# Methodological Innovation in HIV Prevention Research with Cara Rice

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Speaker 1: Methodology Minutes is brought to you by the Methodology Center at Penn State.

Aaron Wagner: Hello and welcome to Methodology Minutes. With us today is Cara Rice, Postdoctoral Research Associate at the Methodology Center. Cara's work is primarily focused on sexual and reproductive health among high-risk populations. Cara, thanks for being here.

Cara Rice: Thanks for having me.

Aaron Wagner: Absolutely. How did you become interested in HIV research?

Cara Rice: You know, I took a little bit of a winding path to HIV research. I grew up as an Army brat and so grew up moving all over the world and experiencing a lot of different cultures. And really from a very early age, knew I wanted to understand health in different populations and understand how different cultures impact health. And originally was a pre-med major in college and double-majored in biology and psychology. And through that, really came to this idea that that was the way to approach human health, was from a biological and psychological perspective, combined.

 After I graduated undergrad, I fell into a job at a health department doing HIV and STI intervention work. That was when my interest in HIV really solidified, because it was the perfect combination of my biological background and my psychological background and it really allowed me to feel like I was making a difference in the community.

Aaron Wagner: Where was that?

Cara Rice: That was in east Tennessee.

Aaron Wagner: Wow. So from there, presumably, that led to graduate school?

Cara Rice: Yes. So I worked at that health department for a couple of years and really got my feet wet in public health and still hadn't fully decided what I was going to do and through those two years, really decided that public health was the right path for me. So I went on to get my MPH at Emory University. And then a few years later, went back to Ohio State for my PhD.

Aaron Wagner: And that led you here.

Cara Rice: Yes.

Aaron Wagner: So can you talk more specifically, other than HIV generally, what are your research interests?

Cara Rice: So my research interests can broadly be defined in kind of two different areas. So the first area is obviously content. And I'm really interested in sexual and reproductive health among high-risk populations and populations that have traditionally been underserved or marginalized. I really care about health equity and really care about providing the research evidence to develop interventions for these populations that have been neglected in the past.

 And I have really focused on sexual and reproductive health largely because I have seen the stigma attached to these types of diseases and I really care about sort of removing that stigma and making it something we talked about. So it's kind of the perfect combination of using biology and psychology and dealing with diseases in populations that have traditionally been stigmatized. So that's kind of the content area.

 Methods-wise, so that's probably the other major area of my research interests. And that's kind of in two different ways, so I have mostly done survey working the past, and that's actually been collection of data. And through that, I really developed a real interest in understanding how we assess certain things and figuring out improvements to those methods. So right now I'm working on some work to try to understand how we can better assess sexual minority status.

Aaron Wagner: That's really interesting. What does that mean? I really don't have any kind of grounding in that sort of work. So when you say, improve the assessment of sexual minority status, what is currently done and what are you looking at?

Cara Rice: So sexual minority status is collected in a variety of ways. So when I say sexual minority, typically people are thinking homosexual or bisexual. That problem is, is that status can really mean different things. So it may just be who people are attracted to. It may be how people how people behave. It may be how people identify. I'm interested in understanding which of those factors actually leads to health outcomes.

 So you know, it's possible that someone may engage in sex with someone of the same sex, which in traditional thought processes may make someone think they're gay and they are going to have the outcomes one would expect a gay person to have. But that may not be true. There are people who have same-sex sexual activity but who perhaps are not a sexual minority when it comes to health outcomes.

 And so I'm interested in understanding how we should be asking these questions, when we should be asking these questions, and how to really best pinpoint which population is at risk for later detrimental health outcomes.

Aaron Wagner: And how does your interest in improving surveys kind of connect to an interest in methodology?

Cara Rice: To me, methodology is important throughout my research projects. So it's important in how you design a study, it's important in how you ask your questions, and it's important in how you analyze your questions. And so, I came here with sort of an already developed interest in how we ask questions and had done some work on my dissertation in that kind of work. And since coming here, I've really started gaining some skills in some of the more advanced analytical methods that the Methodology Center is really well-known for.

 And it's really allowing me to want to apply those methods of my earlier question of how we ask things. Like let's use a latent class analysis to really understand how these different factors combine and make profiles to help us understand what population might be at greatest risk for health outcomes. And it's also allowing me to answer questions that I hadn't been previously been able to examine about sexual and reproductive health.

Aaron Wagner: What are some of those questions you've been able to ask now. What are some of the new insights you can glean from some of your previous work?

Cara Rice: One of the thing I was most excited about doing when is started at the Methodology Center that I recently have been able to complete, is a latent class analysis of sexual behaviors. So my dissertation work involved assessing a wide range of sexual behaviors among men who have sex with men to try to understand what behaviors might be associated with sexually-transmitted infections and HIV.

 And for my dissertation I had done sort of this broad descriptive analysis of these behaviors. But really, in the back of my mind, I had repeatedly said, but I want to know how these behaviors combine. I want to know how these behaviors work together. And really, just didn't have the methodology know-how to be able to do that. And so, actually, as part of my interview with the Methodology Center, Stephanie Lanzo was describing latent class analysis to me and it was this ah-ha moment where I was like, this is exactly the method I have been looking for and I have to know how to do it whether you hire me or not.

 Luckily she hired me and it was the first project that we worked together here, is doing a latent class analysis of those sexual behaviors to try to understand what behaviors tend to hang together, to then lead to the highest association with sexually-transmitted infections.

Aaron Wagner: And at the risk of going beyond PG, which is unusual for some of our podcasts, what'd you guys find?

Cara Rice: So it actually ended up being really interesting. We used this population of men that I had collected data from in Columbus, Ohio. And it's a sample of 235 men who were attending a sexual health clinic for testing and treatment. And I assessed all these sexual behaviors via survey. And when we did a latent class analysis, really three clear classes emerged.

 One was the anal intercourse only class. So these were the men who really engaged only in anal intercourse. One was what we called the partner-seekers. And these were men who really only engaged in anal intercourse but they engaged in them through anonymous sex and through group sex. So these were men who engaged in anal intercourse but with sort of a variety of partners. And then the last class was sort of the all behaviors class. And these were men who engaged in a variety of sexual behaviors, including anal intercourse and group sex and anonymous sex, but also a variety of other sexual behaviors. And this group of men, this class of men really, was highly-associated with sexually-transmitted infections and HIV status.

 And so, to me this is not the final word for sure, but it's starting to provide this groundwork for one of my earliest questions, to get back to sort of the survey things, that started from this idea of public health interventions have largely relied on anal intercourse as a measure of whether a man is at risk or not. I sort of don't really agree with that method. I think it's not enough. Of course, we know that anal intercourse is a risky behavior in the sense that it can transmit disease. But it's not the only world.

 What I hope I am doing with my research is sort of expanding the idea of clinicians and practitioners to say, we have to know more about men. We have to know more about the sexual behaviors that are occurring because this population really deserves evidence-based research and evidence-based interventions that really can help to intervene in this high rates of disease in this population.

Aaron Wagner: Yeah, that's really, really cool. And that work was published in the Journal of Sexual Medicine, is that right?

Cara Rice: So one paper was published in the Journal of Sexual Medicine and then another paper is under review.

Aaron Wagner: So when people read that paper, kind of a common reaction around the office was, Cara mentions things that I don't even know what those things are. Your research on this is extremely personal and I was just kind of curious. How do you go about collecting such intimate and personal data, particularly around something that is so heavily stigmatized, in a way that you feel like is valid, do you know what I mean? A way that you think is safe enough for these men to provide objective, honest answers?

Cara Rice: Sure, and I think that that's the important question because it's certainly questions that could be prone to a lot of bias. So my answer to that is a little bit long, I guess. On the sort of very surface level, what we did was we used REDCap survey to assess all this information. And we had it on iPads and men endorsed all of their participation in these behaviors through self-administration of the survey.So they didn't have to talk about it, they were just able to answer yes I've done that, no I haven't done that. And so that immediately sort of takes away some of the embarrassment factor.

 The other thing is I think, where I did the survey helped a lot. So I did it in a sexual health clinic, in a city where there is a really, pretty alarming rates of HIV and STIs. And the sexual health clinic is really well-respected and well-known among MSM for being a really-accepting place. And it really has a good reputation. And so I think men sort of come into that clinic knowing that they're going to have to talk about their sex life because they want a full assessment of their health. But they really trust that the clinic is a safe, confidential, you know, place to have those conversations. So I think I was able to sort of capitalize on the reputation of the sexual health clinic.

 I think I had research assistants who really cared about the population as much as I did, and really cared about the research. And just this really great group of research assistants who, there was no judgment, there was no laugh factor. It was just this is what we do and this is what we have to know to be able to provide the interventions we want to provide one day. And so I think all that came across to the men that, you know, we're just doing a survey. Like this isn't to find out something sordid or titillating. Like this is just a survey. Just answer the questions we just want to know, so we can better serve you in the future. And I think it just worked out really well and got really great feedback from the survey and ended up getting really great data from it.

Aaron Wagner: That's awesome. That is really cool. Yeah, it's great that that resource exists.

Cara Rice: Yeah, for sure.

Aaron Wagner: So you mentioned latent class analysis. Are there any other new methodological techniques you've tried out since you've been here?

Cara Rice: I am currently in the process of learning TVEM, and hope to-

Aaron Wagner: TVEM, for anyone who doesn't know, time-varying effect modeling.

Cara Rice: Yes. And you know, it helps us to understand how associations may change over the course of time. So research men who have sex with men is traditionally challenging because it's very hard to get large samples of these men, particularly large generalizable samples. So, just to sort of explain it in layman's terms like where you find MSM. You know, if you want to do a study on Hispanic people, it's very easy to sort of find cities where there are a high prevalence of being Hispanic.

Aaron Wagner: Yeah. It's easy to identify. Sure.

Cara Rice: Yeah, they're easy to find. And so you can think of other minority groups as being fairly easy to find, identify, people don't usually mind endorsing that they are Hispanic. So you can sort of find these other minority groups. Trying to study men who have sex with men is challenging because, where do you find them? And a lot of men don't want to admit it. There are still a lot of stigmas, and certainly in some parts of the country worse than others, and so it's a tough population to assess via survey.

 And because of that, the data that we do have is a little bit limited. It's not always generalizable to the whole population. There's a lot of work that's done in sort of really high-risk populations, that is just hard to make the case that it applies to all MSM. All that said, because that we also don't have always great data on how associations change over time, because we don't have these huge data sets. And generally, to understand how associations change over time, and it means you have to have a pretty big data set with groups representing all those different ages.

 So I'm trying to use TVEM on some new data that we're working with to try to understand how different ages might be associated with different sexual behaviors and thus with STI and HIV risk. The CDC has identified this young group of men, 18 to 24 years old as most at risk for STI and HIV acquisition, which certainly the data supports, but I'm interested in understanding a little bit more in-depth of how different ages influence men's choices for sexual behaviors.

Aaron Wagner: That's really important work. Good luck. So where would you like to see your research go and where would you like to see the field of HIV research head?

Cara Rice: I would like to see my research continue in a really interdisciplinary way. I'm really excited about adding new methods to my skillset. The field of HIV research is really moving in a way that relies heavily on biomarkers, which I think is an important step in the field of HIV research. And so I'm excited about sort of being a part of this transition. The HIV field is really in a process of change because we're finding out a lot about the power of anti-rectal viral therapies. We now know about prep, so using basically what we used to use as a treatment, we're using that as a preventive medicine for HIV. So all these things are changing the course of HIV research, so it's a really important and exciting time, and so I am really excited to continue my work in HIV research to better understand what populations to target with interventions and understand how we can best prevent new infections.

Aaron Wagner: Yeah, absolutely. Cara, that sounds really awesome. Very best of luck to you and thank you very much.

Cara Rice: Thank you.

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