

Coordinator: Welcome and thank you for standing by. At this time, all lines have been placed in listen only mode until the question-and-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 (Shonda Shrader). Thank you. You may begin.

Shawnda Schroeder: Thank you. Good morning or afternoon everybody depending on where you're located. My name is Shawnda Schroeder and I am the Principal Investigator for the Rural Health Research Gateway --- also, referred to just as "Gateway". Today the Rural Health Research Gateway is hosting a webinar entitled, "Obstetric Care Quality and Access for Rural U.S. woman."

For those of you not familiar with Gateway, Gateway is a web site that provides easy and timely access to research and findings of the Federal Office of Rural Health Policy funded rural health research centers of which Minnesota is one. We share information dating back to 1997 all the way to current. Our goal really is to help to move more new research findings of the rural health research centers to various end users quickly and efficiently through webinars, policy briefs, email alerts, and other mediums so our website can be used to find abstracts of current and past research projects, publications from those projects, information about the research centers, and even information about the individual researchers. Following today's presentation, this webinar will be posted through our web site and you can find Gateway at www.ruralhealthresearch.org.

I've also included the link to the website on your screen today. It should be on the left bar. You can feel free to join our Gateway alerts. Through which you will receive periodic email updates when there are new publications or when there are archives of webinars available --- so today's webinar will be recorded and we will share the archive of this webinar through our research alerts and on our web site along with Katy's slides.

We have muted all lines, but I encourage you to use the question-and-answer chat box at the bottom of your screen if you would like. At the end of today's presentation, the HRSA operator, Kim, will open up the meeting for questions and those written in the chat box will only be read if and when there are no more calls on the line.

If there are any remaining questions in the chat box at the time that our meeting ends today, I will share those with Katy and she will respond to them in our research alert that we send out. So, thank you all for joining us today and I thank you to those who have agreed to present and participate.

So, I'd like to introduce to you Katy Kozhimannil. She has a PHD and an NPA and a Neuro Associate Professor in the Division of Health Policy and Management at the University of Minnesota and the Director of Research at the University of Minnesota Rural Health Research Center. She applies the tools of Health Policy and Health Services Research to the field of Woman's Health with a focus on Maternal and Child Health.

Dr. Kozhimannil earned her Master's degree in Public Policy at Princeton University and holds a PHD in Health Policy from Harvard University. She completed post-doctoral training at Harvard Medical School. Dr. Kozhimannil conducts research to inform the development, implementation, and evaluation of health policy that impacts healthcare delivery quality and outcomes with a focus on perinatal period.

The goals of her scholarly work is to contribute to the evidence based for clinical and policy strategies to enhance equity and to improve maternal and child health and well-being and to collaborate with stakeholders in making policy change to facilitate and improve health for families and communities. I am very excited to turn the presentation over to her today. And just to remind you, to please hold questions until the end or use the chat box -- so thank you and I will turn it over to you.

Dr. Katy Kozhimannil: Thank you so much, Shawnda. And good morning or good afternoon to everyone. I'm really excited to get a chance to talk with you today. I know you have a lot of viewing choices for entertainment today especially today a person could be watching hearings on Capitol Hill, or listening press conferences, or watching YouTube videos from last night's farewell address, but instead you were here with me and I appreciate that.

So as Shawnda said, I'm Katy Kozhimannil. My preferred gender pronouns are "she" and "her." I'm an associate Professor at the University Minnesota of School of Public Health and I'm also a Director of Research at the University of Minnesota Rural Health Research Center. Today I'm really delighted to be able to present to you about the findings and implications from several years of work our team has conducted on maternity care in rural America.

Before I begin, I'd first to acknowledge the wonderful group of unit managers that rural hospitals across the country who volunteered their time to guide our research team and the work that we've done around maternity care quality and access. The pride that they have in their work caring for pregnant people, delivering babies, and giving birth in rural communities is palatable and I hope it's reflected today in the presentation that I'll give.

I don't acknowledge my co-authors and collaborators at the University of Minnesota of Rural Health Research Center and finally I acknowledge our funder with great appreciation from which I'll present in supported by the Federal Office of Rural Health Policy at HRSA –

So I think it's important to start with understanding childbirth and kind of the broad context of health care deliveries.

Childbirth is the most common reason for hospitalizations in the U.S. Nearly 4 million people give birth every year and about half a million babies are born in the rural USA every year. Childbirth is not only common, it's quite costly.

The total cost of for maternity related hospital care topped \$27 billion annually and that's more than 7.5% of all hospital costs. For those public and private cares, maternity and newborn care is the most expensive service line. That is, they pay more for these services than for any other type of care.

When we think about who paid for childbirth, it's important to note that almost half of all U.S. births are funded by state and Medicaid programs. They pay about half of what private health plans pay for healthcare and that's important because there's a greater portion of Medicaid funded in rural compared to urban areas. Rural areas are distinct in many ways that are relevant from maternity care, access, and quality and I want to highlight a few of those as we move forward in this presentation.

In 1985, about 24% of rural counties lacked obstetric services. By 2002, this number had risen to 44%. Between 1985 and 2002 approximately 760 U.S. hospitals closed their O/B services. It's estimated that almost 6 million U.S. women live in rural counties without a obstetrician and nearly 80% of women in those rural counties do not have access to a local hospital with obstetric services.

Access is declining, but among those rural hospitals that do provide obstetric services what is the quality of care? Who is delivering that care and where the opportunities and constraints on the capacity of rural communities to support local childbirth? These are some of the issues that have motivated our centers recent work on maternity care quality and access in rural areas.

Shawnda Schroeder: Katy, this is Shawnda. I do just want to interject just for one moment.

We're getting some feedback, that it's too quiet and they cannot hear you so if there's anything you can do to speak up.

Dr. Katy Kozhimannil: Okay, I will try to speak louder.

Shawnda Schroeder: Thank you. Thank you. I'll let you know if there's any more comments

Dr. Katy Kozhimannil: There's a button on my phone that has a higher volume and I just pushed it, so hopefully that will help for folks. Please let Shawnda know if there are other limits. Is that a little better?

Shawnda Schroeder I'm not seeing any comments. Oh, yes, it's better for those that have been saying that. Thank you.

Dr. Katy Kozhimannil: Okay, great. Thanks for letting me know.

Okay, so today I'm going to present highlights from three different projects that we've undertaken related to maternity care quality workforce, and access in rural areas. First, I'll describe our research which documents the relationship between hospital birth volumes and the quality of maternity care in rural areas.

Secondly, I'll present findings from a survey of all rural hospitals that offer obstetric care in nine U.S. states and describe who is delivering babies in those hospitals.

Finally, I'll look at non-local childbirth which is sometimes referred to as "bypass" among rural woman describing the characteristics of woman and of local hospitals that are most predictive of non-local birth. Together, I hope this information paints a picture of the current state of maternity care rural America and I'll end by tying together some of the findings and discussing implications in a time of quite rapid change in healthcare policy.

All three of the studies that I will highlight include data on all hospital birthday to rural women in nine U.S. states -- Colorado, Iowa, Kentucky, New York, North Carolina, Oregon, Vermont, Washington, and Wisconsin and we looked at the years 2010 and 2012.

So the final analysis included over a 100,000 births in 581 hospitals in 2010 and about 104,000 births and 565 hospitals in 2012. So you have hospital

discharge data from the statewide databases of the healthcare costs and utilization project and these data contained 100% of hospital discharge records for all pairs within the state in a given year. You may ask why these states? They were chosen based on the five of their rural population.

U.S. rural distribution and also and perhaps most importantly in terms of the logistics because they permit the use of patient zip codes and linkage of their data with data on hospital characteristics from the American Hospital Association Survey. So these nine states are, obviously, not all states and may not be fully generalizable to all other states, but they were the places where we able to get the data that we needed to do these studies.

In addition, we conducted a telephone survey of all rural hospitals that provided obstetric services in these nine states. The survey sample consisted of 305 rural hospitals with at least ten births in the data from 2010. The survey questions that we used were based on the review of the literature and recommendation from the Advisory Committee of Obstetric Nurse Managers from eight rural hospitals.

They include -- closed and open ended questions about the hospitals obstetric services including delivery volumes, the types and numbers of clinicians that attend delivery, staffing challenges, and staffing changes as well as anticipated future changes and staffing. The survey interviews were conducted by the Office of measurement Services at the University of Minnesota between November of 2013 and March 2014.

Just so you know a little bit about who answered these surveys the majority the vast majority -- 95% of the survey respondents had a managerial role in obstetrics for woman's health -- so they were the director or nurse manager, for example, of the hospitals and obstetrics or woman's health departments. A total of 263 hospitals responded to our survey. That was a response rate of 86% and we were really delighted with that.

The hospitals that responded didn't significantly differ from non-respondents in terms of characteristics like size or number of beds accreditation or system affiliation. Among the responding hospitals there were 19 that had stopped providing obstetric services between 2010 and the time that we talked with them and 244 were currently providing obstetric services.

So we merged the data from our survey with the American Hospital Association Annual Survey data and also the hospital discharge data for the analysis that I'll describe.

Now I'll focus on the first study and I will say a lot of this I'll provide some resources at the end where you can get more details about each of these studies what I want to do is just provide a broad overview of kind of what we did, why we did it, and what we found.

So the first study we know that birth volume is an important factor guiding rural hospital decisions about the financial solvency of their obstetric units. The possible relationships between birth volume and outcomes in obstetric care quality and safety in rural hospitals deserves close scrutiny. Most of the health services literature in volume and outcome relationships has focused on conditions that are not commonly treated or procedures that are not performed that often in rural hospitals and example side constraints often results in underrepresentation of small and rural hospitals in these kind of broader studies of the volume outcome relationship.

So measurements in high risk obstetrics and rare adverse outcomes has really dominated the volume quality literature in obstetrics, but implementing such measures is a real challenge in hospitals with low obstetric volume so the goal of our workload to measure the relationship between hospital birth volume and obstetric care quality will use newer quality metrics or the capture outcomes that are short of mortality or severe morbidity and examine differences among rural hospitals.

So for this study rural hospitals included all critical access hospitals and other rural hospitals located in micropolitan or non-core counties as assigned by the Office of Management and Budget. That's the definition that we use. We divided hospitals into approximate quartiles to assure distribution across the range of birth volume and we classified annual birth volume as low between 10 and 110 births a year, "Medium", between 111 and 240 births a year, "Medium-High", 241 to 460 births a year, or "High" which is greater than 460 births a year.

The primary outcomes for this analysis included quality and safety measures that had been recommended by professional organizations accrediting bodies and quality measurement experts and they're based on ICD-9 diagnosis and procedure codes. Quality outcomes include the low risk cesarean rate which in this case we measured among term single and vertex pregnancies with no prior cesarean. Cesarean birth without medical indications, without medical indication, and safety outcomes were episiotomy among vaginal deliveries and stern three lacerations among vaginal deliveries.

The medical indications that we used for this were based on specifications of set forth by the joint commission and that's what we used to create these measures.

I will spare you all the details of the multivariate progressions models that we used, but anyone who has questions about that please feel free to follow-up and ask. So, I want to highlight our results. Our findings revealed that quality, decrements there were quality decrements in maternity care across all settings.

Now I will say, you know, this is focusing on rural areas. Quality decrements in maternity care are not confined to rural areas certainly. But volume was not consistently related with outcomes. So generally, we found that lower volume rural hospitals had poorer performance on cesarean related measures compared with Medium-high and High hospitals.

On the indicator, low volume hospitals had core performance in medium volume hospitals, but they didn't differ significantly with medium, high or higher volume hospitals. And in contrast to cesarean and labor induction quality metrics, the lowest volume rural hospitals had significantly better performance than medium high and high volume hospitals in episiotomy measures. The laceration which is a rare outcomes did not differ significantly by hospital birth volumes. So our study results indicated that obstetric care and safety vary very significantly across rural hospitals by birth volumes, but better performance was not consistently associated with lower or higher volume facilities.

So having maternity and newborn care within a community is important for rural families, but the number of hospitals providing this type of care has steadily declined. Although access issues has gained attention in the field of rural obstetrics, it's important to also focus on the quality of care services for women who receive their maternity care at rural hospitals.

So what do our findings imply about the quality of childbirth care for rural communities? I'm going to first discuss the workforce and then look at patterns of care in local and non-local birth and then bring all of this kind of together in a discussion of implications.

I'm moving on now to the second study but Shawnda I want to check-in with you to see if my volume okay and folks can hear me. Are you hearing anything else about that?

Shawnda Schroeder: Yes, I haven't any other comments regarding the volume so I think it's probably working.

Katy: Fantastic, great. So now that we know a little bit about what happens during birth at rural hospitals, let's talk a little more about who is doing the work of obstetric care in rural areas. So, this is a second study I'll present.

Healthcare workforce shortages for any of you that work and rural areas is a long-term problem and something that we talk a lot about especially in geographical isolated areas?

Obstetricians provide a vast majority of obstetric care in the U.S., but their geographic distribution is very uneven and it contributes to disparities in access rural areas. Family physicians who have historically provided both prenatal and obstetric care in many rural settings, are attending fewer births and providing prenatal care less frequently over time. In addition to a supply of general surgeons has not kept pace with population increases and that's a concern for smaller rural hospitals that rely on general surgeons especially for cesarean deliveries.

The availability of clinicians provide anesthetic anesthesia services and train nursing staff is also a challenge and a concern of rural areas. The purpose of this study was to describe the types and combinations of clinicians that are delivering babies in rural hospitals so to describe their employment status at the hospital, their relationship between hospital birth volume and staffing model, and to briefly describe some of the staffing challenges that are faced by rural hospitals.

We really are hoping to inform the implementation of some of the policy initiatives that are focused on workforce generally and to consider them in the context of obstetric and maternity care services.

Okay, so the primary data search for this study was the survey that we conducted that I described earlier and the birth volume categories are the same as I described in the prior paper.

We compared hospital categories across volume groups using high squared statistics and the most of what we're presenting here is by varying associations and we also analyzed responses to open-ended questions about clinician changes and staffing challenges.

We did conduct multivariable regression analysis of the association between hospital birth volume and obstetric workforce in an effort to control for the patient and other things that may be associated with those factors.

So, I'll dive right into some of our findings. This figure shows the relationship between hospital birth volumes and the number of maternity care clinicians of different types. So obstetricians are shown in kind of this red or maroonish color and family physicians are shown in blue. No relations are red and blue and politics, in any way. The relationship between birth volume and the number of obstetricians is strong and positive.

So the mean number of obstetricians per hospital increases with birth volume ranging from 1.4 obstetricians in low volume hospitals to 5 in high volume hospitals. However, the relationship between birth volume and the number of family physicians is slightly more complicated. The mean number of family physicians per hospital peaks at 6.3 in the medium-high volume hospitals, but it dropped in high volume hospitals to 3.3 family physicians and that's the same as hospitals with low birth volumes so you see a little bit of a different relationship depending on clinician type.

So this figure is similar to the prior one on the x-axis, but here the y-axis shows the percentage of clinicians that are employed by the rural hospitals across hospital birth volume categories. So the proportions of obstetricians and family physicians who are employed by the hospital versus being in private practice also differs significantly by hospital birth volumes.

On average, medium birth volume hospitals have the highest proportions of 75% of their obstetricians are employed; while low birth volume hospitals have the highest proportion of employed family position.

So notably, but perhaps not surprisingly, nearly all -- so 98% of the survey hospitals -- reported that they had challenges in staffing their obstetric units.

Our analysis of their responses revealed five themes. They were around scheduling, training, recruitment and retention, census fluctuation or the number of births going up and down, and intrahospital relationships. I'll tell you a little bit more about each of those briefly. So scheduling obstetric nurse staff especially dealing with vacations, sick days, medical and maternity leave, covering night and weekend shifts, and managing on-call systems was the most common challenge reported by more than a 1/3 of the rural hospitals that we spoke too.

Many rural hospitals found it difficult to access training opportunities and maintain staff competencies in work volume settings. One respondent explained, "We have to travel a long way for training -- two to three hours." Another said, "We have so few deliveries that it's difficult to keep staff fully trained." Hospitals with lower of birth volume also had more fluctuation in their obstetric patient load so the flux of increased deliveries and downtime one respondent said, "At times I may need five nurses, and other times I need two. I don't have a consistent flow of patients."

Challenges with recruiting and retaining obstetric providers were reported by 21% of hospitals. The vast majority of responses related to nursing staff including dealing with turnover and having not enough nursing staff overall for the unit. About 12% of hospitals reported staffing challenges and relationships between the obstetric unit and the rest of the hospital. Specific concerns included -- a difficulty in getting other hospital staff and administrators to understand the high-risk nature of obstetrics, following guidelines and meeting hospital productivity standards, and justifying obstetric staffing when census was low as well as financial issues related to the obstetric service line.

So to summarize our findings from this study -- we're flying through the study findings -- hospitals with lower birth volumes -- those were fewer than 244 per year -- were more likely to have family physicians and general surgeons

tending deliveries; while those at the higher birth volume more frequently had obstetricians with mid-wife with pending deliveries.

I didn't show that general surgeons and midwives in this presentation now, but the full paper doesn't say that information. General surgeons performed cesarean deliveries in about - in more than half of the lowest volume hospitals and 58% of the lowest volume hospitals, but in none of the highest volume hospital surveyed. Workforce challenges were reported by surveys, hospitals are related to their role location and to the low - the lower birth volumes -- and again, I'll just go through the implications of this study and the prior one after some information on our third study which focused on non-local childbirth for rural woman.

Now we have a picture of a city. The pictures are folks in the country. So moving onto the final study here I'm going to highlight the issue of non-local childbirth. So clinicians and hospital administrators need basic information about the rural women who give birth at non-local hospitals, as well as the hospitals that they leave behind in the rural community in order to effectively develop and implement clinical and policy strategies to appropriately care for low risk women locally and to triage higher risk women to insure that they have access to the higher acuity services when they need them.

The goal of the study was to measure of whether local hospital characteristics or maternal diagnosis that were present in childbirth were associated with delivery in a non-local hospital among rural women.

So for context, I want to describe a recent ACOG and FMSM -- so that's American Congress of Obstetricians and Gynecologists in a Society for Maternal Fetal Medicine -- consensus statement on the levels of maternity care. It lays out designations that correspond to specific capacities available and facilitates that provide obstetric care. This came out in 2015 and was the first coordinated effort to address appropriate triage of pregnant women to settings that meet their clinical needs.

Pregnant woman in rural and remote areas received particular attention in discussions of regionalization and levels of care owing to the challenges and ensuring local access to high acuity services when necessary. This is a discussion that's happened for a long time in the area of neonatal care and we're used to having that discussion in perinatal regionalization around neonatal care and NICU levels of care and now the conversation is starting to focus more on women. Compared with women in urban areas, rural women experienced poor health outcomes and have less access to healthcare both generally and with respect to obstetric services.

In rural areas, women must travel greater distances to access hospitals with obstetric care and many rural women with low risk pregnancies can safely give birth at local hospitals -- and that's a choice that helps reduce the additional perinatal morbidity risk of increased travel distance. However, there are complications that necessitate higher acuity care and they have infrequently in obstetrics even among low risk pregnancies sometimes it's difficult to predict.

The challenge of ensuring that appropriate maternity services are available to meet the clinical needs, of concerns among rural obstetric unit managers, medical directors, and clinicians. This is a big, huge, huge, challenge and we know as I mentioned about half a million rural women give birth every year in U.S. hospitals, but whether and which of these women give birth locally is crucial so understanding that is really important for operationalizing these maternal levels of care and for the work that's done in local, rural obstetric units.

So here again we use multi-various logistic regression models to predict the odds of childbirth in a non-local hospital. So we defined a local hospital as "any hospital in the nine studied states that was either first either the nearest hospital to the patient's residential zip code that provide obstetric services or any hospital within 30 road miles of that patient's zip code centralized that

proved obstetric services” so the local hospital is either your closest hospital or any hospital within 30 miles that provide obstetric services.

The 30 miles driving distance was selected based on prior research on access to perinatal services and we did sensitivity analysis to look at alternative specifications in terms of road distance cutoffs. We examined patient age, race ethnicity, level of rurality, clinical diagnosis, as well as local hospital characteristics such as birth volume, neonatal care level, ownership, and so forth to look at both the characteristics of the women who are giving birth non-locally, their clinical characteristics, and the characteristics of the hospitals they left as well as the hospitals that they went to.

I want to say one more thing before I leave the slide. So I talk about a range of different clinical diagnosis. We also create a composite of conditions that may require maternal fetal medicine consult and this was based on work that was done by the Angels Project in Arkansas looking at rural women and their need for higher acuity clinical services. So really trying to understand, you know, what are some of the things that we can know ahead of time and how was local versus non-local childbirth handled for those women.

Okay, so I’m going to jump into some of our findings and I’ll go through each of these. So the chart on the left shows the percent of rural women who gave birth in non-local hospitals by maternal clinical diagnosis present at the childbirth hospitalization. So, rural women with conditions that may require maternal fetal medicine consultations had a higher rate of non-local childbirth than those without those conditions and that’s what we would expect given referral patterns for higher risk patients.

All maternal clinical diagnosis we studied were associated with higher chances of giving birth in a non-local hospital. Among those clinical conditions, women with multiple gestation and preterm deliveries, 47% of women with multiple gestation and 44% of those with preterm deliveries,

have the highest to childbirth in a non-local hospital. That makes sense for a variety of reasons.

Those are things that are generally notable ahead of time are at least risk factors for them are known ahead of time and are conditions which generally do require higher acuity services. The chart on the right shows the percent of rural women who gave birth in a non-local hospital by primary care so and I want to emphasize that these are control for clinical characteristics. So women with Medicaid is a primary care so it's a predominantly low income individuals were less likely to deliver in a non-local hospital than women with other types of insurance even after controlling for their clinical condition.

So, again, Medicaid is based on income eligibility so this finding highlights that lower income rural women are less likely than higher income rural women with the same clinical conditions to give birth at a non-local facility.

So this table shows the characteristics of hospitals where rural women gave birth so the delivery hospitals based on whether or not the birth occurred in a local or non-local hospital.

So first we'll see that about 1/4 of all births to rural women occurred in non-local facilities and about 75% occurred locally and that's which quite consistent with one might expect in terms of the percent of pregnancies that are generally considered higher risk versus lower risk, but the question is, Are the right 25% giving birth non-locally and are those that are giving birth locally appropriately cared for in that timeline?

What we can see is that about 2/3 -- so 64.4% of rural women -- who gave birth in non-local hospitals went to an urban hospital and about 68% of those who gave birth locally went to a rural hospital that was not a critical access hospital. Also, at the bottom of the table we can see that non-local births were much more likely than local births to occur in a hospital with higher acuity newborn care -- that is with a - either a NICU or an intermediate care unit for

a newborn - so 71.7% versus 31.7% when you add the numbers in the columns up. I'm doing math on the fly here.

Oh, now I can highlight those. So, there are the numbers that I'm highlighting and there if you add them together that's where you get the 71.7% versus 31.7% in terms of non-local childbirth happening in places with higher acuity neonatal care capacity.

So, our finding. We found that approximately 75% of rural patients gave births locally. Rural women with preterm birth and clinical complications as well as those without local access to higher acuity neonatal care were more likely to give birth in non-local hospitals.

These findings are consistent with potentially appropriate referral and care seeking patterns that ensure that higher risk rural patients have access to the level of care that they need. However, I think it's so important to note that after controlling for clinical complications rural and Medicaid beneficiaries were less likely to give birth at non-local hospitals which implies a potential access challenge for this population.

Now I'll bring each of these studies into communication with one another and discuss some of the implications in the current policy context or at least as much as we know of the current policy context.

So before I get into the limitations or before I get into the implications I do want to acknowledge some of the important limitations of our analysis that are relevant for interpretation. I mentioned up front, but the results from these nine states may not be fully generalizable nationally.

We control for states six effects in our studies, but I'll come to make it for across states and future study on the effects of state level policies in particular is really warranted. Also, hospital discharge data do not contain clinical notes or information on prenatal care, on parity, on gestational age at birth. Also, we

- so there's a lot of information that's not contained in hospitals discharge data that would be interesting and important.

There are other factors as well that maybe not observable in our data and these include things like -- whether local providers had referred women for obstetric care in non-local hospitals or about the quality of local providers. We don't observe maternal education income or willingness to travel. We don't observe people's health plans and their network or the influence of friends or family on maternity care physicians.

I think that there's a lot of room for more research to be done on these topics preferably with data that allow for clinical diagnosis information and linkages between mothers and infants, detailed information on referral and transfers, as well as health plan network. To my awareness no such nationwide data currently exists, but I think that there is a lot of room for further information on these topics.

So, that said, I'm going to move onto this and go through some of the implications of the findings that we do have given their limitations. In the first study, I described it indicated that a obstetric care quality and safety outcomes may vary across rural hospitals by birth volumes, but better performance was not consist associated with lower or higher volume facilities. I want to draw out a few implications of this study as they relate to the broader issues of maternity care and access and quality.

The first major implication of our body of work and of this study is that quality improvement strategies must account for the rural context. For example, the pattern has been turned, quote – “a relentless ride” in cesareans and other obstetric interventions has not bypassed rural hospitals. The first paper I present shows this event. The use of cesarean delivery has been increasing in rural hospitals even when medical indications are not present and these trends run counter to recommendations by ACOG and other professional organizations.

But the recommendations by these same organizations regarding ways to produce unnecessary cesarean use may be less acceptable in rural hospitals and rural settings. Rural hospitals, especially lower volume rural hospitals, report having specialized personnel, less flexibility and surgical staffing, more challenges and recruiting obstetricians, anesthesiologists, general surgeons, and nursing staff, limited resources, and they have increasing concerns about malpractice liability costs and other costs related to functioning.

Some of this is corroborated by the findings in the workforce paper -- the second paper I presented -- but taken together these findings indicate that a rural specific focus on use of cesarean delivery with attentions of volume dependent resource and staffing issues maybe warranted in a broader context of maternity care quality measurement and improvement.

Now I'm moving on to the implications of the Workforce Study. Many of the obstetric workforce challenges reported by surveyed hospitals including recruitment and retention of separate clinicians, access in training opportunities, and maintaining staff competencies are related to their rural location and to low birth volume.

This implies that individual hospitals working in isolation may struggle to address staffing challenges. Potential solutions could focus on education and training efforts across disciplinary lines and involve more than one healthcare delivery system for same or one or more hospital working in partnership. A few examples.

First is kind of related to preparing clinicians for rural obstetric practice. The overall decline in the provision of maternity care by family physicians and how best to structure residency programs to prepare family physicians to provide specific services have been debated by clinicians, professional associations, and residency programs for some time.

More extensive and advanced maternity training could help interested family physicians be better prepared to practice obstetrics in rural areas. Also, with so many rural hospitals having clinicians for more than one specialty attending delivery the need for interprofessional education and training is clear. A medical and nursing education policy, standards, and curriculum can be adapted to reflect the reality of a rural obstetric practice.

Interprofessional education in particular can help improve help their processes in patient outcomes. That's been documented in other clinical areas. In a practice culture, and it also improves the practice culture that are working in rural areas.

Looking at maintaining skills in low volume birth settings, is beyond initial clinical training obstetric care clinicians and nurses in rural settings could benefit from ongoing training to maintain competencies and improve skills especially in low volume settings as well as access to structured opportunities consult the specialists regarding obstetric complications. Training that focuses on addressing obstetric emergencies in rural events is especially important in lower volume birth settings and maybe helped my telehealth simulation training and other aspects of innovate healthcare delivery and innovate delivery of training.

Okay, moving onto the third survey. I showed the results of our recent findings on non-local childbirth and I want to interpret these findings in the context of the maternal levels of care designation and what that may mean for rural communities.

Implementation of maternal levels of care will help make clear to both patients and clinicians the types of obstetric services that are available in different facilities.

Greater use of maternal level of care designation may improve the process of triage and referral of rural pregnant patients who develop complications and

require a higher level of care than what's available locally. I think it's an incredibly improvement on the current infrastructure of perinatal regionalization that focuses not only the infant and the infant's potential healthcare needs with respect to neonatal care, but also on the mother because it's more effective to transfer a mother than it is to transfer a mother once a baby is born and the two need to be separated, so I think there is a lot of improvement there.

The higher likelihood of non-local childbirth of rural women with more complex pregnancies implies potentially appropriate referral patterns which may actually characterize a functioning perinatal regional system. That's great news. It's nice to get - to see findings like that. However, after controlling for clinical complications, the rural Medicaid beneficiaries are being less likely to give birth at non-local hospitals is a problem.

This finding also raises the possibility not just of active challenges for Medicaid beneficiaries', but also the possibility of over-triage so that maybe that privately insured women may give birth at non-local hospitals when they could have been appropriately cared for in a local facility. Given these findings, I think particular attention to access their state and by low income rural Medicaid beneficiaries is important moving forward.

In just over a week, a new President will be inaugurated and will be entering a new era of health policy.

I think many people are expecting radical changes to Obamacare or likely repeal, but the exact form of these changes and the, you know, what repeal and replace may look like is yet unknown. Based on some of the Republican alternative proposals, we can consider potential changes and their effects on rural maternity care, but I do expect that the following facts will continue to be true.

I think that the concept of value which has been highlighted in recent policy efforts I think will become increasingly important in policy decisions. I do think that people will continue to give birth and that the cost of childbirth will continue to be shared by families, employers, and also by taxpayers. So it's really - it is hard to speculate about kind of what any healthcare delivery system will like look in the, you know, in the coming months and years, but a focus on the needs of a rural people may guide the intentions of the new leadership in Congress and in the executive branch as many hail from rural states and districts.

But again, the specific forms and future directions is yet unknown so I offer this need implications, you know, into an unknown era that I think the idea of value and of the role of government financing in childbirth will continue to be issues that guide policy decisions and that affect the lives of rural communities and families.

So what is the way forward? In the slides that follow, I've outlined just a couple of federal and state level strategies that may be helpful in considering the goal of improving value and quality and rural maternity care.

First, I'll focus briefly on the federal level and then move to the state and local level.

So there are several policy levers that can be used to improve access to high quality maternity care services -- so rural and then giving birth in low volume hospitals. On the federal level, there's a bill that's been working its way through Congress. It has actually passed the house. It's called the, "Improving Assets and Maternity Care Act" which would have HRSA with identifying maternity care workforce shortage areas across the country.

Those areas would benefit from loan forgiveness programs through the National Health Services Corp and may incent maternity care clinicians to practice in those areas. Similar strategies have been used in the past to address

other types of healthcare workforce shortages and this is a, you know, a potential vehicle for moving forward. In addition, federal efforts to support maternity care quality improvement generally including requirements and resources to develop, use, and report quality measures require attention to the needs -- the particular needs -- of a rural resident.

So here I'm highlighting the Quality of Care for Moms and Babies Act of 2015. Debbie Stabenow and Chuck Grassley is a bipartisan effort to introduce this legislation. It would require a recommended core set of maternal and infant quality metrics. But if past it implemented with attention - it only passed an implement with attention to the differences between rural and urban areas with this legislation really helped levels of playing fields for rural families ensuring rural relevant measures are recorded on and accessed to federally collected information on the quality of maternity care in rural areas.

At the state level, there are a number of different policy levels that may be relevant as well.

The first is Medicaid policy. In addition to federal policy, state policy effect workforce in rural hospitals. Variability across states in a number of types of maternity hospitals indicate that each state has particular constraints and opportunities for addressing rural maternity care.

Medicaid funds, as I said, nearly half of all 'burbs and half of 'burbs in rural areas. State Medicaid programs are likely going to be facing some changes in the coming years, but with basic opportunities for coverage design, benefits design, reimbursement rate, payment policies, and managed care arrangements to ensure an adequate supply of providers and to reduce financial barriers to accessing evidence based maternity care services.

Medicaid could also play a leadership role in advancing transparency and availability of information on quality metrics. Efforts to improve reporting

and availability of quality measures have been spearheaded by Medicaid programs and I think that could play for improvement in the future as well.

One potential scenario for the future of Obamacare is the possibility of Medicaid block grants which could further reduce available resources but would provide an even stronger imperative for high-value care in maternity services in state Medicaid programs.

So not only do the number implies a rural maternity hospitals vary across states, but so does the maternity care workforce.

Efforts to address healthcare workforce challenges are not limited to the federal level. The state plays a lead role in determining licensing, credentialing, and scope of practice regulations for clinicians including those in maternity care. There's a lot of variability across states in the allowed scope of practice for advanced practice nurses including certified nurse midwives and restrictions that don't allow clinicians to practice at the top of their licenses may limit access to maternity care services including midwifery care, for example.

So efforts to reduce practice barriers for certified midwives or other advanced practice nurses may increase access to care for people in rural areas. Other state and local policy to address maternity workforce and quality concerns in small, rural hospitals in particular it may include -- subsidies for training programs for maternity care professionals in professional schools especially those that encourage homegrown rural workforce, encouragement of family medicine rotations and residency programs that include a focus on obstetric services in rural areas, subsidies for continuing medical education and other ongoing training and capacity building for maternity care professionals working in smaller, more remote hospitals, collaborations between clinicians, professional societies and healthcare delivery systems on integration of care and transfer across settings including -- attention to transfer some a planned homebirth in rural settings and also from other smaller rural hospitals to other

hospital settings. And finally, state and institutional level of quality improvement initiatives and collaborations to leverage resources and innovation across smaller volume rural settings.

One of the nice things that incentives for collaborations across small, rural hospitals because they're generally not competing for patients so this an area if collaboration, if feasible.

Ultimately, the goal of any policy intervention in this area should be to provide workable solutions to the challenges that pregnant women in rural and remote area space both in accessing comprehensive maternity care services and insuring their received high quality maternity of care. General effort undertaken at the federal, state, or local levels ought to account for the particular circumstances of rural communities, rural clinicians, and rural families as they navigate the life and health challenges of the company, pregnancy, and childbirth.

So for more information, I posted here a few links through policy briefs and some of our recently published articles. Please also check the Gateway web site for a complete listing of the products and publications that have come out of this body of work. Thank you so much for taking the time to watch this webinar today and I welcome any questions or comments that you may have at this time.

Coordinator: Thank you. At this time, if anyone wishing to ask a question or make a comment, please press star followed by one on the keypad of your telephone and please be sure that your telephone is unmuted and clearly record your name at the prompt so that your question may be introduced. Once again, it is star followed by one to ask a question. One moment please.

Shawnda Schroeder: I'm going to just interject for a quick moment while we wait for the first question to come in. This is Shawnda Schroeder. I am going to go back one slide so people could see the resources as they request and then I also decide

to let you all know that today's webinar will be archived on our website of the Gateway web site www.ruralhealthresearch.org. You can go there to see the slides from today's presentation in the archive as well as the transcript and those are usually available within a week or two of the webinar and we will send that out to our research alerts as well. If you would like to sign up for those, you can do through our website. So, I will pause to see if there are any other questions on the line.

Coordinator: At this time, I am showing no questions.

Shawnda Schroeder: Well, if there are no questions if you have a question, please do so chime in but I'd like to thank Dr. Kozhimannil for presenting today. I appreciate you taking time. For those of you on the call, we do also want to note that for those of you who enjoyed today's webinar or would like more information about upcoming webinars, we do have one more webinar coming up on January 24. This webinar has quite a bit of a different focus.

This webinar is about how to prepare a strong rural health message and on this call you'll hear from myself as the PI of Gateway and also from the Rural Health Information Hub. You're going to learn about rural health resources and research that's readily available through our website, you'll learn about how to use the information to develop a strong rural health message for decisions makers, to the public and others, and finally, you'll hear from - you will hear from a guest speaker, Dr. David Schmitz, who serves as the current President of the National Rural Health Association and he will speak to how he views both Gateway and RHHhub have developed different products and messages that have impacted rural.

And if you'd like more information about that webinar, again, go to our web site - sign up for our research alerts or follow us on Facebook or Twitter. So, thank you again, and if - I'll ask the operator one last time if there are any questions?

Coordinator: And I'm still showing no questions.

Shawnda Schroeder: Perfect. Well, thank you Dr. Kozhimannil. You must've really covered it really well.

Dr. Katy Kozhimannil: I hope so. I have questions for everyone who's listening, but no, I'm just kidding. Thank you so much for the opportunity to present on this topic and thanks to all of you who took time to - who listened and, yes, thank you so much.

Shawnda Schroeder: Thank you. Thank you for all of those on the call today and have a great afternoon.

Coordinator: This does conclude today's conference. Thank you so much for joining. You may disconnect at this time.

END