Michael Mina

Female: Welcome to Conversations on Health Care with Mark Masselli and Margaret Flinter. A show where we speak to the top thought leaders in health innovation, health policy, care delivery and the great minds who are shaping the health care of the future.

This week Mark and Margaret speak with Dr. Michael Mina, Assistant Professor of Epidemiology, Immunology, and Pathology at Harvard School of Public Health in Harvard Medical School. He's been a vocal proponent since early in the pandemic on making cheap, rapid at-home test available to all Americans which would have greatly reduced the pandemic. Dr. Mina also is helping develop a global immunological survey much like the national weather service to better track disease outbreaks around the world.

Lori Robertson also checks in, Managing Editor of FactCheck.org looks at misstatements spoken about health policy in the public domain, separating the fake from the facts. We end with a bright idea that's improving health and wellbeing in everyday lives. If you have comments please email us at CHCradio@chc1.com or find us on Facebook, Twitter, Spotify or wherever you listen to podcast. You can also hear us by asking Alexa to play the program. Now, stay tuned for our interview with Harvard's Dr. Michael Mina here on Conversations on Health Care.

Mark Masselli: We're speaking today with Dr. Michael Mina, Assistant Professor of Epidemiology, Immunology and Pathology at the Harvard School of Public Health in Harvard Medical School. He's a member of the Center for Communicable Disease Dynamics at Harvard, and lead researcher at the Human Immunomics Initiative.

Margaret Flinter: Dr. Mina has been advocating since early in the pandemic for the deployment of a rapid testing infrastructure as a public health tool to quickly contain COVID outbreaks and get this pandemic under control. Dr. Mina welcome to Conversations on Health Care.

Dr. Michael Mina: Thanks so much. I'm very happy to be here.

Mark Masselli: You know, the CDC just issued a recommendation on the booster shots causing some commotion. Their recommendation calls for booster shots for those that are 65 and older and those 18 and older who are working at higher risk professions or institutions. You said we should be less focusing on boosters, and more focused in on the world's unvaccinated of which there are billions suggesting that one shot to an unvaccinated person is worth a thousand boosters. I'm wondering if you could just tell us more about that the ongoing threat with so much of the world still unvaccinated

Dr. Michael Mina: I think it's important to realize that I have the luxury of being able to discuss these things without actually having to deal with the

practicality. The practicality is that CDC is in a position where they're focused on the United States. I am in a position where I rightly get to focus on what's happening around the world. This is really a tension, I would say when you have a government that has their primary operating principle is towards one country. But we are in a global pandemic, how do you balance those things. I would say that, arguably we have not figured out how to balance them.

In this pandemic a global aid is domestic defense. The more we can limit spread and limit the virus across the world, the better we're going to be in the long run. But it's very hard to make that assessment in real time. One unvaccinated person in a country where there are a lot of cases right now, but not a lot of vaccines. Giving that one unvaccinated person a vaccine is likely to match the benefit that that person would have in a nearly fully vaccinated community that it would take thousands of booster doses. We just have to look at the infection fatality rate or giving it to a 12 year old for example. You'd have to vaccinate thousands and thousands of 12 year olds to have the same benefit in terms of mortality protection.

These are really global ethical issues that are extraordinarily difficult to manage without having an overarching equilibrating body that is able to allocate vaccines appropriately across the globe. But unfortunately in this time, the wealthy continue to do what the wealthy do, which is gain access first and even if it is unfortunately at the expense indirectly of protecting other much more vulnerable individuals.

Margaret Flinter: Dr. Mina, you've been a pretty clear voice since early in the pandemic calling for broad deployment of rapid COVID testing for all Americans. You've made the point that rapid testing is the tool that maybe helps us end the pandemic without lockdowns or massive quarantines. But as we hear about shortages of rapid tests and some of the public health sites for testing not as readily available, maybe you could talk to our listeners a little bit about kind of the medical approach to testing using the more sensitive but the slower PCR tests with a more delayed response time to rapid test is maybe the better public health intervention.

Dr. Michael Mina: Early on in this pandemic, we focused on the PCR test in general because that was -- it's a very easy thing to develop, a PCR test. We need to know the sequence of the virus and then within a day or so we can have a well working PCR test. But the PCR test was pretty readily recognized that PCR is not the best approach if our goal is one of public health. What I mean by that is for public health, we're not interested in asking is this person symptom due to an infection that they had two weeks ago? That's for a physician to answer. A physician does not have to think about the 99.9999% of people that are not

passing through their office.

But in public health, we have to think about the system, we have to think about how do we reduce transmission of this virus across the community. To do that a rapid test is what we need, because a rapid test will indicate if you are currently infectious, and they're extremely accurate for doing that. If you're infectious with this virus and a risk for spreading the virus to other people, then these simple rapid tests are going to turn positive.

There's been so much confusion about is it less accurate or more accurate. In many ways, it is actually the more accurate test for that specific question. What happened early in this pandemic is we medicalize the approach. It felt like our approach to tackling this pandemic, this global health emergency was trying to tackle it at an individual medical basis, one person at a time. You will never claw back a pandemic one person at a time, you have to deal with the pandemic and then the medical issues resolved themselves if you stop the spread. But what happened was we started regulating these tools as medical devices, which put the FDA actually in an impossible position of trying to say, okay, we need to take a test that is highly accurate to ask if you are infectious and compare it to a PCR tests that's highly accurate to ask, do you have any remnants of viral RNA even if you were infectious for weeks ago, so they're very, very different things.

I like to liken it to a security system at an airport is a bit like having 1% of all people who are going through the -- into an airport, we're only shuttling 1% of them through the security screens. Meanwhile, 99% of the people are just not getting screened at all. This is the difference what we found, obviously years ago with airport screening is we can't do that, we actually have to have a 100% of the people walking through metal detectors, even if they're not the most sensitive to detect them. Very last little charge metal you might have in you, they are doing the exact job that we need them to do amongst the most number of people as possible, and that's what rapid tests are extremely good at doing.

Mark Masselli: It seems that President Biden's gotten religion about scaling up the production of rapid tests and really trying to drive that price point down. He's planning to deploy them, I know we're going to receive them here at Community Health Centers, but also safety net providers across the country, really making sure the underserved population are able to have access to it. But there are some real concerns about the lack of supply. I'm wondering if you could talk to us about the hurdles that remain whether the current administration's efforts are going far enough.

Dr. Michael Mina: Well, at the moment, they are not going far enough. But I do believe

that they are trying. The President's COVID-19 action plan that he announced the other day was a massive step in the right direction. What happens with these types of plans is he comes out and says we're going to get 280 million tests, that's a pretty mediocre number of tests when you have a country of 330 million. When we need tests to help us in our everyday lives, we need more than one test per person per year. What it was, was a recognition that these tests are extremely important to our overall efforts to battle this virus.

I think where the administration has had difficulty is understanding actually what is the true bottleneck in terms of Americans having access. They've been trying. When I spoke with the Trump Administration and earlier during the transition with the Biden Administration, the response that I got quite often was, this sounds like a great idea. Frankly, we don't have any supply to actually make a robust plan for the country, so that's kind of where the conversation always ended.

What we can do is we can recognize so why is the US so behind our European counterparts to get this test? It's not because the test don't exist. It's not because we need to scale up a few companies more because they're the only companies that can make these tests. It's because we have evaluated these tests all wrong. It has created a bottleneck in terms of which companies have actually been able to pass through the FDA gauntlet to get authorization.

You can't really blame the FDA, they've been asked to do one thing which is authorized medical devices. Unfortunately, because the US doesn't have a regulatory framework for public health tools, all of these powerful public health tools had to go through the FDA’s bottleneck of medical devices and most of them not because they're inferior technologies, but because the companies didn't know how to set up their clinical trials to kind of skew the participants the right way.

I have not been able to gain authorization, so there's actually a very simple solution. That solution is for the President to use executive action to do something very simple, which is to state that the tools used for public health testing will be designated as public health tools. What that would do is it takes the onus off of the FDA, and it places the burden on the CDC or the NIH to figure out how to authorize these appropriately as transmission indicating tools, not tools to tell you that you have any RNA from a previous infection. But the tool that tells you now in real time that you are infectious, if the CDC takes it over, then they can use the right metrics to evaluate these tools, they can say we just need the tools that will detect people who are infectious. Then we can also even look to Europe and say, what are our trusted allies, and if they've had good experience for a number of

months with certain tests, then immediately overnight we could say, we are going to see to review and enable those companies to come into the United States as well. We could triple our access to tests literally overnight, and all it takes is a re-designation, that's very sensible.

Margaret Flinter: That's such a clear call to action, and maybe less clear is what should we be doing in the nation's schools? I understand more than a million children had been diagnosed with COVID. In the past week, we've certainly seen younger children being sicker than we saw pre-Delta Variant. Yet school systems seem to be really struggling. Should they be testing all kids? How do we avoid hopefully the kind of extended quarantines and lockdowns that we had before? What is your public health perspective on testing for COVID in the schools, at least in areas where the pandemic is really running rampant?

Dr. Michael Mina: I mean, there's nothing more important, I think, in a society than making sure that we're giving children the foundation that they need to succeed. Taking a year away from peers away from school, we don't have any idea actually what the damage is going to be. We need to stop quarantining students. A lot of schools have relied on PCR testing, even when they're taking three days to return. The test that comes back three days later is just not stopping transmission and particularly with Delta. We keep putting a lot of energy into these PCR tests, largely because we haven't had the rapid tests available.

If you have an outbreak in your school, you can stop the outbreak very, very fast, deploy rapid test, have them in people's homes. If you have cases start to emerge in your school, have all of the students use a test each morning for five days to keep kids in school, without needing to stay home just because Johnny in their classroom was found to be infectious. These tools are 95% sensitive to detect people who are currently infectious, and nearly 100% sensitive to detect the super spreaders which are really the problems in school. If you're really interested in stopping spread, these are 95 to 100%. We can deploy these at scale across schools so Johnny in the classroom is found to be infected, instead of telling all 25 of those children to go home for 10 days. That's an information problem.

We closed down society last year, purely because of an information problem. But with rapid tests, we actually have a tool that solves this inflammation problem. So have kids use them before they go to school. A lot of people say well, how do you know that they actually used it? Well, we actually have software and we have verification programs that enable it. Companies like eMed have worked with the CDC and Abbott to create platforms that allow you -- allow a proctor to actually watch that, yes little Johnny did do his test today and he gets a real laboratory pass. The result goes to the public health

authorities, so it allows us to also keep the epidemiological data flowing. We should really be using all of these different tools to keep kids in school and frankly to stop outbreaks.

We've been focusing on masks, but we should also recognize that masks don't do a whole lot in a classroom because they're all pulling down their mask all the time, and this is a highly response virus. But a rapid test before school will be like a 95% reduction in risk that you're walking and spreading. I would urge the CDC too to really start creating guidance for each individual sector of society, whether it's schools, businesses, vaccinate or test we have to really have a hard conversation about why that program was created by the President because vaccines aren't stopping transmission. It's a hospitalization staffing too. We just have to redefine what it is we're even trying to do here and I think we absolutely can.

Mark Masselli: We're speaking today with Dr. Michael Mina, Assistant Professor at Epidemiology, Immunology and Pathology at the Harvard School of Public Health in the Harvard Medical School. He's a member of the Center for Communicable Disease Dynamics, and a lead researcher at the Human Immunomics Initiative.

Dr. Mina, your team at Harvard has been applying multiple disciplines to really develop a new surveillance system for monitoring outbreaks. How do we do a better job of data mining and surveillance? What's the larger strategy that goes all the way down to the local public health organization that they can utilize as well?

Dr. Michael Mina: I'm really glad you're asking this because there is a major difference between public health surveillance and public health mitigation strategies. Surveillance is to give the public health authorities an idea of what's going on so that they can then act. But public health testing and screening is actually the action. There are two different things, and I think we have tools actually that we have not really deployed for pandemic preparedness in the future that can actually allow us to discover new pandemics before they really take off using the immune system, using new tools that allow us to profile millions of blood samples very rapidly for all sorts of viruses to look for the immune signatures of a novel outbreak. What I would like to see developed as a global immune observatory to really tie laboratories across the globe together for true pandemic surveillance.

But coming back closer to home, we have a lot of different options for this pandemic. For example, a lot of people think that we are just been testing purgatory. I don't want us to just be testing forever. I want us to be testing strategically. To do that we need to have good surveillance systems at local levels. We can do what some schools have done which is deploys sort of testing a fraction of students once a week, it's just enough to be able to identify if there's an outbreak

that's sort of emerging. But we also have really, really powerful tools in wastewater surveillance, which you can actually do quite easily in many locations. You could say, as long as there's no massive cases going on community, we're going to just do passive wastewater surveillance for viral RNA. If you start to detect viral RNA in the wastewater, then you know that there's cases and then you can turn back on the individual level testing.

I call this sort of dynamic testing approach is it doesn't just have to be that everyone tests themselves once a week, no matter what, stop the testing, when cases really start to pick up, then you can scale up the testing. The only way to really do that, to have this sort of dynamic fluctuating amount of testing is to have people have these rapid tests at home, because then you're distributing the effort of turning them on and off, you're not having to deal with a lot of big logistical chains of hiring nurses. You're just allowing the public to do what the public should be doing in a public health emergency, which is participate in public health, even from their own homes. I would like to see us really have dynamic testing, combined with localized surveillance programs that can enable schools to move forward in a very tolerable way.

Margaret Flinter: Well, Dr. Mina that is a really helpful public health perspective. I wonder if I could turn our focus just for a minute to some of the people in the middle of this pandemic, and that's the health care workforce that's been at the heart of trying to respond and care for people. I think 3600 health care workers died from COVID last year, a disproportionate impact on people of color and yet application for people coming into health care, at least in medicine and nursing, where there's some good data is up. It seems like there's been a renewed call to service perhaps that people were experiencing. But from where you sit, how should we be thinking about maybe revising training and curriculum to meet the needs of our world going forward? How should we be preparing them maybe a little bit differently?

Dr. Michael Mina: We should recognize where our deficiencies are in our medical training. But also in our public health training, we talk a lot about health care, but in the midst of a pandemic, actually, the health professionals, they are the boots on the ground for the sick people. But dealing with a pandemic actually doesn't really require health care interestingly enough, it requires engineering, it requires a lot of different sciences. Actually, health care is almost like the end of that line, it should be the last thing because if you're seeing somebody in a health care setting, that means we've failed up front with the public health bit.

One of the things that I wish that we could do, because it's hard in

high school and college for students to really get engaged with public health, we should be building graduate schools that are much more robust around public health that is almost equivalent to medical school. We have master's programs, but we don't really have a real profession of public health in the way that we have an industrial complex of medicine. Maybe many, many physicians actually find themselves wanting to do public health. But ultimately, the way that we train students is so medicalized that it doesn't tie together.

We tell people that they understand public health, but actually they don't. They never actually practice it. I would love to see for example, medical education include rotations in public health agencies. Our physicians are some of the brightest people in this country and but to not funnel them as many who would want to into these things where instead of you're dealing with one patient at a time you're dealing with populations. I would love to see rotations really start pushing on that. CDC is actually has a little bit of that there's actually residency programs for public health, but they're pretty limited.

I do think we have to be really careful after this year. While we're seeing a big increase in people wanting to go into professions that have been engaged with the pandemic, at the same time we're seeing the people who have actually been engaged with the pandemic, who are already professionals burning out at unprecedented rates. How we tackle that I think, is really going to be crucial to make sure that we are not -- we're not setting students up to see mentors who are burning out and then choose to run away from it.

This country in particular has a tremendous amount of money and resources, and I don't feel that we deploy it well enough. Like just what residents get paid, for example, has barely increased in years, and so that causes people to move away from things like public health, because it doesn't pay very well and move towards neurosurgery. Why don't we pay people who go to the CDC like we pay doctors? We should be paying people commensurate with the work they're doing, and public health generally tends to be pretty darn secondary.

Mark Masselli: I hate to say that there's a silver lining to this dark cloud, we've seen the advance of the mRNA vaccine. What are you seeing out there that maybe past the pandemic itself in terms of the exploration that's going on with these new platforms?

Dr. Michael Mina: I don't think it's bad at all to say you hate to say that there's a silver lining, and there are so many silver linings to this absolute travesty that we've been dealing with. The technology that is getting developed during this pandemic has literally been accelerated anywhere from 2 to 10 years, as a result of the need and urgency. mRNA vaccines are an amazing advancement that have kind of been

trickling out for a while. Years ago, I was working a bit with Moderna on their Zika vaccine. Now what we're seeing is the world has seen the power of these tools in a profound way. These are going to be the tools as we move into the future that are going to enable us to harness the immune system to battle cancer, really a pretty early stage in our understanding of how to coerce this powerful system we all have inside of us our immunity to fight things like cancer.

I believe very firmly that in the next coming years we're going to start seeing mRNA vaccines that are going to be personalized to your cancer to actually help us fight it off. We're also going to see moving away from the vaccine industry but towards sort of testing and all this telehealth because people couldn't move around during the pandemic, we saw this massive acceleration of physicians and telehealth companies getting on board to say, look, you don't have to spend a half of a day to go to a doctor just to talk with them for 30 minutes, you can actually do it from your home quite well. This has really changed people's view of what is possible in healthcare.

Now, we're also seeing things like RADx with the NIH really accelerate the development of new technologies for diagnostics across the board. The need to go into a doctor's office on a regular basis is going to change. We're going to be talking to our doctors through telemedicine. We're going to have tools at our disposal to either join into drug trials from our home or just to be able to monitor ourselves on a more regular basis and be able to really get preventative health care as a part of our society. It's things that we can't even imagine what their use is going to be, but it is absolutely going to make, I think, the average Americans interaction with what is currently an extraordinarily strained health care system much more manageable.

Margaret Flinter: We've been speaking today with Dr. Michael Mina, Assistant Professor of Epidemiology, Immunology and Pathology at the Harvard School of Public Health and Harvard Medical School. Dr. Mina, we want to thank you for your commitment throughout this pandemic, to helping to educate the public to advance the science of public health and interventions that will save lives. Thank you so much for joining us today on Conversations on Health Care.

Dr. Michael Mina: Thanks so much for having me.

[Music]

Mark Masselli: At Conversations in Health Care, we want our audience to be truly in the know when it comes to the facts about health care reform and policy. Lori Robertson is an award winning journalist and Managing Editor of FactCheck.org, a nonpartisan, nonprofit consumer advocate for voters that aim to reduce the level of deception in US politics. Lori, what if you got for us this week,

Michael Mina

Lori Robertson: How do people who have not been vaccinated against COVID-19 pose a risk to people who have been vaccinated? An unvaccinated person who is infected with COVID-19 poses a much greater risk to others who are also unvaccinated, but vaccines are not 100% of effective, so there is a chance that an unvaccinated person could infect a vaccinated person, particularly the vulnerable. Although all of the vaccines approved and authorized for use in the United States are effective at preventing symptomatic disease, so called breakthrough cases of COVID 19 after vaccination are to be expected, perhaps even more so now because of the more contagious Delta Variant of the virus.

A September analysis by the Centers for Disease Control and Prevention said that since the introduction of Delta, vaccine effectiveness against hospitalization ranged from 75% to 95% and effectiveness against infection range from 39% to 84%. While the chance is much lower for vaccinated individuals, they can still contract the virus and even have a severe case. In particular immunocompromised people who already have moderately to severely weakened immune systems are vulnerable. That's why the Food and Drug Administration authorized a third dose of the mRNA vaccines for certain immunocompromised people.

Also, studies show vaccine effectiveness against infection and milder forms of the illness wanes over time, and the elderly can experience a decreased immune response due to aging. The CDC and FDA recently recommended a booster shot of the Pfizer vaccine for those aged 65 and older as well as other groups at increased risk.

More unvaccinated people in a population also leads to more virus transmission. Johns Hopkins University Epidemiologist David Dowdy told us that when transmission rates increase, the risk for everyone goes up. Still, the risk of getting COVID-19 is higher for the unvaccinated. A CDC study found that due to the Delta Variant, the unvaccinated were nearly five times more likely to become infected about 10 times more likely to require hospitalization, and almost 11 times more likely to die from COVID-19 than fully vaccinated individuals. That's my fact check for this week. I'm Laurie Robertson, Managing Editor of FactCheck.org

Margaret Flinter: FactCheck.org is committed to factual accuracy from the country's major political players and is a project of the Annenberg Public Policy Center at the University of Pennsylvania. If you have a fact that you'd like checked, email us at chcradio.com, we'll have FactCheck.org's Lori Robertson check it out for you here on Conversations on Health Care.

[Music]

Margaret Flinter: Each week conversations highlights a bright idea about how to make

wellness a part of our communities and everyday lives. Stanford based bioengineer Manu Prakash has a simple goal. He wants to create a portable medical lab small enough to fit in a backpack, and he's already developed a tool that fits the bill. While sitting under a tree in Uganda, he noticed that the local medical clinics door was propped open by an expensive centrifuge machine, one that was reliant on electricity now broken and no longer in use.

He wondered how could he create a portable centrifuge that would be inexpensive to make and easy to replace? His inspiration came from a simple childhood toy, the whirligig, a toy that functions by pulling two ends of a string threaded through a round object like a button.

Manu Prakash: We spent a significant portion of this time truly understanding the mathematical face space for how you can convert linear motion into rotational motion. There's some beautiful mathematics hidden inside this object.

Margaret Flinter: He took this simple toy idea to another level creating a human power centrifuge made from simple components, paper, twine and plastic. All together each paperfuge, as he calls it, can be constructed in under two minutes and cost only 20 cents. Yet remarkably, it works extremely efficiently.

Manu Prakash: With this set of principles, we're able to essentially make a centrifuge that spins all the way to 120,000 RPM. We can separate and pull out malaria parasites from blood. This is a tool that requires no electricity, no infrastructure. You can carry them around in your pockets for a price point of 20 cents

Margaret Flinter: The paperfuge, a cheap but highly effective feel to for clinicians providing a portable solution to diagnostic challenges creating a quicker pathway to diagnosis and treatment. Now that's a bright idea.

[Music]

Mark Masselli: You've been listening to Conversations on Health Care. I'm Mark Masselli.

Margaret Flinter: And I'm Margaret Flinter.

Mark Masselli: Peace and Health.

[Music]

Female: Conversations on Health Care is recorded at WESU at Wesleyan University, streaming live at www.chcradio.com, iTunes, or wherever you listen to podcasts. If you have comments, please email us at www.chcradio@chc1.com or find us on Facebook or Twitter. We love hearing from you. This show is brought to you by the Community

Michael Mina

Health Center.