

Per Ostmo:

Now, it is my pleasure to introduce our presenters and we have three today. First is Dr. Alana Knudson. She is a Senior Fellow in the Public Health Department at NORC and the Director of NORC's Walsh Center for Rural Health Analysis. She has 30 years of experience implementing public health programs, leading health services and policy research projects, and evaluating program effectiveness. She serves as the Project Director for the ETSU NORC Rural Health Equity Research Center and The CNMI Pennsylvania Rural Health Model Evaluation. She serves on the RUPRI Health Panel, the Board of Directors for the Maryland Rural Health Association, and The National Rural Health Resource Center.

Our second presenter today is Dr. Kate Beatty, sorry Beatty. Kate is an Associate Professor in the Department of Health Services Management and Policy at ETSU's College for Public Health. She is affiliated with The Center for Rural Health Research and CARE Women's Health. She has studied patterns in clinical service delivery in rural and urban areas, organizational barriers, and facilitators to access to clinical and preventative services, collaboration between health departments and hospitals, and the role of inter-organizational partnerships in health services provision in rural communities.

Our third presenter today is Dr. Qian Huang. She is a Research Assistant Professor at The ETSU Center for Rural Health Research. Her work includes developing methods and tools to assess underserved healthcare areas, creating the Healthcare Resource Index, building and maintaining The South Carolina Rural Healthcare Resource Dashboard, and The Tennessee Multi-Sector Plan for Aging Data Dashboard. She has also conducted several quantitative studies on COVID-19 disparities in the U.S. and worldwide. I am very pleased to hand things over to our first presenter today, Dr. Alana Knudson. Go ahead and take it away.

Alana Knudson:

Great. Thank you so much, Per, and thank you for the opportunity to share our work. I'll first provide a brief background of our center and then hand it over to my colleagues to share the findings from our research. Next slide, please. First of all, our Rural Health Research Center was established in September 2020 when the East Tennessee State University and NORC's Walsh Center for Rural Health Analysis were funded as one of seven federally funded rural health centers. For those of you who may not be aware, this is a four-year cooperative agreement for a total of \$2,8 million. There are a number of other centers funded across the country, including Minnesota, South Carolina, Kentucky, Washington, Southern Maine, and North Carolina.

Our partnership, The ETSU Newark Partnership, established The Rural Health Equity Research Center, and this is actually a collaboration between The ETSU Addiction Science Center, The ETSU Center for Rural Health Research, and The NORC Walsh Center for Rural Health Analysis. Our center's focus is on health equity and addresses issues related to rural public health, healthcare access, mental health, and the needs of vulnerable populations. Next slide, please.

For those of you who may be unfamiliar with The Rural Health Research Center work, we receive funding from HRSA's Federal Office of Rural Health Policy, and each year we submit five proposals for which The Federal Office of Rural Health Policy selects four. We conduct that research then on an annual basis. These topics are selected to help provide information to the federal office and other federal agencies on issues pertinent to rural health and also to support the implementation of good health policy. All projects focus in national and scope and primarily rely on secondary data sources. Next slide, please.

As in all things rural, it takes a village and we have a great team at both ETSU and NORC that contribute to the various research products that we produce on an annual basis, and this comprises our team. I would like to recognize Michael Meit, who serves as the Deputy Director of our center, along with his colleagues at ETSU and my colleagues at NORC. As in all rural health research centers, one of our goals is also to contribute to supporting the next generation of rural health researchers, and we have two graduate students that support our work. Next slide, please.

As I mentioned, each year we have four different projects. This provides the lineup for our projects from year one and year two, next slide, and this comprises our projects for year three and year four. Note that in year four, our current year, we are working on five different research projects. This is in part because the newly established Centers for Disease Control and Prevention, CDC's Office of Rural Health, has funded a research project for our team. This recognizes the four research projects that FOHP has funded and also an additional rural public health research projects. With this, I will turn it over to my colleague, Dr. Beatty.

Kate Beatty:

Thank you, Alana. As mentioned, I'm going to talk about one of our previous studies, actually from year one, and then Qian is going to give us a preview of a really exciting project we're doing this year. Okay, so just a little background. In 2020, 21% of adults age 18 and older, or about 52.9 million people, had a mental illness in the past year. Any mental illness is defined as a mental, behavioral, or emotional disorder, and though we have about 20% of all adults, we see that mental illness does not affect all peoples at the same level. When we look at the data by different demographics, we see differences by gender, age, race, and ethnicity.

With longstanding barriers to prevention and treatment, mental health conditions remain a prevalent problem in rural communities. About 20.5 adults in rural communities have had any mental illness, but many individuals with mental illness do not receive mental health services. Of those approximately 52.9 million adults in the U.S. with any mental illness, less than half, or 24.3 million, had access to mental health services in the past year.

One of the things that may be affecting treatment-seeking behaviors is stigma, and so stigma is the negative social attitudes attached to a characteristic of an individual that may be regarded as a mental, physical, or social deficiency.

Stigma implies social disapproval and can lead unfairly to discrimination against and an exclusion of the individual. Its negative consequences are significant and can limit opportunities across several aspects of life, including housing, employment, social relationships, healthcare, and more. Stigma can impede seeking and engaging in healthcare, mental healthcare, and disease self-management for those with mental illness. Stigma can have serious consequences for the stigmatized individuals as well as their communities at large.

Now, a few studies have investigated mental illness stigma in rural communities. One study among rural Appalachian parents of children with mental health concerns identified stigma as the barrier to seeking services for their children. In older adults, rural respondents reported greater public and self-stigma when seeking help for personal problems. One study of individuals living in South Dakota found a great gender-rural interaction where men had higher levels of stigma related to mental illness than women, but rural women had higher levels of stigma than their urban counterparts.

Given the potential influence of stigma in affecting whether and where individuals seek treatment combined with more limited resources to address mental health needs in rural communities, we found it was important to understand any potential differences in stigma levels between rural and urban communities. The purpose of this study was to describe the burden of public stigma associated with any mental illness in rural versus urban communities and examine stigmatizing attitudes and beliefs towards any mental illness among the general population, which includes looking at difference by rurality age, gender, race, ethnicity, and experience with mental illness.

We did this by using a panel called AmeriSpeak. This is funded and operated by NORC at the University of Chicago. It's a probability-based panel designed to be representative of the U.S. household population. AmeriSpeak panelists participate in NORC studies or studies conducted by NORC on behalf of governmental agencies, academic researchers, media and commercial organizations. For the purpose of this study, a sample was drawn from AmeriSpeak that was designed to support rural and urban analysis using rural/urban commuting codes, or area codes, excuse me, for a measure of rurality. We targeted a sample of about 2,000 panelists, age 18 and older, with a thousand living in rural areas and a thousand living in urban areas.

To understand mental health stigma, we researched the peer-reviewed literature and national surveys and identified a pool of established validated questions. Specifically, we found a brief validated scale of 11 items designed to examine public attitudes about mental illness. The questions were scored on a Likert scale with the responses from strongly disagree to strongly agree, and the items factored into two subscales, negative stereotypes and recovery outcomes.

For the negative stereotypes questions, they included, "I believe a person with mental illness is a danger to others, is unpredictable, is hard to talk to, and has

only themselves to blame for their condition." These were the questions that made up the subscale of negative stereotypes. For recovery outcomes, they were questions including, "I believe a person with mental illness can improve if given treatment and support. Feels the way we all do at some time. Can recover. Can be as successful as others in the workplace, and treatment can help people with mental illness lead normal lives."

We had one additional question that we included in our survey to understand the experiences with mental illness, so we included a question, "Have you had or do you personally know of anyone who has had a mental illness?" From the AmeriSpeak panel, they also have quite a bit of demographic information that is collected, so that was already part of the panel data. For this study, our variables of interest, again, were rurality, which was urban or rural based on the RUCA codes, racial and ethnic group membership, age, gender, and again, any experience with mental illness.

Now, I just want to mention that we did not do serious mental illness, which is something we found in the literature that most of these studies looking at public stigma are looking at any mental illness. We are not defining it and neither did the previous researchers define any mental illness. This is just to allow it to be more generalizable across the scope of stigma on all types of mental illness. The questions were individually considered continuous on that scale of one to five, and then we summed those to create two subscales. For negative stereotype, higher scores corresponded with more negative attitudes. In contrast, in recovery outcomes, higher scores corresponded with more positive attitudes. We ran both bivariate analysis and weighted linear regression models. All the analysis were weighted with a variable created and provided by NORC to account for rurality group in addition to their base sample waiting for it to be representative.

All right, so the panel survey yielded a little over 2,000 responses, actually 2,091, with 52% of folks residing in rural areas and 48 in urban areas. There were some differences we saw based on rural and non-rural residents. Specifically, we found that rural respondents were older and that almost 80% of rural respondents were non-Hispanic white compared to 61% who were in the urban respondents. Of really important note, both rural and non-respondents experienced any mental illness at the same rate of about 81% of respondents had experienced either themselves or someone they know had a mental illness. Additionally, I think the most important thing to highlight is that there were no significant differences between rural and urban respondents in terms of the two stigma subscales. They did not differ on their negative stereotype or the recovery outcomes.

Now, when you look at the full regression model examining the negative stereotypes subscales, there were still no differences based on rurality or geography or gender. However, other covariates were significantly related to negative stereotypes. Older individuals had the highest negative stereotype scores followed by those who were 30 to 40 and the 45 to 59 age group. The

youngest group reported the lowest scores indicating less negative stereotypes than their older counterparts. Additionally, non-Hispanic Black respondents had the highest scores for negative stereotypes followed by non-Hispanic other respondents, Hispanic respondents, and lastly, non-Hispanic white respondents.

Finally. Respondents reporting no experience with mental illness had higher negative stereotype scores than those who have experienced any mental illness. Now, when we look at the full regression model for recovery outcomes, we have fewer significant differences, so there weren't differences by age, race, and ethnicity or rurality, but we did find gender differences where females reported higher recovery outcomes than males. Similarly, differences were found for experience with mental illness, so those individuals reporting that they did have experience had higher recovery outcomes, so the inverse of what we saw with the negative outcomes.

Overall, rural respondents held no more negative attitudes towards individuals with mental illness than their urban counterparts. Respondents with experience with mental illness had lower negative stereotypes and higher recovery outcome scores. White non-Hispanic respondents had the lowest negative stereotypes with Black non-Hispanics having the highest and females had those higher scores of recovery outcomes than males. Then, finally, we noted that older respondents had higher negative stereotypes than younger respondents.

These findings suggest that Black non-Hispanics and other non-Hispanics respondents overall hold negative stereotypes related to others, so addressing behavioral health access and stigma issues in communities of color can really help to address health inequities. We found that stigmatizing attitudes and beliefs did vary by gender, race, ethnicity, and experience with mental illness. It is encouraging that not only did rural respondents not hold higher levels of stigma, but that they experienced mental illness... that experience with mental illness was associated with both lower negative stereotypes and more positive recovery attitudes. These findings could inform strategies to reduce public stigma among subpopulations that may hold greater stigma towards mental illness, and given the limited access to mental health services, consideration of such strategies could be especially important in rural areas.

We know that rural communities experience disparities in behavioral health services, so the delivery of and access to mental health services such as assessment, treatment, medication management, and monitoring are often limited to our rural communities. Given that stigma is a widely recognized barrier to recipient receipt of mental health services, targeted strategies could improve access to and engagement with services among those experiencing mental illness in rural communities. All right, I'm going to stop share and...

Per Ostmo:

Kate, if you want to wait... Okay, there we go. We have a couple of questions to go over here. Alana, unfortunately did have to step off, but our first question was, "Right at the end of Alana's introduction. What is missingness?" Kate, can you explain what missingness means?

Kate Beatty: Let's see, for which one of the... Let me look at which study that is.

Per Ostmo: It would have been Alana's last slide.

Kate Beatty: Which one of our studies? Yes. Okay, so the question is about our year four study comparing health indices differences in rurality, missingness, and associations with health outcomes. This is really looking at different health indices. They are made up of multiple often social determinants of health, and what we know in the rural research is that often these are things that may be less common, and so if they are at such a small level, then that data is not available, say, at a rural county. Really trying to understand how these different indices may be acting different or may be less representative is really what we were concerned about for the rural experience.

Per Ostmo: Thank you, Kate.

Kate Beatty: Mm-hmm.

Per Ostmo: Our next question, "Did you examine the data by profession? For example, farmers and ranchers versus healthcare employees, other industries?"

Kate Beatty: No, we didn't. As Alana mentioned, we have four projects a year. They're limited in budget and scope, so we were really limited by our budget to only include 10 questions. That is a really good question and I can check and see if we have a little bit more granularity in the data as far as what their professions are and that kind of more... the descriptives, the demographics that are just collected in general on the panelists. I do think that's a really important piece because we know profession can have an impact.

Per Ostmo: Thank you, Kate. Our next question is, "Is this study published in a peer-reviewed manuscript form?" If you want to talk about the difference between policy briefs from your center and what you have in store for manuscripts.

Kate Beatty: Yes, so we have two briefs. For all the rural research centers, our main deliverable to the office is policy briefs because they utilize these for their own advocacy work within their agency and across the federal agencies, which is part of why these studies are all national in scope. We do have a peer-reviewed journal article that is this close to being submitted, and so that actually will look more at the end part where we're looking at these bigger models and understanding how all of the different demographics have an impact on stigma.

Per Ostmo: Perfect. Thank you.

Kate Beatty: Mm-hmm.

Per Ostmo: There's some other comments here that we might want to consider. One of our attendees says, "I wonder if perceived stigma by others, especially healthcare

providers, impacts willingness to seek treatment in rural communities where it's harder to be anonymous?"

Kate Beatty: Mm-hmm. Yeah, we see this and hear this not only with mental health stigma, with LGBTQ+ folks, with HIV/Hep C folks, with addiction, and so that is a reality that does face rural communities. We talk about this in some of our contraceptive work, too, where, yes, it's an anonymous patient if you're an adolescent, but if your mom's best friend is the public health nurse, you might be a little bit less likely to go to the health department to receive services for that fear of loss of anonymity.

One of the things when we presented this data to our Tennessee Rural Health Association, we had a couple of folks from the Coordinated School of Health who do a lot with adolescent mental health, and they were talking about how these intergenerational families where grandparents are taking care of these children, the children may not have the stigma and maybe their parents wouldn't, but the grandparents' stigmatizing feelings may impede those adolescents getting access to services that are even available to them in the school. This is a real challenge.

Per Ostmo: Thanks, Kate. I'm really excited here because our next question comes from a researcher from Turkey, so first of all, thanks for attending our webinar. Our attendee says, "In research that they conduct with farmers and rural people, women tend to express their health problems more openly. On the other hand, men tend to hide it. I think the situation is more or less related to masculinity culture that surrounds men in rural areas." What are your thoughts on this difference, Kate?

Kate Beatty: Yeah, and so that did show up not in negative stereotypes in this, but in the recovery outcomes. Women had those more positive feelings about how folks with mental illness are just like us, so that can't really speak to some of those gender differences. I think one of the positive parts of this is the strongest indicator of both lower negative and higher positive was experienced with mental illness. As we see more discussion, even post-pandemic about mental health, I think that that can help lessen that because speaking about it and seeing people that look like you experiencing something that you're experienced can help to de-stigmatize those mental health challenges and illnesses.

Per Ostmo: Excellent. Thanks, Kate.

Kate Beatty: Mm-hmm.

Per Ostmo: Qian, do you want to go ahead and share your slide deck? While you're getting that ready, I wanted to share one last comment from the Q&A here. One of our attendees says, "My rural white mother-in-law laughed when I said, 'What about HIPAA?', when she told me about gossipy doctors." There is, I think,

maybe a little distrust of doctors. Does that sentiment impact your research at all, Kate?

Kate Beatty: Well, I mean, I think it does, and it speaks to thinking about other avenues of getting access to mental health treatment. We see more and more, and I'm sure we all hear about different technologies around better health and other online services. Those do, again, have challenges with our rural and definitely frontier folks who don't have access maybe to the broadband you'd need for those, which would get around the gossipy physicians. I think that gets at needing to address and intervene with healthcare providers about the importance of being seen as a trusted individual for this type of care. More so in rural because we won't have 10, 20, 30 different providers to go to for these types of services.

Per Ostmo: Great. Thank you, Kate. We are going to have time at the end of the presentation for more Q&A, and for now, Qian, I'm going to hand things over to you for your part of the presentation.

Qian Huang: Thank you, Per. Can you see my slides, right?

Per Ostmo: Yep. Looks great.

Qian Huang: Perfect. Thank you. Today, I will provide an overview of one of our ongoing year four project, A Suicide Mortality: A Comparison of Urban and Rural Rates. Suicide contributes to significant mortality in the U.S., accounting for over 48,000 deaths in 2021 alone. CDC recently examined a trend in suicide mortality, including the variation by sex and age in the U.S., and they were increasing from 10.7 death per hundred thousand population in 2001 to 14.2 in 2018. Then, the trend passed a little bit, saw a downward trend between '18 to '20. However, in 2021, we saw the largest one-year increase in suicide mortality over this time to 14.`, which was a 4% increase.

Demographically, males are at a much higher risk of suicide mortality than females. I just saw comments in the Q&A and said that there are some cultural reasons and male doesn't want to express their mental burden and will cause some problem. Differences in suicide mortality among racial and ethnic groups have also been identified with the highest rates among American Indian and Alaska Native people in 2021. While the study was very important and useful, it didn't analyze rate by geography.

There is another CDC report in 2020, did look at the urban/rural differences in suicide mortality from 2000 to 2018, and found that overall suicide rates were higher in rural, which is 19.4 versus 13.4 in urban in 2018. Suicide mortality increased at a higher rate in rural areas than urban areas over this timeframe, leading to a widening disparities. Rates are both high for male and female in the rural areas compared to their urban counterparts, so there is a need for better understand the suicide mortality in rural areas. People live in rural areas are



considered vulnerable to suicide, including veterans, American Indians, Alaska Natives, people who are LGBTQ, and farm workers.

Much has changed since 2018 and 2019, especially with COVID-19 pandemic, though our understanding of trend in rates among and within rural communities is still limited. This project will examine the variation in suicide mortality rates by geography and explore its driving factors, including age, access to mental healthcare, geographic isolation, stigma, at-risk substance use, access to firearms, and socioeconomic factors among urban and rural and from 2018 to 2021.

As a state level, we will analyze suicide rate per year, 2018, 2019, and 2021, and by rurality, we'll use a rural-urban continuum codes here. For the content level analysis, we will aggregate suicide rate for those four years to explore the spatial distribution because the data are suppressed because of the confidentiality. We don't have enough data to do yearly data, yearly analysis, and we will compare those rates with demographic characteristics and vulnerability resilience indices using multivariable analysis. We will also conduct some spatial analysis to analyze the spatial pattern and do some data visualization as well. The data will come from CDC Wonder, RUCA 2013 or 2022 codes based on the suicide mortality data availability. The index is from CDC and Hazard Vulnerability Resilience Institute and U.S. Census Bureau.

We'll also conduct some spatial analysis to analyze the spatial pattern and do some data visualization as well. And the data will come from CDC wonder RUCA 2013 or 2022 codes based on the suicide mortality data availability. And index is from CDC and Hazard Vulnerability Resilience Institute and US Census Bureau here presented some preliminary results. Overall, rural areas in the US has have experienced high suicide mortality rates from 2018 to 2021. And the differences between urban and rural rates vary ranging from 5.35 per 100,000 population in 2019 to 6.59 in 2021.

Here presented some preliminary results. Overall, rural areas in the U.S. have experienced high suicide mortality rates from 2018 to 2021, and the differences between urban and rural rates vary, ranging from 5.35 per 100,000 population in 2019 to 6,59 in 2021. This graph illustrates the varying suicide mortality rates among HHS Regions, the Health and Human Services Regions, and Region 8, which include this line, which include Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming, along with Region 10, the red line here comprising Alaska, Idaho, Oregon, and Washington, reported the highest suicide mortality rates in the study period.

In contrast, HHS Region 2, covering New Jersey and New York, the purple line here, had the lowest rate, with fewer than 10 deaths per 100,000 population. This is by HHS Regions. How about by state? Mid-map showing crude suicide mortality rates in urban and rural areas by states, and those two maps shares the same legend. We can see clear, spatial pattern of the suicide mortality rates

in the U.S. The Western U.S., particularly in rural areas, have elevated suicide mortality rates.

Most states reported higher rates in rural areas compared to the urban areas, with exception of Mississippi, South Carolina, and Wyoming, where Wyoming urban area rates was 2.19 per 100,000 population, higher than in the rural areas. The preliminary conclusion of this research indicated rural areas have faced a higher suicide mortality rates from 2018 to 2021, and HHS Region 8 recorded as the highest [inaudible 00:36:20] suicide mortality rates among all regions, while Region 2, New Jersey and New York, has the lowest. Geographically the Western U.S., especially in rural areas, observed elevated suicide mortality rates.

In future analysis, we will explore the differences in suicide mortality rates by gender, age, race, ethnicity, by year, and combined with rurality. We will also incorporate variables like SVI break, socioeconomic variables and access to healthcare as data permits. It's very important to note that the county level data have been suppressed for privacy issues. Out of 3,143 counties in the U.S., owning 1800 counties are available for the county level analysis, even though we aggregate those into four years. Data are suppressed when count is less than 10 and flagged as unreliable when the numerator is 20 or less.

The policy implication of this mental health and suicide mortality research emphasized the importance of the access to mental health providers, its workforce. It's always the problem we're talking about. There's a need to increase the workforce, maybe possible through training some non-traditional providers to join the mental health workforce. We talk about mental health, but even though they are our mental health services, some areas are still missing adequate coverage. It's a solution, but it's not the final solution.

Expanding insurance coverage for mental health is also very important as some insurance company don't cover mental health services at all. Building a supportive work environment is also critical. Most importantly, we need to talk about this issue and we need to bring this issue to the public and improve the public awareness and a perception of mental health issues. Last, we would like to provide some resources for everyone here today, and here's a link. Some of them we already put in the chat. The link to policy briefs on the public stigma and the Toolkit for Rural Mental Health. Please let us know if you have any questions. Thank you.

Per Ostmo:

We do have a couple questions, Qian, and early on in your presentation you mentioned disability I think was included in your study. Does that mean that, or sorry, you mentioned veterans are included in the study. Does that also mean that disability is included?

Qian Huang:

Based on the data, we could not include the suicide and mortality data for veterans or disability, but we can definitely add the disability variable in our socioeconomic sociodemographic variables.

Per Ostmo: Okay. The next question would be for both Qian and Kate. "For both stigma and suicide, have you looked at the differences between metro-adjacent and non-metro-adjacent rural counties? That can be significant, and I'm sure this has to do with the RUCA code numbers."

Qian Huang: That's a great question. Right now, we are on the early... this is like a teaser of fresh start of this project, and right now we only have... An urban [inaudible 00:40:18] we do use RUCA code, but in CDC Wonder, the suicide mortality data is still based on the RUCA 2013. It hasn't updated to 2023 yet. We will do by RUCA code, so it's all different in nine or the categories, so we'll do within rural, and how about less rural, rural metro-adjacent or non-metro-adjacent, and we'll do it separately based on different code category.

Per Ostmo: Okay, perfect. The next question, "Is there any data that would be able to trace the availability of firearms and its relationship with mortality rates in rural areas?"

Qian Huang: We are trying to find the firearm variables and try to incorporate as one of the socioeconomic variables in our dataset. If the data is available, we will definitely incorporate this variable in our analysis.

Per Ostmo: Okay. Our next question, "Does the response time or access to emergency services increase suicide mortality in rural areas?"

Qian Huang: There are some research that did talk about that, so especially in Montana. We can see it's super high suicide mortality rates, and one of the explanation is it's far to the emergency service and the travel time is very... it's a long time travel distance. We will put this variables in our analysis as well. We can do 30 minutes travel time to emergency service and we will explore whether they're correlated or not.

Per Ostmo: Perfect, and for anyone in the audience that hasn't seen it, the Maine Rural Health Research Center published a chart book on ambulance deserts, so you can see visually how much of Montana is considered an ambulance desert.

Qian Huang: Yeah.

Per Ostmo: Our next question, and Harry Holt, if you're still in the audience, I might actually have you unmute for this. The question is, "Another interesting issue would be the status of 'red flag' laws and the relationship with suicide mortality rates in rural areas." I'm not actually sure what is meant by red flag. Qian or Kate, are you familiar with that term?"

Qian Huang: I read it in some of the research, but I would love to hear Harry to explain it more about this.

Per Ostmo: Okay. Harry, I'm going to give you permission here to talk.

Harry Holt: Yes. Hi. Can you hear me?

Per Ostmo: Yep.

Harry Holt: Okay. Amazing presentation. Fantastic. Thank you for those insights. Yeah, a red flag is in terms of this would be law enforcement or family or friends that see someone who is struggling mentally and has mental health struggles and be able to enter the home and confiscate or retrieve firearms for a certain number of days until that time of struggle is... It's like an Article 32 where you have a judge or a testimony or a judicial officer that gives an order that the firearms need to be taken out of the home until the mental health struggle has passed. Some communities have them, some don't. Some states have them, just different variations. It's just interesting to see how that might affect the mortality in rural and urban areas. Thank you.

Qian Huang: Thank you. I really like this idea. We can definitely... Just did some quick search and some state has this red flag law to do the gun violence prevention, and we could definitely add this variable in our county-level, our state-level analysis.

Per Ostmo: Wonderful. Thank you for sharing, Harry. All right. Our next question, "The data that was used for the study, is this data available by region and state? Is this a free-to-access data set?"

Qian Huang: It's for suicide, yes. It's from CDC Wonder.

Per Ostmo: Okay, CDC Wonder. Excellent. "Will future research include means of suicide as an investigated variable?" Would be-

Qian Huang: The means compared like from gunshot, from firearms is this one. We would love to, but we don't have that data.

Per Ostmo: Okay.

Qian Huang: The data we use is from CDC Wonder, public available data, and we can only do it by ICD code, ICD 10 code, and it's a type of... but we don't have the means of suicide. We would love to do the analysis about the means of the suicide, but we just can't find the data.

Per Ostmo: Okay. Our next question is about the suicide mortality rate. "Would it be appropriate to compute the age-adjusted suicide mortality rate? How would an age-adjusted rate impact your study?"

Qian Huang: That's great. In CDC Wonder, they do have an age-adjusted suicide rate, but it's not available by specific geographic level. If we... in our different level analysis, we will consider to compute age-adjusted suicide mortality rate in our study.

Per Ostmo: Okay. All right. We do have a few more questions here. "What are your thoughts on how this relates to deaths of despair?" I know that's a general question, but suicide is an important component. How do we connect suicide mortality to the concept of despair?

Qian Huang: Concept of despair? You mean the concept of-

Per Ostmo: I guess how would you operationalize despair? How is that something you can define to study suicide mortality?

Qian Huang: That's a great question. It's about the disparity. What's the... Oh.

Per Ostmo: Despair.

Kate Beatty: The diseases of despair, that work has been really important in identifying the challenges that rural and white males are facing. I think looking at some of those SPIs and the things that are looking at economic outcomes as well as health outcomes around overdose-related, cirrhosis of the liver, those I think are really important. Our teams have been talking about how some of our communities don't have those high levels of certain diseases of despair, but still have really high mortality rates, especially among farmers and AG folks, and so there's been some work that Alana shared. I wish she was here to plug it back in from USDA and the Ag Department who are really working to identify how to prevent suicide in those communities. I do think that it is really connected. One of the exciting things about this project is that this is being done now post-2020 COVID, and so we're getting to understand the changes that have happened as a result or directly or indirectly from the pandemic, which might speak to some of those diseases of despair as well.

Qian Huang: Yeah, I agree, so I agree that suicide could be a very important piece or the result connected to the death of the despair, and those could definitely be combined or be a part of it and could... If I saw it as a dissertation question and it would be interesting to explore the mixed method study or just some quantities connect them together, that would be a very interesting study.

Per Ostmo: Thank you. Our next question also has to do with the suicide mortality rates. "Did that analysis include pregnancy or postpartum status? Was that data available?"

Qian Huang: That's a great question. It's interesting. We found a lot of... If we compare male and female, actually male is higher than female, especially middle age white male has a very high suicide mortality rates compared with other groups. In current stages, we may not include this in our study, but this is definitely a topic deserve a lot of attention and we will love to do it for our future studies.

Per Ostmo: Okay, great. Our next question, "Have you researched the benefits of offering incentives to mental healthcare workforce to stay and work in rural areas?" This

seems like a workforce question, and workforce questions we generally ask the researchers over at The Washington State Research Center, WWAMI, but Qian or Kate, if you have any answer for that?

Kate Beatty: We have not as part of this work, but I think you're getting on a really important topic. We do... East Tennessee State University does have a medical school that particularly their mission is family medicine for rural, and they have programs that seek out high school students and rural communities to kind of be a feeder program. I could see how that could just be extended to additional mental health service providers to keep them in rural areas. There are the programs that allow folks to get their loans repaid, but we know that unless somebody has a real close tie to that area or communities like that, they're likely to leave shortly thereafter to go to a suburban or urban area.

Really, the pipeline for the rural healthcare and mental healthcare workforce is going to be critical to address these needs and getting innovative, as you mentioned. Incentives starting out, identifying homegrown talent I think are all really important ways to keep folks who are passionate about rural communities in those place, but then we also have to provide opportunities for them that allow them to be able to practice. I think that's another challenge. If you only have so few providers, be it OB-GYNs or mental health providers, they just don't ever get to be off. They may not have colleagues to bounce ideas off of, so really getting innovative, creating networks for them, I think, all play a really important role, but-

Per Ostmo: Thanks [inaudible 00:52:52].

Kate Beatty: ... we have not done that research.

Per Ostmo: Okay. Thank you, Kate. Our next question has to do with the breakdown for ages in the study. "Was there a breakdown on suicide mortality rates for age teenagers with mental health that's diagnosed or undiagnosed? How did the age breakdown work?"

Qian Huang: That's a great question. As I mentioned, it is actually the middle age 45 to 64, they are the highest for suicide mortality rates in 2000 to 2020. They are around... Sometimes it's between eight to 10 per 100,000 individuals, and teenagers, actually the lowest actually is 10 to 14 and 15 to 24. It's the lowest suicide rate, and then the second highest is 25 to 44. Those are all working adults, yeah, and teenagers has the lowest.

Per Ostmo: Okay. Our next question is pretty interesting here. "Some states. such as Minnesota, are actively working to pass legislation that would make medically assisted suicide legal. How would something like that be incorporated into future studies if possible?"

Qian Huang: This is very interesting. Right now, we are only considered socioeconomic variables or those social vulnerability or resilience index with the relationship, like driving factors of this, but I do think policy, laws, those political reasons are a very important piece as well. If this one passes the legislation or those... or we just mentioned the red flag laws, those can all be considered as policy variables. We could do some... add some binary variables. If this community has this related policy, we can flag as one and we can do some dummy variable and put this variable into the suicide mortality analysis and see whether they're related. That's a great suggestion. Thank you.

Per Ostmo: Great, so we're going to do one last question here, but first, I want to remind everyone that if you are subscribed to Gateway's Email LISTSERV, you'll be notified when these new publications are released. I know Kate mentioned a journal article coming out, and then when the final product for the suicide mortality project is out, that will be released through Gateway, so make sure you're signed up so you don't miss any research.

I do want to get to this last question here. "It seems that researchers are using a binary approach to gender, either male or female. I'm sure that's a restriction by the data set you're using. When there are many people who don't identify this way, are there any efforts to be more inclusive in gathering data? Maybe simply letting people state their gender rather than limiting to two choices? As researchers, how do you approach that?"

Qian Huang: That's a great question. We always talk about data quality, and this is CDC Wonder data, and they only have male or female, those two choices. This is something we cannot achieve based on those public available secondary data. If we do a qualitative research, we send a survey out and fill those out. That could work, but this is hard to achieve at this moment and by our resolve.

Kate Beatty: Yeah, I think this is something that I personally think is an important question and an important part of our data, but with large secondary data sets, we need to move that forward and ask for that. The census is now becoming more inclusive in their questions. There's some really great resources through NIH on how to ask questions that are more inclusive of gender identity and sexual orientation. I think we all should be striving to include more inclusive questions.

At this time, we're still limited to this bifurcation of gender that we find in the data sources that we have now, but as Qian mentioned in our research that we do, where we're being the primary data collectors, I think it's an important... especially when we're looking at issues related to rural individuals who may identify outside of the binary genders because they may have unique challenges, especially if it relates to mental health and suicide ideation. A great question. I think we all should be really working to move research and surveillance data forward in a more inclusive way.

Per Ostmo: Thanks, Kate. I did put a link into the chat where you can sign up for Gateway's Research Alerts. You'll also be notified when the recording of this webinar is

posted. We'll be sharing the recording, the transcript, and the slides, so if you're looking for the slide deck, make sure you're signed up for Gateway. That should be available by this Friday. I did want to do a quick shout-out if you're interested in more LGBTQ+ health research, check out The University of Minnesota Rural Health Research Center. They have published a lot of incredible research on that topic. It is 1:00. I want to thank our presenters for being here. Thank you to our audience for submitting such great questions, and I hope to see everyone at future Gateway webinars. Thanks everyone. Bye-Bye.

Qian Huang:

Bye.