

Medscape Masters

Measles Outbreaks: Vital Updates for Your Practice

This transcript has been edited for clarity but has not been copyedited.

Dr John Whyte: Welcome, everyone, to Medscape Masters. I'm Dr John Whyte, Chief Medical Officer at WebMD, and I'll be your host tonight. We're really excited to have you here for tonight's discussion, Measles Outbreaks: Vital Updates for Your Practice.

I bet that's not something that most of you have thought about in the last few years, believing that we wouldn't need a measles update here at Medicaid. But, here we are.

Joining me today are three top experts in the field:

- **Dr Paul A. Offit**, Director, Vaccine Education Center, Children's Hospital of Philadelphia; Maurice R. Hilleman Professor of Vaccinology and Professor of Pediatrics, Perelman School of Medicine, University of Pennsylvania
- **Dr Tochi Iroku-Malize**, Family Physician, Founding Chair and Professor of Family Medicine, Donald and Barbara Zucker School of Medicine at Hofstra/Northwell, Hempstead, New York; Chair, Board of Directors, American Academy of Family Physicians
- **Dr Dan Filardo**, Medical Officer, Measles, Rubella, and Cytomegalovirus Epidemiology Team, Division of Viral Diseases (NCIRD), Centers for Disease Control and Prevention, Atlanta, Georgia

Dr Tochi Iroku-Malize: Thanks for having us.

Dr Whyte: Of course. Let's dive into some background statistics. The medical victory over measles has been threatened recently. It was one of the world's most contagious airborne viruses, and now it's returning to our communities.

We've all seen the news—cases are rising globally. Public health offices are aware of spring and summer travel-related transmissions. It's important to remember, measles was officially eliminated from the United States 24 years ago, a significant public health achievement for those of us interested in public health.

And remember, there are no effective antivirals to treat measles; it's caused by a virus. Measles spreads through the air when a person coughs or sneezes. The symptoms—fever, along with the three Cs: cough, runny nose (coryza), and conjunctivitis—are well-known to those of us who studied for the boards and some in practice.

Measles typically starts at the head and, as was discussed earlier, the classic rash spreads to the rest of the body. The measles virus can remain airborne for up to two hours after an infected person has left, and people can get infected simply by being in that room afterward. Measles is so contagious that up to 90% of the people close to an infected person will become infected if they are not protected.

Before the 1960s, most children contracted measles, resulting in missed school days, quarantines, hospitalizations, and medical complications. It's estimated that 3 to 4 million people in the US were infected each year, with about 48,000 hospitalizations annually.

And an estimated 1,000 people experienced encephalitis each year from measles, with 400 to 500 deaths annually. We can't minimize that. Since the widespread use of the measles vaccine, there's been a greater than 99% reduction in measles cases compared to the pre-vaccine era.

Today, measles is often brought into the United States by travelers. Each imported case could start an outbreak, especially if under-vaccinated groups are exposed. That's kind of where we are so far in 2023, and there might be new data out very soon from the CDC, but there have been seven outbreaks in the United States so far this year, with a total of 113 measles cases reported by 18 jurisdictions, including New York and California.

At local levels, vaccine coverage rates can vary considerably, and pockets of unvaccinated people can be found in states even with high vaccination coverage, where outbreaks can occur. Measles cases are reported by the states through the CDC via the National Notifiable Diseases Surveillance System. Both probable and confirmed cases should be reported.

Panel Discussion and Audience Interaction

Dr Whyte: Like you said, it was for board exams. You knew what you had to do. But I didn't think we'd be talking about measles, especially not in the United States. And so, because it is truly the vaccination that worked. The idea was to eradicate this to prevent it from spreading. And so, yeah. I did it, except for the global health work that I do. But other than that, in the United States, I did not know that this is what we were going to be facing. And so, I've got a lot of students. And some younger doctors have never seen measles before outside of textbooks. And that's good. Because I wanted to get to that.

For the clinical community that's listening, some of them may have never ever seen measles in their personal or professional life. When we talk about the three C's. But

when people have a runny nose and cough in kids, that's a lot of things. There's that classic rash. But the doctor, can you remind our audience? How did they diagnose measles?

Dr Paul Offit: OK, well if I'm traveling back to the 1950s, I had measles. It's pretty characteristic, you know. It starts as a rash at the hairline, spreads down to the face and trunk, and eventually reaches the arms and legs. The rash is lacy and is associated with fever, in addition to cough, conjunctivitis, and coryza. You often see Koplik's spots on the buccal mucosa. It's pretty straightforward for those familiar with it, though they've mostly encountered it in board exams.

Dr Whyte: Well, the fact of the matter is that when measles was common, you didn't need a test to determine whether it was measles—it was evidently measles. And, as you said, before the measles vaccine—the first measles vaccine was introduced in 1963—everyone contracted measles: 3 to 4 million cases a year, 48,000 hospitalizations, and about 500 deaths or so. It was a common infectious disease.

Dr Offit: In answer to your question of what I would have expected to see: the last significant measles vaccine, the resettlement vaccine, was introduced in 1968. There were two major blows to the public's perception of the measles vaccine. The first came in the late 1990s when Andrew Wakefield put forward the incorrect hypothesis that the measles, mumps, and rubella vaccine caused autism. This, to some extent, caused the fraying of vaccination rates. So, although we had eliminated measles in this country by 2000—by elimination, I mean there wasn't transmission from an American child to another American child—it still entered the country because there were some countries where measles was common. But it would spread because herd immunity was high. So that was the first major blow.

I can tell you that I interviewed Maurice Hilleman for a book I've written, and he was alive then; he passed away in 2005. I remember interviewing him in 2000 when measles was starting to come back. You're starting to see some cases again. And I remember asking him if he ever thought this would happen. The only reason it did was that a critical percentage of parents were choosing not to vaccinate their children. The second blow came with COVID, with the mandates leading to a libertarian backlash, and there was enormous pushback, not only against the COVID mandates but also spilling over to school mandates. And with that, you're seeing more parents of kindergartners choosing not to vaccinate. And as you said in your introduction, herd immunity has frayed. When herd immunity frays, measles is always the first disease to return because it's the canary in the coal mine; it's the most contagious of the vaccine-preventable diseases.

Dr Whyte: So, I think that was the one to pinpoint the cause, but I'm curious what my other colleagues think. I want to turn to Dr Filardo first because the CDC likes to count, right? They like to keep track of cases. People may say, "OK, it's a clinical diagnosis." And I'm going to make that diagnosis, but now it's an important time to count accurately. Do people need to perform a test? If so, what tests are needed?

Dr Dan Filardo: Yes, it's a cornerstone of the elimination era that we try to laboratory confirm all measles cases, and so we recommend a dual approach. Historically, IGM serology was the method of choice. We still recommend that people undergo a blood test for measles IGM, which is suggestive of acute infection. However, the cornerstone of laboratory diagnosis now is the use of PCR, especially now that we are in the era of performing PCR, which wasn't available historically. PCR can be run, preferably on nasopharyngeal or oropharyngeal swabs.

PCR can also be performed on urine but usually only in conjunction with an NP or throat swab.

Dr Whyte: I want to ask, what about people who think, "OK, to your point, Dr Offit, a lot of people got measles and everyone turned out OK"?

Dr Offit: Not everyone.

Dr Whyte: Because it's been so long.

Dr Iroku-Malize: Again, if they are hospitalized, one out of a thousand people who have measles will have brain swelling, which can lead to encephalitis and encephalopathy.

It's also a respiratory illness, right? So measles can lead to pneumonia, and that's the most common cause of death from measles in young children. Thus, three out of a thousand people with measles will die even with medical care. These are typically unvaccinated individuals. That's why this is important. As we say, if people say, "Oh, don't worry about it, you know, you get it and it will go away," that's not necessarily true for a number of individuals. We have to really pay attention to this. That's why we have the CDC recommendation for children to receive their first dose between 12 to 15 months and the second dose between four and six years of age. And that's why, again, most public schools, or a number of them, now require students to be up to date with the measles vaccination because it spreads so quickly.

Dr Whyte: Do we communicate this serious risk enough? Because there is this perception by some parents that it's not a big deal. I think that's part of the reason we're

doing this having this discussion because a lot of people have to have not seen it. And so having that conversation if they didn't like polio right? It was people. When polio was rabid and people saw it, when there was a vaccine to prevent it then they jumped to make sure people said OK I want to make sure I can do something to prevent my children from having this. Not seeing measles and not understanding the complications and things that could go wrong with it and how easily transmissible it is. I think that's been part of it. And so and then that's also as a doctor of 10. You know the COVID issue also. Maybe they'll say no to that.

Dr Filardo, what's the current recommendations about quarantine? So now you take your child your child has measles. What's the quarantine recommendation for that child as well as the rest of the family?

Dr Filardo: Well in terms of isolation of cases so people who are confirmed to have measles or suspected to have measles we think that people are infectious from orders before to four days after they have the onset of the rash. And so when people I'll play good laboratory tests it as we talked about and go confirmed then we think that they're no longer contagious to others five days after the onset of it. And then you know it is a part of measles control quarantine to try to protect the community. And those around them potentially Iris settings like daycares and schools for people who are unprotected against measles to then be potentially excluded from those areas where they might expose other people who are vulnerable to measles are vulnerable to severe infection.

Dr Offit: And so that's where quarantine kind of comes into the picture as well for people who are unprotected against measles who then get exposed. I often want to thank um with children with measles or sick in other words we either miserable. There are many viruses that can cause fever and rash. But when they called me down to the Emergency Department because they ask often old people like me to come down to the emergency departments I've seen a lot of measles. If the child has a fever and rash and generally looks pretty good that's usually not measles. Measles is makes you miserable. Often the lights are down. There's so much code a phobic. They're looking down. and a large percentage actually have abnormal chest X-rays even though they may not have clinical pneumonia measles really isn't. I think people don't realize how sick we can make you. I remember Jenny McCarthy was on Oprah Winfrey trying to make the claim that the measles mumps rubella vaccine caused her child's neurodevelopmental problems. And now she said and I quote Sure. I'll take the frickin measles every time which tells me not only have we largely eliminated measles we've eliminated the memory of people don't remember how sick this virus.

Dr Whyte: That's a compliment to you because they were calling the wise sage to come holders and validate. Now I want to ask because rashes beforehand and depending on the age of the parent or maybe their grandparents are watching the child. And then the child has measles given that it was a different schedule at a certain time point. Can you remind people who might as an adult need an updated vaccination?

Dr Offit: Yes, I'm happy to discuss the recommendations for adults. There are several methods to present evidence of immunity in adults. Most commonly, it's one documented dose of MMR. Another method of presumed immunity is having been born before 1957, as the number of measles cases was roughly equal to the number of children born in the US at that time; thus, we assume most individuals were exposed to measles, which we believe confers lifelong immunity. Additionally, having a laboratory-confirmed measles infection in the past or possessing a positive IGG against measles on a blood test are also considered evidence of immunity. In most cases, one dose is sufficient, although two doses are recommended or required in higher-risk settings, such as among healthcare workers or adults attending post-secondary institutions like colleges or trade schools. Given the increased risk of exposure to measles outside the United States, we particularly emphasize this for international travelers over 12 months old, recommending a total of two doses of MMR to ensure full protection during international travel.

Dr Whyte: Then, Paul, you brought up the issue of vaccine hesitancy that we've seen during the pandemic. There's always been some resistance to the MMR vaccine. Earlier, we mentioned there was a push to eliminate religious and other exemptions. Now, it seems everyone's an expert on vaccine efficacy. How do we engage parents in conversations about vaccination?

Dr Offit: There's a lot of misinformation out there—online and among parents—that vaccines are too numerous and too closely spaced. How do we counter this? Public health officials sometimes downplay the importance of herd immunity, suggesting it's not crucial, encouraging attitudes like "just let your kid get it," which is clearly bad medicine. How should we address this?

The primary role of a parent is to ensure their child's safety, which vaccines effectively provide. Sometimes you hear parents ask, "Why do I need a polio vaccine if there's no polio?" That's precisely because we have the vaccine. For example, in 2022, a 27-year-old man in New York City who hadn't traveled abroad was paralyzed by polio—it's a risky game to play. Similarly, diphtheria used to kill 8,000 people a year, a common killer of teenagers, now controlled by vaccination. It's like playing Russian roulette; the stakes are unnecessarily high. Currently, I'm at the National Center for Immunization Coalitions and Partnerships in Philadelphia, where I've met many parents turned

activists after their children suffered or died from vaccine-preventable diseases. Their stories underscore the critical importance of vaccination.

Dr Whyte: So, engaging with the community passionately and compassionately is crucial. You don't want to join the ranks of parent activists who lost their children to preventable diseases. It's imperative to articulate the risks of foregoing vaccination—viruses and bacteria are real threats, and opting out of vaccination is akin to playing a dangerous game with your child's health.

Dr Whyte: Dr Iroku-Malize, what are practical tips for clinicians that are on the call right? There's a lot that we have to do during a visit. All right. So what is your advice?

Dr Iroku-Malize: It's part of the conversation. So you as a family physician for us you know we take care of the cradle we say from early early infancy to the end of their life. And we know that there is you know as was mentioned earlier the false information that can undermine the safety.

Dr Iroku-Malize: We always take this series is patients to forgo the treatment and rather than follow the guidance of a very trusted doctors scientists and medical experts as he mentioned. And so we've already built that relationship but we and they trusted us to do the right thing for them all along. They trusted messengers.

We can answer questions in a non-judgemental way. So I say to everyone hates all my colleagues to all the residents and students and I talk to that. When we're talking to patients when we're talking to these individuals who trust us you cannot be judgemental. You have to respect what they're saying. Listen to what they're saying. Then give the information that you can provide that evidence-based information to them to help them make that educated decision when it comes to vaccinating their family. So they're going to express their concerns about potential side effects the honest re-assure them that the side effects occur because of vaccine is usually doing its job to by activating the immune system. And the symptoms are usually mothers should go in a day or two and if they have any other questions or unsure about certain vaccine or immunization in general to talk to us to have that conversation. And again if it's not today then maybe we'll have this conversation at a later date but always don't give up on the on the patients and don't give up on your community. Every time that you have that conversation with them Every time you see them and make contact with them you should bring up and have a conversation about you know vaccinations that will help prevent the illnesses that we're starting to see come up again.

Dr Whyte: Dr Filardo what advice do you have for clinical colleagues that you are having challenges?

Dr Filardo: You know I don't know that I have a lot to add to what my esteemed colleagues have shared already. I think it's a particular challenge. Maybe, one piece that I could add is that You know made me about counseling... you know a piece of our website that we just updated because we're trying to update our website to provide more information to both the public and healthcare providers. Is that a small proportion of measles cases do occur among people who have been vaccinated.

I think that being transparent about that is important. And providing that information to both the public and health care providers is important. I think that what I would say to say healthcare provider who gets pushback from the family about saying questioning the importance of measles vaccination If a case can still occur among people who are vaccinated is that it's a very rare event. And we think that measles vaccination brings along multiple benefits. Even if it are in the rare instance that it doesn't protect somebody from measles we think it makes a person much less likely to transmit measles so it protects those around them including those in the household and those close family members.

So highlighting that really as a major benefit And we also think it reduces the likelihood of complications and of severe disease.

Dr Whyte: I want to get to some questions from the audience. People are starting to ask questions and the first one is why do MMR and ProQuad have different minimum intervals for the second dose one month interval for the second MMR dose and three months interval for the ProQuad?

Why do we have these different dosing?

Dr Filardo: I think to some degree was just based on the way that they were studied. And to my understanding for ... which is MMRV there was the standard dosing interval that was used was longer than the standard dosing interval that is used for him.

I will say broadly for all live virus vaccines there's a recommendation for 28 or a separation of at least 28 days and that's true for for all formulations of MMR alone as opposed to MMRV.

Dr Whyte: One question says what interventions do you feel are most beneficial? We talked about kinda talking meeting patients where they are not talking down to them. Um this says any updates on measles in pregnancy?

Dr Filardo: I'm happy to share some thoughts on that and Dr Iroku-Malize if you have additional thoughts um you know we do know that measles infection that incurs occurs during pregnancy can lead to adverse maternal outcomes. And so can we think pregnant people are at higher risk of developing complications? Especially pneumonia as highlighted by Dr Iroku-Malize previously as a as a potentially severe complication of measles. And it can also lead to adverse fetal outcomes pre-term delivery low birth weight things like that.

Measles does not cause congenital malformations or it's not associated with congenital malformations like rubella. So it's different than rebellion in that way but it can still lead to adverse maternal and fetal outcomes during pregnancy.

Dr Whyte: In terms of the temporal relationship through the year are there certain times of year that we expect to see more cases? So meaning I think folks are getting to: Are we kind of seeing this as a blip.

Are we seeing that we're going to expect to be seen more cases in the summer based on what we're seeing now or is it something that comes more later in the year in winter? Can you give us a sense of the temporal relationship that you think we might see in terms of the increase in number of cases?

Dr Filardo: Yeah. We've looked at these data at CDC in terms of during the elimination areas to 2000 and beyond. There is some seasonal um some seasonal variability although it's not a tremendous. And I think it's really driven in the United States because where we're setting that has eliminated measles the epidemiology of measles in this country is really driven by importation. And so at times where there's increased international travel so that occurs around rally the winter holiday season and then the spring break and summer holiday seasons. When there's more international travel we tend to see more importations.

Then really that just you know you can think of every importation as a spark onto Tinder. And then when you know somebody with measles encounters a pocket of people who are under vaccinated or unvaccinated then that can trigger outbreaks. And so you know the increased number of Importations just confers an increased risk of their being measles outbreaks that occur. So that really drives the seasonality that we see here.

Dr Iroku-Malize: I think it's interesting because you know we say that the rest of the choices we had the triple a respiratory issues happening during the during winter season. I think also with the lack of awareness that we have amongst our colleagues and our peers because they haven't seen measles before have hearing about the coffin then the money you know that these symptoms there thinking OK maybe it's just a cold the flu or RSV. And that's what that those are the first three things you're making. Then maybe the fourth thing is COVID before they go to measles. Rash some people think oh this is just a fever rash right? You know part of the talk that you know that people sometimes will not break out. An example because of the fever months. I think that's going to be part of the reason why you're going to see it and people are not going to pay attention not going to be aware.

And so that's one of the reasons we have to say don't keep that in the differential as we're going through. Because we say yes. We were thinking about the other respiratory illnesses but this is also a respiratory illness. So keep that in mind.

Dr Whyte: Well with that the question comes up is wearing a mask protect people from getting measles?

Dr Iroku-Malize: No. Sorry because you can also get it from contact right? You know it's airborne but remember that you can also get it from the surfaces individuals have you know the droplets have gone to. And so that's why we say when they come to your office if you suspect to have that high level of suspicion.

Well if you suspect and they come into the office you see somebody with rashes started from the head down and you know and they're coughing and sneezing. Runny nose in the eyes immediately isolate them immediately. Back to the waiting room don't keep them in the waiting room because they'll be in that room afterwards which can be hard clinic settings.

Put them in a room and hopefully a number of us have these special rooms. We want them but I know you may go into that room. And then have them in your office have the individual especially the parcel at least was fascinated as the healthcare personnel. And usually everyone whatever. But just in case at least immune be the ones where the PPE and then go back into the room and then continue taking care of the individual from that But that's the biggest thing is once you suspect it, isolate them immediately.

Dr Whyte: Yeah. This question comes up also for adults. It says How do you handle patients requesting tapes if they do have a documented history of vaccination versus no history vaccination?

Sometimes we see that for adults in terms of jobs. Sometimes we see that for schools.

Dr Filardo, is there a CDC position on that or what do you recommend?

Dr Filardo: Yeah CIP has pretty clear guidance on this. So I'll caveat this with you know healthcare institution or school may have their own policy and so that might supersede ACIP guidance.

But the guidance is that for a person with two documented doses of MMR that is really considered lifelong protection. So for a member of the community or a health care worker who is able to provide those documentation in two doses they started regardless of their IGG level, they do not need another dose. Some healthcare institutions say Well we feel the risk is high enough and we recommended that our healthcare workers get an additional dose. We've heard of that but that is overall the ACIP guidelines.

Dr Whyte: We talked about this question offline before we started. Could we see atypical measles? Or is there always fever rash cough conjunctivitis?

Dr Filardo: Um I do want to preface this. I think you can get a little confused sometimes when we use the word atypical because there was this syndrome that is not much seen anymore called atypical measles syndrome AMS. Sometimes also gets confused with altered mental status because of the acronym.

That was very specific to people who received different formulations of measles vaccine that was provided only during the 1960s that was an inactivated or killed measles vaccine. Those individuals had a really a syndrome that looked quite different than measles. Rash had a different distribution. It was sort of an antibody complex mediated syndrome cause hepatitis and other sorts of.

Dr Whyte: So but nowadays can we see it now?

Dr Filardo: When people talk about atypical measles nowadays what they really mean is measles that doesn't fit the textbook. Like you said that's pretty rare for people who are unvaccinated Are unprotected. It's really pretty standard way that it presents in rash.
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Dr Whyte: And the good news is they can test right? So you can have that suspicion still quarantine. If you have that suspicion and then test. And usually within 24 hours or 36 hours you'll get that back. But just ask you about that.

Dr Iroku-Malize: Starting from the head going down working its way down. Right. And then eventually coalescing. Yeah. About that. With the respiratory symptoms.

Dr Whyte: A question came in with the recent mumps outbreak. There is guidance to give a third dose of MMR in case of exposure. Is that same guidance recommended for measles exposure?

Dr Filardo: Yeah. That guidance is pretty specific to mumps vaccine. Correct. The vaccine effectiveness of mumps is a little bit different. And really I think the two dose effectiveness of MMR against measles and 97% has really not ever led to there to be a need for a recommendation for an additional dose in an outbreak setting like is recommended for mumps.

Dr Whyte: Well we have Dr Offit back. All safe?

Dr Offit: Yeah the joys of apartment living. Right the usual false alarm relieves the building. It comes back but I'm alive.

Dr Whyte: All right OK. Now a question also came in how do you all feel about a modified vaccine schedule in general where a parent wants to deviate from the official recommendation?

Dr Offit: Now I think you know these are very well tested scaffolds. You can't put a vaccine onto the schedule. Unless you show that it doesn't interfere with the safety your emergency profile of the existing vaccines. And vice versa. These are called concomitant use studies. There are hundreds of them.

It always worries me when people sort of want to make up their own schedule because you don't know how that all works and also usually a modified schedule means a delayed schedule meeting. That is therefore increase in that period of time during which are susceptible to diseases with no advantage. I mean there's a perception that it's safer but it's not safer. this is a well-tested safe schedule so I think it doesn't make sense but curious to hear what others think.

Dr Iroku-Malize: So giving them the evidence explaining exactly what it said know that this is tested this is how it should be. However we do know there are those who missed doses who never got there does is you notice it because they may have moved and they just never caught up.

We have these schedules where we try to catch people up and so worst-case scenario if there is a thing about delaying then we'd rather delay than not keep it all. And so that's our mindset in terms of that but we really will push for it to be done the way it should be done. But we also of course take into consideration the patient what's going on in the family and other things that may be happening.

Dr Whyte: So with this question Do children who are lowly vaccinated need to still quarantine if they have close contact with an infected individual?

What's the recommendation there?

Dr Filardo: No, they do not need to quarantine if they are fully vaccinated.

We should still you know having a known measles exposure as we mentioned in rare circumstances. And especially with close and prolonged exposure people who are fully vaccinated can develop measles. It's a very small number of cases on an annual basis. And so people should still be counseled to monitor for symptoms and to report.

Know there'll be notified of the health department of the exposure and they should notify the Health department if they do began to experience symptoms. So it's not that there's no management at all but there is there's no recommendation to quarantine.

Dr Whyte: Have there been any major mutations of measles since the 1950s?

Dr Offit: Remarkable right. I mean here you have a vaccine that was developed in the mid-1660s. It was the last best vaccine and this virus has not all viruses mutate but it hasn't evolved away from recognition by vaccine-induced immunity.

It's really reassuring. I mean you see how that contrasts diseases like you know the SARS-CoV-2 which is constantly evolving.

Dr Whyte: Regarding schedule modification is there a role is their role from modifying the MMR schedule to bring forward prior to 12 months of age to provide immunity particularly during an outbreak?

Dr Offit: Well we did I mean we during the 1991 measles outbreak in Philadelphia when we had 4500 cases and nine deaths. We've actually down to six months of age because we had to we're certainly not there yet. Be curious your doctor ... on this but we're not there yet. I mean with you know roughly 130 case in the United States. We had 4500

cases in one city and this and that when those three winter months. So I don't think we're there yet but can you do what I understood the emergent situations? Yes.

Dr Whyte: But what's considered emergent isn't an outbreak would have to travel you know that Filardo you mentioned about travel to other countries have kids yet aren't vaccinated. So what's that recommendation that?

Dr Filardo: Thank you for highlighting that. So along with the as I highlighted so for those over 12 months of age that two dose recommendation for travelers are essential infants between 6 and 11 months of age. We do recommend one dose of MMR prior to travel ideally at least two weeks before travel to allow for. So the development of immunity before travel.

I do when traveling to the CDC have a list of countries up or not We don't in terms of that specific recommendation we just say international travel. And you know people sometimes say Well what about Canada and Canada unfortunately is experiencing similar to what the United States is experiencing. They don't they certainly don't have widespread outbreaks but they are experiencing cases small outbreaks this year. And so we recommend really any international travel.

I do want to highlight a little bit about the immunology you know and in terms of how it affects maybe the receipt and by age.

So you know we certainly don't think it's high risk or a bad idea to get MMR between ages 6 and 11 months. That's why we recommended for international travelers. It would not be a great idea at least based on our understanding right now to implement on a population scale. And that's because of an emerging body of evidence that maybe the response to the dose that one receives before 12 months of age is a little bit less robust. And that's just because of a less mature immune system.

And if you look at individuals who've got that first dose between 6 to 11 months and then they got two more doses according to the routine schedule. So another dose at 12 months and another dose in four years. If you look at those individuals later in life saying adolescence some studies have shown a slightly lower level of antibody against measles.

I'm not suggesting that you have a huge susceptible population because of that vaccine strategy. But there's a suggestion that it's not the best strategy to implement in a setting like ours where the risk of exposure before 12 months of age is really pretty low that it might compromise sort of our overall vaccine strategy in the long run.

And that's more on a population level when you're talking about talking about vaccinating hundreds of thousands or millions of people according to that schedule. But you know our advice is that if someone is recommended to receive that dose 6 to 11 months of age do you need two more doses according to the routine schedule. And then that will provide we think for you almost all individuals confer lifelong immunity as well sorted by no normal two dose schedule.

Dr Offit: Also, people know decades ago when most mothers have been naturally infected I generally higher antibody responses then following vaccination? I mean the half-life of passively transferred IGG transport suddenly it's roughly 21 to 25 days. But even you know at six months of age nine months of age there's still could be a functional decrease the capacity to make an immune response to that vaccine. And that's which pushed to sort of up to you know to like ultimately to 12 months Now. Most mothers haven't been naturally. I could have been vaccinated. So the antibody response somewhat lower. So I completely agree with Dr Filardo that the now giving it a younger age which was much less easy to do back in the days when that when you know wild type virus was king is more possible.

So I think it's generally make a pretty good immune response and live attenuated vaccines. I mean you know cause it's these are T cell dependent responses and kids can usually make a pretty good T cell dependent response at that age. But I do think there isn't it that we had a child in our hospital who whose mother had been both naturally infected and vaccinated. Kids went to another country came back and had clearly and absorbed the board of Measles me I had an unusual rash didn't have fever. It mean it didn't have to drop off conducted by describes which clearly at measles we prove it was It was a difficult diagnosis.to make because of those attenuating antibodies to diagnose it.

Dr Whyte: How did you diagnose it?

Dr Offit: The way that the doctor ... which is via PCR.

Dr Whyte: OK so you did do that. Yeah. That's why I wanted to check this before.

Then where would you recommend viewers go for additional information? Where would they go on the CDC site?

Dr Filardo: You know we have our cases and outbreaks page which we're now updating. We previously were updating on a monthly cadence. We've updated to doing it every week so that will get updated every Friday.

As I said that includes information like an epi curve by week of cases the map that you showed including number of cases in the range per state. And then some epidemiologic information.

You know how many people were unvaccinated are known to be vaccinated versus those who have documented prior doses. So there's a lot of information there.

There's also a specific page for healthcare providers that includes information about vaccination diagnosis. And then there's also a page for health departments a little more focused on our public health partners which includes a toolkit and some resources there that can be used and also shared by those health departments with clinical providers.

Dr Whyte: Then what about the AAFP?

Dr Iroku-Malize: So AAFP we have a website called Family doctor dot org. And so that's where patient information isn't. Of course you can always go to your family your family doc and they will know they can give you that information as well. They can pick out some patient education manuals for you and some things that are specific to you. Because of course it depends on you know what where you are your community the other factors that are influencing what's going on in your life.

Dr Whyte: One question that came in early on that we didn't get to is when you might have to re vaccinate a patient whether it's a child or more likely an adult. What scenarios would be considered if the person's on dialysis if their stem cell transplant, if they have while they're on biologics, if they're taking an idea they specifically ask about IVIG. Do any of those factor into consideration?

Dr Filardo: Some of those for the most part people who are immunocompromised are vaccine as country indicated because it is a live attenuated vaccine. For people who have undergone stem cell transplantation there are very specific guidance for that population.

In terms of when after an allogenic stem cell transplant they would be eligible and again to thank every vaccinated because you don't trust the immune response to come through in the stem cell transplant. And so there are recommendations for that specific community for re vaccination.

Dr Iroku-Malize: That's usually a year or more after this up to the transplant.

Dr Filardo: You mentioned that thing to thought And then I've lost it so I posit dialysis.

Dr Whyte: Was that dialysis? It was Let me go back to it because I was that person this question. It was dialysis IVIG, biologics, stem cell.

Dr Filardo: IVIG. So this comes up in terms of you know IVIG because it contains pulls antibodies from people including those who have been vaccinated against measles it would interfere with the response to the MMR vaccine. And so people are recommended to wait.

If somebody who's been previously vaccinated then has a new indication for IVIG that might not make sense of this standpoint. But somebody who's on IVIG who needs vaccination in the future they should wait eight months after their last IVIG infusion to receive the vaccine.

Dr Whyte: Any final recommendations to our viewers in terms of tips to convince those parents who are hesitant, who don't think it's a big deal um who just aren't quite ready to vaccinate their kith despite all that we've been talking about for the last 45 minutes. Maybe we'll just go around and we'll start with Dr Iroku-Malize first.

Dr Iroku-Malize: So again I say to my colleagues out there Be patient. Have your facts available. Listen to the patient. Understand where they're coming from and why. Because believe it or not people have different reasons for not wanting to get vaccinated or not when they chose to be vaccinated. So have that conversation to understand where they're coming from And present them with the information the evidence-based information as to how this is a protection.

Dr Iroku-Malize: This is part of our toolkit to protect their children to protect their family members and then as an as this whole thing helps us to build this community of immunity for those who really can't get the vaccine Because of medical visits. So this is really important that they're doing their part to protect their loved ones and also to build that community of immunity.

Dr Whyte: Dr Filardo?

Dr Filardo: Again I'm not sure I have much to add. I'm not a pediatrician I haven't spent a lot of my medical career working with parents on the childhood vaccination schedule and the way that my colleagues.

I think I would echo what Dr Iroku-Malize said before though which is that we really think that that strongest thing that can help influence this decision is a trusting relationship between a patient their family and the provider. And so I think doctor Rocha and Elise said as well that maybe it's not just one conversation it's conversations that occur over time and that's certainly was my experience as an adult provider. And you know in serving people living with HIV and talking about different vaccines that are recommended for that population over time as we got to know each other in the clinical setting. And so I think I would highlight that sort of trusting relationship that develops not just during one visit.

Dr Whyte: I'm gonna give Dr Offit the last word.

Dr Offit: So I think it's not only the most parents haven't seen measles most doctors haven't seen measles to some extent to become less compelling advocates. The having experienced in 1991 measles epidemic in Philadelphia where we have 4500 cases. And I that's you're compelled by how serious that virus can be going. We were we were schools were canceling trips to the city I mean it was that bad. But the thing that was most upsetting to me in my I guess medical lifetime with subacute sclerosis ... which is a chronic measles infection of the brain. It comes up sort of years after that initial infection and it is invariably relentlessly downhill were children lose. Their personality starts to change their handwriting changes They start to lose motor and sensory skills and inevitably it's like falling off a cliff in slow motion and there was virtually nothing you can do about it.

It is really really hard to watch and in three cases in my life and to see one is to know why would you ever risk this virus.

Dr Whyte: I want to thank you all for a terrific discussion. I want to thank our audience for attending or really taking awareness of this growing problem and how we really need to act now On to nip it in the bud and protect our kids. I'd love to hear your thoughts on tonight's event where when you leave the event a link to a quick survey will pop up on the screen. Your feedback will help us improve these events and bring your future topics that you're interested in. And with that I'm going to give everyone back a few extra minutes. That's always a good thing to enjoy your evening. And I want to thank you all again and thank you for participating.