Pandemic and Seasonal Influenza Vaccine Preparedness and Response: Harnessing Lessons from the Efforts to Mitigate the COVID-19 Pandemic – Report Release Webinar Perfected Transcript

WELCOMING REMARKS

DANA KORSEN
Good morning, everyone, I'm Dana Korsen, the director of media relations at the National Academies of Sciences, Engineering and Medicine. Thank you for joining us this morning for part one of today's public briefing on four reports that were released yesterday as part of the National Academy of Medicine's Advancing Pandemic and Seasonal Influenza Vaccine Preparedness and Response Initiative. If you haven't already, you may download copies of these reports and other supporting materials on the same page that you are viewing this webcast right now. Next slide, please. Those are the links as well now on your screen. For those of you not familiar with the National Academies study process, for each requested study, committee members are chosen for their expertise and experience and serve pro-bono to carry out the studies statement of task. The reports that result from the study represent the consensus view of the committee and must undergo external peer review before they are released, as did these four reports.

I'll now turn it over to Victor Dzau, president of the National Academy of Medicine, to kick us off this morning.

VICTOR DZAU
Thank you, Dana. I'm so pleased to open the public record briefings for this NAM initiative on pandemic and seasonal influenza vaccine preparedness and response. It's a monumental effort to deliver four timely and important concern studies at the same time, that's and

As we learn from COVID 19 experience, surveillance, supply chain research infrastructure must be well resourced before and not in the midst of the next pandemic. So, given the global nature of this issue, we agree that this work should be international and complementary to the WHO influenza effort. With this background, effort.

astonishing to see is there's very little being done across sub-Saharan Africa, across the entire African continent and Latin America. And so one of the things our committee deliberated upon was is it fine to have several several

But in acute scarcity, as we've seen with COVID-19, it's not going to really address equity. Rich countries will take the vaccines that they think they're needed even now taking boosters. And so it's good to have a system, we have to understand how it starts to break down in in crisis. The second is that innovations are coming in terms of influenza vaccines. Platform rechrstand

So the World Health Assembly should explicitly clarify that the PIP framework does cover genetic sequence data. We can discuss this in the Q&A, but there was some discussion over how much is genetic sequence data actually covered in terms of sharing and this means the PIP framework has been developed to balance the need to share data, share sequencing with actual, getting access to the products, the vaccines and make sure countries don't feel like they're left behind if they share and then don't feel like they get the benefit of sharing. And so you have to build off this framework to cover a broader range of pathogens and their genetic sequence data. So we have something that seems to work reasonably well, how do we take that further? We come to the next recommendation. Four is about, this is about how to support R&D for influenza platform technologies that we need to extend the mandates of, you know, bodies that have been created, CEPI and others to actually look at influenza and other respiratory viruses and looking at their industry partners platforms and saying, how can we structure these to look at whatever new respiratory pathogen might be on the horizon?

So if we come to the next one. Recommendation five is about what we might call a moon-shot program, which we're saying would be ultimate, would be to

executive vice president and senior fellow at the Center for Global Development. And Alexandra Phelan, an assistant professor at the Center for Global Health Science and Security at Georgetown University Medical Center and adjunct professor

systems are built around that. They are not

term. And I hope and I think we're seeing that as well applied worldwide. Hopefully, that leads to better health care delivery in different ways as well.

ALEXANDRA L PHELAN

And if I can supplement Phyllis Arthur's comment is I think there's increasingly increasing awareness globally that many of the decisions we've seen through

think fundamentally equity has to be at the center of any negotiations for pandemic treaties going forward. And that invariably includes looking at what role can international governance play in addressing those efforts, as well as building up capacity and financing more broadly.

DANA KORSEN
Thank you for that. Perhaps we've touched on this a bit, but next question is 6.4 billion doses available, but only 400 million committed to about 25% of the population in low and middle-income countries seems suboptimal. How can we better manufacture and distribute to reduce the threat for flu pandemics and COVID?

PHYLLIS ARTHUR
Amanda, you want to carry this forward yourself? And then I'll follow you.

AMANDA L GLASSMAN
Yeah. So I think, you know, part of the key

And that's the power of good, high-quality biologics manufacturing is that you can get those efficiencies that give you more output. So we need to think about how we do this in a voluntary way, such that you're having geographic partnerships that are incentivized by governments, by the various world banks, so that companies all over the world are partnering to have manufacturing partners everywhere to make sure they can make those very easy or not easy to make those transfers and continue that working relationship on the biologics improvements between themselves as the originator company and the places that may be partners to that technology. So it's not a once and done, it's a continuum of improving manufacturing over time.

AMANDA L GLASSMAN
And I just do want to recognize that the administration announced yesterday actually...

PHYLLIS ARTHUR
An RFI.

AMANDA L GLASSMAN
Exactly, a plan to produce approximately an additional 100 million mRNA doses a month against COVID. And importantly, they said, or other pandemic viruses. So far, a lot of it's been mainly about domestic supply, but obviously this has implications for global supply as well, and you can imagine providing such financing for distributed manufacturing all over the world, too. So I thought that is a really good news item. And the question is, how global will that be in its scope? Thanks.

DANA KORSEN
Thank you for those comments. Next question. My concern is that this addresses only respiratory transmitted viruses. Don't you think perhaps the infrastructure that you propose would be better in adapting in all- wr adapting providing"@Ó Þ0Ð 0a

remember just last week at a conference in London and the room was full of 200 people and no masks

or a revision to the IHR charter? And how much of the global health security agenda also becomes a financing mechanism? Because, famously, over the past couple of years prior to COVID, the GHSA did a great job conducting external evaluations of countries levels of preparedness and also developed a national plan supporting countries to develop national plans, which had a whole list of items to do and investments to make. But these were not financed for the most part. And so the question is, can we put some real financing behind these country plans for preparedness and surveillance? And here again at the US government has been at the forefront with Norway, South Africa, some other nations in the G20 process talking about a new financial mechanism and more financing for preparedness, particularly for country level surveillance and preparedness and quick detection of outbreaks.

But that has not become concrete yet. So I think what happens in the next couple of months is going to be really important for the future of this area.

DANA KORSEN
Thank you. And with that, we will close this first part, so thank you to our committee members for this thorough discussion on the Global Coordination Report.

VACCINE RESEARCH AND DEVELOPMENT TO ADVANCE PANDEMIC AND SEASONAL INFLUENZA PREPAREDNESS AND RESPONSE: LESSONS FROM COVID-19

DANA KORSEN
We'll now move to the second half of this morning session with a discussion on our report on vaccine research and development. I'd like to introduce one of the co-chairs of that report, Enriqueta Bond who is founding partner in QE Philanthropic Advisors. So, Dr. Bond over to you.

ENRIQUETA BOND
Thank you so much. And good morning, everybody. I think you're going to hear a lot of country

and require annual updates so these infrequent funding is needed to develop more novel platforms and technologies that may lead to vaccines that are

I think, sites as we heard in the previous presentation, this is a great need. Next. Again, the international coalition of medical regulatory

commit to transparency in the oversight of clinical trials review of data authorization, and approval of pandemic influenza vaccines, including the release of facility inspection findings, clinical trial protocols, and clinical data that are the basis of decision making. Regulators should convene independent advisory committees to build public understanding and confidence prior to the authorization or approval of novel vaccines.

Next recommendation. The WHO and the international coalition of medical regulating authorities should facilitate coordination between regulatory and public health agencies when announcing different decisions on the same or similar vaccines to explain the different underlying circumstances and

Vaccine Development, and Co-chair of the Vaccines and Therapeutics Taskforce for the

JOSHUA M. SHARFSTEIN

Sure, I would say, not that close, as far as I'm aware, I don't know. I would say all the details, but there are certain, you know, correlates that are accepted, particularly where the response to the protein that is now the major antigen, but cellular immune responses, I don't think so it's one of the things that we talked about in the report that it's really important to develop new correlates of protection, perhaps even better than the ones that we have, and particularly, as they relate to novel vaccine platforms. And being able to do that is the difference between having to do a huge study every time and being able to do a much more efficient study 5D0s58t71[illegible]

to, it will be a steep learning curve for the manufacturers. But if they participate early, as we are recommended to in R&D activities in data, sharing activities in how to adapt the technology, and bring it in such that it makes sense within their capabilities in their structure, I think that will be

know, would be a real game changer. Presumably also it would make the costs of vaccine less burdensome because you have one vaccine that can do it all and you don't have to each year gear up and try to get the next one. So you'd have a thing, you know, the system in place to really go just crank it out.

DANA KORSEN
Thank you. Our next question is, if it is accepted that vaccine pressure changes viral ecology favoring increased prevalence of escaped new mutants, is their interest to fund as a research model study of influenza vaccine impacts on the viral ecology of enlarge livestock populations? For example, how does influenza vaccination of swine populations impact the variability of circulating influenza variants?

KANTA SUBBARAO
So, I can try to take that one and see if anybody else wants to jump in as well. So there are some studies that are conducted. So there's influenza surveillance, in swine populations, and there's depending on which part of the world you live in influenza, the swine herds are is the livestock are vaccinated, pigs are vaccinated. And in China, they're vaccinating poultry, with a vaccine to protect and to prevent age five, and h seven influenza viruses. So, in China, they were very, very successful in controlling H7 and H5 infections on poultry. So, we haven't seen any H7 and H9 human infections for about two years ago. And we do see some we've been seeing an uptick of H5 and H6. So again, just like with seat human, seasonal influenza, they have to update they may have to update their vaccines. But it's a good question. I think that it's not likely that vaccine pressure is driving all of the antigenic drift because there's not enough vaccine used globally, to for the vaccine to be responsible.

But vaccine induced pressure could play a role. And so that it would be, you know, a good system to study in animal populations as well.

DANA KORSEN
Thank you. Our next question, is unprecedented data and cost sharing between manufacturers allowed for the scale up for COVID vaccines without the same urgency? Do you ever see this being copied for seasonal vaccines? And how do we make that scalable?

MARIA ELENA BOTTAZZI
I can try to take that question. So I think we do highlight that indeed, what we need is to keep the momentum and then and incentivize the manufacturers to be able to continue with the ability of participating and collaborating amongst themselves, especially during the normal business as usual times, right, you know, during, you know, even the years where we just have to advance not innovation in the seasonal vaccine design. But I think that it will be important to indeed give them that incentives and that's why in our recommendations, we call for the actions from organizations such as World Health Organization, and of course, you know, the U.S. government agencies to provide a path towards bringing all these manufacturers together so that they can continue seeing the ability of collaborating and feeling that need to continue collaborating and sharing their challenges and of course, looking for solutions that then can be very rapidly adopted in the event of course of a pandemic influenza situation.

So it is clearly a group effort that will require the agencies to really be the framework where they can call for the ability of meeting and sharing the information and make bring the incentives for them to be able to participate.

ENRIQUETA BOND
Josh, do you want to add to that? No, hold it. Maybe Kanta? Yeah, sorry.

KANTA SUBBARAO
Yeah, no, I don't really have anything to add. I think that that's, you know, that is.

ENRIQUETA BOND
Yeah, I think the example, Kanta that you told us at the committee about we already have tried to develop other platforms. But without that sustained funding, they really haven't gone forward to fruition. Or they don't compete well, with the current egg-base vaccine.

KANTA SUBBARAO
Yeah. And I think the other example is really that in when there have been efforts to diversify the manufacturing to countries that weren't previously manufacturing influenza vaccines, some companies have had difficulty in sustaining a market. And so that's one of the reasons why doing studies to define the burden of disease would help as well, to sort of keep those players alive.

JOSHUA M. SHARFSTEIN
Just re-emphasize that the urgency of pandemic preparedness should be helpful here. I mean, as much as we can make the case for seasonal flu, the ability to do this is really important for pandemic preparedness, and that should hopefully drive more support, collaboration and progress.

DANA KORSEN
Thank you. Our next question, can you expand on the recommendation five to on increasing transparency in clinical trials? What's the best way to do that?

JOSHUA M. SHARFSTEIN
I'm happy to

time. But it allows not only manufacturers but I think the public to better understand, you know how vaccines are being judged in terms of safety and efficacy. And I will emphasize again, Josh's point about having federal advisory committees. I do believe, you know, for example, a Virbac deliberating on the regulatory sort of needs that they felt were important for vaccines in various populations, I think has been really helpful to have those discussions and open in public and it allows us to be able to ensure that diverse perspectives are heard and also that the public can watch those meetings and understand sort of how these decisions are made. So, the rationale for these decisions, I think is important and transparency is a part of that public process.

DANA KORSEN
Thank you. Next question. So this is in reference to one of the conclusions that says low and middle income countries have disease burden studies performed, vaccination rates are improved. So, given that what is the best way to incentivize burden of disease studies in low and middle income countries?

KANTA SUBBARAO
So, I can take the first part and have my colleagues jump in after. So I think I will, I was referring to this, in part because we've had the experience in the past, we are following the first recognition of avian influenza viruses circulating and the 2009 pandemic. So, there was an effort that the WHO led to try to bring developing country manufacturers into the space and to develop homegrown influenza vaccines. And some of these companies of companies have actually struggled to have a find a market because the local policymakers, and actually, the local population m a r k e l . 9

officials is that

from the study represent the consensus view of the committee, and they must undergo external peer review before they are released, as did these four reports. I will now briefly turn it over to Dr.

Victor Dzau, who's president of the National Academy of Medicine, to kick us off this afternoon.

VICTOR DZAU
Thank you, Stephanie. And welcome all of you to the second session of the public report briefing for any initiative on pandemic and seasonal influenza vaccine preparedness and

of all, we work, we had to analyze the evidence of the effectiveness of these key non-vaccine measures. And we're talking about masks, indoor air quality, and ventilation that had been developed across different disciplines, and include also novel or existing diagnostic tools that could be adapted and optimized to mitigate respiratory infections. The second thing that we had in our as part of our tasks was to explore the social and political context that could underlie the effective implementation and optimization of those public health measures and diagnostics.

So one is effectiveness and the other one is how could we implement it in the right way, taking into account the contextual factors. Next slide, please. Number three was to review promising COVID therapeutic approaches, like antiviral, monoclonal antibodies, host-directed responses, plus the supplies that are needed also for these therapeutic approaches to be implemented. And try to see which ones have demonstrated some effectiveness and could give us some critical opportunities to be used during seasonal or pandemic influenza. And number four was to highlight innovations around the world during COVID, as well as other seasonal and Pandemic Influenza events, particularly that were related to surveillance, and rapid, transparent data sharing that can lead to best practices recommendations from for notification, contact tracing, testing efforts. And that could include and should include the digital technology and data science. Next slide, please. Finally, the number five was to COVIDshould Include to M

And finally, what to do when we have the global emergence. Next one, please. So recommendation number two had to do with the incentives that need to be built into systems for more rapid reporting of surveillance data from all countries to WHO and to the One Health Tripartite to more quickly be able to identify in that, at the bottom of that

and for that, the context is critical. And we have realized that social and political contexts are quite important. So in recommendation 4.1, we're calling for global and regional public health agencies, and national governments, including the local and the state health agencies, to adopt policies that are tailored to each affected population, taking into account its' social, economic, and cultural characteristics.

They're needs, the resources, and other contextual factors, including its norms, values, and beliefs in order to optimize the implementation of public health interventions, especially those interventions that rely upon individual behaviors. Next one, please. In recommendation number 4.2. Governments, leaders, and departments of health at local state and national levels as well as elected and appointed government leaders should take the systemic factors, including race and socio-economic characteristics that affect the health of affected populations into consideration when developing and implementing public health interventions. Demonstrate in their behavior, other Institute's adherence to

we have seen, especially in low-middle-income countries, which we were not used to stockpiles, we were not able to produce. OK, so we have really to have these periodic inventory evaluations. Next one, please. Recommendation 5.2, the government agencies responsible for public health guidance in each country should develop a framework to guide, use, and how to prioritize treatments that can be flexible with changing evidence during a respiratory viral pandemic. And, again, let's highlight flexible, let's highlight evidence and changing because this is an ongoing situation, this framework should be able to be adjusted depending on the pathogen, taking into account its transmission mode, the at-risk populations, and associated morbidity and mortality rates.

Next one, please. In recommendation 5.2, I mean, this was a little long, there were some important considerations that we wanted to highlight, OK. So WHO will evaluate guidance from global and national

PATRICIA GARCIA
So I would like to invite Linsey to answer that question.

LINSEY MARR
We see these types of barriers everywhere, but there is extremely limited evidence to show that they work and face shields are really barriers intended to block spray by large droplets. And they actually would not work for aerosols in the same way, we did find limited evidence that they can potentially be harmful. For example, there was a study of schools where they found that there was an association between the use of plastic barriers on desks and a higher incidence of COVID 19 symptoms. There was also a study, but there it has been a newer study showinvplastic was

STEPHANIE MICELI
Thank you. And as a follow-on to that, doesn't the recommendation that the International Health Regulations be amended to allow countries to close their borders run contrary to the recommendation to eliminate disincentives for countries to report outbreaks of pathogens with pandemic potential?

ALEX CAPRON
Well, Stephanie, as I tried to suggest, we think that would not be the case, that there would be a contradiction between those, we think it's very important that incentives exist at the local regional national level in making reports, including that final level between the nation and the global institutions. And you can avoid that if any response by closing borders does not single out that reporting country, but rather or countries, but rather is instituted at a time when the country wanting to make that limitation could have a very substantial benefit and it is doing it worldwide, recognizing as was certainly true in COVID, that this spread of the virus, the respiratory virus is likely to be wider than whatever is perceived at that moment. And so they have to be very certain that they're in a situation where they're not having community transmission, in which case the border closure would be ineffectual and set of bad precedent, and that they are doing it as to the rest of the world, rather than as to a country that has done the responsible act of quickly reporting an outbreak of the novel virus that could have pandemic potential.

STEPHANIE MICELI
Our next question for the committee is, could you please explain more about what role you are recommending for the World Health Organization in getting countries to adopt standards for ventilation? That would be more protective of people indoors.

PATRICIA GARCIA
Linsey.

LINSEY MARR
We are asking the World Health Organization to develop guidelines for ventilation. There is some material out there now. I think there's a lot we've learned and a lot that can be done to further emphasize ventilation and provide some numerical targets for ventilation rates that will appreciably reduce the risk of disease of transmission.

STEPHANIE MICELI
Thank you. Our next question is in recommendation 4.2, you mentioned leaders should model good behavior. Did the committee talk about what to do to mitigate the impact of that behavior?

PATRICIA GARCIA
Anybody that would like to answer that? One of the things that we realize is that by the time we were starting to work on this report, which has to be based also on evidence, most of the evidence was just being collected and most of the studies that had to do with the leadership and the context were starting to be done. People, even researchers, have been very busy trying [illegible] this is an area that definitely needs more data, needs more research. definitely [illegible] One

ALEX

with respect to non-vaccine interventions and including into the vaccine realm, which some of the other study groups have addressed.

But I think it's important to remember that as good as some of those indicators can look, how you're going to be able to shift depending on the pathogen, the mortality rate, the transmission modality, and how contagious something is, that your ability to pivot in the moment and to address some of those challenges and your ability to address a supply chain that globally may be impacted may not be picked up as well on existing metrics and are things that we need to be able to prepare for in advance.

RAINA MACLNTYRE

I might just add briefly that the indices probably, you know, I think all the indices that go into something like the Global Health Security Index are good and necessary, but looking at lessons from the COVID pandemic, the three things that probably weren't accounted for that should be accounted for in subsequent iterations of such indices are culture, leadership, and universal health care. And those three things could explain, for example, why relatively affluent countries did badly last year.

ALEX CAPRON

We also noted other social factors very much related to what Dr. MacIntyre just said, which is if there are equity factors for

ROSANNA PEELING
And I just like to add that I think through this pandemic, we've learned that public health, unlike what we thought we used to do well in public health, we need the public to be part of public health. We cannot simply just tell them what to do and they will do it. So I think with this pandemic, we've learned

ADOLFO GARCIA-SASTRE

Maybe I can add something about therapeutics. So for influenza, we have some drugs available, we have Neuraminidase Inhibitors we have Endonuclease Inhibitor. But these drugs still need to be taken very early on during infection in order to make an impact. They may cause an impact for people that are hospitalized, but the impact is more limited there. And we know very little about how to treat severe se30c9003(rin)4.8(g)]TJ/TT31Tf2.63390TD0Tc9003Tfj/TT4tin8ow

It's very difficult cultural norms, as Raina was saying. I mean, for societies that are more individualistic is more difficult for us. People are using masks, but the problem is that they don't... And I'm talking about Latin America. We're very social. We don't respect distance, social distance. We want to

countries, to talk about, cold-chain infrastructure, immunization frameworks, et cetera. Next slide please. The third item in the statement of task

So the numbers that are listed

including non-governmental partners

please. We move on to Chapter five which focused on what are some of the frameworks, tools and innovations for distribution

That is, it should be everybody's task to think about whether the country has the preparedness plans or not for various health programs. And if there are gaps identified, then those deficiencies should be supported through technical assistance and financial support. Even in other programs and not just for pandemic influenza. Similarly, when global institutions like the World Bank, IMF or IFC, they are doing their development initiatives with the countries, they should integrate country preparedness assessments into their country economic assistance programs because economic development is also at risk when we have a pandemic. Next slide please. We were asked to look at some of the innovations that came out of the pandemic, of course still ongoing. We do identify some in the report, but we ask that there needs to be a comprehensive review of the innovations developed. Some of the innovations at the global level are well-documented already but there are lots of innovations happening at regional level and local level that still requires systematic review and capturing some of those innovations.

To also see where the gaps are for a future pandemic preparedness and response. Next slide please. When we come into barriers, incentives and innovation for sustainable mechanisms, a few key findings we have is that novel vaccine technologies are needed to produce more effective influenza vaccines in shorter timeframes. Because we have limited time in a pandemic (INAUDIBLE) and therefore we need to figure out new technologies that can get us there quickly and the vaccines are more effective. The second finding was that liability and risk faced by manufacturers, along with the lengthy regulatory review, are also barriers to innovation. So what can we do to somehow mitigate some of these liability and risk that manufacturers' face? And finally, transparency of clinical trial process is important for increasing vaccine acceptance and therefore demand, because if there is a challenge in terms of vaccine acceptance obviously that ivit003Tf

of these different technologies for mass production. Once we have this assessment done, that should inform a decision making framework not only for future investments in those technologies, but going back to recommendation in the context of Chapter three that I talked about earlier, that would then also inform what kind of distributor network do we need to build globally.

Because the technology capabilities inform the nature of the distributed network that we need to build. Next. I think that's the end of my formal presentation, I would like to now invite my co-chair Dr. Prashant Yadav to offer some comments. Prashant over to you.

PRASHANT YADAV
Thank you Ravi, and thanks first of all to all of you who are joining and also to our committee members who like Ravi said come from deep expertise in different aspects of manufacturing,

lead. We have Dr. Noreen Hynes, who's a physician, trained and board certified in internal medicine and infectious diseases with additional tropical medicine and epidemiology training. She also serves on the faculty at the Johns Hopkins University School of Medicine and Public Health. And finally, we have Dr. Jennifer Pancorbo, who is director of industry programs and research at the BioManufacturing Training and Education Center. So our first question for our panel is how did the committee decide that the G20 would house the proposed manufacturing task force?

And what would this entity look like?

RAVI ANUPINDI
Prashant do you want to respond to that?

PRASHANT YADAV
I'm happy to have you, but I think Matthew might be good to talk about this as well.

MATTHEW R DOWNHAM
That's fine, thank you. Thank you very much Prashant, and hope you can hear me all OK. So indeed, the suggestion was that the COVAX manufacturing task force that's been existence now for about four months, such be housed under the G20. Particularly given some of the activities that the COVAX Manufacturing Task Force is engaging on, particularly thinking through to one of the particular work streams co-convened by the WHO to support vaccine manufacturing capacity capability across low middle income countries. And this was felt to be aligned not just with the G20, but also with the G20 initiative in terms of supporting, for example, geo-diversification of vaccine manufacturing moving forwards, particularly to ensure improved public health security provision for those particularly in underserved or regions of the world that don't necessarily have vaccine supply currently. So the sense was the alignment, particularly like the say between the COVAX manufacturing task forces. We met objectives, its vision, its mission and how that aligned with the G20 accordingly.

Hope that addresses the question properly.

PRASHANT YADAV
One thing I will add to what Matthew said was, I think the committee deliberated quite a bit on the idea, what's the right hosting entity and structure for this task force. And the two ideas that we took into account in our deliberations for it has to be hosted in a place where the membership is consisting of countries which are currently or likely to be vaccine manufacturing countries. And we also took into account that if it is hosted by a structure which is all member states, then we may not have the kind of governance that is needed for something which is very specific, a technical task that requires very intense coordination. So I think that's those two points led the committee

getting a good sense of what are the factors that are impacting demand, whether

RAVI

pandemic has impacted multiple supply chains and supply aspects, that have impacted not just health care, health major control provisions, but also the vaccine industries. And so there's a certain thought behind how supply chains need to be

distributing vaccines into low middle income countries. And so in terms of the question in terms of also, how can the LMICs be more involved and not left behind? I think there's a call here to have more Geo-diversification of vaccine manufacturing and establish footprint in the middle income

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has to do with a traditional Ministry of Health Preparedness Plan being ready to respond to additional surveillance, which we heard earlier today. It's very, very critically important, but it has not gotten into the manufacturing and supply capacity in many of those plans, and not all countries participate. So it's an idea that can be embellished as, for example, when the G20 task force could look at this further.

RAVI ANUPINDI
So I think, I suppose, you know, you raised the issue about the question, Prashant raises the existing kind of frameworks. I think part of this convening also is to begin to understand, OK, where are the gaps? And are existing frameworks good enough? What has been your experience from, you know, countries experiences from managing the COVID 19? If there are gaps that is rather theoretically committing to upgrade them or maybe develop a new set of criteria for what preparedness actually means.

STEPHANIE MICELI
Thank you. And since we are nearing the end of the time, it looks like this may be our last question. And we would love to hear from all of you, looking again at recommendation number five on real time global data to inform manufacturing, the World Health Organization is working on efforts to develop large scale levels at a, dashboard or hub that takes in information from companies to inform drug supply chain efforts. Is this similar to what this committee was envisioning for influenza vaccines?

RAVI ANUPINDI
Matthew, you want to take this one?

MATTHEW R DOWNHAM
In simple terms, yes. And so that the WHO hub is largely leveraging off the directors influenza program in terms of rapidly sharing data, for example, the database gives aid leveraging off the cancerous infrastructure. That upgrade shows through a network of laboratories globally that are monitoring and tracking the disease and its value. It's epidemiological and development, all of which feeds into the manufacturing strategies and decision making process. So that means, you know, that that exists today and has been in existence close to 70 years, certainly was the kind of template. And certainly, as I say, the (UNKNOWN) thinking forward to using that kind of model for future activities to monitor and track diseases and inform manufacturing accordingly. So I say sometime is yes, but obviously open to my colleagues for the feedback.

PRASHANT YADAV
So again, I wasn't sure, you know, WHO has, the World Health Organization has two or three initiatives which are probably fitting to what was described in the question, if it is about the influenza, just say it works as Matthew's describing hopefully he did, but it's also very well be about WHO work on building a control tower, demand and supply matching to for essential COVID technologies. And if that's the one that is being referred to in this question, I think it is structurally like that. But I think what we are recommending goes one level farther and it says a planning methodology which brings together what is the current supply, what is the, what is the currently installed manufacturing capacity and what is the demand and what tool allows doing that planning for influenza vaccines, both seasonal and for scenarios of pandemic.

RAVI ANUPINDI
Thank you. Anybody else? I think, I'd just like to add to that, Stephanie, I think the, also, what we

discussed in the committee is bottom up, there's lots of the country specific situation varies.