Again, it requires a bunch of different legal interventions sometimes as well as infrastructural changes, but then the final question, the money question, is how do we discourage Natalie choices or even better, encourage healthy ones? And that also is not typically a 1. One or zero proposition. You have to include many things in the law, but also in the policies of agencies and the way things are enforced and implemented in order to actually make behavior change. So with that, I'll say there are a couple slides from actually

the last iteration of this webinar series that I pulled out again because they really speak to how we can better use data to do some of these things. This is a slide that reflects a map from Robert's foundation. They have a series of maps from all over the country of localities, and they peg along these transportation routes -- so these are state highway, I believe, and the interstate -- and they mark exits and life expectancies at these different exits of the people who live around them. And it's really at that particular, right? This is a part of central California with a 12 year life expectancy difference. And the last webinar really talked about why that might be, what these sort of legal, infrastructural and interventional might be? The incidental public health laws that make this type of -- have made it happen historically and continue to happen now. For me, looking at this, I think of, well, how do I study this? How do I show that this life expectancy is attributable to something that we can change, that we can do something about through law and policy? And that's where we get to, well, how are we actually studying law and policy? Is it sufficient to say, "Well, a bunch of things happened before a law was passed and then some things happened after a law was passed." And that can be attributed to the law changing. So we have smoking rates before the law was passed and after. Is it because of the law that people are really smoking less or smoking more, maybe? And how do we show that? So we know, though, that we can't truly manipulate law and policy the way that we can manipulate randomized controlled trials and with a drug and placebos and we can tell -- you take a drug, you the placebo, and we see who comes out better. We can't do that with law and policy. So we're kind of left in this natural or observational experiments. But it provides such rich opportunities for evaluating law. In fact, you look here, this is about texting and driving, and you can see, you know, there's a good distribution in this case of states that have laws that, you know, prevent texting and driving and states that don't, and following what happens to the actual injury outcomes related to this down the line can be very informative and show people really what's working well and what's not. And if you take, you know, the analogy here and take it a step further with empirical studies, you can show, you know, a state with texting and driving laws, a treatment, say, and without, a control group might have significant differences in car crashes or fatalities related to texting. So it's something to kind of look out for, and it's an opportunity that we have. So that brings me to, finally, what is legal epidemiology. I have here a definition for you. It's the scientific study and deployment of law as a factor in the cause, distribution, and prevention of disease and injury in a population. This is the actual definition of epidemiology with the word

"law" added in. And the reason that is the case, the reason we did this is we being folks in the field who have worked in this space for a while, I think we really wanted to make this about law as a Public Health Research Tool, more so than the province of lawyers. And so we think that law can be really studied objectively, can be understood as having discreet impacts. It's not just a sheet of paper with a bunch of words on it. Each of the pieces of that law, different sentences can have different impacts. And we can study those. If we provide research that is scientific and systematic and so on down the line, research principles that we expect from pretty much studies in every other area, we should also expect from law, especially related to public health. And so I think this is where this term comes from and why it might be familiar to a lot of different people. Within the concept of legal epi, we have different kinds of studies. The one I'm going to show you a little bit more about is legal mapping. We consider this how we compare and contrast laws across jurisdictions and, moreover, across time. And this really provides some rich data. As you can see here, if you have quantitative data Dialogue4Health sets that compare let's say, legal, you know, documents or the components of legal documents and what they mean with health outcomes, you can show trends, you can use what we call surveillance of policy, policy surveillance in order to really get that kind of data. You can also show qualitatively discrete impacts for public health if you can say, for agency authorities, for programs and for the folks who might be regulated in a particular environment, and that allows us to use some cross-sectional data from law, and say, well, what does the law at this time mean for your [off mic] which is also a rich source of data. So I want to show you examples of how we've done this. The first is, we really have legal data to inform the public. I'm sorry, this used to be a PowerPoint presentation, and the graphic, the CNN health graphic would fly in. So this is [off mic] on the slide, but I wanted to tell you that, you know, we have created in this case, a data set. From all over the can you be, from the state, tribal, and territorial level. It's an extremely rich data set throughout this pandemic, and we've found that, you know, the types of things that people are doing within those authorities, those laws, really, are linking to certain kinds of behaviors, certain kinds of outcomes. So you'll see, the CDC report says people in four key contracts are listening to stay at home orders. Even though that's not exactly how we'd frame in the science, we can show certain places with certain orders in place have certain population-related activities or outcomes that we can measure. That measurement is really powerful, because it allows us to track progress. So here is one of the

four cities that we have data from, and you can see how the first emergence declaration to limits on large gatherings, to school closures, how all of those related to this larger percent of folks leaving home, in this case. You can also start to show what works and what doesn't. This is a study from a few years ago related to Medicaid and how Medicaid was changing reimbursement policies, in this case, in Illinois, for providing young children behavioral therapy instead of medication for ADHD. And so in very young populations, 2 to 5-year-olds, you can start to see the change after what happens with the vertical line, which is the policy being instituted, what happens after that. And you can see the same thing for the older age-group, 6 years, and it's very interesting to show because you can start to see, well, the policy had an effect at this time and every change in the policy at these repeated effects over time. And that's really powerful and rich information. And, finally, on the qualitative side, you can ask people. Make changes in laws, infrastructural changes in this case, some work that our work did on electronic health records, when that was a relatively new set of policy levers changing from paper to electronic, we realized that, you know, that really impacted outbreak investigations and control. And so at that time, these kinds of guides are still used because they ask people, what are the best practices that you had related to this change in legal environment and we were able to send a tool kit to study the information. So that's really great. So I'm going to end by saying, what does this mean for you? So we have these tools to show how law is really working or not working well. The truth is, we can build capacity across the field throughout the field, and we have been for several years to build their capacity to do legal epidemiology in house perform. And so some of the things that we found that really support that allow people to understand what the best practices are related to law and policy that will then hopefully, improved health outcomes. Those things are really information, infrastructure and support on our own, we try to provide a bunch of information. We have what is called the public health law academy, and within that, the legal epidemiology center. We can get a host of materials and information and guides about how legal epi works and what you need in order to be able to do it. Infrastructurally, we run different programs for public health practitioners as well as counsel, lawyers to public health departments that law them to do their work better and in tan Democrat better. We also have our own internal -- just became external, actually -- information system that allows us to house legal epi data sets, and if that is of interest, please reach out. That is called the public health information portal. It allows us to do our analyses on laws and policies and save them

sort of just like any surveillance system at CDC. And then we provide a ton of technical support to departments. With that, I want to tell you about the STLTs project. This is the state, tribal local and territorial legal epidemiology program, which has been an initiative that has been funded through CDC, through our office [off mic] to be able to work directly with jurisdictions, some of them you'll see highlighted here, some of these are the states we've been asked by the localities to sort of information confidential for now until we publish and use this work. But I wanted to kind of show you that we've been working around the country with folks on how to build legal epi capacity in house and how to really use the tools that we have to further their own work. So, again, here's some information about where you can find detailed, deep dive into legal epi, certainly on our website, and how you can reach out to us and I believe that's the end of my presentation. I want to turn over to Michael, who's really been, you know, one of the partners in one of the jurisdictions, I show you that has taken the work to the next level. And I want to leave it to him to show it how it's worked. Thank you very much.

>> So I just have a couple of questions for you, Tara, before we move on to Michael. And I'd like to take this moment to ask you a few things that people have asked from the audience. Before we get going on the questions, though, I want to remind everybody, if you missed the first session that we held in this series, you haven't missed out. Just go to the Dialogue4Health website and you will find that recording posted there. So you can still download it and see all of the slides and listen to the speakers. So maybe, Tara, what you could start out with is just talk about some of the ways that non-lawyers can be involve in legal epi research and maybe give a couple of examples of partnerships between community health practitioners and public health practitioners.

>> Tara Ramanathan: I'd love to. So this has been a real focus of our work for a few years. Matthew, our boss has really pushed a bunch of us so we can better work directly with public health practitioners, and that's where a lot of work has come from. We work public health departments. Typically practitioners from all kinds of different backgrounds, politics, epi, data scientists, the list goes on. Health departments reach out and say, hey, I want to be able to use these tools to do different things. We might have a lawyer set them up, train them, but it's the public health practitioners doing the work, and it's folks from all kinds of backgrounds. We consider this a trans-- field, which means that you have to have a bunch of different perspectives at the table, including lawyers, but not throughout, certainly.

A lot of it comes directly from the public health practice, and so the public health practitioners who really contribute to it are the ones that know what the data means, that know what's happening on the ground, that know how to engage their communities in what's working well and what's not working we will. We've been training health departments to do their own policy surveillance over time. So mapping studies over time that really impact their own initiatives. And Michael is going to talk about one of those. There's a bunch of different examples that you can find. Happy to sort of send out resources about it after this. But there are sort of jurisdictions that have approached differ topics and you won't see a JD behind any of the names, pretty much that do this kind of work. So hopefully that helps.

>> Thank you, and I have another quickie maybe not so quick. Can you speak a little bit to how legal epidemiology has been used to study laws that may not traditional health law? Because they address a social determinant of health can have a great impact on health.

>> For sure, yeah. This is maybe one of the biggest, most important areas that public health lawyers are working on and focusing on now. There have been many initiatives around the country, too many to name to talk about the impacts that housing has had, how economic activities, earned income tax credits, things like that, have had on certain kinds of public health outcomes. You know, everything from opioid uses to injury prevention of different kinds, violence prevention. I'll say, you know, the first webinar of this series, again, to plug that, I think Sam, who is a staff attorney of health equity law expert in our office, she really has been spearheading some of our work on understanding how civil rights laws and other laws that really, again, are not intended with health in mind but have significant health outcomes, how those look in different areas of public health practice, in everything from, you know, health equity as a overall endeavor, but with special focuses on immunizations and things like that. Really an area to keep a watch on and I said this before the presentation started, but legal epi -- legal epidemiology now a mesh term that you can kind of search for if you're looking for articles and new things that come out. It's just as a year or two ago, a few partners have spearheaded that effort out of University, and they've got that instituted as a mesh term at our office. And that allows us to have an institutional knowledge about sort of what has been done in this field, and allow folks to have a home within this practice, sort of have their work highlighted. And so it's an area to keep an eye on.

>> Murlean Tucker: Great. I have a couple of questions from our audience that I think you can start to answer: What research or has there been research done on the negative health outcomes of incidental laws within the criminal justice system?

>> Tara Ramanathan: You know, not from our office, but I would point to you, there's a really interesting group out of, I think, Harvard that looks at -- it's very innovative work because they look at interventions that they can actually control, not natural experiments like what I talked about, but actually more randomized controlled trials-type studies on access to access to justice in various kinds within populations that enter and leave the criminal justice system. I'm blanking on their name right now. But it is out of Harvard I believe. It should be fairly searchable. The group that I think that really works in that space. Although I'd love to think about other examples and send them to you if you'd be willing to share.

>> Murlean Tucker: That would be great. Thank you. Another question I think that is quite good right now: How does the data collected feedback to inform and update laws that produce poor health outcomes, and are these laws amended through the legislative process?

>> Tara Ramanathan: I love this question, it feeds perfectly into Michael's presentation. I think the interesting thing from our perspective is that jurisdictions use this type of information for all kinds of things, so the capacity-building efforts, I told you, you know, while we taught people essentially how to do these analyses of law and policy, they didn't necessarily say, well, this is going to inform this legislative initiative. They went into it thinking, it could, it might, depending on what we find and I believe some of them had plans to share this with legislative liaisons or other folks that were able to work with folks in their jurisdictions. I think that is a compelling use of this information. But some folks find it useful for strategic planning within their own health departments. How do I better use laws and policies within my health department to effectuate equity, to effectuate better outcomes within the work we do. Can I add it to sort of our list of priority sort of areas in which to build workforce competency? Can I use this as a tool to get folks more comfortable with our own regulatory processes and procedures and how to improve those, because it's something that we have a lot of control in our health departments also. Those are the kinds of things that we've heard people take away from the practice. It's not just, now we have a data set and now we can use it to do various things. Like we use other data sets, but now we have a tool and a skill set that allows us to tackle many areas of public health practice. That's some of

the stuff that I love hearing about and that I really love find is common from this kind of [off mic].

>> Murlean Tucker: Right, so before we move on to our next speaker, I have just one last question, and I think there will be some additional questions we'll get to in a joint Q&A, but can you just talk for a moment about the public health law academy?

>> Yeah, so it's an online course. We have a cooperative agreement CDC has a cooperative agreement with change solutions in Oakland in California, who do amazing work related to public health law as well. They have worked with us for seven, eight years, at this point, maybe. Many, many years on building this capacity in the public health workforce to better law and policy. Not just in legal epi, in other areas of public health law as well, and the sort of output of that has been the public health law academy, there are trainings about many different topics in public health. There are some new ones that are exciting coming out, social determinants of health and law, administrative law, sounds really boring but is actually super impactful for agency work. Those trainings really help build the nomenclature, build the sort of confidence and competence in the workforce that's not legally trained to both understand what the law means and work with sort of what the laws in their jurisdictions say to understand, you know, what's necessary. What's the next thing? Is it legal epi or is it something else? There are some really rich, you know, trainings on legal epi within the public health law academy that I'll point you today, because it's our goal to do that. But the basic sort of set of tools that is visible on the academy is really incredible. And all those trainings, if a practitioner in a health department is comfortable to look at those and understand what they mean and think they're applied more widely, there are facilitators' guides to go with them. So you can take that and use that training to then inform your workforce about the things that you need to know. So ... that's what I got.

>> Carmen Nevarez: Thank you, thank you. That was really good. I'm going to go to introducing our second speaker, and we'll come back some questions from him and then come back to the audience questions and answers. It's a pleasure to be introducing Mike Ellsworth, who serves as the federal liaison and review officer, he's the policy counsel for the Washington state department of health. Mr. Ellsworth advises the Washington's Secretary of Health on federal legal issues and advocates for public health priorities within Washington's federal congressional delegation. Mr. Ellsworth -- includes [off mic] decisions. And he began his career in public health in public services as a law clerk in the king county law

association. So with that background, it's really a pleasure to be presenting Michael Ellsworth. Mike, you're on.

>> Oh, thanks, so much, Carmen for inviting me to share Washington state's application of legal epidemiology. The last webinar was very exciting and engaging to public health practitioners like myself, and I was honored to receive this invite to present with Tara.

So before before -- I want to put out the disclaimer that I'm speaking for myself and not on behalf my agency. I came into public health in a side door. I worked in health and regulatory health law for a decade in a division of my agency. I was promoted to a agency's law. And increased my awareness about law and policy resources. And I was originally connected to the CDC's center for state, tribal, local and territorial support through the association of state territorial health officials, because I was hoping to organize a virtual training on public health law. Little did I know when I connected with Tara that they had other plans for our jurisdiction. CDC had an opening for a jurisdiction to participate in a legal epidemiology project. I thought this would be a great opportunity for my agency. As part of it, Tara came out and helped lead a two-day training for a lot of staff as pictured on this slide. Before we dive into applied legal epidemiology, I just want to make sure you know what an alternative is. A traditional legal survey, and that's when he is pictured here. A lawyer will identify key search terms and then enter them into a legal search engines, instead of finding an answer to a question, you get a summary of laws related to the topic. What you see on this slide is a legal epidemiology chart. You have specific questions, and answers for each space, one limitation with the format is the chart is very long, in this case, 12 pages, to be exact, for all the states, questions, and citations. In that same report, we have -- summarized in this beautiful info graphics, will do that legislators and other stakeholders can see what others are doing. When we had a measles outbreak in our state, which looks somewhat mild compared to the COVID pandemic this year, but in 2019, we had a measles outbreak, and when we were addressing some of the policy issues, I went to the CDC report, and the information in there was so useful in making recommendations on policy response or just knowing what other jurisdictions were doing. Because that's always a big question for legislators and policy makers. And so, you know, this was a info graphic that we included in briefings to the secretary of health that the CDC put together. And then, finally, you have data atlases. And the website LawAtlas contains informatics of which states have responsive laws, and there's great studies there, including on alcohol and cannabis and all kinds of

public health issues. That was one of the questions in the Q&A on the side. This is a really functional, interactive tool for policy makers. And to get information to the point it can be published on LawAtlas, you have to go through the process on this sheet, created by the -- as part of the project, we received four virtual trainings with Temple University. I want to quickly run through this diagram. The sponsor defines the scope of research. Staff conduct background research of secondary sources in a five-state survey. A team develops coding questions based on the background research and five-state survey and then two teams collect the laws they think are responsive to the coding questions. The second research team or redundant research team, as it's called is a really important part of the process, and I'll speak to that in a little bit. Finally, you code the results into an online database, have another team do quality control, and then publish. So I did not fully understand the rigors of academic legal epidemiology when we entered into this project but as we've gone through this process, it's really increased my confidence in the results. And -- sorry. There was a slide there that I thought was in there but is missing. Sorry about that. It was a chart that had all our research on it. It was pretty extensive. But maybe it's later on. Excuse me. I'd like to share some lessons we've learned from this project. First of all, law and social science in the intersection, also the importance of scoping the problem, legal ambiguity, data swamp, data lake and data atlases, and, finally, you know, public interest. First of all, to me the term legal epidemiology makes the subject sound more intimidating than it is. It seems like since COVID-19 a lot of people have become legal epidemiologists. I can't blend that title, to me, it blends law and public health. It seems to include folks from a wide variety of education backgrounds, and we had individuals who were epidemiologists and also people who were subject matter experts on the subject we picked as well as staff attorneys where available. So we had a great cross-section from our agency supporting this work. You may have seen in college textbook captures a lot of the challenges we faced in conducting this research. We started our legal epidemiology project in the summer of 2019 on a rather ambitious project. This is the regulatory process 35 states use to determine whether new health care facility capacity should be permitted in the state. This is a really contentious issue. There is a lot of research out there on whether certificate of need is effective. However, the published research often does not identify specific laws and you end up with a battle of the experts. Some experts say it's good, and some experts say the system should be scrapped. It has limited usefulness. However, we may have been overly ambitious in our

research and ended up on a Quixotic journey. This experience really highlighted the amount of ambiguity there is in language and law. The joke goes -- you will get 11 different answers. Similarly, it's really hereditary to get a "yes" or "no" answer out of an attorney, and that is when legal epidemiology process tries to do. Trying to fight complicated legal complicated into yes or no answers is no small feat. There were a lot of times when we would read things differently. The legal epidemiology process tries to reduce the ambiguity to ensure consistent interpretation with feedback loops and quality control errors. I didn't know how novel the LawAtlas and the underlying software is. Most of our data is a swamp. They share it on the hardware or cloud. And there's little organization. IT agencies and government is trying to create a data lake. LawAtlas -- IT folks are very impressed with this work, and indicate this is the direction agencies are trying to move in using AI to clean up and systematize to create spatial data atlases. It's weird doing this -- when we started, there was interest from legislators and lobbyists, but this takes time. This has what -- how to create timely and responsive findings that people who are making decisions are even aware of? I'm looking forward to finishing our legal epidemiology project and seeing how useful it is. Although we are still working on our project, I've learned a lot on our journey which I have applied in my daily practice approximately I want to quickly go through some of the practical applications I have found so far, including how we have applied it at our agency what I call legal epi lite, a greater recognition of the limitations, and finally some resources I found useful.

This project has increased staff awareness about public health law, legal epidemiology and national resources from policy work. We will use the certificate of need legal epidemiology project to frame development. Also, staff who have worked as part of interdisciplinary teams on this project can use it to lead future legal epidemiology projects. Right here we have a legal epi lite or what I call legal epi lite. This is an example of the work my colleagues have created this summary. It's a 15-state survey of facility enforcement laws. We limit the number of -- from legal epidemiology, including background research in a five-state survey to define scope for the project. This process made me realize that a lot of richer on policy and law is not as reliable as I thought it was. For example, published research will indicate that states have laws on respective issues, but do not provide the underlying citations for the reader to look at. I don't find such research very incredible anymore. Now that you know pour about legal epidemiology, hopefully you will seek out

other sources part of your research. Right here is a list of websites that have legal epidemiology and also trainings on the subject. So love to get the questions, Carmen, thank you so much.

>> Wow. Mike. That was really good. Thank you. So both of you brought up some great stuff. I have a couple I want to pitch to Mike. Share a little bit about Washington state department of health, what they're using or how they're planning to use legal epidemiology in its work. Just give us a little bit more detail in some particular area you found to be interesting.

>> Well, as previously mentioned, you know, being aware of legal epidemiology resources and using those to address policies issues like the measles outbreak and what sort of policy options are out there as far as vaccine requirements has been really useful. Going through the process of this research on certificate of need even though we're not finished yet has been really useful. Recently, we were looking at ways to fund foundational public health, and even though it wasn't one of the questions that we set out to look at in our research, I remember that Massachusetts charged an additional fee on certificate of need to fund public health interventions and communities. And so we brought that up with legislators as an idea on how to get there. We will use the research results. I'm really excited. We're one-third of the way through. We end up going through 15 to 20,000 pages of law to encoding 93 questions and both teams have mapped out all the laws out there. And now we're in the process of going and entering into the data system, we're one-third of the way through that. We're really hoping to use this legal epidemiology project as a way to do evidence-based policy work in this space and see if we can move stakeholders forward on it. So just a lot of great outcomes and the people who are part of the team have been using this in their daily work. I get law clerks now on a quarterly or semester basis and teaching them about this. There's just a lot of excitement around legal epidemiology and what it can bring to the field of public health and law.

>> Perfect. Talk a little bit about where some of the best starting points are for people who want to learn more about public health law research and legal epi methods.

>> That's a great question. I think the sources that Tara highlighted from CDC are a great starting point. There are very traditional public health lawyers nationally and also people -- the only public health -- that are aware of legal epidemiology and yet it's growing. The awareness is growing. And so connecting to the CDC also, there's the network for

public health and a lot of research that's published there is presented at their annual conference and we have a virtual conference coming up, September 16 and 17 on COVID-19. And it's quite possible that more legal epidemiology research might be shared during that conference related to COVID. So going to the websites that were included in this PowerPoint training and looking up CDC site, LawAtlas, lots of great resources out there, and once you start digging into it and networking out, you realize just how robust it is.

>> That's really helpful. You talked about the LawAtlas during your presentation. Can you share a little bit more about how that can be a useful tool for practitioners?

>> Yeah, LawAtlas has so much great info. If you go in there, I forget the title to go into all the different subject matters where they've compiled legal epidemiology into those interactive maps, but, you know, whether it's alcohol and cannabis or COVID-related or just everything, it seems, there is oftentimes research there, legal epidemiology research that's gone through that robust process there with those interactive maps where you can go through the questions, you can check the boxes to see what states have what laws on it. It's ever growing. That's why it's important to have presentation like this to increase the awareness, to increase the amount of people participating and trying to create these resources for all jurisdictions to try to address these public policy issues.

>> So I'm going to bring Tara back into the conversation. And I'll ask some questions and then each of you will have a chance to answer and then I just want to remind everybody that if you missed it, the first presentation in this series is already developed and has been stored on the Dialogue4Health website, and this presentation, including the slides and recording, will be available on the Dialogue4Health website and will be out in a week. And you are absolutely free to send a link to the site to any of your colleagues whom you think might be interested and, again, we always want to hear from you about the kinds of issues that we might want to do going forward. So let's -- let's look at some of the issues that are being pitched to us by the audience. I think we've got some really good questions raised. So I'm going to start with many states have recently declared racism as a public health crisis. A common structure for operationalizing legislative resolutions like these is the task force. What would you suggest to keep a focus on restorative social policies, Tara, why don't we start with you and move over to Michael.

>> This is such an interesting question. I was kind of trying to think about how to parse it. There's a first -- there's several different ways that we approach looking at at the

relationship between law and policy. It's not just a linear timeline, right? It's not just that you have a policy or a law in place and then there's some health outcomes. Ideally the health outcome and the knowledge and the dissemination of information about what the sort of public health, you know, state is, the way things look in different areas informs then how law and policy are sort of framed and revised and cleaned up and added and, you know, made modern. And I think there's a couple of different things here: The first is that, you know, you mentioned a task force, which is usually the way that folks are trying to -- many of these sort of declarations are trying to address this issue, and I think, you know, the community engagement piece, it often is the starting point. It has to be the starting point. But how do you sort of more long-term think about the institutionalizing of sort of racial justice, of equality, equity and more importantly, just a sense of community engagement throughout the implementation, the enforcement, the, you know, understanding of health outcomes piece. I think that's really, you know, that's where our focus has brought us in the last, you know, I'd say 10 years of this legal epi sort of work in our office. I'd say there is a sense of continuous improvement throughout that cycle of, you know, now we have a declaration that says that racism is a public health crisis and here's our first step. We're going to convene a task force or we're going to understand what the community needs are. Whatever that might be, wherever they're starting, the census, the policy has to be evaluated throughout its sort of -- throughout the process so that you know that -- so you had a task force. Well, that didn't really have an immediate impact on the community today. So what does the community want and what exactly is the best evidence out there for how to get that community, those, you know, those services or those needs. Have those needs addressed. I think there's a sense of that I think the second sort of thing that came to mind is, well, how do we ensure this the laws are working for a long time and it hearkens back to some of those graphs that I showed at the very beginning which are, we currently have some knowledge of what impacts some kind of laws have had, we think, such as smoking, tobacco control, and probably some other areas that I've seen mentioned in the Q&A as well. Probably more. I think that the difficulty here is that, you know, we want to see that kind of a chart brought out for the future. Right? That's why we surveil. The difficulty I find in a lot of jurisdictions is having individuals understand what the law actually says and what it means for them. Individual stakeholders, communities, there's a lack of what I will call legal literacy in typical populations. Not just in the public health workforce. You know, in a community, to know, well, where do I go and find

the laws that impact me? How do I know which ones are correctly in effect? How do we know that we are applying those laws justly? You know, equitably, and so on. And that's a ambition proposition. We have colleagues, legal epidemiologists, I'm thinking of the state of Indiana, we have one colleague who's gone around to look at opioid-related policies at the look level in counties throughout the state, and he has to go through the records offices to pull paper files, because they don't have the resources in those localities to put those laws into books that you would think of, you know, the typical lay library books sometimes in the background of your local I don't know lawyer that advertises. Those books aren't necessarily available at every level. Whether those documents are scanned and made electronically available is a whole different proposition. And oftentimes the answer is: They're not. Whether the county pays for their laws to be uploaded subway service like community code. We don't have really holistic or current, sometimes, legal research services. And so it's up to us sometimes as public health practitioners, to say, all right, well, I'm going to keep a record of this law. And I'm going to try to make this law understandable. I'll say this about this question, that we assume that the information about whether a law is working justly and equitably and addressing what we wanted to address can be measured and can be studied. But sometimes, the problem isn't accessing the law itself, and it goes back to the question earlier, is it the realm of public health practice to be working in legal epi, and I think it absolutely is. If we don't even understand what laws apply to our work. It's super hard for others. It's also a good chance to engage your health department council, if you have one, or, you know, somebody who works with you all in local academic institution. Something like that. To be able to stay, can you help me understand what the legal environment is on this issue, even where we are right now, let alone whether it's working well in others. Okay, off of my soapbox. I'll let Mike go.

>> Mike?

>> Yes. I guess I guess I would kind of go back to possibly -- it would be great, you know, whether or not whether it's the center with The Health Equity Law, the CDC to be pulling these laws together or somebody to champion that work because there is such a need at the local level to understand that policy landscape nationally and seeing what interventions are being attempted and are there model standards that we could be incorporating into our policies to improve equity and health in owl policies. And, you know, it's interesting, like, what the LawAtlas says, because the research related to health in all

policies and health impact assessments, I was just trying to click there as we were talking about this, they're dated, and looking at this, we have those laws in Washington state, and taboo reflect that, because the research was done at a specific time, and it takes a lot of resources to update this all over again. And so, you know, given Black Lives Matter and just all the social equity stuff that communities are trying to work through, this would be an incredible tool. And yet to have those tools in place and those resources in place, it may not get there within the next, you know, period of time that it would be particularly useful to make some of these decisions given how much momentum there is on these issues.

>> Thank you so much for that. I want to just shift gears a little bit and go back to a question that was asked a little bit earlier. Have you produced any analysis legal database concerning alcohol or cannabis, any plans, if it's not the case, and is there anyplace you might turn this particular question for finding that kind of a search information? Tara, why don't you start?

>> Sure. So CDC runs a system called APUS, the alcohol policy information system, I think. That's usually where we turn -- it's a part of our chronic disease at CDC National Center for chronic disease prevention. I think they have the most up-to-date information. There's surveillance over time on alcohol-related policies in jurisdictions. I believe it's just state level. I don't know how many metro areas are included, if any. It is a good starting point. It storefront has the policies that have been deemed to be the most effective in how well jurisdictions handle that. I haven't specifically mentioned the colleagues that I've referred to throughout this presentation. I should have. The first is, again, LawAtlas. So temple university's policy surveillance program led by Scott Puris. That group has produced what we think of as the best academic empirical research, the stuff that gets to, can I get closer to sort of the causation proposition, can I get closer to showing, you know, this law is linked with a particular outcome. That, there are several studies on there that I would point you to related to both of these issues. I think there are many groups, though, throughout the country that collect and analyze this information. The thing I wanted to mention -- the first thing it made me think of was, most recently when Colorado passed its marijuana-related legislation, in the law, the legislature required the public health agency to collect I think it's a public health agency or a group of agencies to collect data on the impact of the law of legalizing. And so it's super interesting. It's one of the best examples we have of a governmental body requiring surveillance and analysis of impact. So evaluation of their own

laws and it's something to look out for. Those kinds of studies will track over time the changes the population is seeing on various kinds of outcomes and I think the tracking and the outcomes and the type of evaluation done is left a little bit up to the agencies to figure out, so they'll look like whatever they have decided to produce. But I know that's publicly available information. So I would point to that.

>> So Michael, you're in a different situation. How would you answer that question? What do you see in Washington?

>> Well, I would completely agree with Tara that there are national resources out there and I would point to the same ones. And, I guess, one other thing that I don't think was mentioned in our presentation that I think is super cool about legal epidemiology and just where I'm really excited to see it go over this next decade is how -- once you've turned law into empirical data and it's coded, you can start doing regression analysis between those interventions then public health data or population data and looking at over time, especially if you can get longitudinal data on law changes, what impact does it have statistically? And so it's just, as we're starting to create more order with all the Big Data that's floating out there that isn't really information or things that our brains can use this much for policy analysis, it's really exciting in this space how it's creating some order or creating some evidence-based best practices that other jurisdictions can look at. And it's been really exciting, some of the peer reviewed published journal articles that Tara has shared with me this folks in her office have done where they've looked at the relationship between policy intervention, laws, and data as far as outcomes. And hopefully, we'll get the same sort of research in this space eventually.

>> Great, thank you. So let's switch gears a little bit again and talk about the implications for legal epi for occupational health law and workplace conditions. Tara.

>> Tara Ramanathan: Yeah, it's a great question. But I am not actually not as familiar with this area of public health work, I hate to admit. So just in this COVID-19 epidemic, there have been so many links between what states require, authorize, exempt, and how they're addressing workplace safety and health issues that we do actually, I think this is the first time at least I have seen legal epi data at CDC linked with some of those, you know, what to do sort of documents, how to address this issue in a particular place. And that data set that traction the changing orders of different -- is available through the GAS system that overlays different kinds of did the. It doesn't answer the question specifically. I think that

this, like many areas of public health, honestly -- is an area to expand in, is a public health law -- it's something that has been historically understood as the questions we get typically relate to workers' compensation. It's not just that simple. And there's a lot of prevention work that goes into workplace safety and I think that airs a lot of unmet potential for how we study and understand outcomes and impact. It would be hard to get depending on what workplaces themselves have to report, if at all. But I think it's a terribly interesting area and I think that it does offer potential -- times like this offer interesting potentials for that area of public health law to sort of expand into more scientific legal epi-style endeavor. So thank you, really interesting question.

>> Great, thank you. Michael?

>> Michael Ellsworth: Once again, LawAtlas has some research in that space, and though it may be somewhat dated, one of the things that I have appreciated is that as a policy maker working on different issues and when I'm working with different subject matter experts, I always want to know what other jurisdictions have done and being able to have that condensed in some sort of a place where you can see those options, just to see the variety of options you have to solve a specific problem, and so even the research there may be a couple years old, depending on whether you're looking at agriculture, construction, maritime, there is some legal epi research in this space, and if your jurisdiction has the ability to take this on and update it, it would be better for everybody out there. So I would definitely look at LawAtlas if it's something interested in to see if there's research already out there that is potentially responsive to the issue you're trying to address.

>> Thank you for that. So how would you use legal epidemiology to assist in eliminating lead poisoning and other environmental injustices? Tara?

>> Tara Ramanathan: So it's much the same principle, I think. It is a question of which audience you're trying to influence. So because -- lead poisoning, I feel like is a true public health endeavor and yet the way that the prevention of lead is undertaken may not simply be within the purview of a health department, or an environmental agency generally. They may be outside the strict authority of a public health department to do something about it. It could be simply a private housing issue. There are lots of different ways that environmental concerns, I think, pop up in terms of law and policy. They're not always within the strict jurisdiction of a health department. Interesting because of that, it takes a little bit of interesting of whom you're trying to impact and which laws, therefore, are the ones that

you're going to be looking at to see how they're working, if a question of actually improving them, who are you trying to speak to and what data is going to be compiling to that audience I think becomes very important when you're talking about different agencies or different stakeholders or different legislative interests and sort of focuses at different times. And having a good sense of where you're going when you're embarking an legal epi project related to any topic is super important. Mike had that lovely slide about scoping, it made me laugh. I will say it's a place where we spend a lot of time is working with our scientists and sometimes regulators, sometimes different folks to understand what exactly the issues that we need to look at or and how much political capital sometimes there is to make things if any are needed, and that becomes sort of the frond-end question more so than something that once you collect a ton of data that you then address at the end.

>> Mike?

>> Mike Ellsworth: You know, if I would -- our public health is an umbrella agency. And we have environmental health as part of it, including lead. That's a big issue. Safe water, drinking water, you know, I would definitely reach out to Tara, because it's, like, and that that's one thing I'd say -- check out LawAtlas if you're working on any policy issue. And also reach out to the center at CDC to see if someone has already done the research. And if not, I'd probably jump into a legal epi lite and do some background research, connect with the subject matter experts and then start with a five-state study and, you know, look at the laws and figure out some coding questions, basic coding questions, and use that as a feedback that five-state survey to see, are these the right questions to be asking? Are there responsive answers to it, including your own jurisdiction, and then expand that out. What I've found right now is it's really tough if you're in school to find meaningful work opportunities. You know, employers aren't hiring. And there's a lot of need for students to get hands on work experience. This is great, people in the public health schools or law schools or, you know, whatever connections you have with colleges and universities, these are great projects that are defined and can be done in a couple of months. If you're working to get one of those projects done to figure out what are the spectrum of policy options in that space.

>> Well, you guys are really going well. We're trying to pack a few more in the last few minutes here. So maybe you could talk a little bit about both of you, about where the kinds of rigorous questionnaires that are available to use to evaluate laws, where would somebody find those? And we'll start, Tara, with you. So -- there's a couple of, I think,

nomenclature things which I'm going to start with. The first is, the sort of questionnaire, what we do to read the texts of the law and understand what its impact might be, that's often, we call that a coding scheme. That's often created by us, meaning if I'm reading a law about environmental health and I might look at the text of the page and see certainly what the law says, but I'll also talk to the scientist and the folks that work in that area be in that public health area, to understand, you know, what is important for them to know about the law? What areas and issues and challenges are they seeing that time reflect in law, and does the law reflect those same things? So the questionnaire that we sort of issue to look at the text of law and read it becomes important. It's not, unfortunately, we have tried and we can't really use qualitative data, software tools and things like that to analyze the text of laws and policies, because that's not just how they're written. They're sometimes super vague. They cross-reference different areas of a legal code or a statutory or regulatory code, that don't necessarily translate as well to sort of qualitative coding. There are some sort of efforts being made related to AI and whether that can be used right now but at the present time we create our what we call coding schemes based on the public health importance and then the use for the data. The use for the legal information. The second thing, which I think the question is also alluding to, is evaluation. And if there is a -- if the question is referring to in qualitative evaluation, what kinds of questionnaires do you create to kind of ask participants about their experiences and understanding of how the law has had an impact, that is a different proposition. Actually, in our office, we have the benefit of having an evaluator who does much of that type of thinking for us. And we work with evaluators around CDC in different areas that want to do evaluation, qualitative evaluations of law and policy. They are often the folks making the questionnaires. We have tried to provide input and it sounds a lot more direct, direct question and answer question asking rather than the qualitative question asking that experts really rely on. The survey instruments that they create often do come up with the exact same that we would want to ask about, but they just do it differently. At the end of the road, that data has just been such a treasure trove. As a lawyer, it is rare to be able to see the impact of the law after you've helped draft it or after you've sort of figured out what it's going to mean for a public health agency. It's hard to know what happens after that. And so it's super rewarding for myself as well as the folks on my team to look at that kind of data -- on the flip sides, it's also a way that we have produced some of our best sort of resources and tools that go back out to the field, because we'll ask people what has worked

well or hasn't, and we'll get information, like with the electronic medical records, the study, the study was a qualitative evaluation that we worked on with several parts of CDC on, but the data that we got from folks in the field was so rich that we were able to produce a tool kit from us. People sent us examples of data use the agreements that they had produced to make sure that public health agencies could get data during outbreaks. They sent examples of -- things like HIPAA notes and things like that that they had used to provide information that they had talked about, but that, extra, we asked them, can we use to show other people, and they said, yeah, feel free. And we put it up on a website so people could access. So hopefully that addressed both parts of the question.

>> Great, Mike?

>> Michael Ellsworth: I just nerding out with Tara and the rest of the CDC. I don't know how much I'd have to add. With the legal epi project we did, we had subject matter experts, and Tara actually helped us facilitate an initial brainstorming session to think about what kind of coding questions we were going to look for in the laws, and then I worked with an interdisciplinary group of people, only, you know, one other person was an attorney, and everybody was able to slog through the laws and really read and interpret them and the process, the feedback loops ensured that we got to a place that there was consensus around our findings.

>> Thank you so much. These questions that we're getting from the audience are just really broad. I want to go to another one that is going to hopefully surface some good insights from the two of you. How or when or do you ever think about including international law in your work? How would that assist you in your work, or do you see any value in that?

>> Yeah, we actually had a staff attorney who worked with our Centers for Disease Control. They have had a global health law and policy project for, I want to say four or five years, and we've had a couple of different staff attorneys over the years work with them on that. They also vetted an attorney in house to help them with that work. It's very targeted to helping jurisdictions access and provide information about their own laws in a sort of collaborative way on global health security, agenda-related topics and just doing that work has highlighted, honestly many of the same things that our domestic work is highlighted. There are significant gaps in being able to access the laws and policies for different jurisdictions, you know, when we look internationally sometimes the best you get is the national level law, and whether or not there are state or local level laws, they may not as

easily, readily accessible, and we've used that sort of international data in every, certainly large international outbreaks, like the one that we're in right now and object to the form of the question, Ebola before it and we've used that to be able to inform and understand, you know, our domestic [off mic] as well, but I think what's really the common thread between our domestic priorities and our international ones has been, you know, the methodology still fits. I think there's some really interesting work coming out of WHO and, again, Mike mentioned the folks that that [off mic] they have been involved in some of that work. I'm thinking of our colleagues at UNC. There's a bunch of different public health law experts. Of course, Larry Gossen in Georgetown, those folks have been working in the international space for a while and the issues may differ in the way that, you know, governments around the world, I'm sorry, address their issues, through the law, the mechanisms may differ but the principles of legal epi still apply because you're still able to say, well, where -- for a public health program can we trace back to the law how it does or does not address it? Something is the law having its intended impact? We take that quantitative data that we create from comparing and contrasting laws over time and across jurisdictions, and can we take that and look at other kinds of data sets to see how things are working, or whether there are significant challenges and how to address them. So I think that goes back to maybe one of the first slides I know is, which is really, legal epi is a tool, and it's shown to work in so many different environments and different ways. I think that what has been most interesting work in my work in the last few years is how applied by governments, actually public health agencies and public health practitioners, and so it's been a great honor to work with Mike on this stuff, and I also share his feelings about being able to talk to him about it. It's been such fun. I will say that as we build capacity in health departments and for anyone listening that wants to have an opportunity to think through how that would work, happy to talk about that within our program. I think that the way that it's applied to different issues will depend very much on the goal of the folks involved and I think a lot of the work that is happening, this large scale, empirical rich data sets is really important. It's just not necessarily feasible with government resources. But we do rely on it for knowing what's happening in the field, and what's going on. I just saw -- I haven't read it, but there is a public health playbook now for COVID-19, with many, many experts on there from around the country. I'm really excited -- I'm sure it has some references to legal epi and legal epi data. It has just been really interesting to see how people are using and applying it in different connections. So tons of different rich

resources. We've named probably two or three of them. Happy to kind of think about a larger list for people depending on what they're interested in. I can share. Thank you so much, and, yes, these comments are just great. Just the most amazing webinar I've been able to be part of. Thank you so much.

>> Yes, and here we come with another one: Actually, Mike, I should just give you a second to answer that, if you have anything to add. Sorry.

>> Mike Ellsworth: You know, thanks, Carmen. Two things: One, tying back to something Tara said earlier about a lot of people are doing legal epidemiology and they don't realize it and it's a process. And, you know, a decade ago, we were implementing medical marijuana and some legal issues there, and I was brought in to help facilitate some work. And what was at that time, there were -- Washington was one of the first states to do it other than Colorado and I looked during that background research part of it, I looked at other jurisdictions internationally and that's really what guided my work, you know, there's nothing new under the sun and learning from each other. It's interesting. It really fit well there. More recently, that legal epi lite process on facilitating portion, I was having my law clerk do research. I'm always amazed at how little research there is on most the subjects when you start getting into little niche areas even though they have huge impact. There was very limited research within our country on it that was responsive and if you started looking more globally but when you read that research, you know, there's so many factors in how law actually plays out within systems, it didn't seem that relevant. And so we didn't highlight that research in her report because we didn't know what was going on in those jurisdictions. All the different, you know, health care systems and regulatory systems that we didn't feel confident making any assertions based on that international research in that space. So I really think it's an issue-by-issue analysis to determine whether or not jurisdictions outside of the US kind of the law and policy decisions are applicable in our country.

>> So I am really sorry to say there are still some questions I would love to ask the two of you, but we have run out of time. I want to really thank our producers for keeping this running and keeping us alive, online, because that's not always easy. I have to thank our fabulous speakers today for presenting so much information, having such good slides and really working to answer the great questions that were put forth by our really great audience, who just, who had us all over the place in looking at some really important issues, some of which we weren't able to even get to. So this is, you know, one in a series of perhaps -- we

can expand on this series, and I just want to ask folks, if you have particular issues that you'd like us to look at, don't hesitate to us a note, and we'll get something you. Thank you for joining us, and look at Dialogue4Health.org to sign-up for the mailing list, and we will make sure that you get notified of all of our future webinars. So thank you, and good-bye to the audience. Have a great day. Stay safe.