Preventing Zika Infection During Pregnancy, Puerto Rico, 2016–17

[Announcer] This program is presented by the Centers for Disease Control and Prevention.

[Sarah Gregory] Hello, I'm Sarah Gregory, and today I'm talking with Dr. Katherine Kortsmit, an epidemiologist at CDC. We'll be discussing protective measures used by women to prevent Zika during the 2016–2017 outbreak.

Welcome, Dr. Kortsmit.

[Katherine Kortsmit] Thank you. Thank you so much for having me, Sarah. I'm really excited to be here and the opportunity to talk more about the work we've done.

[Sarah Gregory] So, we've heard a lot about Zika and birth defects, but what is it?

[Katherine Kortsmit] So as you mentioned, in recent years we've heard a lot about Zika. Zika is an infection caused by a virus. It is especially concerning when a woman is infected with Zika virus during pregnancy as it's been found to cause poor birth outcomes, such as brain and eye abnormalities, microcephaly, and other birth defects.

[Sarah Gregory] How is it transmitted?

[Katherine Kortsmit] So, I think a lot of people have heard about the most common transmission. So, transmission of Zika virus primarily occurs through the bite of an infected mosquito. However, it can also be transmitted by having sex with a partner who has been infected with Zika virus.

[Sarah Gregory] We actually...I actually did a podcast about sexual transmission of Zika back in 2011. So if listeners want to look for that, you can learn a little bit more about that aspect of it.

[Katherine Kortsmit] Oh, great! That's really interesting.

[Sarah Gregory] Your study is about Zika and ways used to prevent it in pregnant women in Puerto Rico in 2016–17, as I said earlier. Why did you do this study?

[Katherine Kortsmit] Mmm-hmm. Yes. So...well, in 2016 as you and many of your listeners may have heard about, there was a Zika virus outbreak throughout Puerto Rico and at that time, many pregnant women were becoming infected with Zika virus. And really at that time little was known about what women were doing to protect themselves from getting Zika virus, and also whether or not women were being counseled by their healthcare providers on what they could do to protect themselves. And so, we had done an earlier study in 2016 using data collected in the fall of 2016 in Puerto Rico that was actually published in this journal last fall. And in that study, we looked at women's use of behavior to prevent sexual transmission of Zika virus during pregnancy, specifically condom use. And what we found when we did that study was when women were counseled by their healthcare providers during prenatal care visits to use condoms to prevent Zika virus, they were then also more likely to report consistently using condoms while they were pregnant. So for the study I'll be talking more about today, we really wanted to have a better understanding if counseling women on other behaviors they could engage in to protect themselves from vector-borne transmission of Zika virus—so, through the bite of an infected mosquito—also play a role in whether or not women engaged in protective behaviors while they

were pregnant. And so we were most interested, for this study, in looking at women's use of insect repellent and whether or not they wore long sleeves and long pants while they were pregnant.

[Sarah Gregory] How did you go about it? I mean, what data did you use?

[Katherine Kortsmit] For this study, we used data from a study called the Pregnancy Risk Assessment Monitoring System—Zika Postpartum Emergency Response study (or PRAMS-ZPER for short), and this data was collected in Puerto Rico during the Zika outbreak. And I will refer to it as PRAMS-ZPER from here on out.

[Sarah Gregory] Ok, could you say the name of that again just a little more slowly for us?

[Katherine Kortsmit] Yes, absolutely. It's the Pregnancy Risk Assessment Monitoring System—Zika Postpartum Emergency Response study. And it's often referred to as PRAMS-ZPER. And this study was...a lot of the methodology for this study was adapted from the Pregnancy Risk Assessment Monitoring System, which is a larger ongoing surveillance system among women with recent live birth.

[Sarah Gregory] Ok. Well, tell us about your study.

[Katherine Kortsmit] Yeah, absolutely. So, PRAMS-ZPER was a collaborative study between the Puerto Rico Department of Health and CDC, and it looked at assessing Zika-related knowledge and behaviors among women with a recent live birth. And, this study was implemented islandwide and it included a hospital-based survey with women who had recently given birth—so, women were invited to participate shortly after they delivered and before they went home from the hospital. And for this study, women were invited to participate if they gave birth between August and December in 2016, and then again the study was repeated in the fall of 2017. And so for this particular analysis, we used data from both...both phases of the study. There was also a telephone follow-up component, but I'll be focusing more today on the hospital-based survey.

And so, this survey included questions on women's use of protective measures to prevent Zika virus infection while they were pregnant. So, for example, women were asked how frequently they used mosquito repellent when going outside or how frequently they wore long sleeves and pants during pregnancy. They were also asked about whether or not a doctor, nurse, or other healthcare worker had talked with them about engaging in these behaviors—so, whether a doctor or nurse had talked to them about using mosquito repellent or what types of clothes they could wear to protect themselves from mosquito bites. And so for this study, we were interested in looking at a few things. So, we wanted to look at the prevalence of women who reported receiving counseling during a prenatal care visit on these behaviors. So whether or not what types of clothing they could wear to protect themselves, and then also if they received counseling on using insect repellent. We then also wanted to look to see the prevalence of these actual behaviors and whether something was associated with how often women engaged in these behaviors while they were pregnant.

[Sarah Gregory] And what did you find?

[Katherine Kortsmit] So for this study, in both 2016 and 2017 we found that most women reported that they were counseled by their prenatal care provider to use mosquito repellent as

well as wear protective clothing to prevent mosquito bites. And...however, what we also found was that fewer women reported engaging in these behaviors. So, for example, in 2016 slightly less than half of women reported using mosquito repellent frequently—so, always wearing it when they went outside—and about 1 in 10 women reported wearing protective clothing every day. We found similar findings in 2017, but when we looked to see if there was an association between whether or not women were counseled and how this affected their actual behaviors. We found that women who are counseled on wearing mosquito repellent were then more likely to use repellent during pregnancy. However, we didn't find a similar association between being counseled on wearing protective clothing and then actually wearing long-sleeved shirts and long pants while they were pregnant.

[Sarah Gregory] So I personally would wear protective clothing more than I'm willing ever to put on repellent. So, why do you think these women were more apt to wear repellent than protective clothing?

[Katherine Kortsmit] Yes, so fortunately, the survey also included questions about reasons women did not use repellent or wear long-sleeved shirts and long pants. So, women who didn't report frequently engaging in these behaviors were then also asked what barriers they faced engaging in these behaviors. And so we were able to look at some of these and many women who did not wear long-sleeved shirts and long pants while they were pregnant every day reported the primary reason for not wearing protective clothing was that it was too hot. And this may be something that can be an important lesson learned for other outbreaks. While counseling is really important, the counseling may need to take into account what may be readily accessible, comfortable, or usable in that specific environment or also address potential barriers to engaging in recommended protective behaviors to better support women in following the recommended guidance, such as wearing protective clothing.

[Sarah Gregory] Yes, I can completely understand that I'm often wishing (especially here in Atlanta) that there was clothing you could wear that was protective but also not so hot.

Do you think these behaviors are generalizable? I mean, would women basically behave the same everywhere with the same amount of prenatal counseling?

[Katherine Kortsmit] Those are really great questions, and I think that's often a limitation with many of these studies is, while these findings may be applicable in similar settings to Puerto Rico, because PRAMS-ZPER was conducted on the island and this data was weighted to be representative of live births of residents of Puerto Rico, our findings may not necessarily be generalizable to all women. However, what we can say is findings from this study could potentially be applied more broadly to the prevention of other vector-borne diseases among pregnant women and could be used to inform efforts in other public health emergencies similar to the Zika outbreak in Puerto Rico. So, I think we can take a lot of the lessons learned here.

[Sarah Gregory] Were there any challenges or limitations to this study?

[Katherine Kortsmit] So as I mentioned, one of the limitations is of course the generalizability of these findings. But one of the things I'd really like to focus on is the overall PRAMS-ZPER study. I had the easy job of being the analyst and being able to write up the results for this study, but the team in Puerto Rico who collected the data and were in the field really did a phenomenal job and overcame a number of challenges. Most notably, in 2017 they went into the field to

collect data shortly after Hurricane Maria hit the island, and so they began collecting data in 2017 in November. But despite these challenges, just want to highlight what they were able to achieve. The response rates were really impressive in both 2016 and ‘17. In 2016, the team achieved an 81% response rate, meaning that among women who were invited to participate in the study, 8 in 10 agreed to complete the survey. And then in 2017, as I mentioned, despite Hurricane Maria having just hit the island, they were able to achieve a 94% response rate. So they did some really incredible work in the field.

I also want to highlight in 2017, the team in Puerto Rico were able to increase the reach and collect data from not only mothers but their partners as well. And they were also able to help reinforce Zika prevention in postpartum health messaging through an in-hospital education component. So again, I just really want to highlight the incredible work our partners at the Puerto Rico Department of Health did in spite of all of these challenges that they faced.

[Sarah Gregory] This kind of work is always so admirable, it's so often done with extreme challenge and the people persevere in the worst circumstances is just awesome to me.

What’s the most important public health message in your study, do you think?

[Katherine Kortsmit] So for this study, I think the most important takeaway is that efforts to improve use of risk reduction strategies to prevent mosquito bites during pregnancy may benefit from provider counseling. So for example, what we found was use of insect repellent was more likely during pregnancy when women received counseling from a healthcare provider. However, another takeaway is it's also important to understand how barriers may make other behaviors or recommended behaviors challenging, such as wearing protective clothing, less feasible. For example, what we found was it being too hot was a primary reason women didn't wear protective clothing, even though it...it was often recommended by their healthcare providers.

[Sarah Gregory] What are the next steps or further studies that you’d like to see?

[Katherine Kortsmit] So, we're currently working on analyzing additional PRAMS-ZPER data to inform future response efforts as well as doing some other analyses particularly looking at the role of fathers, which I noted was an additional component added to PRAMS-ZPER in 2017. I think more broadly some of the lessons learned from PRAMS-ZPER could be applied to inform other data collection efforts during public health emergencies similar to the Zika outbreak.

[Sarah Gregory] Are there any treatments now for people infected with Zika?

[Katherine Kortsmit] Unfortunately, no. At this time, there are...there's no specific treatment for Zika and there's not currently a vaccine to prevent it.

[Sarah Gregory] So, it looks like repellent and clothing are the best ways that people can protect themselves from getting Zika. Is that right?

[Katherine Kortsmit] Yes. So, those are two of the ways that people can protect themselves from getting mosquito bites. There are some other great resources then that outline other ways to protect yourself. On the CDC website, they have recommendations to prevent transmission of Zika. And so, those are some of the personal protective measures (is wearing repellent or long-sleeved shirts and long pants). Other ways people can protect themselves is to protect your home to minimize mosquitoes. So, removal of standing water or using screens on windows and doors are a couple of other ways.

[Sarah Gregory] Could you give us the exact URL for the Zika website?

[Katherine Kortsmit] Yes, absolutely. So if you go to cdc.gov/Zika, this will take you to CDC's page where they have numerous resources listed on prevention and transmission of Zika virus.

[Sarah Gregory] Is repellent safe for pregnant women to use? I'm sure that's a concern of many women everywhere.

[Katherine Kortsmit] That is, I imagine, a concern. When used as recommended, EPA-registered insect repellents have been proven to be safe and effective, even for women who are pregnant or breastfeeding.

[Sarah Gregory] Tell about your work and what you enjoy most about it.

[Katherine Kortsmit] I'm really fortunate to be working in a field I'm passionate about. I recently transitioned to a new role as an epidemiologist in CDC's Division of Reproductive Health. Most recently, I've had the opportunity to work with colleagues on a number of analyses using data from the Pregnancy Risk Assessment Monitoring System, which I mentioned a little earlier is the larger ongoing surveillance system among women with a recent live birth. And so we're…we're looking currently at maternal immunization rates and looking at the effects of workplace leave duration on breastfeeding outcomes are a couple of examples. I mean, I'm just...I love the work I do and having the opportunity to work in a role to contribute to improving maternal and infant health.

[Sarah Gregory] What do you enjoy doing in your personal time? That is if you have any recently.

[Katherine Kortsmit] Yeah, so I...in my personal time, enjoy spending time with my family. I have a toddler, and so he...he keeps us on our...our toes and keeps us busy these days.

[Sarah Gregory] Well thank you so much for taking time to talk with me today, Dr. Kortsmit.

[Katherine Kortsmit] Thank you for having me. I...I've enjoyed it

[Sarah Gregory] And thanks for joining me out there. You can read the November 2020 article, Preventing Vector-Borne Transmission of Zika Virus Infection During Pregnancy, Puerto Rico, USA, 2016–2017, online at cdc.gov/eid.

I'm Sarah Gregory for *Emerging Infectious Diseases*.

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