

## **A Global Deal for Our Pandemic Age: Implications of the G20 High Level Independent Panel Report on Financing Pandemic Preparedness and Response**

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Virtual Roundtable Perfected Transcript

### **Victor Dzau, National Academy of Medicine**

Well, good morning, good afternoon, good evening. Welcome all of you for attending this virtual round table. It's a unique opportunity for the National Academy of Medicine in the US and the Consortium of Universities for Global Health together to co-host this meeting. We're here to tell you about the G20 High-Level Panel Independent Panel Report, which I'm sure you going to welcome and have lots of different questions. I'll leave that to the presentations.

Let me begin by saying, for some time the global health community has been vocal about how unprepared the world is for pandemic threats. After previous major pandemics, such as the West Africa Ebola outbreak, many reports have called for major reforms of global health security and for much more investment into the preparedness and response. Sadly, the international community has not come together to ensure that the needed reforms and financial investments were implemented, although some commitments were made, many will not follow through.

We're now seeing this devastating COVID-19—millions of lives lost, disrupting communities and society and, of course, resulting in trillions of dollars loss in economy, and there's still no end in sight. I believe this is the moment where we must act and make the reforms and investments we need to be prepared for the next pandemic, because it will happen again.

The recommendations from the G20 High-Level Independent Panel Report were authored by economists and financial experts, and if implemented, will create the resources that we need to develop and strengthen the critical elements for pandemic response. The report has nicely built on the work of other panels and compliments them, such as the IPPR Report, the G7, and of course, the Pan-European Commission as well. I think what's unique about this report as you'll hear, is that it really looks at what's needed to invest in preparedness and response. As you know, we sorely need the resources in order to move forward. It also proposed a governance structure, which I think is so important.

We need to capitalize on this momentum, garner the political will and technical expertise to act urgently. If we don't do something about this now, in my opinion, we may not have a second chance. Failure to act is not an option. No one wants to see the world being devastated again by another pandemic like COVID. To me, it's a never-again moment.

I'm so pleased that we at NAM are partnering with CUGH, who hosts this event, and we have the leaders of the High-Level Panel Report to present findings and global experts to react and discuss the recommendations.

With that, I'd like to welcome my co-host, Dr Michele Barry, who's the Ben & A. Jess Shenson professor of medicine in Tropical Disease, and director of the Center for Innovation in Global Health at Stanford. Over to you, Michele.

**Michele Barry, Consortium of Universities for Global Health**

Thank you, Victor, and welcome everybody. As Victor said, I'm Michele Barry and I am at Stanford University. But today I'm here in my capacity as the Chair of the board of the Consortium of Universities for Global Health, also known as CUGH. As some of you know, CUGH is a coalition of over 170 academic institutions and other organizations from around the world engaged in addressing the pressing health challenges to improve the well-being of people and the planet.

The COVID-19 pandemic has painfully reminded us of our vulnerabilities as a species. Together with climate change, countering the existential threat of pandemics has become the human-security issue of our times, as Victor mentioned. The report of the G20 is a critical step-up to the status quo and calls for decisive political and substantial financial commitments. In the words of report, "the current pandemic was not a black swan event. Indeed, it may ultimately be seen as a dress rehearsal for the next pandemic, which could come at any time, in the next decade or even in the next year, and could be even more profoundly damaging [than COVID-19] to human security."

While this grim reality is certainly a definite possibility, it's been said that epidemics may be inevitable, but pandemics can be optional. Through this document, we can begin to construct a framework that will allow us to explore the global gaps as well as a sense of scale of investments needed.

I now have the pleasure of introducing our three speakers who will present the recommendations of the report.

First to speak is **Tharman Shanmugaratnam**, who is the current Senior Minister in Singapore, having served for several years as the Deputy Prime Minister and Finance Minister. He is currently at the helm of Singapore's Central Bank and has also chaired the International Monetary and Financial Committee at the IMF for 4 years. As well as leading the G20 Eminent Persons Group on Global Finance and Governance, **Tharman** was the co-chair of this report on financing pandemic prevention and will offer his summary of the report. **Tharman**, over to you.

**Tharman Shanmugaratnam, HLIP Co-Chair**

Thanks Michele, and thanks to both you and Victor for bringing us together.

On behalf of Larry Summers and Ngozi Okonjo-Iweala, my fellow co-chairs and our panel members, we value this opportunity, but we also value the many conversations we've had with

experts in medical science, epidemiologists, and the key people in the global health organizations. We were a group principally of economic and financial leaders, but we found this interaction invaluable.

Let me, within the very short space of time that I have, highlight four shifts in thinking that we need when we think about, to use Michele's words, when we think about how we can avoid pandemics, because they are optional.

First of all, we have to not think of each episode as a one-off. There's a great danger, even with COVID, that everyone is just dying to get past it; everyone is trying to get over this terrible episode and then get back to normal. We're nowhere near the end of COVID, and we have to start thinking about how we live with endemic COVID with all the resourcing required: boosters, monoclonals—a whole set of issues—not just in the advanced world but on a global scale. It requires considerably more resources than is currently being contemplated. Even the current challenge of vaccinating a large part of the world's population, itself, requires much more resources than have been applied. So, think of this issue as part of a new era of repeated shocks. As Michele put it, it's not just pandemics; it's also climate crises. And, just as we don't think of extreme weather events as a one-off, we now have to think about how we prepare for future shocks that are already baked into the system.

Second point I would make is that it requires a new way of thinking about international cooperation. Global-health security has been funded principally through aid budgets, development assistance, and largely bilateral plus some philanthropic support. It's got very weak multilateral funding in the system. That's fundamentally the wrong way of thinking about the issue, because fundamentally we shouldn't be thinking about it in terms of helping other countries, for instance, low-income countries. We should be thinking about this challenge within the framework of global public goods. It's fundamentally about every nation's interests when every other nation is prepared and able to respond to shocks. There's no better case than a pandemic to illustrate that. This is fundamentally about collective investment in global public goods, rather than about boosting aid budgets. That applies to every aspect to pandemic preparedness—whether it's early warning systems, or strengthening the One Health system that is critical, the upstream efforts to strengthen the One Health system, or whether it's strengthening national capacities in developing countries—they're all part of global public goods, because if we have points of weakness in one part of the world, they become a global point of weakness.

Third shift in thinking required, coming out of understanding that this is about global public goods and on a large scale, we have to now think about how we strengthen multilateralism—not just bilateral initiatives, not just philanthropy, but we need a stronger multilateral base in the system. This involves a few dimensions.

First, the multilateral institutions themselves. We need a stronger WHO. There's no solution to pandemic security that does not involve a stronger WHO, and the WHO needs stronger multilateral funding, not just bilateral and philanthropic. It's a precarious situation from year to

year, and it needs a more stable and predictable base of funding—likewise, other global health organizations [need stable funding].

Second element of multilateralism has to do with making the most of the international financial institutions, meaning the World Bank, the other MDBs, and the IMF. They are unique institutions; they have unique strengths. The MDBs are able to leverage, they are able to multiply resources, and they are able to capitalize investments by national governments as well—they have that unique advantage—and we've got to make much more use of them. The IMF is uniquely positioned to raise and to deploy surge financing in an actual pandemic. It'll frankly be worth starting again with COVID-19. The international financial institutions would have been front and center of the response from day 1, particularly in financing. We have to now build the global commons into the call of their mandates, not as something that comes about when you get an unfortunate shock in the system, but something you prepare for. The IFIs—the World Bank, the MDBs, and the IMF—are uniquely positioned to tackle the largest global challenge of today, which are the problems of climate change and pandemic security.

Third aspect of strengthening multilateralism has to do with funding. We need to move beyond what is today a siloed landscape of global health organizations—particular diseases, particular interventions. We need a global mechanism, not a new institution, not a new multilateral institution, but a new global mechanism for funding that can fund existing institutions and programs based on priorities. We don't have that today; each of the organizations goes around with a begging bowl each year to raise monies, largely from bilateral sources. If this is about global public goods, and if this requires much greater scale, it can only be achieved with a multilateral funding mechanism.

It is not, in fact, expensive. In fact, it's extraordinarily cheap compared to the costs of even a modest pandemic. It's extraordinarily cheap. Our report estimates that, very conservatively, it's requiring an additional \$15 billion in international funding each year. We think that of that \$15 billion, it's sensible to put about two-thirds of it into a new global fund—a new global funding mechanism to fund the system, not to be able to originate projects and become an operating entity, but to fund the existing organizations.

Now, what's \$15 billion, and what's \$10 billion? Fifteen-billion dollars spread out over a large number of countries will be roughly 1000<sup>th</sup> the annual budget of a typical country, be it low income or high income. Obviously, the burden will have to be shared in some fair and equitable manner, with the advanced and large countries paying in more, but it's a tiny amount. It's about 0.1% of annual government budgets. And compared to the cost of even a modest pandemic, a modest global health security shock, it's infinitesimal. So this is in fact affordable, but we need a global funding mechanism and not just continue to rely on the existing siloed funding landscape.

Finally, we should avoid the temptation of thinking that this is all about money and not about governance. It requires both a strengthening of money and governance, and it's about global

money and global governance. If we don't strengthen governance, particularly in bringing finance together with health, we're not going to be able to address the problems. First, we're not going to be able to attract the money, because the reality of the world is that major donor countries would want strong governance to ensure effective deployment of funds, effective accountability as well. We should not be creating new mechanisms that duplicate existing mechanisms. Existing health governance is in the WHO and the World Health Assembly. Some reforms will be required, as the IPPR has recommended, but that's where it sits—a stronger WHO.

What we lack today is governance that brings finance together with health. This is something that is solvable. We proposed some mechanisms in our report. It's doable. Avoid thinking that we reinvent the world and go for perfection, because we're not going to do anything that way. We've got to start from where we are, improve and strengthen the system, and make sure that we think of initiatives in global terms, multilateral terms, and not just with regard to individual institutions or individual bilateral initiatives.

I'll stop there. Thank you very much.

**Victor Dzau, National Academy of Medicine**

Senior Minister Tharman, it's a great privilege to work with you, and your leadership has really made such a difference, certainly, I think not only in your capacity in the finance area, but in this case, making a big difference to us in global health.

I've been fortunate enough to serve as advisor to this panel of economists and finance experts and the NAM has served in the administrative secretariat role, along with Wellcome trust.

I would say that the report touches on so many important issues that is meaningful to us in global health. My short presentation will be from the perspective of global health: what do we need? And then Amanda Glassman will talk about what are the specific recommendations.

I said earlier that we can't let a COVID-like pandemic happen again. We do know that controlling the current pandemic must be a priority. We cannot wait until the pandemic's over to scale up prevention to prepare for response to the next crisis. Can I have the first slide, please?

Michele's already referred to this quote from the report, which I think deserves another emphasis. It says, "The world faces clear and present danger of more frequent and more lethal infectious disease outbreaks.... [COVID] is not a black swan event ... It's a dress rehearsal for the next pandemic, which could come at any time, in the next decade or even in the next year..."  
Next slide.

I think the issue for many of us is really looking at, what do we learn from this pandemic? This slide summarizes what I believe we will learn.

The collective failure of the world to take pandemic prevention, preparedness, and response seriously and prioritize it accordingly. There were many challenges in every component of detection and response system in almost all countries (surveillance, public health systems, R&D), and equitable access to countermeasures such as vaccines, therapeutics, and diagnostics.

There are also many lessons learned from the failures—vaccine nationalism, insufficient global supply and manufacturing, the lack of sustainable financing, and the need for global health and financing governance. But, there were a few bright spots, to be sure—unprecedented speed of vaccine development and ACT-A, where major actors came together to form a groundbreaking collaboration to accelerate development, production, and equitable access to tests, treatments, and vaccines. Next slide.

The report panel identified four major gaps. First, a lack of surveillance capacity to be able to detect the pathogen with pandemic potential. We all know the current surveillance tools and strategies are primarily designed to monitor nonpandemics and ongoing seasonal influenza. There's a real need to detect a pathogen with pandemic potential, like *Coronavirus*, before it's widespread transmission. Certainly, we need a One Health holistic approach to target surveillance more effectively across domains of humans, more environmental health, and strengthen the ability to detect and monitor existing novel zoonotic pathogen's strains for antigenic drifts/shifts impeding prevention.

Second, the national health care system, public health system, really struggled. Global health was generally ineffective and care delivery systems were overwhelmed with insufficient capacity, preparedness, and supplies. There's a real need to strengthen national health systems as a critical foundation for global pandemic response.

Third, the pandemic showed that the global R&D ecosystems fragmented and were really poorly coordinated. There was no end-to-end system at the beginning of the pandemic. Of course, the good news is Act-A certainly came together, but it's not quite sufficient.

Fourth, the lack of sustainable financing, as Tharman talked about, to strategically support preparedness and response. Global health security is severely underfunded. Next slide.

As a principal of Act-A, I've seen how we struggle when having sufficient funding. Even though Act-A's done a lot, today we still have a gap of \$16 billion to meet the goal for countermeasures for 2021 and 2022. As Tharman said, financing so far has mainly relied on development assistance as a primary source. This is not a sustainable approach. It should be anchored in enhanced, reliable, and timely and multilateral funding.

As Tharman said, we need to empower the IFIs to more boldly support global commons and provide incentives for low-income countries and lower–middle-income countries to invest in themselves, but those incentives need to have some concrete grant support, matching funds, and others. Next slide.

I think going forward there's a real need for a much better systematic and coordinated approach, better governance, and more sustainable financing. I think the need is for the Ministers of Finance and Health of each community to come together.

All the previous reports that we've written, many have been by global health experts. As someone says, we're looking for a slush fund, looking for more money, and financiers see this as a drain. As there's no buy-in from them, but as Tharman pointed out, actually, if you look at the economic impact globally, this is a small investment.

This is where I think the G20 sort of needs to address this issue by forming a high-level independent panel of experts and finance economists to identify, as you can see the two bullets [on the slide], what are the gaps and what are the solutions. We've been so fortunate to have the co-chairs of Tharman, Larry Summers, and Ngozi as co-chairs.

I think what's different is that this report is written by finance experts, and the proposed solutions that Finance Ministers can act on, the urgent need to invest substantially more than we'd be willing to spend because the world is paid many times over when dealing with the damage of COVID-19.

First point is, it's really important that we strengthen the governance of health and finance. The current architecture is not fit for purpose to prevent a major pandemic. And, of course, as you'll hear later, there's a proposal to bring together a new government structure that brings health and funding resources together. Tharman also mentioned a new fund. I think that's really important in order for us to have enough resources to respond. Next slide.

My question, my last slide is, how would this finance make a difference? How would we in global health use this resource to strengthen preparedness response? As you can see [on the slide]:

Number 1, invest in surveillance and research. Strengthen the One Health approach. There's a need for massively scaled up global surveillance and alert systems. Then all countries should introduce surveillance as the backbone of their healthcare system. National, regional, and global public health agencies should strengthen rapid, open, transparent reporting data and quickly identify origins and spread of novel agents and strains. We must apply cutting-edge technology developments such as genomic surveillance, leveraging data, conducting sole surveillance, analyzing crowdsourced data streams, and building collaborative tools like data sharing platforms. And it must be done at scale to be integrated with research on known and emerging infectious disease. They require WHO, together with regional and national disease control agencies, National Centre for Disease Control, and World Bank responses to work collaboratively.

Second, we must invest in resilient national systems. Adhere to strengthen a critical foundation for global pandemic preparedness response, a whole-of-government health security plan and approach, and as Tharman said, IFIs must step up to support the low- and middle-income

countries, and investments should be integrated with ongoing efforts to tackle endemic infectious diseases.

Third, supply of medical countermeasures: There is now a real agreement to try to develop a 100 days' target for rapid development of vaccines, therapeutics, and diagnostics. To do this, we have to take lessons learned from ACT-Accelerator and create a permanent end-to-end ecosystem. Through CEPI, we should implement a global prototype pathogen agenda, address the problems of epidemiology, and develop vaccines against, say, representative of some roughly 25 viral families known to cause disease in humans. We need much larger, ever-warm capacity for manufacturing, supply of critical medical supplies, and a greater diversification, the creation of distributed manufacturing sites globally.

And finally, all those will require financial resources and a global governance to ensure the systems are tightly coordinated, properly funded, with clear accountability for outcomes. I think that we'll also be, as Tharman says, trending WHO, when and how partners reach their ownership, private sectors, NGOs, and all others.

I think this report has got all the major issues. As I said, again, if we don't embrace this and quickly implement this, I'm afraid we may not have a second chance.

Thank you very much. Let me turn to Amanda **Glassman**, who is Vice President of the Center for Global Development and a project team leader, and she'll tell you about the recommendations.

**Amanda Glassman, HLIP Project Team Lead / CGD**

Thank you, Victor. Next slide, please.

Okay, so let me start building on Victor's comments to take a moment to reflect on the scale of financing that's required to meet these gaps and activities that have been laid out.

The first thing to say is that, of course, greater domestic investment by national authorities is the main source of financing to prevent and contain future pandemics, and it has to be part of national investments in healthcare and public health system strengthening. Every country should spend more. In the OECD countries, they spend less than 2.8% of public spending on health, on prevention, and public health in general, of which a subset of activities has to do with pandemic. In low- and middle- income countries, the spending for this use is not even tracked. And in terms of aid spending on preparedness, there are a couple of different estimates, but in no case is it more than 10 to 20% of spend.

We are really underspending, and we know that the action has to be domestically. But we also know that domestic spending alone will not prevent the next pandemic. The panel looked at the requirements and has recommended that governments collectively commit to expanding the international financing piece of this puzzle by \$75 billion over the next 5 years, or about \$15 billion per year. This funding would cover some of the global-level functions that Victor's talked



about—surveillance, for example, or the development of medical countermeasures, as well as the support needed to complement low- and middle- income countries' own investments at the country level, particularly focused on those domestic actions that generate benefits not just for that country but for the rest of the world. This is a really important point, because low- and middle-income countries face a lot of competing demands for very scarce public spending. Many countries, the lowest-income countries, are not treating preventable diseases that can be managed like diabetes, so the tradeoffs are huge for these kinds of investments. The idea with this grant financing is to be able to complement those national investments, recognizing that what those countries do to stop outbreaks where they start benefits all of us. We should all contribute to covering those expenses.

The panel really feels that this is the absolute minimum of the new international investments needed. We used really strict definitions of what would qualify as a global public good for the purposes of pandemic prevention and preparedness, and very conservative assumptions of the scale of what was required, and the topic of the development of medical countermeasures, and developing ever-warm manufacturing capacities, for example. We had one of the members of the panel, Michael Kramer, had made estimates of requirements that were \$60 billion a year. We could spend a lot more on this and still be having good value for money, but this was sort of the very conservative level that is needed.

As Minister Tharman noted at the beginning, these are very affordable investments. We use the word *miniscule*. It's an iota of the trillions that we are busy spending on response now, and it's very small compared to the huge benefits that can be generated by investing epidemic preparedness. One of the studies that was commissioned as background for this report looked at, given what we know about the probabilities of future pandemics—certain kinds of pathogens, for example—a greater investment in preparedness in India, depending on the pathogen, could yield between 2% and 22% percentage points of GDP and net benefits if they were to finance pandemic preparedness at the level required. It's a huge payoff. Next slide.

I'll just dive right in now to the very specific recommendations. The first two recommendations really go together. It's the new governance that's proposed, and then the second recommendation is the new financing that's proposed. These are really intended to fill gaps in the current system.

We'll start with the systematic approach to ensure enhanced and predictable global financing for pandemic prevention, preparedness, and response across the global health system. For that purpose, the panel proposed establishing a Global Health Threats Board under a G20+ platform that would comprise both health and finance officials. This is really important, because we have seen that the existing structures and activities are disconnected from the kind of financing that is needed, that is fundamentally not aid financing. The idea of this board would be to provide that systemic financial oversight in articulation; that we'd be able to allocate and reallocate amongst the different institutions that could execute in order to assure timely and enhanced global financing for pandemic prevention, preparedness, response; as well as the effective use of funds; and to ensure that coordination between the key international bodies. All of the

organizations involved in the current response are doing their best to coordinate, but none really have a mandate to do so. We've seen various issues. We've seen competition, for example, in the effort to procure PPE, which was actually adding to the supply difficulties at the start of the pandemic. That improved over time, but there has been a huge coordination failure in this current response. Similarly, when COVAX got set up, having a large amount of funding at risk able to be deployed, which existed within the different organizations in the global health system, but that money was not forthcoming at the right time, and so the donations arrived late, money wasn't put up at risk, and we are where we are today.

A third gap that this board was intended to address was really inspired by the experience of the financial crisis previously and the creation of the Financial Stability Board. One of the key functions, it's also a global public good: to prevent financial contagion between countries. This Financial Stability Board proactively tracks global risks and outcomes to assure that every country plays its role in enhancing global health security, a little bit like what the Intergovernmental Panel on Climate Change does for climate. We need something like that in terms of pandemic risk. This board, that proposal, complements the independent panel's proposal for a Global Health Threats Fund to be established by UNGA and mainly comprising sort of Heads-of-State level. This is a more operational board more focused on financing, coordination, and tracking those key macro-critical risks. Next slide.

The second piece of that recommendation is related to the fund itself. Again, just to revisit: First, the key is that it's not an ODA-financed fund. There might be some ODA used here, but ideally it would be sourced from non-ODA budgets. It could rely on things like leveraging the existing multilateral development banks' balance sheets and resources, because some of this can be channeled through subsidized lending, for example, or even an international tax. If you'll recall after 9/11, the US government implemented an airline ticket tax, and that money went to the fight against terror. This is a similar kind of threat; we need to finance it that way.

The second issue was the scale of resources. This isn't something marginal. As Victor pointed out, we have three big tasks ahead, three gaps to finance: surveillance, low- and middle-income countries' complimentary investments in dynamic preparedness, and medical countermeasures. Those three things need a pretty big scale of funding, and it's not something that's really covered by any of the existing entities that operate today and requires its own structure. It's also this need for a pool of money that can allocate across organizations and the global health system. It's also beyond health because to prevent pandemics, to prepare for the next one, it's not just about human health, but it's about animal health, it's about the interactions with climate, etc. Then there are the benefits that we would like to achieve by having a fund connected into the Multilateral Development Banks and the IFIs. That's the proposal here. You can see the uses that were proposed. Next slide.

A third really important recommendation, and this relates to the slide about the resource requirements, is that there is a need for greater domestic financing for prevention and preparedness. This will require an agenda of reforms. It's normal in most health systems to put most money into patient care, responding to needs. Everyone who works in primary health care

or prevention sees this huge skew and allocation of resources in their own systems. This is not a huge ask on health systems to finance preparedness adequately. The panel estimated that low- and middle-income countries will need to add about 1 percentage point of GDP to public spending on health over the next 5 years. Eminently doable but requires a positive reallocation or growth in spending dedicated towards health and a focus on outcomes.

A fourth area is around strengthening financing for the World Health Organization and One Health and to put it on a more predictable footing. This is a recommendation that is also reflected in the recommendations of the independent panel. The specific recommendation is to increase assessed contributions to about two-thirds of the WHO's current base program. That's not more than \$1 billion per year. As one of our co-chairs Larry Summers often remarks, the total base budget of the World Health Organization is less than one Ohio hospital system's annual budget, and yet we expect them to prevent the spread of these very dangerous pathogens around the world. This really needs to be fixed. Next slide.

The fifth point, and very much in complementarity to the recommendations around the fund, there was a specific recommendation that the G20 leaders should work with the other shareholders at the World Bank and the other multilateral development banks to make financing for global public goods, and especially for pandemic security and climate action, part of their core mandate. I look forward to hearing from Jim Kim who was formerly President of the World Bank and certainly conceptualized this problem in this way. The World Bank and the MDBs generally have a very country-based model of lending. For challenges like pandemic prevention and preparedness, we sometimes need to act regionally, we need to act globally, for example, to put up the money to be able to finance the prepurchase of commodities by COVAX, for example, that would have spread vaccines all over the world. There's a set of recommendations that really focus on enabling the MDBs to meet that aspirational goal to finance global public goods in a more systematic way, not at the expense of poverty reduction but as a second core imperative. Next slide.

Sixth, the IFIs really did respond very rapidly to the COVID-19 crisis in financing terms, but it could have been faster. There were no rules related to pandemic risk in terms of their own releases, and too often there was a lot of bureaucracy associated with the preparation of proposals, board processes, or safeguard checks, and things like that. When we have a pandemic risk like this, the key is speed. There's a number of specific recommendations related to increasing the automaticity of the way that the IMF, the World Bank, the regional development banks can release monies into countries to enable them to respond quickly as well.

I won't linger on the seventh point, but obviously we need to assure that multilateral financing by this fund and by other sources of financing, be very complementary. Next slide.

Finally, leveraging the capabilities and resources of the private and philanthropic sectors is particularly important in areas such as derisking early-stage R&D. Very often, we see

philanthropists act as first movers for some very innovative actions in global health. I hope that we'll see something similar in this space as well.

A final recommendation, which was around assuring insurance solutions for adverse events associated with the use of medical countermeasures. This actually ended up being a pretty important bottleneck in the rollout of vaccines around the world. COVAX had a mechanism backed by some private insurers, but all countries should have such a mechanism available when we're in an emergency, rather than having to deal with these issues as they come. Next slide.

To conclude, we really do need to just invest much more than we've been willing to spend in the past. The collective investments that are proposed here are eminently affordable. The next pandemic may come at any time. Some of the analysis done for this panel suggests probabilities that I was unaware of prior to starting this work. The number of annualized expected losses associated with pandemic risks far outweighs many of the climate risks that we routinely invest money on in order to respond. That's not to say they're in some kind of contest, they are not, they are all important. But, just to say, this is a risk that has been substantially underestimated and under mitigated for a very long time. I'll end there. Thank you very much.

**Michele Barry, Consortium of Universities for Global Health**

Thank you, Amanda.

We've now asked for prominent panelists to offer commentary on this report from their particular expertise/perspective. I'd like to first introduce Jim Kim. Dr Kim is the vice chairman and partner at Global Infrastructure Partners, a fund that invests in infrastructure and projects across sectors around the world. He previously was the President of the World Bank.

Jim?

**Jim Yong Kim, Global Infrastructure Partners**

Thanks very much, Michele. Thank you, Victor, Tharman, Victor, and Michele. It's so great to see you again.

Let me try to just go quickly through the points. First of all, this is a really wonderful report. I don't think I've seen anything quite like it. It's an attempt to bring all the players together in a way that I think is just both visionary and challenging. It's full of strong, actionable ideas, and so many of them make sense. Let me go through some of the specifics.

The Global Health Threats Board. Again, this is a great idea. I think this is something that I remember Victor and I spoke about quite some time ago. It will need to be both negotiated and empowered, and both of those processes will take time. Can we do it in a way that this board can make quick decisions on the global pandemic response, regardless of the inclinations of

elected leaders, especially in powerful countries? I hope so. I think that's absolutely critical for the process of negotiation and empowerment. Of all the groups that could potentially do that, I think the G20 is, in fact, the right group, and of course nobody knows how the G20 functions better than Tharman.

I was a little surprised at the \$15 billion a year. I think the number is low, but then Amanda gave a very good explanation of why you decided to come in at that number. I would suggest that once we get into the specifics of how the pandemic response systems can be built in developing countries, and I'll talk about that in just a bit, there may be more of an appetite. If you look at the specific aspects of this pandemic, I mean what we're going to see, I don't think anyone really believes right now, in the rich countries, that letting...Well, I shouldn't say doesn't believe. I don't think that the reality of allowing the virus to spread in poor countries is actually going to redound on the rich countries. I don't think there's a sense of that happening yet, but unfortunately, I think that will happen. I think there will be a realization that we really are going to have to try to vaccinate everyone in the world to get on top of it. I think there are ways of explaining the value of that and incorporating it into some development and programs that could really work.

The Global Health Threats Fund. I think that's great. I think that's the right thing. I think the World Bank as a facilitator separate from World Bank governance, a financial intermediary fund, I think that could work very well for all those functions. When you think about who would decide how that money is spent you go right back to the Global Health Threats Board. You've got to make sure that board is empowered if you're going to run what will be a very sizable fund.

Now, let me get to the specifics of what the program could look like, that I think ultimately could spur a lot more interest in providing financing. When I was at the World Bank Group, we put something together called the Human Capital Project. I did it toward the end of my time at the World Bank Group, because I didn't want to come in and immediately just focus on health and education, which is what I've done forever, but try to understand the entire system. At the end of the day, what we found was that if you look backwards, the importance of improving health and education outcomes was far more strongly correlated to economic growth, again looking backwards, than just about anything else that we'd studied. We developed a Human Capital Index where we ranked countries on their outcomes in, now I think it's five or six different areas. I think the impact was very positive. Countries began to think, "Oh, my goodness, so investing in our people is not something that we do after we build roads and provide electricity. It's something that we have to do from the beginning." I think there's a sense there of needing to go in this direction. But in 2015 in Nigeria, for example, we're spending 0.7% of GDP on health, and you just can't do much with that kind of spending.

Here's a specific suggestion of how we can help build this kind of resilient domestic system for prevention and preparedness, including finance. I was involved in developing the contact-tracing program in Massachusetts. I realized after a while, that this was essentially a conditional cash-transfer program. There were a lot of unemployed, very bright, capable people. We

trained them in contact-tracing, and then ultimately they did contact-tracing, they did supported isolation and quarantine, and then they got involved in helping with the process of getting more people to get vaccinated. In fact, the latest outbreak in Provincetown, that many of you may have read about, that influenced the CDC's thinking on changing their policy on masks was done by that group of contact-tracers. Even if they weren't able to trace every single person who was infected in Massachusetts, the fact that they were there still tracing the course of a virus led to critically important information that now has led to a policy change. What it meant for these people, though, is that it was cash for them; they ended up paying \$35/hour. It not only helped them to stay out of poverty, but it stimulated the local economy.

I think that we've got to think about, if you're going to develop this system, what does it mean? It doesn't mean creating CDCs in every country in Africa. It's about ground game. What we've learned, I've worked on so many different public health campaigns—drug use, TB, HIV, cholera, Ebola—that it's critical to have a ground game. The ground game in this sense could also be a poverty-reduction program, and ultimately, it's local, fiscal stimulus. What we found at the World Bank Group from repeated studies on conditional cash-transfer programs, is that they not only improve health education outcomes, but they also lift people out of poverty and they stimulate the local economy. I think that a lot of this spending has to go into building the kind of on-the-ground programs that can stop pandemics.

Strengthen financing at WHO, I couldn't agree more. How are we going to do that? What will be different this time? I don't know, but it has to be different this time.

Financing of the global public goods. It's a great idea. The World Bank Group is already doing this, and they're doing it at pretty high numbers. I have to say, I'm just incredibly proud of my former institution and their response to the pandemic. They're going to be distributing something like \$160 billion over an 18-month period. I think the right place to bring this together would be at the meeting of the heads of the IFIs, so the head of the IMF, all the regional development banks, the World Bank Group, Asian Infrastructure Investment Bank, the New Development Bank. The heads of these institutions meet together at least twice a year. To bring them together to figure out how to spend this global public goods money, I think, would be the right place to do it.

The fast tracking and surge-financing is critical. Amanda and Victor said it. To not use the extremely strong AAA ratings of the IFIs to access financing quickly would be crazy. What will be needed are some kind of guarantees, pressure-less guarantees, etc. These could come automatically from G20 members if an agreement has been made. If that's the case, once the signals are there, the G20 members provide the guarantees, IFIs can access capital markets literally overnight.

I think the one part of the report that I think needs a little bit of work, and you know it's classically the part that needs the most work, is leveraging the private sector and philanthropy. If you step back and say, which community has gone beyond expectations in response to the pandemic? Is it the public health community? Unfortunately, no. Is it the multilateral

community? Unfortunately, no. We've got the incentives right. At least, for example, for Moderna, we have to really thank the Trump administration for providing the kind of financing that got them into looking for the vaccine and then developing it. Can we take a lesson from there? Drugs and vaccines, of course, we need to incentivize those groups. But what about manufacturing, getting people to be able to switch to PPE and other critical materials quickly? Can we get the incentives right? Logistics and distribution? Some of the industries did very well. The shipping, transport, maritime did very, very well. Airlines almost died. Is there a way of sending a set of incentives so that they jump in on a part of the team, helping us to respond. What about technology and communications?

I think that there are tremendous possibilities, but you can't do what we've always done, which is politely invite them to some of our meetings in the multilateral system, and then ask them to provide funding or donations. That's been sort of the majority of the interaction with the private sector. I don't think that's the right approach. I think the question we have to ask is, how can we set up the incentives so that the private sector will not only participate, but innovate, so that we can respond more effectively?

You know the insurance is a great idea. World Bank Group has a lot of experience, some good some bad. I think there's a role for insurance, but I think that the mechanisms suggested in terms of more rapid accessing of the capital markets and some kind of a fund is more appropriate. The insurance mechanisms will have very specific roles but won't be at the center of the response.

Sorry for going on. This is such an important report. Every single recommendation resonated with me in one way or another, and I'm grateful for the opportunity to participate.

### **Michele Barry, Consortium of Universities for Global Health**

Thank you, Jim.

I'd like to pass the Zoom over to **Keiji Fukuda**, who's professor at the University of Hong Kong School of Public Health. Previously, Professor **Fukuda** worked as the Assistant Director General for Health Security and Environment for the WHO and had a critical role in the 2009 swine flu pandemic. Keiji, over to you.

### **Keiji Fukuda, The University of Hong Kong**

Thanks Michele. I want to thank Victor especially for the invitation to join this quite amazing discussion on this really important report, but also Keith Martin and Michele, yourself, and CUGH for hosting the discussion.

I've been asked to provide a couple of thoughts on the Global Health Threats Board as a proposed governance mechanism for the fund. I want to start by putting the overall G20 initiative in context. I've been working on outbreaks and pandemics for a while, and I've learned

from all of the major emerging infectious disease events that I've seen that we repeatedly see a consistent group of global and national vulnerabilities highlighted over and over again related to outbreaks and pandemics. I won't go through a litany of them, because there are so many documents covering them, but among them, I think the single biggest failure is that we have failed to use the time between major crises to substantially increase or to substantially strengthen the systems and capacities that we clearly need. These capacities have been identified over and over again, and I think that Victor, and Jim, and Amanda have already mentioned many of them. They're needed both at the global level, but they're particularly needed at the national and subnational levels.

If we ask ourselves, why haven't we done better? Again, there's a lot of different reasons for that, and, again, they've been mentioned over and over again in a lot of documents and meetings. Consistent with what Victor was highlighting, the first one is that we really have lacked reliable and adequate financing going to the right places at the right time. The second thing, though, which has really bothered me, is that we've lacked to fully act upon fairness in equity. We talk about it all the time, but we really have failed to act upon it. And the third thing I want to highlight is that we have not consistently implemented the multilateral governance mechanisms that we already have previously agreed upon, particularly in the form of the IHR.

Given that as a backdrop, I'm really extremely positive about the G20's engagement in the pandemic prevention and preparedness discussions, and also very enthusiastic about many aspects of the report related to financing, particularly to a couple of the main things. One is the proposal to increase sustained funding in a manner that doesn't undermine existing ODA initiatives. This is really crucial, because robbing Peter to pay Paul always creates hostilities/barriers and accounts for some of the silos that we see at a time when we really need to be stressing a kind of whole-of-government/whole-society approach. The second thing that I like about the proposal is that the bringing together of Health and Financing Ministers on a formal basis and on a regular basis is exactly one of the major gaps that hasn't been filled for as long as I've been working in the field. Implementing on both of these things would be a very substantial improvement over the current situation.

I think it's also true that, when you go through the report and you look at the board's proposed role in terms of government, there are going to be some issues that need further discussion. The first one is that if the board consists primarily of G20 members and its G20+, even with the others, it's still going to only represent a fraction of the United Nations' 193 member states. An obvious question which is going to come up is, what is the relationship of the unrepresented countries and other entities to the governance, or to the board? Will they have any kind of voice in the governance of financing and, if so, how and if not, why not?

I think a second issue which is going to come up is, how is the board, regardless of how it's constituted, is going to fit into the existing global health governance ecosystem? As all of you know, that current global architecture is pretty complex and, in many ways, fragmented, but it does have main actors who have a stable relationship with each other. This is notably countries with the World Health Organizations. Then there's the other relationships among the other



international organizations and civil society, major donors, industry, and initiatives like GAVI and so on. In this architecture, given the current state of things, the board is clearly going to be seen as a major player, and the question that's going to be debated is whether the board will be seen as a useful addition to that architecture, or is it going to be seen as a disruptive but ultimately necessary evolution, or is it going to simply be seen as a rival to existing structures? Again, something that I think will get debated through.

I think a third kind of question which comes up is, how is the board, or the proposal for the board, going to mesh with other current proposals from other groups? As has been mentioned already by Amanda, the IPPR has proposed a Global Health Threats Council operating at the level of Heads of States as a global governance structure under the United Nations. If, as is proposed by the High Level report, the council and boards are complementary, how is that going to work? It makes sense in that one is a ministerial-level board, the financial board, and the other is a Heads-of-State-level board. What will be the actual relationship? Will one be subsidiary? How will they ensure complementarity rather than collision on some issues? I think these are other issues which are going to have to get discussed.

I think these are examples of some complex issues, which are going to come up as we go forward over the next several months. As you all know, there are many different reports either that have come out or are going to be coming out, and then we're going to be heading into some significant discussions in the Fall time related to a potential treaty. In my experience, I think that these kinds of questions will get worked out over the coming months through a number of different forums and discussions until there is some kind of convergence on the main points.

Just to summarize a couple of the key points. I think the core elements of the proposed fund and its governance are extremely useful, in particular the emphasis on reliable new financing through a mechanism that doesn't detract from other ODA priorities. Secondly, the fact that the proposed governance mechanism brings together health and finance sectors, which is going to address a major current gap. But again, as I highlighted, the proposed board does raise some critical issues. How will others, and especially other countries but also WHO, be represented in the governance? How will the fund and the board fit into the current global governance's ecosystem? Finally, with the number of new proposals that will be coming out from other groups, how are they going to mesh together?

I think that we're going to be hearing a lot of discussions, I expect to see a lot of evolution in these discussions, over the next several months. I think that this report is very much a significant step in the right direction.

Let me stop there, and thank you.

**Michele Barry, Consortium of Universities for Global Health**

Thank you, Dr Fukuda.

Our next speaker or commentator is **Jonna Mazet**.

**Jonna** is the University of California Davis's Vice Provost, Grand Challenges and Chancellors Leadership Professor of Epidemiology and Ecology, as well as the founding Executive Director of UCD's One Health Institute and also the Predict Challenge. **Jonna**, take over.

**Jonna Mazet, UC Davis**

Well, thanks for having me. You can go to the next slide.

I really am pleased to see NAM and CUGH jumping in here and, like my colleagues before me in this discussion, am incredibly supportive of this report. I think it is much more comprehensive. I am a One Health person, so I can speak to why I think that is critical.

Of course, we know we're vulnerable, and I think this report has done a very nice job of laying out the justification for why we can't just sit and wait for the next disease X.

Our current living is in disease X that that we've now named COVID, but we have seen on the order of, about 10 years ago, on the order of three new emerging infectious diseases each year that can cross the boundaries of human and animals and are driven by activities that we are doing on this planet that put us into contact and at risk for these viruses. We now know that's increasing, the report shows that, and that we're probably experiencing more than five new infectious diseases this year, every year. What we need to be careful about is to not think that those things that have come before, like COVID, are the only things we need to be looking for. Next slide.

Now, one of the recommendations of the report is that we need a stronger internationally coordinated effort or multiple efforts to prevent spillovers at their source. I absolutely want to bring that point home. Before this pandemic, we only really knew about just over 250 or 260 viruses that could cross that boundary. I have been working with a team funded by the US Agency for International Development that has built the evidence base to say that there are probably at least a half-a-million viruses out there that we know nothing about that are just like SARS coronavirus 2 that can spill over into us, and some of them will make us sick. Next slide.

We really need to be focusing on these One Health interfaces where people/animals are interacting in ways that put us at risk. They are driven by problems in our environmental handling, our planetary health. I've shown you some here [in this slide] that bring that point to home, but I also want to just focus on the report, talking about the G20+. I think that is critical. We need multilateral investments. I've been very involved in bilateral investments, more than for my projects—almost \$300 million that have gone into education strengthening, One Health platform strengthening, systems strengthening. They have developed all of the protocols, and standard operating procedures, and safety procedures to show us that those half-million viruses can be safely identified, and we can identify our behaviors that are putting us at risk. Next slide.

One of the behaviors that has been highlighted is this wildlife-human interaction, especially in the food value chain. One that I'd just like to show you here is that we can collect the evidence and then mitigate risk like this. If we are looking at rodents out in the field, about 20% of them have coronavirus that might be available to spill over, but when we put them into market situations and put them into high-level husbandry, we get to a place where they're over 30% infected and available to mix with other species. Very concerningly, when we get to the restaurant interface, we see that going up even higher. We get to a place where over 50% of the rodents being butchered and eaten in the restaurant are infected with coronaviruses. This is just one little example to show you that we really need to make changes in our food systems. It's not just the wildlife value chain, it is the whole way that we have organized food systems to really be disconnected from agriculture, so that we are just working towards a bottom line of cheap food, not healthy food that helps us reduce our planetary risks that are driving some of these emerging infectious diseases from becoming threats to our health. Next slide.

We can't eliminate every spillover or disease event, but we can identify and stop them from spreading at their source. This is where I think I would like to just build on what we've learned, because we have an evidence base that has supported the recommendations in this report. Next slide.

Stepping up One Health investments is really a key portion. I want to let you know that during the past more than a decade, just about a little over a decade, working with bilateral investments from the US Government, we've been able to identify viruses. We've been able to show that you can saturate the curve, you can find all the virus that's out there. We have, as the report says, all the technology, all of the science, all of what we need to make it happen, but we don't necessarily have equitable financing or all of the world being able to access the technology, even though we're making it as available as possible. It is completely feasible to do that, and I support the report's recommendation that there are mechanisms to do that. Next slide.

If we think about One Health, this Venn diagram shows you the four areas of One Health. One is human health, obviously, animal health, obviously, but also plant and environmental health, because much of this is about how we use the planet and how we get food. And so, on the one side I've listed some problems where One Health approaches can be very useful. Right now, we are in the midst of living the zoonotic disease experience. But all of these other problems and many more are driven by some of the same factors. This is why the One Health concept has been highlighted in the report, and why I think it's so critical. It is land use, climate change, economic development and globalization, migration, all of these things are driving the problems on the other side. You get an efficiency for solving some of the world's existential crises. Even if your plan is to reduce zoonotic-disease emergence and protect against its effects, you also get other positive benefits that are hugely efficient for our global economy. Next slide.

And what you can do, because I noticed in the chat, so what happens when you invest in these efforts? Do we know how to do it? Yes, we do. Do we have evidence that the outcomes are

improving things? Yes, we do. One thing is that the people that were working on building and improving the systems, as well as finding virus before it spilled over and understanding where those viruses spillover and how they spill over so they could mitigate their risk, we were also responding to outbreaks. Our teams responded to more than 50 outbreaks in the 30 countries where we were working, most of those diseases of unknown origin causing fevers and hemorrhagic disease. What we learned was that if you take a One Health approach, and you have the environmental teams, the animal teams, and the human health teams working together, you can shut those down and stop them before they emerge into large-scale pandemics and epidemics.

Also, that knowledge helps us prepare for the next one. We can now make watchlists. One of the products of doing viral discovery is that you get real-time information. This [slide] is showing you a watchlist that highlights SARS coronavirus 2. Next slide.

But if I wanted to, as a public health planner, perhaps in Uganda—I've just shown you the Uganda-specific watchlist—you can go to our new online tool at <https://spillover.global/>. You can make your own watchlist for what you're interested in. As a clinician it might be looking at pathogens that might be in your area that aren't in your differential list; as a public health specialist it might be deciding where and how to implement risk mitigation; as a company, it may be to make the watchlist to start to think about diagnostics, new therapeutics, new vaccines. Thanks, you can close the slides.

I wanted to just let you know that what we have learned is that if you invest in One Health, you can prevent, but you can also use the knowledge as you are gaining all of the evidence to improve things like those vaccine pipelines. Our viruses that we were finding as we go going were being used by governments to test novel vaccine pipelines and things that helped amazingly in this pandemic. I'm incredibly positive on this report. I think there are some even better-yet policies that that can go a bit further, like thinking about how excellently systems like CEPI integrated into these programs and really did take that public-private partnership to the next level. We are here, partially, invited by NAM and CUGH, and I want to say that, in this particular pandemic, we really underutilized resources like CUGH and NAM. We underutilized our experts that didn't happen to live within a government entity. I would like the outcomes of this report to acknowledge and build better partnerships. Absolutely look to the LMICs that actually often have much better One Health practices than some of our most developed countries, and learn together. Thank you.

**Michele Barry, Consortium of Universities for Global Health**

Thank you, Jonna. That was excellent.

Our next speaker or commentator is Bruce **Gellin**. Dr Bruce **Gellin** is the Chief of Global Public Health Strategy for the Rockefeller Foundation's Pandemic Prevention Institute, and he's also a renowned expert in infectious diseases and vaccines. Over to you, Bruce.

## **Bruce Gellin, Rockefeller Foundation**

Michele thanks, and thanks to Victor and the National Academy and for CUGH for featuring this report and this important discussion.

I'm delighted to be here today as part of this. Particularly, I have a chance to reflect on the surveillance aspect of this and highlight in the report a comment on the need for a global, genomic, and epidemiologic surveillance program within the next 5 years to prevent and detect crossbreeds from spillovers. This recommendation is exactly the kind of global indoors imperative that we need, and it's what we need right now.

I'd like to look at this in the context of four considerations to ensure that this recommendation serves the purpose of catalyzing the action we need. The first one is about speed at which we pursue this goal. I'll also comment about the scope of this endeavor, the certainty with which that it gets built, and the utility to all countries and sectors, both in the context of pandemics and in peacetime, and the need to build the everyday systems that will inform actions for a safer world. Fourth, behind all these is the importance of trust, that the system will be a benefit for all.

First, about speed. As Victor highlighted at the beginning, we can't wait until the current pandemic is over to start work on the future. Establishing such a network within the next 5 years is frankly too long; we need to begin to work on it now. While there's always calls for better coordination, we must recognize that fragmentation is our foe, and we must begin to work now to integrate existing data systems, seek additional source of data that can provide new insights, and innovate the analytics that can help us pick the signal from the noise, and to identify those signals that matter. We need to do this more readily, more nimbly, and more quickly. We must set and meet much more immediate goals for connecting existing networks and initiatives in the near future, and need to act with the urgency that this demands.

The scope of this effort, particularly what types of data and information we've gathered and shared is also critically important. The report had a focus on genomic sequencing in its epidemiologic context, because we need to recognize that the sequencing alone does not provide the information needed to get ahead of this pandemic and to run future ones. COVID is quite instructive but, again, this is not only about COVID, it's about, as Tharman mentioned, about disease acts of the future.

This is the first outbreak where genomics has played such a critical role. As we discuss the needs of the future, we must acknowledge that the spread of the Delta variant is demonstrating the enormous risk of flying blind. In terms of the global representative sequencing of the SARS-COVID-2 virus, we need a clear understanding of context in which these variants are emerging and spreading.

To this global health audience here, a geographic representation is obviously central. While this means worldwide, it also means within countries as we've seen in the US as we continue to struggle to swiftly sequence and share genomes that reflect the diversity of the population and

the settings in which these variants are emerging. It's this emergence and behavior of the variants, of those that we know now, sadly the ones that have yet to be identified, that will force us to rethink what we know about the virus, its transmission, and the diseases it causes, and therefore, what our response should be.

While the technological advances that make the inclusion of genomics a must, this is critical but insufficient. So in addition to the geographic representatives, we need to understand what we're seeing in the context of larger clinical, maybe even larger picture, including the new pressure from infection and vaccination. What can these data tell us about reinfections and breakthrough infections, about the viruses from those who have and don't have symptoms, and about disease severity?

The technology now allows us to look even deeper and to take full advantage of these insights that come from these deeper dives, looking down to the level of variant subsets, doing detailed sequencing and diversity within the Delta isolates to better understand some of the questions I raised before. Are some more transmissible? Are some more lethal? And to pluck out, again, signals from the many noises. It's this kind of information that can lead to concrete actions, from recommendations about behaviors and policies to keep us out of harm's way, to the development of diagnostics, drugs, and vaccines that meet the variant challenge.

As I've mentioned, this recommendation rightly highlights the clinical epidemiologic context. To accomplish this, we have to bring together many different organizations—academia, industry, public health, animal health—and to seek to include data from nontraditional sources as well, the kinds of insights that can that can give us new information about where we might better learn about where things are coming from and where they're at.

The nontraditional data is usually outside of the traditional public health data of laboratory, chemical, and epidemiologic data. And it can include things like where and when people are moving, consumer habits, environmental data, vaccination status, and other information. And we just heard from Jonna, as we design the surveillance and data system for the future, we also need to be sure that we have the systems that can capture and even predict with a high degree of likelihood some of the half-million viruses that she tells us might spill over from that human-animal interface.

All these data need to be available in safe, secure, and trusted data repositories along with the robust representativeness as I mentioned before. And while we seek to apply this principle to the current crisis, these have to become the everyday system, so not just those that are pulled out for a pandemic. They have to have value in peacetime, and they have to be ready and fit for purpose for the next public health emergency, for outbreaks and pandemics in the future, and they need to be ready when we need them.

Third utility. It's fundamental not only for the systems to have the impact that's desired but to make the case for their support, as we've highlighted across this, of surveillance as a global good. We must make certain that this system is designed to inform the many decisions that

need to be made, and built to trigger actions, and be viewed as useful by all countries and all sectors.

As Jeremy Farrar from Wellcome Trust says, we need to turn surveillance into intelligence. A rapid sequencing ensuring genomes and the contextual data will not chain rural pandemic drifts on its own; it's the actions triggered by this information that's essential. That's the system we need to work on now and to be built in the future, and it's a system that must be useful to all countries and all contexts, including periods when there are no pandemics or emerging pandemic threats. To ensure this utility, systems need to meet the needs of many sectors: of health workers; policymakers; Ministries of Agriculture; Ministries of Finance; communities who are grappling with the anti-microbial resistance, multi-resistant TB, AIDS, malaria, and other threats, and beyond this disease X that's yet to emerge.

As Keiji highlighted, the utility must be understood as a system that leads to immediate and equitable access to the needed biomedical tools and other resources. The global vaccine equity gap is a glaring example of a broken system. Low- and middle-income countries struggling with COVID surges and Delta without adequate vaccine supplies, they're not necessarily having an incentive to share the data that will be helpful to inform and guide scientific breakthroughs.

The system needs to perform efficiently and effectively, led by WHO. We need to set global and national performance metrics, such as the goal for the number of representative sequences, the time between sample collection to sequencing, and between complete sequencing and sharing. These milestones can be used to track progress and fine tune our gaps.

And finally, more than the promise that technology offers is the importance of trust. The system must bring together all sectors and data to turn information into intelligence, and to do that requires trust across the system, acknowledging that there is benefit to all for taking these steps. We have to think of the bidirectional utility between public and private sector. I think that the end of the report rightly says about how to ensure that private and public sector are in the effort to engage, that they both have needful information that traditionally sits with the public sector; likewise, public sector responses will be improved by access to private sector-held information. The creation of this trusted surveillance-to-intelligence-oriented network depends on brokering trust to platforms and data products that meet the needs of the communities. As I already mentioned, we must acknowledge the current reality to see the challenges here occurring in equities and vaccine availability and ask ourselves, what are the incentives for countries to engage in a surveillance system if the signal's ineffective and the actions trigger a result in life-saving tools for some but not for all?

Every day, the cost of slow, piecemeal, and inadequate sequencing becomes clear. [It's the] reason we're racing to get ahead of Delta, and we have an immediate, ambitiously coordinated push to bring together and share information across borders and also with the private sector and R&D partners, who have a critical role to play in developing vaccines, drugs, and diagnostics responsive to these variants. Without them we will not have a chance of getting ahead of the next variant.

There's no question that we can and must do better. This report highlights the need to do this so well. The additional nuances, and milestones, and perspectives are the ones we need to put in place now, and if we get that right they'll be the foundation for enduring global growth.

**Michele Barry, Consortium of Universities for Global Health**

Thank you, Dr Gellin, and I thank all the panelists for their perspective on this landmark report.

As Dr Fukuda mentioned, we need harmonization within the complicated global health infrastructure, and we need to seek equity and solidarity with all voices being heard. [We need to] emphasize IFIs, particularly the World Bank. We need to address the concept of investing in global public good with surge funding, as he tried to do during his tenure at the World Bank.

Thank you for emphasizing the need for funding, a One Health approach to generate what you call watchlists and modified behavior, event spillover, and zoonotic diseases. Dr Gellin, you really emphasized the fact that we need to have trust, speed, coordination to integrate data systems, identify signals, and be able to rapidly sequence and share genomics for shared surveillance and public-private sector cooperation.

Now, I asked people to put their Q&A's. While we're doing that, I will ask some targeted questions to each of the panelists very quickly.

Jim, I'd like to address you first. You called for IFIs to mobilize surge funding during the pandemic preparedness. With your experience of having led the World Bank, which is very, very complicated place, how do you think this actual enhanced role can be operationalized and what type of multilateral support would be needed to make this happen?

**Jim Yong Kim, Global Infrastructure Partners**

Michele, I'm sure you remember, and it's been a while since we had our discussions about global health, but since that time I've entered a different world altogether. As you know, I'm an anthropologist; in setting the culture, one of the things that the Bank does really well is develop this surge funding. There are already resources inside the bank. There's cash inside the bank, there are cash holdings, but the really most remarkable thing about the Bank is how good of a AAA rating it has. It borrows at just a tiny bit at a higher interest rate, just a tiny bit higher interest rate, than the US Treasury, which borrows at the lowest rate of all. If there are guarantees that surge funding, even for something that's not related to a specific country but it's for a global cause, if there is the kind of support from the board and from especially the G20 countries to do it, they can raise literally billions of dollars in a day. They simply go to the capital markets and say, "Okay, who wants to purchase a World Bank bond?" World Bank bonds are very popular because they're so safe. They are among the safest places to put your money. In a difficult situation like a pandemic, people are moving to safety, and the good news is that the bonds of the international financial institutions are like that.



Just to give an example, we didn't have to go to the capital markets, but during Ebola it got to be August of, I think, 2014, and there had been no money pledged to tackle Ebola in the three West African countries in the Mana River Valley. I was actually on a trip in Hong Kong, and I called the board members, I called the dean of the Board, and said, "Look, we need to do something about this." Within about 5 days we had approved \$400 million to go from the World Bank Group to the three Mana River Valley countries in order to respond to Ebola. So, the Bank and all of the IFIs can move very quickly if the governing structure agrees to it. I think the key here is not waiting until it happens and then waiting for the decisions to be made but to set up some kind of an automatic structure, so that if there are signs that this Global Health Board sees that this is another one, a big one and it's coming... Again, I think it's just so great to have the One Health Institution with Jonna. We'll see things, maybe in animal-based systems, that will give us this alert ahead of time. The Bank and other banks can raise billions and billions of dollars for rapid response. Now, somebody's got to pay it back, somebody has to pay it back eventually. That's what you need some of the guarantees for. But the flexibility and ability to move quickly... Although the Bank has to say, "Well, we have to go through our procedures. We have to go through this and that and the other." I've been right there when the Bank has moved literally within hours. It took 24 hours to get the approval for huge amounts of money for Ebola. It was the right thing to do, and I frankly think it spurred both the US and the UK to respond more aggressively. There was literally no financial aid at 9 months into the outbreak. It took a while for to get there. I think, ultimately, the US and the UK had a bigger role in actually building the response—France eventually as well. It's possible if the governance structure and the G20 says tells the Bank to do it.

**Michele Barry, Consortium of Universities for Global Health**

Thank you.

I think what I'm going to do, because we're running late on time. Victor, you wanted to invite some other panelists for questions, but I would like to ask people to write their questions and go to the panel, the questions that are being collected right now.

**Victor Dzau, National Academy of Medicine**

I was just simply going to say great set of discussion, terrific, lots of good thoughts. I just want to be sure that people who want to know more about the report get to us, Amanda, Tharman, particularly any recommendation and the clarification, so we can spend a few minutes doing this.

And then we have a number of people who joined us, and in particular the three, who I would like to call on maybe I can start with **Adanna Chukwuma** who's a senior health specialist at World Bank.

**Adanna Chukwuma, WBG**

Thank you so much for this excellent presentation. I don't think this report could have come at a more timely period, and I think the recommendations for the Board and the financing mechanism are spot on. I have two questions about that.

We've seen the callbacks facility and in the middle of a pandemic when it cannot be more salient, that we need countries to rally around and contribute. We've seen how they struggle to raise financing. Amanda raised that point. If the panel can speak a bit about what are the incentives for countries across the world to make assessed contributions to this new fund? It's the first question that I have.

Secondly, to the point that you raised about financial intermediary and funds, is the panel recommending that this be housed in the World Bank? You spoke a bit about how effective the Bank has been at moving funds to the front line, and so, do we set up a fund or can the Bank be the mechanism that that we use?

Third, still at that point about where we house things. A lot of people brought up the fact that world and local acquisition has a central role. It's also a recommendation for our own strengthening of that role, thinking about governance in the world of acquisition. There's also comment about the G20, and how do we make sure there is representation across the world. I'm just wondering, in terms of housing this board, should we be instead thinking about a mechanism in the WHO within the UN system? Of course, that's difficult. It's not like it's straightforward. I'd like to hear the panel's thoughts on that as well.

Thank you.

**Victor Dzau, National Academy of Medicine**

Lots of great questions. I think I'll start with Tharman and Amanda first. **Tharman?**

**Tharman Shanmugaratnam, HLIP Co-Chair**

Thanks, no, thanks very much.

I think first, the broad lesson coming out of all of this is that if you only start once a pandemic has emerged, we are already very late. Even with remarkable private sector efforts, remarkable national efforts, we are now 19 months into a crisis and we are very far from the end of it. The reason for that is, first, we did not have the manufacturing capacity in peacetime. And I mean manufacturing capacity for multiple candidates, because you really don't know which candidate will get regulatory approval, and not just vaccines, but drugs. And there's no private sector incentive to do this ahead of time. That's why, as Jim highlighted, incentives are critical, and the public-private partnership is critical. We have a whole chunk of our report, in fact, in what's called section B of the report, that gets into this in quite some depth. Michael Kramer and several others are working collaboratively on this issue, applying their minds to it.

It does require something we've never done before, which is significant public subsidy for manufacturing facilities that you try to make as useful as possible in peacetime. But even if you're not using it to full capacity in peacetime to meet existing endemic needs, it's still an extremely good investment to have that ready. I think that's a new game in public policy. The private sector will respond if they've got adequate incentive. There are various ways of structuring this incentive. We started very late in the day, and so we started with what's called pull incentives, meaning procurement incentives: I agree to buy a certain amount that you produce. That's not good enough.

During peacetime, we need to have what's called push incentives, where the public sector either takes a stake in a facility or the various other forms of risk mitigation you could apply, but basically the public sector has to be part of the game. We haven't done this before. We've got to do it on a major scale, and it's an extremely good investment. We do think, particularly given the advancements in technology both in vaccine technology as well as production technology, the engineering and the systemization of the engineering, we do think that it's possible to make fairly good use of this in peacetime for existing needs. It's not as if it's empty facilities with people standing around; it's actually going to be quite well used. I want to highlight that, because so much of the difficulties we are facing have to do with starting too late and the lack of having an existing warm facility globally distributive, not necessarily every country, but it's got to be globally distributive.

Second, to come to **Adanna's** question on the World Bank and FIF. I think Jim explained that extremely well, the unique ability of the World Bank to raise money very quickly at very low cost. It's crazy not to use the World Bank vault, basically.

The IMF in engaging in surge financing of countries, it has a very large capacity to do so. We've got a very large balance sheet at the IMF. I'm not just talking about issuing SDRs, which is a rather blunt mechanism because it goes to everyone, with a large part going to the richest countries. I'm talking about just lifting the usual ceilings on country borrowing in a crisis, the same way that we lifted all sorts of ceilings domestically in the advanced countries in this crisis. If you look at what central banks and government authorities, budgetary authorities, have done, they haven't gone about careful calculations of costs benefit and so on. It's a huge crisis and they needed to actually put a lot of liquidity out there in businesses, and individuals, and households. Likewise, we have to think of that internationally. When you face a crisis of this nature, you need to put money out very quickly for countries to be able to first provide the safety net so you can have lockdowns. You can't have lockdowns without safety nets. And second for countries to be able to participate in pooled procurement mechanisms like callbacks and ACT-A accelerator. Countries need to participate in it; they need the monies to be able to fund their purchases. That is a role for both the IMF and the MDBs and, in particular, the World Bank. I echo everything Jim said on this issue.

The WHO is today dependent largely on bilateral and philanthropic financing, the Gates Foundation being a significant donor. It is a multilateral institution. It needs both more money

as well as more predictable money. That means, when we've advocated, as well as the IPPR, shifting the proportion of its base budget that is funded from multilateral sources from one-third to two-thirds. It's not a dramatic change, but moving from one-third to two-thirds gives it more predictability as well as more funding. It's just an example of what has to be done.

I think we have to accept the world as it is, fragmented, siloed, but in fact, with the mechanisms that tie things together, coordinate better. We can actually solve many of these problems ahead of time. It's frankly far less complex than climate change. I mean, you have to think hard about climate change; we really lack serious needle-moving solutions about a whole range of issues. On pandemic security, with One Health being given much better resourcing and attention; with national health care systems, everything down to community care, the village level, being given the necessary resources; and with a system of ever-warm manufacturing capacity, we can actually mitigate very significantly the risk of what Michele called "a pandemic option."

We can mitigate it very significantly. We're greatly advantaged by how medical science has evolved. Working on, I think it was Victor who mentioned, working on the major multi-pathogen vaccine as well as drug platforms is an extremely important issue. We wouldn't have thought about this 20 years ago, but the science now allows us to think about it. We sort of know what we have to do. It's not going to be 100%, but we can very substantially mitigate the risk of pandemics in the future.

**Victor Dzau, National Academy of Medicine**

Thank you, Tharman. I think there's a number of questions that talks about, and also Keiji says, don't, what's his word, let me look at this, "must not undermine ODA activities."

I think, Amanda, if you can emphasize this is a new fund, and then some questions about saying, how to do assessment contribution.

**Amanda Glassman, HLIP Project Team Lead / CGD**

The idea really is to develop a multilateral entity that is financed multilaterally outside of ODA monies, probably including some ODA money but predominantly non-ODA money. The panel looked at a number of options and ways to accomplish that goal. There are pros and cons with a lot of existing organizations, but none is exactly fit for purpose.

Given those imperatives for this financing, one is the source of funding that we've talked about. An assessed contribution would be an amount where every country in the world contributes according to the size of their economy and the size of their populations, so kind of an ability-to-pay model in the same way that the WHO is financed with its base budget, but the idea would be to do that at an adequate level, and/or other secular sources of financing, as the example that I gave. That example was not discussed by the panel, I should say, but it's one that I have

looked at, which is this airline tax that was implemented to finance anti-terror activities after 911. There are those kinds of sources that are out there.

In terms of the organizational arrangements that would enable that kind of multilateral financing, it really does seem most suited to something that is created as a financial intermediary facility at the World Bank that is also that kind of organization. There's some discussion about whether it's a fund, it could be a fund inside the bank, or whether it has autonomy and its own governance, which is something that the panel landed on. That was because of the kinds of activities that it wanted to fund, some of which fit well within the bank mandate and some of which would be very unfamiliar to the Bank. Financing the research and development of medical countermeasures is not something that one thinks of as a comparative advantage of the World Bank, but one would think about it as a comparative advantage of an organization like CEPI, for example. It's something that has to be done in very close coordination with the US government's financing entities for research and development, the European, many of the upper middle-income countries have mechanisms to finance R&D.

That's why in the end, the panel ended up with this idea of a model like the Global Environment Facility, which would enable leveraging and integration with the World Bank, but that would also enable financing of some of these other kinds of entities that work well in those spaces. It's a big challenge, I think, to think about how to organize this, and there are costs and benefits. That's where the panel landed, and you can read through the very careful thinking that went into that recommendation. Thanks.

**Victor Dzau, National Academy of Medicine**

Thank you Amanda. **Catherine Hankins** has her hand up. Cathy?

**Catherine Hankins**

Yes, thank you. That was an excellent, excellent overview of this really critical report.

My question was partly answered by Tharman, but maybe you can elaborate a bit more. We're seeing such promise in this mRNA technology, potentially for malaria vaccine, potentially for an HIV vaccine, and others going forward. Can you talk about the immediate manufacturing/transfer-of-technology needs to scale up, first of all for COVID, so that we can get what looks like 8 to 16 billion doses done within a year, and then have that technology, you said, in peacetime available but have it, you said, distributed around the world? Can we get this going quickly in Africa and Asia and elsewhere?

**Tharman Shanmugaratnam, HLIP Co-Chair**

Thanks, Catherine.

I think there are three challenges there.

The first is about manufacturing and supply; the second is about delivery systems, in other words, how do you actually roll it out and take it from the airport tarmac and put it in people's arms, which is a huge issue; and the third issue, which underpins both, is how do countries finance this. I've talked earlier about the financing, the fact that we needed to have it before a crisis, we needed to have a system of pushing money out very quickly to help countries finance their participation in pooled procurement mechanisms, like callbacks.

Then coming back to the issue of supply. If you look at it today, and I say this a little tentatively, but from all the information we now have, we are going to be able to produce enough vaccines for the targets we've set, end of this year, middle of next year. The rate-limiting factor today is delivery systems. We already have examples of vaccines being delivered but not actually used because it's actually a rather complex matter, particularly when you require cold chains, but even where you don't require ultra-cold chains, it requires a whole delivery system down to every town and village. That's something, again, that we need to do in normal times because that's what you need for existing diseases as well.

Doing it in normal times has utility in normal times, but it's critical in a crisis. Frankly, that's a major issue we have to deal with. The World Bank is responding to it, but there's still a lot of work to be done in low-income countries and a significant part of the lower-middle income world to develop those delivery systems. It doesn't require top-flight doctors, it requires technical staff, it requires nursing staff, and it requires people who are going to be hired for the next 2 years and trained up to be able to do this well. Even in the most advanced countries, that's what we're doing. We're training people who are not medically trained to be able to perform these functions. That's a delivery system issue.

The main point I'd say is that, because we were so late this time, we now can't stop variants from developing. Someone mentioned that earlier as well. We have to be now prepared for the fact that this is going to be a prolonged fight. After we are finished with this huge round, there are going to be more rounds. There will have to be booster shots, we may have to think about monoclonals, we have to think about fighting an endemic disease and making sure that we do it on a global and equitable basis. This is a consequence of having started far too late.

But if you asked me today, I think the supply chain is now reacting. If you look at the major mRNA producers as well as the others, the supply is coming onstream. It does require, we should have started this earlier, some global distribution of fill-and-finish facilities at the very least. Over time we'd like to go beyond fill-and-finish, but in a crisis fill-and-finish is still very doable. We're beginning to see that being put into place. I would just say, the critical issue today is simply just the volume of global supply, may be produced in Belgium or wherever, but we need that volume and that volume is now coming onstream.

**Michele Barry, Consortium of Universities for Global Health**

Tharman, can I ask you to just elaborate a little bit more about last-mile delivery and talk a little bit about... and there have been several questions in the chat about equity and allocation and how you would see this panel at all interfacing with that.

**Tharman Shanmugaratnam, HLIP Co-Chair**

The gap in delivery systems was not something that was being looked at very carefully. The gap in vaccine supply caught a lot of attention, and although very late in the day, is being redressed. Delivery systems, when we come down to it, had to do with first some purely technical issues, coaching, which many countries just didn't have the facility for, they didn't have the logistical capacity for. It's something that's doable, it just takes time. UNICEF and others are working hard at it; the World Bank, as well, is providing a good deal of funding. It requires trained manpower. We know from advanced cities and nations how this is done.

Quite a few people are being redeployed from one sector to another to be able to do this. They're not medically trained people, but it's something that someone can be trained for. Helping low-income countries and lower-middle-income countries train up their people quickly is still a critical task. It's not something that meets the newspaper headlines, but it's a critical task. So those two things logistics, some cold storage facilities, and training people up are really important.

The venues and the sites are context specific. In Singapore, for instance, a large part of our vaccination is not taking place in clinics and hospitals, it's taking place in what we call community clubs. Every constituency has a community club. It's an accessible place close to home, particularly for the elderly, and we train people up. We shifted in the cold refrigerators, I'm not sure if you call it a refrigerator, but all these cold facilities. And it's doable.

These are things that the World Bank, UNICEF and others are very helpful on, it's just that we started late.

**Jim Yong Kim, Global Infrastructure Partners**

Can I jump in for a second?

I just want to, and Tharman is still on my screen, so Tharman, you remember, I think it was January or February of 2013 when Japan announced a much more aggressive monetary policy. That was a very tense meeting, but we worked it out. The thing that came up, and it really taught me a lot about how multilateral systems work. Japan had announced a much more aggressive monetary policy, meaning that we were going to devalue their currency. The argument was, well are they just doing this to get a trade advantage? And there were many people in that room who were very angry about it. But I think you, Tharman, people like Mark Carney, just said, "Look if we walk out this door and talk about currency war, then you're going to see the global economy just plummet, and so everyone has to agree that, when we walk out

this door, we're not going to do it." I have to tell you that was just one moment when I thought, okay that's why we have these G20 meetings and some of them are endless. That's why we do this because there are moments in the in the life of the world when the 28 largest economies more or less plus a bunch of guests have to sit around a table and make some hard decisions to make sure that the global economy doesn't go over a cliff. I want to just emphasize how important it is that this is a G20, NAM, CUGH report. That's really important, because if you let it go and throw up a jump ball among all the multilaterals, you're going to get what you always get. That's our area, that's not our area, you should leave it to us, you should leave it to them.

Everyone has to answer to the G20 in some way. It's true that it doesn't have, other than South Africa, there are representation issues. But there has to be someone somewhere that says, okay, if we don't take any action the global economy is going to go over a cliff. And I have seen it work.

I wasn't there during the global financial crisis thing, but Tharman probably knows more than I do, but it worked then to. The extent to which we can put the issue of health and One Health, all those issues, and say if we don't address this, the global economy is going to fall over a cliff again, that's how decisions, I think, are actually made. I'm just being very honest as a person outside the system. Of course we should have more representation, et cetera, et cetera, et cetera, but the more you get, the more inaction you get. What I'm hoping for is that the G20 Finance Ministers, Central Bank Governors, and the G20 leaders will come together and say, "Oh my God, the economy could go over a cliff until we get everyone vaccinated. Oh my God." We've never done anything like that before, but that's what we need to do, and I think the starting point will be this report.

That's why I think this report, the next phases of it, would be very specific issues. How good is the Bank at doing conditional cash transfer programs? It's a kind of getting people ready on the ground. All the logistics issues, I think we can handle those. The thing that will be hard is, how do you get people to do certain things? You give them cash, and then they do certain things. Oh well, we've got experience doing that, and we can take that structure and you know provide financing for WHO, for others throughout the system. But it has to be from the perspective of if we don't do it, the global economy will take a crash again, there'll be more people in poverty. Nobody wants that. Everybody at G20 is motivated.

One final thing that I'm worried about. One way to get to two-thirds of the budget being assessed contributions, Tharman, is just to reduce all the nonassessed contributions. That could happen. What you'll hear is governments will say, yeah but you know, the legislative gave this to us, for female circumcision, and unless they're going to do that with it, we can't move it otherwise. It's going to be a major shift to get there, but I think there are other ways of bringing the WHO into helping with these, you know, financial intermediary facilities. There's ways to do that so that effectively, they have more power, they have more ability to act and more resources, without necessarily having to get into that argument. That's what I would worry about. They say, "Oh great, okay, so we'll just take out all the voluntary contributions and then you'll get to two thirds." This is an incredibly important initiative, because Tharman specifically,



because he's so respected among the G20 Finance Ministers and Central Bank Governors. If we can bring this to them saying, "If we don't do this folks, you're going to see another catastrophe, and they're going to be catastrophes over catastrophes. Listen to this report, engage, and let's figure out how to protect the global economy through investing in health."

**Michele Barry, Consortium of Universities for Global Health**

Thank you, Jim, and thank you for that urgent call.

I'm conscious of time. I'm going to turn this over to Keith Martin, who's the Executive Director of CUGH, to make some final comments. Keith.

**Keith Martin, Executive Director, Consortium of Universities for Global Health**

Thanks so much, Michele. I think all of us watching were really taken by the challenge that all of you put forth through this superb report.

What I wanted to do is really answer the question or put it on the table is, what's next? How do we take this superb report and breathe life into it in the current political environment that we have right now.

We know we have a challenge to fill four gaps. Let's take a look at a few of the key points. One is the issue course of governance and how do we integrate the financial component with the technical component, which is going to be critically important to be able to deliver the type of outcomes that have been called for within this within this report.

On the governance side central to this report, we'll strengthen the WHO. It calls for the increase of funding for the WHO, but also to increase the structure of the funding from 20% of its assessed funds right now to 66%. Those calls have been on the table for a long time, but we cannot wait any longer to be able to empower the WHO to have the resources it needs to be able to deliver the work that it is doing.

Three other reforms that would be essential this time. One is to have a permanent Executive Board within the WHO in Geneva that can actually execute the fiduciary oversight responsibilities that member states have to be able to ensure the WHO is doing what it needs to do. Second, an independent Office of Evaluation answerable to the Executive Board will be able to also strengthen this. And an independent Data Board, because we know that data quality is essential to all of what we are doing, having that independent data board that can evaluate and respond publicly to report publicly is going to be critically important.

On the funding issue, Dr Glassman and others have mentioned, including Dr Kim, options for funding. The key for us, and we've seen this through this discussion, is how do we actually ensure that funding is actually assessed and not voluntary. Voluntary funding, as we know, is a setup for failure. It's too easy to game the system, it's too easy to get benefits without being

able to contribute, so we're going to have to figure out a way to be able to achieve that. Assessed contributions have to be done.

There is one frankly, and the IMF has spoken/reported eloquently about this, is that billions of dollars far beyond the \$75-\$50 billion called for in the report are actually sitting, illicit funds are sitting in the bank accounts, shell companies, and other investment vehicles in high-income countries. Those amounts dwarf the \$149 billion in ODA every year. Maybe we should actually put that on the table, because liberating those funds would actually enable a quick infusion of cash to be able to fund the recommendations in this.

On the capacity building side, let's look at what the gaps are right now. The global health security agenda, we know through the joint external evaluation, those gaps are identified, they are evaluated. Why don't we focus on that? That's low-hanging fruit in terms of the capacity building that aligns clearly with the objectives of preventing, detecting, and responding to future pandemics.

Finally, just strengthening includes not only Ministries of Health but also Ministries of Finance, Public Works, Legal Structures. To Dr Mazet's point, the One Health opportunity, strengthening animal health oversight, strengthening vet capacity, has co-benefits dealing with climate change, pandemic preventions, and also the biodiversity crisis. The biodiversity crisis and climate change—two existential threats that affect all of us.

Finally, we're siloed. This is an opportunity to break those silos down, to bridge gaps, and maybe this is our chance, this report is a chance to be able to move forward to enable all of us to deliver the global public goods all of us need. Over to Dr Barry.

Thank you for joining us on behalf of CUGH.

**Michele Barry, Consortium of Universities for Global Health**

Thank you, Keith, and thank you to all the participants, all the commentators. Victor, do you want to say a few words to end also?

**Victor Dzau, National Academy of Medicine**

Obviously, I want to thank everyone for participating. Outstanding discussion, as I said. You know, we may not have another chance if we don't get this done. I'm just worried we go back to where we were, or where we are, if we don't get these things implemented. I know that Tharman, Amanda, myself, Larry Summers, and Ngozi Okonjo-Iweala are very committed to trying to move this forward. Thank you.