Conversations With the Editors: Promoting Science and Combating Anti-science: The Past and Present of the Antivaccine Movement

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Featured Guest Biography: Jeffrey Baker, MD, PhD, is director of the Trent Center for Bioethics, Humanities & History of Medicine at Duke University. A professor of pediatrics and history, he has practiced for more than 25 years as a general pediatrician in Duke Children's Primary Care with a focus on children with autism and special needs. Dr Baker's work has also centered on child health, and he has written several notable articles related to pediatrics and vaccination.

EDITOR'S NOTE

Because so much of the anti-science conversation during the COVID-19 pandemic has focused on vaccine hesitancy and public reluctance to get a new vaccine, we wanted to help readers better understand the history of opposition to vaccination. To do that, we have invited Dr Jeff Baker, a medical historian and primary care pediatrician, to share his insights.

INTERVIEW

Ravi Jhaveri, MD: Good morning. It's really a pleasure to have Dr Jeff Baker here today to talk about promoting science and combating much of the anti-science that's focused on vaccines and immunizations. I wanted to first start with a lead—in question. Vaccine hesitancy has really gotten a lot of attention over the last 10—15 years, but vaccine hesitancy is not a new phenomenon. Can you give our readers perspective on the historical patterns of vaccine hesitancy?

Jeffrey Baker, MD, PhD: Sure, and thanks for inviting me to do this. I don't know how many people recall that there was an enormous antivaccination movement in the 19th century, reacting against smallpox vaccine, which was really the only vaccine in town at that point. It was a powerful movement in countries like Britain and the United States. For example, in England, there were demonstrations in cities such as Leicester that attracted over 80,000 people.[1] Both England and America both developed anticompulsory vaccination leagues, and these groups became media savvy, reaching a great number of people with tracts and pamphlets. And like today, these movements drew energy from many other social movements. Some of their members were middle-class folks who were suspicious of

science, perhaps attracted to homeopathy or natural healing philosophies. Others came from the working class. Yet underlying all this diversity was one common theme—that of libertarianism. The English movement, for example, began as a reaction to the compulsory smallpox act of 1853, which was expanded in 1867. It was very much a direct reaction to this act, and antivaccinationism at that time tapped into broader sentiments about liberty and suspicion of the power of the state.

Dr Jhaveri: In terms of the echoes of the current pandemic, can you talk about vaccine hesitancy or refusal around the rollout of polio vaccine in the 1950s? Was there still a big movement or was there a bigger buy-in at that time?

Dr Baker: I've mentioned the power of this movement in the late 19th and early 20th centuries, but then anti-vaccine sentiment to some extent faded away. It declined even as more vaccines came in. Public health officials in the mid-20th century relied less on compulsion than education in promoting vaccines. They were aided by the fact that science had tremendous authority in the mid-20th century.[2] The Salk vaccine against polio was a major media and cultural event; people really didn't need to be compelled to take it when it was first released. Compulsion returned in the 1970s and 80s, as health authorities came to rely on school mandates as a tool to promote high vaccination rates and disease eradication. This was a good deal less invasive than the kinds of compulsion that had been used for smallpox, with inspectors going door to door asking, "Are you vaccinated or not?" and issuing fines. Anyway, antivaccinationism faded as a movement in the mid-20th century, and then it came back.

Dr Jhaveri: Let's get to that point about it coming back. How is it different today? What factors or cultural forces are at play? People like to blame social media—is social media really the reason or are there other factors?

Dr Baker: It's one factor but not the whole story. One big difference is that today's movement questioning vaccines is less a response to a single vaccine than to the fact that so many vaccines have been produced over the last 30 years. The irony is there's plenty of evidence that the vaccines we have today, besides being effective, are actually a lot safer. There really were safety concerns with 19th-century smallpox vaccine. Superinfections were common. Kids with eczema could develop generalized infection from the vaccine strain. Even earlier 20th-century vaccines were often produced from killed whole-cell bacteria and triggered high fever and unpleasant side effects. In contrast, most of today's vaccines are much more elegant, safer, and simpler. Yet unsubstantiated claims about vaccines are more common than ever.

Here is where the internet becomes important. I've already mentioned pamphlets in the 19th century. They were powerful, but they still didn't have the power of the internet, which can take rumors and spread them widely and even globally. Heidi Larson, an anthropologist who has studied this, talks about emotional contagion—how rumors can just spread like an epidemic.[3] Although the internet and social media are not the cause, they are great amplifiers.

What is generating all this anxiety? I think it is less about vaccines than a deeper and widespread sense of distrust. We're in a time where lots of people don't trust government, don't trust authority, don't trust corporations, and feel disenfranchised and disempowered. These widespread feelings are the raw stuff out of which antivaccine sentiment is born.

Dr Jhaveri: To follow up on that, associated with the distress, too, is polarization—not just political but along societal lines. I think of the Disneyland measles outbreak in 2014 and 2015, with the vitriol you'd hear from both sides about people who are not only antivaccine but vigorously provaccine. The conversation, the strength of the arguments on both sides really is disturbing. Regardless of what your fundamental perspective is on vaccines, the tone of the conversation, if you could even call it that, is really troubling.

Dr Baker: And not only between doctors and patients but even between families. A journalist, Arthur Allen, has written about vaccine hesitancy on the Western Slope of Colorado, and he writes about how the families and

neighbors are bitterly divided, not speaking to each other.[4] Both pro and con about this. It's another manifestation of the polarization of our country.

Dr Jhaveri: I've always been curious why people perceive vaccines differently than medications or devices—where they seem to be much more readily willing to take an aspirin or get a knee replacement. Why do vaccines draw this really powerful reaction that drives people away?

Dr Baker: I think it is because they're associated with public health as opposed to individual health. You know the medications you just mentioned, they fit nicely into the model of consumerism, which is how many people think about medicine today—a model of individual choice. Why can't I make decisions for myself? Vaccines are different. You might decide to get a measles vaccine for your child, but there's still might be a 5% chance that it won't generate antibodies. Your child is being protected by the other vaccinated people around him/her. So that's a fundamental difference—vaccines work through the community (or herd) immunity. They don't simplify into a consumeristic model, and that is why people see them differently.

Dr Jhaveri: That's an excellent point. You alluded to it a little bit before when you were talking about the historical context of opposition to vaccines, but I'm not sure our readers really appreciate the diversity in terms of the groups that oppose vaccination across, for example, socioeconomic status or educational levels. Could you provide some perspective for us on that?

Dr Baker: Although united by libertarian opposition, as well a general theme of distrust of experts, there are lots of different groups represented in antivaccinationism. The first big division is between the truly committed antivaccination folks—deeply distrustful of doctors, government, corporations—as opposed to a much broader swathe of people with varying levels of uncertainty about vaccines but mainly want to take part in making decisions for their kids. *Vaccine hesitancy* is a term that has caught on for that bigger group, and I think an important distinction.

Second, it's important to remember that people may have many reasons to question vaccines. I've already mentioned consumerism, which is the American ideal of simply wanting to make decisions about your own family. A second set of concerns I might call "green" or "environmental," in this case linked to the adjuvants and preservatives used in vaccines. Some folks appeal to religious objections, though this can also be a shorthand way of signifying distrust in science. And finally, libertarian beliefs continue to be widespread on both sides of the political spectrum. You have powerful antivaccine groups in areas north of San Francisco in Marin County, in the Idaho Panhandle, and in Texas. These are really different groups of folks politically, and yet they're united in projecting their concerns onto vaccines.

Dr Jhaveri: I think many assume that opposition of vaccines is linked with a lack of education, but when you look at it, it is quite the opposite. Often the highly educated oppose vaccines for many of the reasons that you've outlined.

Dr Baker: That's been a long historical theme as well and was true for the smallpox agitation. There are some very educated people prominent in that movement, including a fair share of dissenting physicians.

Dr Jhaveri: To point out to our readers, in addition to being a medical historian, you are a primary care doctor. Can you talk about some of the ways that you've incorporated discussions about vaccines? How do you present the topic? How do you present yourself when you're discussing vaccines for your patients?

Dr Baker: I've done a good bit of research about vaccine controversy, especially focused on thimerosal and autism.[5] I've really come to believe that the key issue is not so much to correct misinformation but to build trust.

First, it doesn't work to shame a parent. I think you need to start with the assumption that parents do want to do the right thing for their child, but they are getting bombarded by conflicting advice. They're getting information

from the internet, from parent's groups, from other sources. No wonder they have doubts. That's no reason to question their motivation.

I would begin by acknowledging that they want to do the right thing for their child and acknowledge how hard it is to sort out all the conflicting claims that are out there. I also need to remember that these folks have just met me. That's one of our challenges; we are forming a new relationship just as the first vaccines are being given.

After that, though, I'll share my conviction that this is not another consumer choice. I want them to understand that this is a different kind of decision—one that has implications for others—and that I think it's important to think carefully about. This takes some time, and I don't want to squeeze the discussion into a quick sound bite at the end of the 2-month visit. I try to anticipate this by asking parents their feelings on vaccines at the 1-month visit and get a sense of their level of concern. I might set up an extra visit.

All of that lays the groundwork to talk about vaccines, their side effects, and the disease they prevent. The latter is so important to address and to do so in an accurate but not sensationalized way. And to again make the important point that while babies may get more shots today, they are receiving immunizations that are far more refined and less likely to cause reactions than their counterparts 50 years ago.

Dr Jhaveri: I think that's great. I want to follow up on that one point about communicating about vaccines. I've often believed, and I don't know how good the literature is on this, that people tend to make different decisions when the risk seems more proximal to them and their community. For instance, did you see changes in people's attitudes around the measles vaccine once we had these larger epidemics? Or people who were before a bit more apprehensive coming in and saying, "You know what, I changed my mind. I want the vaccine and I want it for everyone right now."

Dr Baker: Sure, I see parents' attitudes towards vaccines swing back and forth with media coverage. An epidemic creates more concern. And when a celebrity on TV makes negative claims, the pendulum swings the other way.

Dr Jhaveri: The other phenomenon that I think happens is seasonally as people stall about getting flu vaccine. Once they hear the reports on the news that it's really widespread in the community and they see that kids are missing school, you see that second surge of people that come in for their vaccine.

Dr Baker: That's probably a better example because I'm still not sure how to talk about flu vaccine. I don't want to sound flippant, but flu vaccine suffers from its name—people think of the flu as synonymous with a cold. No matter what I say, quite a few folks just don't think it's that big of a deal. Until we're in the midst of a real flu epidemic that's getting lots of publicity.

Dr Jhaveri: You've obviously heard all the statistics about surveys of people who, when confronted with a question, "Are you going to get a vaccine when it's available for SARS-CoV-2?" that people are very apprehensive. Can you talk a about how we, as physicians and medical providers, can remain optimistic and persist through these waves (of anti-science and vaccine hesitancy)?

Dr Baker: I'd like to close with a nice story recalling how polio vaccine brought together Americans in the 1950s, but it's hard to deny that we're in a different moment of time. Even so, let's not forget that most Americans do in fact vaccinate their kids. And even with so much distrust of government and experts, quite a few still trust their health providers. I hope that this will extend to a new COVID vaccine. Of course, it'll be very important that the process of assuring the safety of that vaccine is transparent and trustworthy.

Dr Jhaveri: You made this point when you talked about measles, but we in the scientific community also spend a lot of time and effort focusing on a minority of patients that are hesitant and oppose vaccination when the lion's share of patients and families really do follow our recommendations. They do get their vaccines on time as

prescribed, and I don't know that we do enough to celebrate their efforts and their diligence in adhering to public health and physician recommendations. I think we ought to do a better job of really celebrating them.

Dr Baker: I would really agree with that. While I don't want to make light of the recent measles outbreaks in the United States, it's worth thinking about how much worse they might have been. There were 1200 cases (in the US) in 2019 and 125 in the Disneyland outbreak.[6] That was a very serious issue for us. But do you know what it was in the European region in 2019? Over 100,000![7] One hundred thousand compared to 1200 here. In Europe, there were a number of deaths, too. So, we should not lose sight of the fact that most people are still on board with this. A lot of antivaccine sentiment, particularly the more extreme sort, is concentrated in geographical pockets. We still have good overall coverage.

Dr Jhaveri: So, faith in the process, trust the science and the data, respect your patients. I think those are sound tenants for helping us get through this pandemic crisis. Are there any other final thoughts you'd like to share with our readers before we conclude?

Dr Baker: I just think there is a tendency to focus on information, misinformation, or even on particular individuals, whether celebrities or whomever. Something that makes me hopeful about this is, compared to other issues of science denial, like climate change, we have an opportunity here where an individual person on the science side talks to an individual family and has a genuine conversation. That gives me reason for hope.

Dr Jhaveri: Agreed. Thanks so much for your time. I really enjoyed speaking with you today.

Dr Baker: Thank you for inviting me.

DISCLOSURES

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