

## Experts discuss measles outbreak and the peril of anti-vax misinformation

June 12 2019, by Alvin Powell

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Barry Bloom, former dean of the Chan School, and Juliette Kayyem of the Kennedy School discuss what's driving the measles outbreak and likely ways forward. Credit: Jon Chase/Harvard Staff Photographer

Measles was declared eliminated in the U.S. in 2000, but by early June,

the U.S. Centers for Disease Control and Prevention reported 1,022 cases in 28 states, the most since 1992.

The disease is occurring in clusters of unvaccinated people who, for religious, personal, or medical reasons, have refused to be vaccinated or to have their children vaccinated.

Though global measles deaths are down significantly from more than half a million in 2000, the disease still killed 110,00 in 2017, according to the World Health Organization.

Barry Bloom, former dean of the Harvard T.H. Chan School of Public Health, and Juliette Kayyem, Belfer Senior Lecturer in International Security at the Harvard Kennedy School and a former Department of Homeland Security official, agree that additional steps are needed to address the crisis, but Bloom comes at the problem from the public-health viewpoint, and Kayyem from that of [public safety](#).

They sat down with the *Gazette* to share their thoughts on the outbreak and likely ways forward.

## Q&A

### Barry Bloom and Juliette Kayyem

**GAZETTE: The Centers for Disease Control and Prevention says that there are seven ongoing measles outbreaks in the U.S. What's the difference between an outbreak and an epidemic? And is a measles epidemic possible in a population with the level of vaccination that we have?**

**BLOOM:** Technically, anything over three cases is an outbreak for these reportable diseases. And because over 90 percent of Americans are vaccinated, it is unlikely we'll see an epidemic.

But there are still big pockets in districts that have very poor vaccine coverage. So that leads to bigger outbreaks than three people: several hundred in New York state, for example, and prior to that in California, Minnesota, and Washington. But it's unlikely there will be an epidemic in the sense of spreading both within those states and across the country.

**GAZETTE: Is there something about this moment that makes measles among the unvaccinated U.S. population more likely?**

**BLOOM:** Every outbreak but one has been attributed to someone who came from abroad. And the one exception is a direct child-to-child transmission.

**KAYYEM:** What we haven't seen before—or at least it's much more intense now—is the extent to which a foreign power, Russia, is utilizing the sense of division in our country, using social media, websites targeting low-information communities, isolated communities, to propagate an unhealthy status for Americans.

It's disinformation, not unlike what we saw during the presidential campaign. But the idea that the Russians come out only every two years is nonsense. They're waging this effort and we've seen it move from the election—the politics space—to the public-health space.

It's not new. During the Ebola outbreak, there were more than hints of this. But we're seeing it now because we're looking for it.

**GAZETTE: So this has been going on, potentially, for some time?**

KAYYEM: With the Ebola outbreak, there was a campaign launched by Russia and others to create skepticism about health care workers and their objectivity. This has always been a concern. I think what's unique in this instance is that it targets U.S. citizens in outbreaks that are already ongoing.

But it's not like the anti-vax movement is new, just in the same way racism isn't new. The Russians have a way of being able to bring out the worst in us.

**GAZETTE: And the anti-vaccine movement has been traced back to a particular—discredited—study, linking vaccines to autism?**

BLOOM: The first anti-vaccine association or society was created in England in 1866 and they've been doing great mischief ever since. So the anti-vaccine movement is hardly new.

There was this dreadful paper in 1998 by [British gastroenterologist Andrew] Wakefield that is famous for making an association between the measles, mumps, and rubella vaccine and autism. How that paper got published is totally unclear to me.

The subjects were a dozen kids attending a birthday party at his house, eight of whom were selected at some level and were probably autistic to start with. Then it was shown that Wakefield had selected and falsified data and had a financial interest in the insurance claims from that set of injuries.

The other thing unexplained is why it took *The Lancet* 15 years to retract the paper and for Wakefield to lose his medical license—only to appear in Texas and at every anti-vaccine rally that he could muster the travel fare to get to.

**GAZETTE: It seems that there was fertile ground waiting for the anti-vaccination message. What is it about vaccinations that puts certain people off or about a portion of the American character that is willing to believe these sorts of things? Or is it just the luxury of the success of vaccines over recent decades?**

KAYYEM: Since these outbreaks began, the vaccination rate in some of these communities has gone up—voluntarily—by 40 percent, suggesting that their ideological belief is only strong when it doesn't matter. It's just crazy. This is where I get so angry.

The public-safety side has a very different approach to this and a lot of people don't like it. I grew up in California, where there's always pockets of this wacky mysticism [and] where there are lower vaccination rates than in Sudan. These are not low-information communities. These are self-centered communities, these are people who have access to the best information.

The other thing, at least more recently, is the sense that big, bad pharma exists only to make money. That's what's clearly animating at least some part of the anti-vax movement.

**GAZETTE: So there's anger there?**

KAYYEM: They think, "It's a hoax, fake news." It's this idea that "two plus two doesn't equal four anymore, no matter what you tell me."

They think this hoax is being led by pharma and big, bad government. That's clearly what's animating parts of this.

Then, of course, there's an incorrect assumption by people on the outside that some religions prohibit vaccinations, and that's not accurate. Religious communities have been very, very good about trying to push back against all of this stuff.

**GAZETTE: But it also seems as if there's real anger out there. "You can't make me do this. This is America." It goes back to a fundamental belief. Why should this fundamental belief not apply in this case?**

BLOOM: There is a fundamental-values issue that we should take seriously. And we have to take the anti-vaccine people and parents who are hesitant seriously.

Because when we say vaccines are safe—and they are extraordinarily safe—there are always some adverse effects, as there would be with aspirin or any other medical intervention.

There's a feeling that there are three sets of enemies. One is the government, which doesn't respect individual freedoms. The second, as Juliette has said, is industry, manipulating people solely for profits and exploiting children in the process. And there's a third group of enemies, which is us, experts.

One of the questions I spend a lot of waking nights worried about is how you answer the question: "How can you scientists and experts be so sure

of everything that you say?" And that's really hard.

The FDA tries to look at a vast number of studies, at many, many trials of these vaccines, and to get them to the level of one adverse event per million. That would be ideal. Some have somewhat more adverse events than that, but none is anywhere close to being a high-probability event.

**GAZETTE: The flip side of that question, then, is to what extent do we all need to recognize that we're part of a community and need to do things that benefit that community?**

KAYYEM: Every society sets rules about acceptable behavior to protect the greater good. Israel has universal conscription—everyone's making a sacrifice.

Here, seat-belt laws were passed because your freedom to fly through your windshield if you get in an accident should be limited because we, as a society, are going to have to clean it up.

So even assuming that there's some risk to vaccination, whatever risk I'm willing to put my child through is for the greater good, including that of the anti-vaxxers and the anti-vaxxers' child.

BLOOM: Massachusetts is at the center of critical decision-making on the issue of individual rights versus the public good.

One of my favorite cases that has nothing to do with vaccines had a connection to Massachusetts: *Schenck v. United States*, in 1919. The judge who wrote the decision is an old Harvardian named Oliver Wendell Holmes. The issue was anti-war anarchists publishing stuff that was detrimental to the war effort. In a two-page decision, the court ruled

that even the First Amendment—and other amendments, in principle—has limitations. In this case, public safety trumped an individual's right to say whatever he wanted. And that's where the famous quote came from where you cannot yell "Fire!" in a theater.

A second case, *Jacobson v. United States*, in 1905, was an anti-vaccine case. It was the first classic case where a person refused to accept vaccines and the court decided that the public safety and security preempted the individual right to do that. That allowed mandatory vaccines before entry to schools, now the law in all 50 states, and it's been controversial ever since.

**GAZETTE: That was in the case of smallpox, wasn't it?**

BLOOM: That was in the case of smallpox vaccination, the world's greatest killer up to that time, and now eradicated globally since 1977.

**GAZETTE: Today, people might say, "Oh, that was smallpox. Everybody should get vaccinated for smallpox. But measles ..."**

Should the state have a limit on its power based on the nastiness of whatever it is you're vaccinating for, or can the state say, "Everybody needs a flu shot"?

BLOOM: That's the dilemma: What is the limit of protecting the public good?

As Juliette pointed out in talking about Ebola, the four cases that occurred in the U.S. were not a lot of cases.



But if you don't do anything, it's not four cases—it's 40, or 400, or 4,000. And then the ability to deal with that is very different. The example for that, right in front of our eyes now, is Ebola in the Democratic Republic of the Congo.

We have a vaccine for Ebola. It has been proved to be close to 90 percent protective. But because of distrust of government and breakdown in security, the disease has now gone endemic. It's there, in a form that has the potential to spread almost no matter what you do. It will be continuing for some time.

**GAZETTE: And there we're seeing serious anti-vaccination efforts, with public health workers being killed.**

KAYYEM: Another thing we have to remember is that if you don't have a certain amount of your population vaccinated, then it's like having your [whole] population not vaccinated. This goes back to the idea of "herd immunity."

That's important because there are groups of people who can't get vaccinated. They have certain immunodeficiencies, certain vulnerabilities, certain allergies.

So when you think about the collective good—to protect the most vulnerable—that's also a compelling state interest. And if I have a strong belief in anti-vaccination, that actually makes more people vulnerable.

**GAZETTE: So people who can get vaccinated, should get vaccinated?**

BLOOM: No kids younger than 1 year old can get vaccinated because

their immune systems aren't developed enough and the MMR vaccine contains live, attenuated strains of measles and mumps.

So that's one population that will remain unvaccinated. A second is any child with leukemia or immunodeficiency. We also talk about vaccines being highly protective—and they are—but nothing in biology is 100 percent. So within any population, even among the vaccinated, there is a very small percentage who, if exposed, will get the disease.

**KAYYEM:** That raises the question—and we deal with this a lot in national-security spaces—[of] knowing there will be exceptions to any rule, what do you want your rule to be? If it's too permissive ... both the anti-vaxxers and the free riders, I'll call them, won't get their children vaccinated.

But there's a community effort that's needed to make this work. In my opinion, you want to make the rule the most restrictive possible. Let people fight for exemptions based on whatever core beliefs they may or may not have, rather than lowering it.

**GAZETTE: So make it a last resort, not a first resort?**

**KAYYEM:** You want the barrier to be high for exemptions.

**BLOOM:** We now have a circumstance where all 50 states require children to have vaccines before they go to school. So that's the bar. Every child entering school is supposed to have a vaccine.

It is widely accepted in every state that kids with leukemia or immunodeficiency or other serious medical conditions have medical exemptions. What's new over the past 20 years are religious and personal

exemptions.

It might seem reasonable in some cases to consider them legitimate, but they're not used in that way. In some states, you can just have a parent sign a piece of paper and say they have a personal objection and that kid in that school doesn't get vaccinated.

KAYYEM: And there's no notification requirement to the other families.

BLOOM: And nobody knows how many kids in any school in this country have been vaccinated. So if you have a child with leukemia who's mainstreamed, that kid is at risk. That was the basis for a lawsuit in California [in which the state] just took away all nonmedical exemptions, religious and personal.

I would point out there are only two states in the U.S. that never had them: Mississippi and West Virginia. And none of them has had a recent outbreak of any of the vaccine-preventable diseases.

KAYYEM: And the personal exemptions, you can go online and find a doctor who will give an exemption. In fact, there's a doctor in California whose records have just been subpoenaed. In cases like this, I like the use of the criminal justice system.

**GAZETTE: So it's like people going "doctor shopping" for opiate prescriptions?**

KAYYEM: He's just a big fraud ...

BLOOM: This is a serious issue. There are constraints on parents to vaccinate their kids. But there is no constraint on physicians giving away

exemptions for money.

Israel has just clamped down on that and I think we should start thinking about it.

There has to be some justification that medical exemptions are legitimate. Most distressing, there are doctors—pediatricians—who advertise that in their practices they do not give vaccines.

In my view, that is withholding potentially life-saving care. This is a violation of the medical code of ethics.

KAYYEM: That is exactly right.

**GAZETTE: Let's talk about how to address the problem. Barry, you've written about eliminating exemptions, and I know Washington state just got rid of them.**

BLOOM: And California.

**GAZETTE: And California. Do you see that being a broad movement across the country?**

BLOOM: I think that would make a great deal of difference. Absolutely.

**GAZETTE: How about other solutions?**

BLOOM: The other major solution is education.

With regard to misinformation, what's really different than it was 20

years ago is the internet and social networks. We have no way to control what's on the internet and how people are targeted, whether by the Russians, by a variety of ideologues, or people with vested interests.

There is a movement, increasingly, to control what comes over the internet. That would have a very helpful effect. When one surveys parents who are hesitant about vaccines and they're asked "Where do you get your health information?" a significant percentage of the vaccine-"hesitants" say they get it from the internet.

The vast majority of vaccine acceptors get it from their physicians and nurses.

KAYYEM: That's interesting.

BLOOM: Again, we believe in freedom of speech and the First Amendment. But that's why I mentioned *Schenck v. United States*. It's a case where total freedom to say anything can be constrained if it harms others.

**GAZETTE (TO KAYYEM): And your stance is a little bit harder, looking at it from a public safety viewpoint?**

KAYYEM: I think all the things that Barry says are absolutely right. You want to engage and educate and get this misinformation offline. But ignorance is no defense under the law, so you can think about a much more penal approach to it.

I want to distinguish between two types of people. One are those in low-information communities. I think they're rare here in the U.S., but those you can work on educating.

But then there are people who are educated and searching out this stuff online.

I could read online—I'm sure I could find it—that it's unsafe to put seat belts on my kids. Or more kids die with bicycle helmets on than with helmets off. I can find that stuff if I want to. But ignorance is not a defense against being charged if my kid dies in a car accident.

I want to put the onus on the parents to be responsible and educated.

One way to do that—which we're starting to hear about, at least in Germany—is you become much more penal. Monetary fines, much more aggressive isolation; you don't have these exemptions.

We have the benefit today that there's not a lot of people dying from this. But if it came to that, you would view this very differently—you would see this as just absolutely careless behavior.

BLOOM: That's a particularly easy choice when we don't see polio anymore. We don't see kids dying of measles pneumonia anymore. No mom sees a kid's death from mumps or whooping cough. That's the price for success and we are paying it right now.

KAYYEM: I travel around the world and other countries envy our lack of these diseases and our relatively low rates of death for some of them.

BLOOM: Take measles. Forty years ago we had about half a million cases, 1,000 hospitalizations, 500 deaths, per year.

There's another point that you never see talked about: Who pays for all of this? This is not cost-free.

We talk about vaccinations and they're not terribly expensive. But these

are not benign conditions. For those who come down with measles, between one in 10 and one in 20 gets hospitalized. Kids get pneumonia, kids get encephalitis, and they really require high-tech treatment.

We're talking about \$125,000 to \$140,000 per child who is hospitalized with measles. And for each infected child that enters a community, the CDC may have to track down 500 or 1,000 contacts, for which the CDC and the states have little surge money.

### **GAZETTE: And isn't measles one of the most infectious diseases?**

BLOOM: It's about the most infectious. If there's a child with measles in an average-sized room with 10 other people who have not been vaccinated, nine out of 10 will get [measles](#). That's how infectious it is.

### **GAZETTE: So where do we go from here? The number of cases keeps climbing.**

KAYYEM: On the public-safety side, what's going on now is a combination of extremist ideologies with social media platforms. But there's a third factor that's unique: These ideas are publicly tolerated, they are danced with, they are not sufficiently rejected in the public sphere.

From ABC—one of their top actresses is anti-vaccine—to a high-profile Kennedy to a president who, until two weeks ago, never had talked about the necessity of vaccine. Without being too political, the public forum matters. And leadership matters. Even the president seems to have woken up to the necessity of saying, "Get your shots." That stuff festers in silence. "Both sides-ism," honestly, is dangerous.

BLOOM: The challenge is that turning things around is preferably done by incentives and education rather than punishments.

I think a big push should be public information from credible people, not just from experts, and we don't have resources for that now. We don't have the social marketers that know how to sell Juul or cannabis advocating for vaccines. We have to get some of those people talking about vaccines to ordinary people.

One more positive step is that we really don't know how many kids actually have their vaccines. When I was a kid I got a card for vaccines. Today, something like that card can lead to data sets to identify clusters of people or schools which, in various local communities, are at risk. We could anonymize the data to protect privacy, but still allow us to head off outbreaks. That would be hugely beneficial.

Committed ideologues are not going to change their minds. But I believe every parent wants to do what's best for their kid, and there's an awful lot of people who need to see that this is not the wool being pulled over their eyes by experts or greedy vaccine companies. We all have a responsibility to do what is best, not only for our own kids, but for our communities as well.

*This story is published courtesy of the [Harvard Gazette](#), Harvard University's official newspaper. For additional university news, visit [Harvard.edu](#).*

Provided by Harvard University

Citation: Experts discuss measles outbreak and the peril of anti-vax misinformation (2019, June 12) retrieved 29 April 2024 from <https://medicalxpress.com/news/2019-06-experts-discuss-measles-outbreak-peril.html>



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