Expert Interviews

National STD Curriculum Podcast

Monkeypox: Current and Potential Future Trends

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Season 3, Episode 3

CDC epidemiologist Dr. Bryce Furness discusses recent national monkeypox trends, the potential impact of waning smallpox immunity, and possible future monkeypox trends with the National STD Curriculum Podcast Editor Dr. Meena Ramchandani. This fourth episode of the ongoing monkeypox series was recorded in September 2022.

Topics:

- Monkeypox
- MPX
- smallpox
- Jynneos
- monkeypox trends

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No Disclosures

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Transcript

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In this episode:

[00:00] Introduction

Dr. Ramchandani
Hello, everyone. My name is Meena Ramchandani. I'm an infectious disease physician at the University of Washington in Seattle. This podcast is dedicated to an STD [sexually transmitted disease] review for healthcare professionals who are interested in remaining up to date on the diagnosis, management, and prevention of STDs.

This is the fourth episode of our monkeypox podcast series, which focuses on the 2022 outbreak. We will discuss epidemiology of monkeypox virus infections and then the current and future monkeypox trends. The next podcast episode will focus on transmission, the public health response, and vaccination. Both episodes were recorded in September of 2022.

I'd like to introduce Dr. Bryce Furness. Dr. Furness is a medical epidemiologist in the Division of STD Prevention at the Centers for Disease Control and Prevention (CDC) and has been embedded within the Washington, DC, Department of Health since 2002. He started and evaluated the district's internet partner notification program to manage pseudo-anonymous partners of syphilis and HIV cases. He also started and managed the district's school-based STD screening program and started and ran the Whitman-Walker Health (WWH) transgender health clinics. He provided oversight for the WWH gay men's health and wellness clinics, and he helped to improve the district's publicly funded PrEP [preexposure prophylaxis] clinic. Currently, he is deployed to the CDC's 2022 multinational monkeypox response while also diagnosing, treating, and preventing monkeypox within the DC's Health and Wellness Center. Welcome, Bryce. Thank you so much for being here. It's wonderful to have you with us on this episode.

Dr. Furness
Thank you, Meena. I appreciate that.

Dr. Ramchandani
I'd love for you to tell us a little bit about your role as it relates to the 2022 monkeypox outbreak, just to start out with.

Dr. Furness
Sure. I'm playing a double role in that I am a federal employee that is embedded in a local or state health department. So I have been on the national response since the first case was reported in May. The Division of HIV Prevention and the Division of STD Prevention have been very integral in helping shape the response because of our history of dealing with the population that's most impacted by this specific outbreak, which is the LGBTQ+ population.

So I have been involved in the national response, but I'm also embedded in the Department of Health here in Washington, DC. And we have a publicly funded STI [sexually transmitted infection] clinic. It's actually a publicly funded specialty clinic. It sees sexually transmitted infections, HIV/AIDS, hepatitis, and tuberculosis. It is within the context of that clinic that I have been seeing, diagnosing, treating, and preventing, through vaccination, monkeypox cases. Which if you would've told me anytime during my career that I would be doing that at a publicly funded STI clinic in Washington, DC, I would've scoffed at you, but here we are.

Dr. Ramchandani
Yeah. I think that goes the same for a lot of us who work as sexual health providers.

[03:03] Changing Epidemiology

Dr. Ramchandani
Let's take a step back. I'd love to hear from you a little bit about, overall, what has been the trend of monkeypox virus infections in the U.S.

Dr. Furness
Monkeypox is not a new infection. It's a new infection to the U.S. or most of the people in the U.S., but it's not a new infection. It's something that's been endemic in Africa, specifically the Congo region in Western Africa, for a very long time. We usually, and by usually, I mean before 2022, we would see one or two cases of monkeypox in the United States a year. And they typically were associated with travel to endemic areas or areas of Africa where this infection is endemic.

I believe it was 2003. We had an outbreak in the United States of America. There were 71 cases reported ultimately in the Midwest, Wisconsin, Illinois, and some of those states. And that particular outbreak was associated with prairie dogs. So it was the exotic animal trade in these prairie dogs. At some point, between getting from where they originated to the United States of America and becoming pets, they were co-housed with other animals from Ghana, I believe. And so there was that outbreak in 2003 of 71 cases. I believe every single one of those cases was exposed to prairie dogs. So it was direct exposure from the prairie dogs.

What's going on in the United States of America in 2022 is also happening in other areas of the world in nonendemic countries. And it seems to be quite different. And the first case, I believe, reported in the United States of America was in Boston, and it was May 19. Since then, we've seen a significant increase in cases, especially in urban areas and predominantly among the LGBT population. But even within that population, it's men who have sex with men. And even within that population, it tends to be men who meet anonymous partners or engage with pseudo-anonymous partners. And what I mean by pseudo-anonymous partners, these are partners that they interact with and engage with through internet service providers like *Scruff* and *Grindr* and *Jack'd*. They may know their profile name. They may know how to message them within the context of that profile, but they don't know their phone number or their mobile number, and they don't have their email address. In some instances, they may not even know their real name. So when I talk about pseudo-anonymous partners, that's what I'm talking about versus anonymous partners, where they can't even reach them through these apps that they use to meet dates and other things. But even within the context of men who have sex with men, there seem to be subpopulations, those that go to sex venues, those that engage in group sex, those that have a large number of anonymous or pseudo-anonymous partners.

[05:44] Dr. Ramchandani
Thank you. That's a really great summary. And since the cases started in about May, you said was a first case that was identified in the US. How has the trend been in the number of cases since that time? I've heard that in some of the big cities, we might see that some of the cases are starting to decrease. Is that true?

Dr. Furness
We are hoping that that is the case. At the national level, we are starting to see a plateau of the epi curve [epidemic curve], which means that the number of new cases is not what it used to be. They were forecasting that we would be somewhere near 80,000 cases, I believe, if the trend continued to the way it was going, but we're not. I think the last number I saw was 23,000 cases. So it is plateauing. It is leveling off.

I know in DC, we're seeing a decrease in cases. And I know I talked to a colleague in San Francisco, and our trends have been parallel. They've been the same. They're also seeing a decrease in cases. So I think what's happening is that overall, this really took off in large urban areas that have a lot of men who have sex with other men: Los Angeles, California, San Francisco, California, Washington, DC, New York City, Philadelphia, and some other places. And it seems that within those places, they're either plateauing or decrease in cases, which is driving what we're seeing, actually. So I'm hoping it's real. We're holding our breath.

Dr. Ramchandani
That's helpful. Yeah. We're seeing something similar in Seattle. We had a huge surge in number of cases in a very short time span. And now we start potentially seeing the cases have started to decrease. And, hopefully,

that will continue.

[07:25] Decline in Monkeypox Cases

Dr. Ramchandani
Why do you think some of the cases are starting to decrease? What do you think some of the reasons are behind this trend? And do you think vaccine distribution of *Jynneos* has played any role in this?

Dr. Furness
So, yes. I think that there are three main reasons why we are seeing this decrease among the populations most impacted. I think the first is that the highest risk individuals, so the individuals that do have a lot of anonymous or pseudo-anonymous partners, the individuals who have sex at sex venues or in large groups, have already had the infection. And we know that we don't know how long it lasts, and we don't know how much they have, but we know that there's natural immunity after natural infection. So, that's part of it. You have some of the highest risk subpopulations have already had the infection and therefore have natural immunity.

Then we also have the vaccine, the *Jynneos* vaccine, which is FDA-approved for the prevention of smallpox and for the prevention of monkeypox. But we don't really have a lot of science or data, and we don't know how good it is preventing monkeypox, especially in an atypical outbreak, like the one we're seeing. But I do think it's playing a role. My guess is that it provides some protection, and we'll be able to quantify that protection based on this experience of this current outbreak, but we're not there yet.

We have seen a couple breakthrough cases at the DC Health and Wellness Center. And what we've seen are these cases tend to be really mild cases that don't require the tecovirimat treatment that some of the more severe cases require. What we don't know is whether or not these vaccinated individuals who had what I'm calling breakthrough cases were vaccinated within the context of postexposure prophylaxis (PEP). So whether or not they were epi-linked or a contact to a case, or whether they were one of the clients or one of the patients who self-identified as having high enough risk to go to PEP++ clinic and vaccinated. So we don't know that, and we also don't know how long after vaccination they started having symptoms consistent with, and actually eventually proven to be part of monkeypox disease. We have had one case that showed up with an atypical lesion two weeks after his second vaccine, which is when the *Jynneos* protection is supposed to be the most robust. And this particular individual had a lesion on his rectum that was *Orthopoxvirus* positive. So presumptively monkeypox, even though he was two weeks after his second vaccine.

So I'm guessing that ultimately the *Jynneos* vaccine is going to prove effective, similarly to what we see with a COVID-19 vaccine in that it's not going to prevent infection. But it may prevent severe disease, hospitalization, some of the really bad outcomes that we see within this current outbreak.

[10:08] Dr. Ramchandani
Do you think it's possible that the virus was circulating in the U.S. even before the first diagnosed case in May? The only reason why I say this is because, in our sexual health clinic, we did see a few cases of individuals with anogenital lesions that did not match the classic picture of some of the other kind of STIs that we typically test for. And I just wonder if, possibly, that there was monkeypox that was circulating in the community before the first diagnosed case in May.

Dr. Furness
I think that there was, so I'm going to say yes to your question. And I think part of the evidence that supports that is that there are two things. I think that there is now—since they've looked at it—there's pretty strong evidence that male-to-male cases through intimate contact and maybe sexual activity have been occurring in Nigeria and a couple other western countries since 2017. So, just based on how this expanded so explosively to other nonendemic countries, I think we would be foolish to believe that this hasn't been circulating, based on the same transmission pattern, if we have evidence that it has been in Nigeria and other places.

The other thing I want to highlight is I've been doing STIs for a long time. And we also saw this with lymphogranuloma venereum (LGV). We started seeing atypical LGV cases presenting as proctitis in men who have sex with men. And it wasn't until we were seeing a lot of these cases over a long period of time that someone realized that if we actually tested these for the two subtypes of chlamydia that are typically associated with lymphogranuloma venereum, they were positive. So we were seeing these atypical lymphogranuloma—LGV infections among men who have sex with men for a long time before we actually were able to attribute it to the chlamydia subtypes that cause LGV. And because this is presented to sexually transmitted infections clinics, and because it's presented very similarly to herpes or other infections of the genitals and the rectum, I definitely think that's the case.

Dr. Ramchandani
So, you know, you gave a really nice summary in terms of the monkeypox outbreak for 2022 and how it compares to past outbreaks both in the U.S. as well as abroad.

[12:35] Smallpox Vaccine Immunity

Dr. Ramchandani
Do you think that there is any evidence that the new outbreak or increase in cases might be in any way related to waning smallpox immunity?

Dr. Furness
I think that is a very good hypothesis that needs to be tested. And I think that we'll be able to test that eventually within the context of this outbreak because I think that you're going to have several people who have gotten monkeypox disease. You're going to have individuals who have never gotten the smallpox vaccine. You are going to have individuals that got the smallpox vaccine, but during routine childhood immunizations, you know, 50 years ago—in the late 60s and the 70s. You're going to have a third group that got childhood vaccinations and then also got the ACAM2000, a vaccine that's different than the *Jynneos* we're currently using but was used in the military back when we were worried about bioterrorism and there was anthrax in the mail.

So you're going to have those that have never gotten a smallpox vaccine. You're going to have those that got the vaccine as part of routine childhood immunizations. You're going to have those that have the routine childhood immunizations *and* the military. And then you're going to have the fourth group that's had all, both of those plus the *Jynneos*. And I have a friend who has had all three of those, basically. So there are going to be these arms that we're going to be able to look at to see if those that got it at—just as part of routine immunizations when they were a child—if there appears to be any protection ecologically during this outbreak.

But it's this *Jynneos* vaccine is a smallpox vaccine that has been approved by the FDA for the prevention of monkeypox. We don't know how effective it's going to be, but there's obviously cross-reactivity between the *Orthoreovirus*, smallpox being one, monkeypox being another. So I think it's a good hypothesis. It would be nice if that vaccine given, in many instances more than 50 years ago, still had some protection, but we don't know the answer to that, and we might after this particular outbreak.

Dr. Ramchandani
Yeah. Thank you. I look forward to seeing that data, especially in those persons who may have received smallpox vaccine and then either one or two doses of *Jynneos* and how that potentially compares. Not only in terms of the incidence of infection but also the severity of disease because I think there are some older data to suggest long-term immunogenicity studies or long-term immunity with the smallpox vaccine and how that might influence clinical aspects of infection if a patient were to be exposed to monkeypox.

Dr. Furness
Yeah, I agree. And I've also—I saw some data, and I don't know where it came from, that there seems to be some pretty good immunogenicity just with one of the *Jynneos* vaccines. So, and I know that we've changed

the dosing, and we were giving subcutaneous, and now we're giving intradermally. Based on the limited science we have, they seem to have similar immunogenicity eventually.

Dr. Ramchandani
That's what I've seen as well.

[15:25] Future of Monkeypox

Dr. Ramchandani
So this is a tough question. This came from one of our clinicians in our sexual health clinic. Do you think that the 2022 outbreak is an isolated occurrence? Or do you think that this is an infection that providers, and mainly sexual health providers, will continue to see for years to come?

Dr. Furness
There is a worry that this will become endemic in nonendemic countries, like the United States of America, based on this current outbreak. And I think there's a lot of things that are driving that fear. One of them is that it will be established in an animal vector here in the United States of America. So that even if there aren't human cases, it could still circulate in the animal population and then bounce back into the human population. So I know, specifically, that there are ongoing investigations looking at pet dogs and whether or not they can get monkeypox and whether or not, if they have monkeypox, they can transmit it to humans.

There has been one case that I know of, it was one single case out of France. I think it was in *Lancet*, but it basically was a man who got monkeypox, gave it to his dog. The dog had symptomatic monkeypox; it was genotyped in the same type that the male had. We now know this virus can be transmitted from humans to dogs. We don't know if dogs can transmit it to humans, but we are investigating that. There is research, and I know DC is one of the sites that's participating in this through One Medical, where they are taking monkeypox cases, confirmed monkeypox cases who have dogs, and they're looking for symptoms and doing blood tests and serology and those types of things.

The other thing that's being looked at, at the veterinarian level, the zoonotic level, are squirrels. There's a lot of concern. You know that monkeys are *not* the animal vector in Africa, so it's a little bit of a misnamed virus. They think that there's a large rodent, and I think it's called the pouched rat [*Cricetomys* spp.]. I forget the exact name of it, but it's a large rodent in Africa that they think is the animal reservoir there. And they think that squirrels are similar enough that it could be an animal vector here. So, that's the concern. My feeling is, and especially with the numbers going down in DC and San Francisco and Seattle and some places, I think this is a well-described enough subpopulation that, eventually, through infection, vaccination, and some other behavior changes that I'll talk about in a minute, that we may actually see this disappear within that subpopulation.

Whether or not we can keep it in that subpopulation, the LGBTQ population, long enough for that to happen is another fear. And I know DC, we're worried. Washington DC has five or six major colleges and universities all within the city. We're not a big city, and we were worried that when those students came back to campuses, that we were going to see this spread outside the LGBTQ population. And because of that, we were one of the first places, we were probably *the* first place in the country that expanded the *Jynneos* vaccine criteria to anybody who wanted it or thought they were at risk. So, I think that if we can keep it out of the zoonotic population, if we can keep it in this well prescribed, not only men who have sex with men but seems to be certain subpopulations of men who have sex with men. I think we have a chance of ending this particular outbreak, if you will.

One of the other things that, and I didn't mention it earlier, but above and beyond the highest risk individuals getting infected and having natural immunity, and then the vaccine giving some sort of protection. There's also evidence that there has been some behavior change within the LGBTQ+ population among men who have sex with men. Specifically, an MMWR [Morbidity and Mortality Weekly Report] came out. I believe it was August 26. The title of which was Strategies Adopted by Gay, Bisexual, and Other MSMs to prevent

monkeypox virus transmission – United States, August 2020. And this article was based on the American Men's Internet Survey, which comes out of Emory University, which regularly queries men who have sex with men. I think the inclusion criteria is any man who's had sex with another man within a year but before being contacted. And what they showed was that 48% of those that filled out the survey decreased their number of sexual partners because of the monkeypox outbreak. So 48% decreased the number of partners because of monkeypox, 50% decreased one-time casual encounters because of monkeypox, and 50% decreased sex partners met on apps or at sex venues. So there has been some behavior change.

You know, CDC's gotten a lot of negative press around monkeypox, probably piggybacking on the negative press we got from COVID-19. But one of the positive things that have come out, and we actually got a shout-out in the *New York Times* that the messaging and specifically walking that very fine line of letting the impacted populations know they're at risk while also not giving the general population anything that could be used for stigmatization. And part of that was the harm reduction messages that came out. The gold standard would be that if you have monkeypox, you isolate for 21 days or 28 days until the lesions scab over, fall off, and you have new skin underneath. We realized rather quickly that, for a lot of individuals, that was not possible. So we provided harm reduction, things they could do to decrease the risk of transmitting this to other people. It's the same within the context of sexual transmission or intimate contact associated with sex. And we provided some things that they could do to decrease their risk of becoming infected if abstinence, or if decreasing partners, or decreasing partners met on apps and venues, wasn't something that they were able to do. So I do think that is one aspect of this decreasing within this particular subpopulation—is that there is some behavior change. And from the get-go, from I think June is the first time we had those safe sex health tips online, we had some harm reduction steps that they could take.

Dr. Ramchandani
Thank you. That's really helpful. I think that you bring up some important points. You know, we really need to address the stigma associated with monkeypox infection and avoid marginalizing groups of people, and really focusing on the facts and how it's spread. It's hit certain populations and it's important to be transparent in terms of those demographics. That's for persons to be aware, to get testing, to get management, to get treatment. And providers to be aware, not necessarily to marginalize populations, but to make available resources to those who need it the most, especially in the setting of limited vaccines.

Bryce, thank you so much for joining us today. It's been an absolute pleasure to speak with you on these important topics. And I know our audience will really benefit from this interview. So thank you so much.

Dr. Furness
Thank you for having me. I have enjoyed it and maybe we'll do this again sometime.

[22:11] Credits

This podcast is brought to you by the National STD Curriculum, the University of Washington STD Prevention Training Center, and is funded by the Centers for Disease Control and Prevention.

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