Coordinator: Welcome and thank you for standing by. At this time all lines have been placed in listen only mode until the question answer session. Today's call is being recorded. If anyone has any objections, you may disconnect at this time. I would now like to turn the call over to Shawnda Schroeder. Thank you. You may begin.

Shawnda Schroeder: Thank you. And good morning and afternoon to all of you who are on the call. My name is Shawnda Schroeder. I am the Principal Investigator of the Rural Health Research Gateway, also referred to as Gateway.

Today the Rural Health Research Gateway is hosting a webinar entitled "The Changing Burden of Diabetes in Rural and Urban America."

For those of you not familiar with the Rural Health Research Gateway, Gateway is a website that provides easy and timely access to research and findings of the Federal Office of Rural Health Policy-funded Rural Health Research Centers. Our goal really is to help move new research findings of the Rural Health Research Centers to various end users as quickly and efficiently as possible.

Our website can be used to find abstracts of current and completed research projects, publications from those projects, and information about the Research Centers themselves as well as individual researchers, two of whom you're about to hear from today.

Following today's presentation, our webinar will be posted on the Rural Health Research Gateway website.

You can find Gateway at ruralhealthresearch.org. And you can join Gateway Alerts to receive periodic emails and updates for when we have new publications or new free webinars. That will also be the way that we send out

the archive of today's webinar. You can follow us on Twitter. You can like us on Facebook, and then you can receive daily notifications on various rural health research.

We have muted, all lines but I encourage you to use the Q&A chat box at the bottom of your screen to type in any questions you have during today's presentation.

At the end of our webinar, the HRSA Operator will also open up the meeting for questions and those written in the chat box will be read aloud if and when there are no more calls on our line.

If there are remaining questions in the chat box at the end of today's meeting, I will send those to our presenters today and get responses back when we send out the archive.

Thank you again for joining us. And I'm now going to introduce our presenters. Dr. Alva Ferdinand is an Assistant Professor in the Department of Health Policy and Management and the Deputy Director of the Southwest Rural Health Research Center at the Texas A&M University School of Public Health.

She is generally interested in the impact of laws on public health outcomes. She has been actively developing a research agenda that incorporates her interest in public health policy issues. She has examined such issues as the impact of tax exemption status on the provision of community benefits among various hospital ownership types, the relationship between neighborhood built environments and physical activity and the effects of texting while driving bans on roadway safety. She has additionally examined variations and the

burden of chronic diseases across the urban rural continuum including cancer and diabetes.

Dr. Ferdinand holds a Law Degree from the Michigan State University College of Law and a Doctor of Public Health Degree from the University of Alabama at Birmingham.

We're also joined today by Timothy Callaghan. And he is an Assistant Professor in the Department of Health Policy and Management at Texas A&M University and the Director of Evaluation for the Southwest Rural Health Research Center. He has a PhD in political science from the University of Minnesota. His research focuses on the linkages between policy, politics, and public attitudes with an emphasis on health policy and politics. His research also studies rural health in America and he has ongoing research examining chronic diseases, community health records, telehealth, and medical malpractice in rural America.

His research has appeared in journals such as the American Journal of Public Health, the Journal of Rural Health, the Journal of Health Politics, Policy and Law, Social Science and Medicine, and many other outlets.

Thank you again to both of you for agreeing to share your research with us today and I will now turn it over to you.

Alva Ferdinand: Thank you, Shawnda, and many thanks to each of you for joining us on the first workday of the week to listen to some of the work that we've been doing in the Southwest Rural Health Research Center around the topic of diabetes.

And we'll be specifically looking at how the burden of disease has changed across the urban rural continuum.

I'd first like to start by acknowledging our collaborators on this work. We have Marvellous Akinlotan and Kristin Primm who are both graduate research assistants in our center. And then we also have been joined on this work by Dr. Samuel Towne, who was at Texas A&M University but is now at the University of Central Florida, and then Dr. Jane Bolin, who is the Director of the Southwest Rural Health Research Center.

We also like to acknowledge our funding sources. Our work has been supported by the Federal Office of Rural Health Policy within the U.S. Department of Health and Human Services.

And the information, conclusions, opinions that you may here during this webinar are that of the collaborators and should not be attributed or inferred to in any way to the agency. And we'd also like to let you know that none of the researchers on this work have any conflicts of interest to disclose.

Now if you're listening to us right now you probably have some interest in diabetes and have a general idea of some of the statistics around diabetes.

But just to get us all on the same page, we're just going to run through a few of the key points very quickly. What we know is that diabetes is the 7th leading cause of death in the U.S. And in 2015 there were approximately 80,000 diabetes-related deaths reported.

We know from previous research that the prevalence of diabetes is about 15 to 17% higher in rural areas than it is in urban areas. And we also know from previous research that rural adults are more likely to report a diabetes-related diagnosis than their urban counterparts.

And when we look at morbidity sort of the burden of the disease and how people are living with it, studies have shown that rural residents living with the disease have higher morbidity and diabetes-related complications than their urban counterparts.

Now just to give us an idea of how the policy landscape has changed and some of the advances that we've made in terms of diabetes self-management and education, what we know that is in theory there's certain pieces of legislation that should have dramatically increased access to care in the U.S. And two such examples are Medicare Part D, which passed in 2006 and the Affordable Care Act, which was enacted in 2010.

We've also seen dramatic improvements and prevalence of diabetes self-management programs and educational programming in recent years as well. However, what we didn't know just yet was how these different policies and educational additions have impacted the way in which diabetes is taken care of and dealt with among the urban rural continuum and especially with regards to rural and underserved areas in the U.S.

So our task at the Southwest Rural Health Research Center was to provide an up-to-date and in-depth look at how the impact of diabetes has changed over time.

So just to give you a quick preview of what we're going to deal with today and what you'll be listening to, what we're going to start off with are recent trends in diabetes mortality across rurality and within different regions. And then we're going to take a look at the predictors of in-hospital diabetes mortality and ED-initiated diabetes care. These are hospitalizations that did not result in death.

And then what we'll do is we'll end with a discussion of the progress we have made in reaching Healthy People 2020 goals for reducing diabetes mortality along the urban-rural continuum.

At this point I'm going to now turn the presentation over to my colleague Dr. Tim Callaghan, who will discuss national trends.

Timothy Callaghan: All right, thanks, Alva. So we'll begin our discussion of diabetes in America with a look at national trends in diabetes mortality. As a brief plug, our Research Team at Texas A&M just published the results you're about to see in The Journal of Rural Health. And if you have any questions about these findings, we'd encourage you to read more about our findings there.

So to analyze trends in diabetes mortality nationally, our project relies on data from the National Center for Health Statistics, and that mortality data is available through the CDC Wonder Platform. Our results for national mortality trends reflect findings from 1999 to 2016, and all mortality rates reflect the number of individuals who have died from diabetes per 100,000 people who live in the area being analyzed at that time in a given year.

As an important note, we're going to be examining diabetes as an underlying cause of death in the slides you're about to see. But as you'll see later in the presentation, our results are largely consistent using multiple cause of death as opposed to underlying cause of death, and our mortality statistics are based on ICD-10 codes E10 through E14.

So as a brief note on rurality, some of you may be more familiar with levels of rurality than others. All four pieces of the results we're going to be showing here today are based on the National Center for Health Statistics 2013 designation of six levels of rurality per county. And these rurality designations

are largely based on population. As you can see there's six different levels of rurality. Large central metros and large fringe metros; both have over 1 million inhabitants and therefore are quite urban. And micropolitan areas and noncore areas are considered rural. So when we're talking about rural we're talking about areas with up to 50,000 inhabitants but far often quite fewer than that.

So our first findings here are just a national trend line looking at diabetes mortality over time from 1999 to 2016 across the six levels of rurality. And again noncore and micropolitan reflect rural, while large central metros and large fringe metros represent the most urban.

Now for – what stands out immediately from this initial chart is that diabetes mortality is on the decline. If you look over the past two decades or so, mortality rates are much lower in urban areas than rural areas. But everywhere diabetes mortality appears to be on the decline.

That said the discrepancies between rural areas and urban areas are quite large. And in particular the noncore has seen relatively high and stable mortality rates when compared to urban areas with slight increases in mortality since about 2013.

Now this table you're about to see here looks at changes in diabetes mortality rate over time across levels of rurality as well as by region. So the negative values you see here indicate that mortality has declined during that period from 1999 to 2016, and if you see a positive number that would indicate the mortality has actually increased.

What is immediately clear from this table is that while diabetes mortality has declined pretty much everywhere, it's done so except in areas that are in the

South and West. And diabetes, reductions in diabetes mortality has been much smaller in rural areas than in urban area.

So on average from 1999 to 2016, you can see in large central metros the mortality has dropped by 5.1 points on average, whereas in the noncore, the most rural, they've only dropped by .85 points so clearly while there are significant improvements in urban areas those improvements have not necessarily defused to more rural areas.

For example, when we look at the South you can see that the most urban South we've seen significant declines in diabetes mortality by up to 8 points. But improvements are almost nonexistent in the rural noncore South.

We can also look at this regionally. And there's some interesting patterns that are worth note when we compare across regions in the United States. The first note that we would like to share is that mortality rates are lowest in the West. When we compare across the four regions, we consistently find that mortality rates are lower in the West. And this could help explain why we haven't seen as large of improvements in the West because they were already doing better to begin with.

Second, it's worth noting how bunched up versus dispersed mortality rates are across levels of rurality by region. Differences between urban and rural are relatively small in the Midwest and the West, the two left hand panels but comparatively larger in the South and the Northeast. The - in other words they're more spread out in the South and the Northeast, which suggests there's larger differences between rural and urban areas.

So some key takeaways from this initial just national large snapshot is that even as diabetes rates remain high nationally, diabetes mortality actually

appears to be on the decline, which is a great thing. Mortality rates have dropped by as much as 8 age-adjusted points in certain parts of the country, and for every region outside the West it's consistently dropped by at least 5 points since 1999.

Nevertheless, when you look at this from a rural versus urban lens there's a significant cause for concern in rural America. As recently as 1999 rates for diabetes mortality were very similar in urban and rural parts of the United States, however, over time gains in urban areas have not necessarily defused to rural areas. And this is particularly true in the South. In the rural South they've seen little improvement in diabetes mortality over the past two decades.

And now I'm going to turn it back over to Alva as she discusses another new paper that we have.

Alva Ferdinand: Thank you, Tim. And if you sort of think about our snapshot of the topics that we're going to cover, what we're now going to turn to is this notion of diabetes-related hospital mortality. So these are individuals who are hospitalized and unfortunately did not make it out of the hospital following diabetes-related complications.

And as Tim mentioned on the previous work, there is a recently published paper on this topic and what you see on the screen is just a snapshot of it. Feel free to read that paper if you want a more in-depth understanding of any of our methods or results, but it is here for you if you are interested.

Now to give you an example of where our data came from and the kinds of procedures we undertook to identify hospital records that were relevant to the

study, we used the National Inpatient Sample from the Healthcare Cost and Utilization Project for years 2009 through 2014.

And what we did was we isolated all cases of diabetes both Type 1 and Type 2 in sampled hospitals. And we did so by identifying cases in which there was an ICD-9 code that was diabetes-related.

And we didn't have room on the slides to list all of these ICD-9 codes. But just to give you an example of some of them we extracted ICD-9 code 250.0 diabetes without mention of complication, 2050.1 diabetes with ketoacidosis, and 20 - 250.4 diabetes with renal manifestation. We then further determined whether that hospitalization resulted in death or not. And what we did was we kept those cases in which death was present.

This slide just gives you an idea of what our basic model specification looks like. And essentially what we hypothesized was that diabetes-related hospital deaths are a function of rurality, gender, age, race and ethnicity, insurance type, which we also refer to as the primary payer on the record, and census region. And what you see on the box in the right is just the categories that we used for each of those variables.

As is customary, we conducted descriptive analysis first to get an idea of the average number of deaths related to diabetes during the study period. And then we conducted multivariable logistic regressions to explore the odds of diabetes-related hospital deaths across the urban-rural continuum in the U.S. in general and then we also did multivariable logistic regression analysis for each of the four census regions in the U.S. just to get an idea of what the predictors look like for each census region. We used STATA 14.2 in this work to conduct all of our statistical analysis.

So if we look at this descriptively, what you'll notice circled here is that in the Midwest and in the South, micropolitan and noncore areas, which as Tim mentioned are the areas that we consider to be rural, had higher average numbers of diabetes-related deaths per 100,000 population.

And what you'll see in the next few graphs are just what these average numbers look like across the urban-rural continuum. In the Northeast, what we see here are that micropolitan residents tended to have higher average deaths during the study period, and noncore areas really sort of blended in with some of the more urban areas in the Northeast.

When we look at the Midwest, the noncore and micropolitan areas tended to have higher numbers of diabetes-related hospital deaths, but they all really clustered of – pretty closely together with more urban areas.

When we look at the South however, if you're looking at your screen right now what you'll immediately recognize is there is a huge gap between our rural residents and more urban residents with respect to the average number of diabetes-related hospital deaths during our study period, really highlighting that there are significant perhaps access issues and management issues of diabetes between urban and rural residents.

And then when we look at the West, in the West being a rural resident seems to actually be protective in that our large fringe metropolitan, large central metropolitan residents are the ones with higher numbers of diabetes-related hospital deaths. So very interesting look at how this shakes out within the different regions.

Now when we look at the odds of hospital diabetes-related deaths across the urban-rural continuum, what we notice in the Midwest and in the South is that

our rural residents tended to have higher odds of experiencing a hospital death that was related to diabetes during this time period.

In the Northeast, again the micropolitan and noncore residents did not experience significantly higher levels of hospital-related deaths compared to large central metropolitan areas. And in the West, again being a rural resident was somewhat protective.

Now if you go back to our basic model specifications, what we're going to do is break this down by census region. So what you're going to see on this slide circled in red are the significant predictors of experiencing a diabetes-related hospital death by specific census regions.

So in the Northeast and what you'll see across all of these regions actually is that older age, not surprisingly, is predictive of a diabetes-related hospital death.

But if you look at insurance type, individuals with other kinds of insurance where they don't have Medicaid, they don't have Medicare, they don't have private or commercial insurance but they have some other type of insurance in the Northeast this was predictive of having higher odds of a hospital death.

In the Midwest, what you'll notice here, is that small metropolitan areas and micropolitan areas had higher odds of a diabetes-related death. And when we look at insurance type, those on Medicaid, those who were uninsured so you can think of the self-pay row as capturing those that were uninsured during this time, and other also highly predictive of a diabetes-related hospital death.

And when we look at the South, more things pop up, right? So we have our noncore residents having higher odds of experiencing death related to

diabetes, and then several of the racial and ethnic classifications compared to the White race showed up as being highly predictive of experiencing hospital death so Blacks, Asians, and those identifying as other race; and then in the South again, Medicaid, self-pay, other kinds of insurance highly predictive.

And then in looking at the West, as I mentioned in the more descriptive statistics, being rural was actually predictive. But again, older age and certain types of insurance coverage were also highly predictive.

So just to touch on some of the limitations, we did not obviously account for persons who experienced a diabetes-related death outside of the hospital. And a word of caution, AHRQ, you know, mentions that we really need to take our racial and ethnic findings with a grain of salt because there are missing data in many cases on the hospital discharge record for race and ethnicity. So we may not be fully capturing the extent to which race and ethnicity play a role in this. We also were not able, because of our use of hospital discharge data, to account for different lifestyle factors.

So despite some of the innovations that we see in the widespread availability of diabetes self-management, what we're seeing is that there's still a substantive difference in the odds of diabetes-related hospital mortality between rural and urban areas. Taken together, rural Americans face a higher diabetes-related mortality burden than non-rural Americans. And future research should continue to explore some of these discrepancies.

I'll now turn to the work that we have done on Emergency Department-initiated hospitalizations. So as I mentioned earlier, these are hospitalizations involving patients who were hospitalized and subsequently discharged and did not die.

We don't really know the extent to which EDs and hospitals across the nation are used for potentially preventable diabetes-related treatments. But literature that sort of talks about the use of EDs and hospitals for ambulatory care-sensitive conditions really highlights access issues, issues of uninsurance, transportation, etcetera, and the ability of people to obtain outpatient care. And what we know from previous research is that when individuals perceive that they don't have adequate access to outpatient care, what they tend to default to is the use of hospitals.

So in this particular study our objective was to examine and place these in individual-level predictors of diabetes-related hospitalizations that follow an Emergency Department visit. Again we used the National Inpatient Sample and again isolated diabetes-related hospitalizations using ICD-9 codes.

And our basic model specification here looks very similar to the one we just discussed except now our outcome variable has changed, diabetes-related hospitalizations stemming from ED visits are a function of rurality, gender, age, race, ethnicity, the number of chronic conditions on discharge, and census region.

And similar to what you saw a few moments ago, we conducted descriptive analysis and then multivariable logistic regression to examine the odds of diabetes-related hospitalizations following an ED visit across the urban-rural continuum in general and then subsequently looked specifically at the odds of these hospitalizations within each census region.

And for this work we used STATA 15. Now let's pull up some of our red circles and just quickly highlight what we found to be predictive of diabetes-related hospitalizations.

Here on the screen you'll see that residents of noncore areas, residents of the Midwest and the West compared to the Northeast tended to have higher odds and then if you are Black or Hispanic or Native American or identifying as some other race, that was also highly predictive. And when we looked at insurance type, those on Medicare, Medicaid, uninsured, and having some other type of insurance also were more likely to experience diabetes-related hospitalizations.

We'll now look at predictors within each census region. And let's start with the South. What we see here is that small metropolitan areas as well as those residing in micropolitan and noncore areas have higher odds of experiencing a diabetes-related hospitalization. Similar to what we saw in the overall model, Blacks and Hispanics also had higher odds, Native Americans and those identifying as other race or ethnicity.

And then in terms of insurance compared to those with private or commercial insurance those on Medicare, Medicaid, uninsured or other, covered by other types of insurance also had higher odds.

When we quickly look at the Midwest, what we see a smattering are those living in noncore areas and those living in large fringe metropolitan areas. We see similar patterns with minority race and ethnicity as being predictive. And compared to persons covered with private insurance or commercial insurance, everyone else had higher odds.

Looking at the Northeast, being a rural resident was actually protective but when looking at race and ethnicity again minority race, ethnicity, highly predictive of a diabetes-related hospitalization and similar stories with insurance.

Looking at the West, again protective for noncore micropolitan areas but similar stories unfolding with minority race and ethnicity, insurance that is not private, and of course across all the census regions, higher ages are predictive of diabetes-related hospitalizations.

So again just to give you a quick idea of our limitations, we really couldn't distinguish between hospitalizations that stemmed from ED visits that were potentially ambulatory and those that were truly emergent. That's really difficult to sort of tease out in the data. We also were not able to control for lifestyle and socioeconomic factors that can also play a role in the prevalence of diabetes and how one manages their disease.

And our work did not directly examine levels of access to care, the perceptions of diabetes, and the cultural factors that may play a role.

But to just give you a sense of the take home messages, there's so much room for improvement in diabetes self-management and care among residents of most rural areas particularly among those residing in the South and in the Midwest.

And as we saw, racial and ethnic minorities, those who are uninsured in all census regions were also more likely to experience a hospitalization. And while the likelihood for such a hospitalization has been going down over time, there are certain subpopulations that continue to be in need of emergency care for diabetes, which lets us know that there is still work to be done in terms of improving access to outpatient care.

I will now turn the presentation back over to Tim, who will discuss Healthy People 2020 and our progress in addressing diabetes mortality.

Timothy Callaghan: All right, thanks, Alva. So we're going to conclude our discussion of key findings by looking at how the U.S. is doing in meeting its Healthy People 2020 goal of reducing diabetes mortality.

So similar to the first set of results you heard about before Alva went onto discuss mortality and Emergency Room visits, our data for Healthy People Analysis comes from the National Center for Health Statistics and the mortality is available through the CDC Wonder Platform. Healthy People 2020 goals used 2007 as their baseline year, so even though we're going to be thinking about the current decade 2007 is actually the baseline year for all Healthy People 2020 goals.

So our analysis of diabetes mortality related to Healthy People 2020 is going to look at all data between 2007 and 2017.

And again when we're looking at diabetes mortality we're going to be thinking about age-adjusted rates that reflect the number of individuals who had died from diabetes per 100,000 people who live in the area being analyzed at a given time.

Unlike our initial analysis, which relied on diabetes as an underlying cause of death, this analysis relies on diabetes as a multiple cause of death to maintain consistency with a standard set by Healthy People 2020. But again we are going to be using the same ICD-10 codes.

As a bit of background, the diabetes mortality rate for the baseline year for Healthy People 2020 of 2007 was 74 age-adjusted deaths per 100,000 individuals. Their goal for the year 2020 was to reduce this mortality rate to 66.6 deaths per 100,000 individuals.

And happily, evidence from 2011 to 2016 suggests considerable national progress towards a goal of 66.6 deaths. That said there is an important unanswered question, which is how does this progress vary across the urban-rural continuum? Are rural areas making as much progress as urban areas in meeting this Healthy People 2020 goal?

So we begin to look at this question with an overall look from the year 2007 to the year 2017. The dashed line you're going to see in the next several figure represents a Healthy People goal of 66.6 deaths, so that line is consistent at 66.6. Any line that's below that number suggests it has already achieved the goal. Any line above that number suggests it is an area that has not yet achieved the goal.

And as you can see nationally large discrepancies exist in progress towards Healthy People mortality goals particularly across levels of rurality. Large fringe metros actually started below the goal rate and have seen improvements over time.

Similarly, large central metros started above the goal point but have since achieved the goal of 66.6 deaths for Healthy People 2020. Rural areas however have not seen similar levels of success. And they actually appear to be moving further away from the national goal in the noncore and micropolitan rural areas.

But you can also look at this by gender, which is something we haven't done too much in this analysis to this point. So we're going to be breaking down these results by gender, followed by race, and then region.

And when we look across the genders it's clear that men are doing much worse than women nationally. You can see that across levels of rurality, no

level of rurality for men has achieved the Healthy People 2020 goal, although men in large fringe metro areas are by far the closest and there's actually quite a considerable discrepancy between men in large fringe metros and men in all other levels of rurality.

When we compare that to women however, women have achieved the Healthy People 2020 goals in all urban areas. That said, they have not yet achieved the Healthy People 2020 goals in rural areas, that is to say the noncore and micropolitan areas, but they are quite close at the most recently available data, which is 2017.

When we break this down by race and ethnicity in other words break it down across races of White, Black, Hispanic and Asian, we can see that only Asian Americans have achieved the Healthy People 2020 target at all levels of rurality. So Asians have achieved at all six levels of rurality but Whites, Blacks, and Hispanics have not yet made that progress. When we look at this across races, we can see that African Americans have not yet achieved this for any level of rurality although there appears to be some movement towards that goal in urban areas. When we look at this across Whites, we can see that Whites in urban areas have achieved the Healthy People 2020 goal, but Whites in noncore and micropolitan areas have not. That said, Whites are by far the closest at all six levels of rurality to achieving the Healthy People 2020 goals.

And lastly when we look at Hispanics we can see that Hispanics in large fringe metros have achieved the goal. Hispanics in large central metros are close to the goal, and there's still considerable work to be done across the other four levels of rurality.

We can also break this down by region. And when we break it down by region, we can say that urban areas in the Northeast, in the South, and the Midwest have all achieved the 2020 goal. That said, rural areas across census regions have not yet achieved the goal. The rural Northeast is by far the closest to the target, and the rural, the South, is the furthest away.

Interestingly and perhaps problematically, while the rural West had previously achieved the 2020 goal, it now actually appears in 2017 that mortality rates are on the rise and moving away from the target in the West.

So what are the key takeaways for the Healthy People 2020 data?

Well first, even as overall mortality rates would suggest significant progress towards Healthy People 2020 goals, analyzing urban versus rural differences reveals quite a different trend. Mortality rates in rural areas actually appear to be moving further away from Healthy People 2020 goals than in 2007. And the addition of 2017 data since January sort of reiterates that trend of moving away as opposed to close to the Healthy People 2020 goal in the rural areas.

In addition, men at all levels of rurality are struggling to meet the Healthy People 2020 goals while women in urban areas have already met the goals and women in rural areas are close to meeting the goals.

Asians, Whites in urban areas and Hispanics in large fringe metros have achieved the Healthy People 2020 goals, but all other racial groups in all other levels of rurality have not yet achieved the Healthy People 2020 goal.

Diabetes mortality is particularly high in the rural South, but all rural areas are struggling across regions. The urban Northeast appears to be performing best,

and the West appears to be emerging as a new area of concern based on recent trends and data.

So putting this all together taking the findings from the national picture as well as the work that Alva has presented as well as these latest Healthy People 2020 findings, we present sort of a consistent picture of what's happening with diabetes in America across the rural-urban continuum. First and foremost, diabetes remains a significant cause for concern in public health.

That said and happily, mortality appears to be on the decline. That said place-based disparities in diabetes care and outcomes are significant with poor outcomes in rural areas and the rural South in particular. While we didn't look at interventions here today, our findings do suggest that interventions emphasizing diabetes education, preventive care, and self-management are needed particularly in rural areas and in the rural South more than anywhere else.

Beyond the work presented here, we also believe that more work is needed to understand how policies aimed at improving health access like the Affordable Care Act as well as Medicare Part D have impacted changing diabetes mortality rates and how they could continue to influence mortality moving forward. Looking at policies is simply beyond our scope here but we do believe that that is an important direction for future research.

Here are our references and those will be available for those who are interested. And here's the contact information for Alva Ferdinand and myself. And we're happy to answer any questions that you may have at this contact information.

But I believe we're about to also have a Q&A session, so thank you so much for listening and we'd be happy to answer any questions that you may have.

Coordinator: Thank you. At this time, if you'd like to ask a question, please press star 1. Please make sure your phone is not muted and record your name when prompted. If you'd like to withdraw the request you may press star 2. Again to ask a question, please press star 1 and please record your name when prompted. One moment please, for any questions.

Shawnda Schroeder: Thank you both of you for presenting today. I am monitoring the chat box to see if any questions come in through the chat box. And we'll also wait to see if any call in from the line. It looks like we do have someone typing a question in. Sometimes that can be a little bit easier than calling in, so if you prefer to do that feel free and I'll read the question aloud.

While we wait for a question to come in, I will share that today's webinar has been recorded. There will be a transcript, the archive of the recording, and the PowerPoint slides all available to you on the Rural Health Research Gateway. We will have that up. The webinar presentation itself, the PowerPoint should be available by the end of today. And the recording and transcript should be available within a week or two.

Here comes one question. The question reads how much of the increases in the rural West can be attributable to an aging population?

Timothy Callaghan: I think that's an interesting question. The one thing I would say is the estimates we are looking at are age-adjusted. So to some extent that should be accounted for.

But I do think it is worth noting that the population is aging in the West, and that's something we will want to look out for as we're moving forward from 2017 into 2018 and 2019 data.

Do you have anything to add to that Alva?

Alva Ferdinand: No. I think that's exactly right and a really, really good question.

Shawnda Schroeder: Are there any questions on the line before I read others in the chat box?

Coordinator: I show no questions at this time.

Shawnda Schroeder: Okay, another question in the chat box then asks if IHS data is included in the NIS data.

Alva Ferdinand: That is a really good question. I don't know the answer to that. I don't think it is. But I don't want to say that concretely. So, Shawnda, if there's a way to get back to this participant with that information I'd be happy to follow-up on that so that…

Shawnda Schroeder: Yes.

Alva Ferdinand: …is a really fantastic question. We did have Native American representation in the National Inpatient Sample. But I'm not 100% sure on where such data were derived from in terms of what kinds of hospitals were sampled. I think they are mostly U.S. community hospitals. I'm not 100% on whether IHS is included in that.

Shawnda Schroeder: A similar question in the chat box asks in your research have you found any significant findings for one tribal specific nation rather than Native American race categories?

Alva Ferdinand: Yes. That's also a really fantastic question. In the National Inpatient Sample, we don't have information on what specific tribes Native American patients may have come from. So we were not able to really get an understanding of that in our analysis.

But it's a really fantastic question and like I said I'll be happy to follow-up to see whether Indian Health Service hospitals are a part of the National Inpatient Sample.

Timothy Callaghan: Right. And for the National Center for Health Statistics data from CDC Wonder, one of the issues with that data is that once you start narrowing too far down into the data, the data becomes restricted and you are no longer able to access the mortality information. So digging down to a single tribe in a single year likely would've been problematic. But it isn't to say that the research wouldn't be very interesting and valuable. And there's certainly are likely to be some discrepancies in mortality rates for example across different tribal groups.

Shawnda Schroeder: There is still typing for another question. Are there any other questions on the line?

Coordinator: I show no questions.

Shawnda Schroeder: Thank you. So here is a comment. The Navajo Nation is conducting a tribal specific (ERFIS) currently.

Alva Ferdinand: Excellent. Yes. I think, you know, the more detail we can get on subpopulations the better we can really understand more specifically how sub subpopulations are affected by the burden of diabetes, so I think that's fantastic. Thank you for letting us know that.

Timothy Callaghan: Yes. And there's going to be broad interest in using that data to understand that community.

Shawnda Schroeder: I will also share that the National Resource Center on Native American Aging looks at tribal populations ages 55 and older. And specifically addresses diabetes and diabetes care management as well.

Alva Ferdinand: Excellent.

Shawnda Schroeder: And they've also shared that tribal Epidemiology Centers are also doing the same.

Timothy Callaghan: That's wonderful. Yes. I would say that that is certainly a weakness of the results we presented here as it does not go into any sort of specific detail on Native American Nations. But it's an important area when we're thinking about chronic diseases broadly.

Shawnda Schroeder: Thank you. Do - is there any other call on the line before I move onto our final closing slide? I don't see any other comments or questions coming into the chat box.

Coordinator: Yes. I show no questions.

Shawnda Schroeder: Yes. Okay. I will say that both of our presenters today are fairly reachable. And I believe, I'm going to speak for you, but I believe they'd be happy to

answer any questions you have following today's webinar, so their contact information was on the screen. You can reach out to them or to myself at the Rural Health Research Gateway, and we can try to get your questions answered from today's presentation.

One final reminder that today's webinar was hosted by the Rural Health Research Gateway. You can join our listserv so that you will be notified when we share the archive of today's webinar or when we share all of the work of these Research Centers.

Any other additional questions you can contact us or visit the website for more information.

I do want to thank you both again for today's presentation. It was very insightful and your work is shard on Gateway with all of the products that related to today's presentation so you can find the original policy briefs as well.

Do either of you have anything you want to say before we log off of today's call?

Alva Ferdinand: No. Just a huge thank you to you, Shawnda, and the Rural Health Research Gateway for this opportunity, and I will echo what you said a few moments ago in that you are more than welcome to email us at any time and we'll be happy to find the answers for you even though or even if we don't know it off the top of our heads right at that moment. We are researchers, so we're happy to look into things that may be helpful.

And thank you all again for sharing part of your Monday with us.

Timothy Callaghan: Yes. I would say the same thing, thank you so much for listening and being here with us today. And as Alva said, we're both very reachable by the contact information that was already shared. And we continue to work on chronic disease research with the Southwest Rural Health Research Center, so I would just say keep looking out for our work as it comes out.

Shawnda Schroeder: All right thank you everybody for joining us today. Have a great rest of your day.

Coordinator: Thank you. This concludes today's conference. You may disconnect at this time.

END