World Health Organization

COVID-19

Emergencies Coronavirus Press Conference
28 December 2020

Speaker key:

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QAK	Professor Quarraisha Abdool Karim
DB	Dr Dan Barouch
DH	Professor David Heymann
MK	Professor Marion Koopmans
MVK	Dr Maria Van Kerkhove
FK	Dr Frank Konings
AMR	Dr Ana Maria Henao Restrepo
MR	Dr Mike Ryan
MS	Dr Mariângela Simão
SS	Dr Soumya Swaminathan
BA	Dr Bruce Aylward
HB	Helen Branswell
KK	Kai Kupferschmidt
NL	Natasha Loder
LB	Latika Bourke
AA	Aaron

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TJ Hello to everyone from Geneva from WHO Headquarters. My name is Tarik, and I welcome you to the last Press Conference on COVID-19 in 2020. As always, we have a number of speakers here in the room, but also, we have some special guests whose names you have been able to see in our media advisory, and that Dr Tedros will introduce individually a little bit later.

For journalists on the line, we would like to remind you that we have a translation in six official languages, plus Portuguese and Hindi. And I would use the opportunity to thank our interpreters who are here with us again today.

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Here in the room, besides Dr Tedros, there is Dr Maria Van Kerkhove, technical lead on COVID-19. We have Dr Ana Maria Restrepo who works in the Department of Health Emergencies at the WHO. And we have Dr Bruce Aylward, who is a Special Advisor to the Director-General. We have other WHO experts online that I will introduce before we start with the questions and answers. With that, I'll give the floor to Dr Tedros for his opening remarks.

TAG Thank you. Thank you, Tarik. Good morning, good afternoon, and good evening. This week marks the one year anniversary since the WHO learned of cases of pneumonia with unknown cause via a bulletin issued by the health authorities in Wuhan and ProMED. We immediately set up an Incident Management structure to follow this development.

This is a moment for all of us to reflect on the toll the pandemic has taken, the progress we have made, the lessons we have learned, and what we need to do in the year ahead to end this pandemic. For the past year, the WHO and our partners have worked relentlessly to support all countries as they respond to the virus. Staff have worked around the clock to accelerate science, provide solutions on the ground, and build solidarity. Science is at the core of everything we do, and it has advanced at a blistering speed this year.

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If we rewind to the start of 2020, it was on 10 January that the WHO published its first comprehensive package of guidance documents for countries, covering topics related to the management of an outbreak of a new disease. The next day, the WHO received the full genetic sequences for the novel coronavirus from China.

By 13 January, the WHO published its first protocol for a diagnostic test by a WHO partner lab in Germany to detect the virus. By mid-January, our international technical expert networks were engaged and meeting by teleconference to share first-hand knowledge with the new, novel coronavirus and similar respiratory viruses such as MERS and SARS, and the WHO convened the Strategic and Technical Advisory Group for Infectious Hazards and the Global Alert and Response Network.

By the end of the month, 30 January, I declared a Public Health Emergency of International Concern, the WHO's highest level of alert under global health law. And by the start of February, the WHO was shipping diagnostic tests around the world so that countries could detect and respond effectively.

On 4th February, the WHO released the first global preparedness and response plan for COVID-19 based on the latest scientific evidence. At the same time, the WHO was connecting scientists, funders, and manufacturers from across the globe together to accelerate research on tests, therapeutics, and vaccines.

In mid-February, the WHO's long-standing Research and Development Blueprint Group brought hundreds of experts from more than 40 countries together to plot out a COVID research roadmap. This was based on years of work on other infectious diseases, including SARS, MERS, and Ebola.

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The roadmap subsequently developed covered all technical areas, from the animal-human interface through to the development of vaccines, and was set up to ensure maximum coordination and collaboration as the world tested, trialled, and rolled out new health tools.

This included the Solidarity Trial, an international clinical trial that generated robust data quickly to determine the most effective treatments. And by March, the WHO was planning the Access to COVID-19 Tools Accelerator, which was launched with partners in April.

The ACT-Accelerator is a historic collaboration to further hasten the development, production, and equitable access to vaccines, diagnostics, and therapeutics for COVID-19 as part of an overarching endgame strategy. And it has worked. Good news came in June, as initial clinical trial results from the UK showed dexamethasone, a corticosteroid, could be life-saving for patients severely ill with COVID-19.

By September, new antigen-based rapid tests had been validated, and the diagnostic pillar of the ACT-Accelerator had secured millions of them for low- and middle-income countries. And then, the shot that rang out around the world was the release of positive vaccine news from multiple candidates, which are now being rolled out to vulnerable groups.

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New ground has been broken, not least with the extraordinary cooperation between the private and public sector in this pandemic. And in recent weeks, safe and effective vaccine rollout has started in a number of countries, which is an incredible scientific achievement. This is fantastic. But the WHO will not rest until those in need everywhere, in all countries, have access to the new vaccines and are protected.

Throughout the pandemic, we have released and updated technical guidance and trainings based on the latest science and best practice from countries. We have then disseminated it through all our channels, including more than 130 press briefings like this one. And our regional and country offices have kept local populations up to date.

We have worked with thousands of brilliant scientists from around the world to build global solidarity, engaging with our critics, and calling repeatedly for all stakeholders to quarantine any politicisation of the pandemic and focus on what really matters, accelerating science to save lives and end this pandemic.

We learn something new every single day, sometimes good, sometimes challenging, sometimes downright surprising, but all helpful. There will be setbacks and new challenges in the year ahead, for example, new variants of COVID-19, and helping people who are tired of the pandemic continue to combat it.

At present, we are working closely with scientists all over the world to better understand any and all changes to the virus, and how these changes affect its ability to spread or make people sick, or any potential impact on available tests, treatments, and vaccines.

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Specifically, we're working with scientists in the UK and South Africa who are carrying out epidemiologic and lab studies which will guide next steps. Science drives our actions. And I would like to thank both those countries for testing and tracking new variants, and underscore the importance of increasing genomic sequencing capacity worldwide.

This means the prompt sharing of epidemiological, virological, and full genome sequence information with the WHO and other countries and research teams, including to open-source platforms such as GISAID and others. Only if countries are looking and testing effectively will you be able to pick up variants and adjust strategies to cope. We must ensure that countries are not punished for transparently sharing new scientific findings.

I'm so humble to work with scientists, epidemiologists, and public health experts in the WHO and around the world. And today, I'm joined by four of the best to look back and look forward. First, Professor Quarraisha Abdool Karim from the Centre for the AIDS Programme of Research in South Africa. Professor, you have the floor.

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QAK Thank you very much, Dr Tedros. It's a real honour and privilege to be part of this first anniversary, on the one hand, celebrating much achievements, but also to reflect on a year and to think, as we move forward. We've not been reminded more about our interdependence as individuals, as countries, as governments, as scientists, and it is this interdependence and the unity of purpose that has enabled us to achieve so much.

I'm going to spend the next few minutes focused on the WHO Solidarity Trial for therapeutics. And I think it marks and highlights a very, very important advance in the State of Disaster, amazingly, within literally two months of the announcement that we're dealing with a pandemic, to launch a trial that finally included over 30 countries, over 500 hospitals and 12,000 hospitalised patients, all with the single purpose of how do we save lives, how do we reduce invasive ventilation processes, and how do we reduce hospital stays?

I don't think any of us needs to be reminded of the devastation that faced us in terms of the lives that were being lost, even in the face of uncertainty. And while it's traditional to undertake small randomised controlled trials to produce compelling evidence, what was done through this scientific consortium, consortium with hospitals and thousands of collaborators across the globe, was to establish a very important platform that was able to simultaneously evaluate four drugs, hydroxychloroquine, lopinavir, remdesivir, and interferon derivatives.

And to be able to do this within a six-month period, enrolling the number of patients that we have, and come up with an answer that's relevant, not just

for one country or two countries but for global accountability and use, is truly unparalleled.

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And while the first four repurposed antivirals showed very little benefit for those hospitalised patients in terms of survival, hospital stay, or in terms of assisted breathing, what it did demonstrate with these four drugs, particularly lopinavir and hydroxychloroquine, was compelling evidence that they had no benefit. And that's as important as the finding of dexamethasone, that was demonstrated in the RECOVERY trial to show 30% benefit in hospitalised patients in terms of survival.

Now, what we've also learned, and that may not have headline news, is a range of non-invasive techniques to enhance ventilation in hospitalisation patients. We've also learned a whole lot about disease progression and the importance of the viraemic stage, the importance of the cytokine storm.

But also, as much as we've learned from those who've recovered in terms of informing vaccine development, what we're also learning about is those who are the long-haul COVID patients, who continue to... While they're not infectious, have taught us so much more about this challenge.

What is impressive, even though we have so much more to learn about new therapeutic interventions, and we'll be evaluating monoclonal antibodies in the new year, hopefully more specific antiviral agents, is that we learn as much from the patients that are being cared for by first responders at hospitals, at the coalface, that despite our promotion of non-pharmaceutical interventions, we still have our hospitals quite inundated in the second wave. We're seeing a number of cases.

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So, how do we move forward? I think the rapid diagnostics is going to help us in terms of rapid identification of individuals, reducing the time for diagnosis. The numbers will enable us also to look at how do we more rapidly identify contacts of those who've been infected, and so that will also fuel the public health response.

We need more than the vaccines we already have to offer the world a safer and better place, and to minimise and mitigate against deaths. So, the vaccines, new therapeutics, new diagnostic tools are all what we can look forward to. And the learnings from those who've got infected, those who've recovered, and from those who have not recovered all teach us important lessons as we move forward. Thank you very much.

TAG Thank you. Thank you so much, Professor Abdool Karim, for those reflections. And now to Dr Dan Barouch from the Center for Virology and Vaccine Research, Beth Israel Deaconess Medical Center, in Boston, US. Dr Barouch, the floor is yours.

DB Thank you very much, Dr Tedros. As I look back and reflect on the past surreal year, I think it really falls into the category of much accomplished and much to do. The response of the global scientific community to this pandemic has been extraordinary and unprecedented in terms of the speed

and precision of understanding the virus and investigating methods to combat it.

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But equally unprecedented is the extent of collaboration, and essentially the global scientific community redefining how we do science. And I think the importance of science and the value of science to this pandemic is unprecedented, where science forms the foundation of virtually all of the interventions that we're talking about today.

Early in February, I had the privilege of joining the WHO Working Group for Animal Models, and I've also participated in the other Working Groups on assays and other topics. These have been international collaborations of hundreds of scientists from all around the world, with open sharing of data and results, often data generated in the past few days before a given teleconference.

Certainly from an animal model perspective, scientists from all around the world started sharing data in early February of this year in the development of both small and large animal models. And I think I can confidently say that research in every single person's group has been accelerated by the openness of sharing of data.

I think a key scientific advance has been the coordinated testing of therapeutics and vaccines in both animal models and clinical trials. Also, these models, the human and the animal models, being the underpinning of understanding the pathogenesis of this virus.

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In many cases, the results from animal models accurately reflected results that were seen in clinical trials. And I think the coordinated testing and, in many cases, simultaneous testing of interventions, in both an interventional animal model as well as large-scale clinical trials, has really led to the acceleration of vaccines and drugs.

The development of safe and effective vaccines offers some of the best hope to end this pandemic. But of course, the vaccines have to be more than safe and effective. They have to be available, they have to be affordable, they have to be deployable, and they actually have to be used globally. So, I think that in terms of the pandemic, the immediate future remains extremely concerning, with cases at the highest levels and deaths at the highest levels.

But the mid-term and the long-term future I believe is bright, with the development of multiple, and probably even more coming up, safe and effective vaccines, therapeutics, public health interventions that often originate by collaborations amongst physicians, scientists, and other stakeholders.

So, I believe in future years, when historians look back on this pandemic, then the value and importance of science in helping to guide the solution and end this pandemic will be clear. Thank you very much.

TAG Thank you. Thank you so much, Dr Barouch, for sharing those thoughts. And now my friend, Professor David Heymann, from the London

School of Hygiene and Tropical Medicine, and Chair of the WHO STAG-IH. Professor, and my friend David, you have the floor.

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DH Thanks very much, Dr Tedros. This year, I've had the privilege of chairing the STAG-IH, as you said, and this has been quite an experience for me. We've had a total of 55 to our Zoom meetings with Mike, Maria, and other leaders of the Emergencies programme.

Despite their busy schedules, they've attended these meetings since January 10th, when the STAG-IH first discussed the report from China with the WHO Secretariat. At our meetings, we've heard from countries, from businesses, from researchers, and from many other groups around the world who have freely shared their information with us.

And because of this, and because of the rapidity with which manuscripts have been peer reviewed and placed in front of paywalls, the WHO has rapidly gained and shared understanding about SARS Coronavirus and its epidemiology, despite the political tensions that have occurred and despite some of the criticisms that have been levelled at the Secretariat, which has continued to work and use the evidence to provide evidence-based recommendations.

As this difficult year ends, we know much. We know that early in sustained outbreak detection, with isolation and management of those with infection and locally managed contact tracing and self-isolation, we can decrease community spread.

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Early on, we learned that this SARS Coronavirus 2 does not always transmit directly into communities, as does influenza. It stops off in discrete outbreaks. And these outbreaks can be contained, even if they involve large numbers of persons.

Outbreak investigation, when these discrete outbreaks are detected early, especially in new areas where previous outbreaks have not occurred, often permits identification of where transmission is occurring, permitting targeted shutdown of transmission while avoiding general lockdowns.

Asia has led the way in this and shown that it's not necessary to lock down entire communities, that you can lock down and target resources where transmission has been occurring, and prevent the rest of the economy to continue to move forward.

We've also seen that strategic testing with clear objectives and rapid availability of results permits timely isolation and management of persons with infection. Newly-developed diagnostic tests, when properly evaluated and used in testing strategies, add benefit to testing strategies where PCR is not available or where results are delayed because of logistics.

Empowering populations with clear and consistent communication has also been shown to be essential, so that people understand how to protect themselves and others while doing their own risk assessment. And this is especially important at times when families get together and transmission in

the community is high. Personal risk assessment is the fundamental base of this pandemic response.

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Close monitoring of health systems is essential, requiring contingency plans for patient support in order to maintain and save lives. And sustained mitigation, such as prohibiting public gatherings and requiring mask-wearing in closed spaces where physically distancing is not impossible, is essential.

We've also seen and just heard that research and development has been sustained. And the challenge is now to make sure that new mechanisms, such as the ACT-Accelerator and the COVAX Facility, are supported in order to ensure equitable distribution of vaccines, therapeutics, and diagnostic tests.

Dr Tedros, I'd just like to close by saying that the world has hope for herd immunity, that somehow transmission would be decreased if enough persons were immune. This concept has been widely misunderstood and still cannot be predicted because of our lack of understanding of immunity and its duration.

It appears at present that the destiny of SARS Coronavirus 2 is to become endemic, as have four other human coronaviruses, and that it will continue to mutate as it reproduces in human cells, especially in areas of more intense transmission. But its final destiny is not yet known. Fortunately, we have tools to save lives, and these, in combination with good public health, as outlined before, will permit us to learn to live with COVID-19. Thank you very much, Dr Tedros.

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TAG Thank you. Thank you so much, Professor Heymann. And now, Professor Marion Koopmans, who is Head of the Department of Viroscience at Erasmus, in the Netherlands. Professor, you have the floor.

MK Thank you, Dr Tedros, and thank you very much for this invitation. I'm very honoured by that. So, if I look back on this year, it's a year scientifically with very mixed emotions, coming to realise just how challenging research during an evolving pandemic is, how humbling, but also how exciting it is. And to me, there's a critical phrase, no one is the expert when it comes to an emerging disease outbreak and we all need to collaborate to build the ship while sailing.

So, for me, some of the exciting points that I would like to highlight are examples where this bridge between scientific fields has been built, starting with the initial discovery work by our colleagues in China, who, if you come to look at it, really did a stellar job in pinpointing the course of this outbreak in a very short period of time, combining virus discovery toolbox with classical clinical virology and immunology to provide very convincing proof of this aetiology.

The second element has been mentioned already, but it's just the unprecedented... The entry of pathogen genomics in our everyday life. Super exciting. It had already become standard, I would say, in outbreak investigations in, for instance, Ebola and Zika. But now, the rollout across the

globe, with great contributions in Africa, in South America, really across the world, has been exciting.

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Also challenging. Because what you see is the bridge needs to be built between the people understanding pathogen genomics, understanding data analytics, but bridging that with the basic virology that wants to, and needs to, look at what all the mutations mean, and how we need to work with that to anticipate the future of the pandemic.

Then, a key and exciting development, I think, is just how important diagnostics have been. I've been laughed at because I say the word diagnostics at every meeting. And I think what we've seen is just how critical a lab preparedness pillar is beyond assay development, because we really need critical thinking and collaborations to understand what these assays do.

How do you know if someone is infectious? How do you measure that? Which tests or combinations do you use to really support the public health actions? All of those. And we've seen new collaborations between clinical labs, public health labs, screening laboratories, epidemiology, and what have you.

Then, breakthroughs from pathogenesis work, with animal studies but also clinical studies and the deeper laboratory work behind that, that has shown that this disease has two key pathogenic mechanisms. The one that we already understood, the exaggerated immune response, but the second one, the coagulopathy, which really led to the realisation that we need additional treatments.

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And then finally, I think totally amazing, the many years of basic research in virology, oncology, immunology, biotechnology that brought us a totally novel way of vaccination, the mRNA vaccines with their... They seem to live up to the promise, and we are where we are because of that foundation. So, all of that, I think, is exciting, also humbling, because there's never enough, and this pandemic keeps evolving and it's far from over.

So my key areas of attention for the near future are that we really should prepare for how this virus evolves. There are the development of pockets of people with increased immunity, whether through outbreaks or vaccination programmes. There is the risk of passage to animals that we have seen that may put pressure on the virus. And we should not worry about that, but prepare for understanding, assessing what those variants and changes mean, and how we need to respond to them.

Finally, I think it's critical that we hopefully by the end of this year can quiet down a bit, but then start thinking about the future. What else is out there? What can we learn from this whole pandemic in building preparedness for the next disease X, and particularly what else is out there. Can we develop better prediction and early warning tools so that the response tools that are in place, that have worked fantastically, maybe will become less necessary? And with that, I think that's my take on the next year.

TAG Thank you. Thank you so much, Professor Koopmans, for such a wonderful wrap-up. I would like to thank again Professor Abdool Karim,

Professor Barouch, Professor Heymann, and Professor Koopmans. Thank you so much for your amazing presentations.

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And amazing to think of what has been achieved in the last year, and to consider what we can achieve in the year ahead. As the year closes, and people around the world raise a toast to mark both the passing of the year and the dawn of a new one, let me raise a toast to science. May we share its results, especially the vaccines, fairly and equitably in the year ahead, and together end this pandemic. Happy New Year. And I thank you.

Before I hand over for questions, I also want to thank the ACT Accelerator partners, GOARN partners, the Emergency Medical Team movement, member States, collaborating centres, advisory groups, and expert networks for working with us. The WHO is lucky to have you and work with you.

None of us can end the pandemic by ourselves. But together, we will end this pandemic. And thanks to each and every journalist tuning in to our briefings and relaying science to people around the world. With that, thank you again. And Tarik, you have the floor.

TJ Thank you very much, Dr Tedros, and many thanks to our honourable guests. I hope our guests will stay with us. And if you would wish at any moment to complete some answer, just unmute yourself for us. That will be the sign that you would like to complete the answer or take the floor. As Dr Tedros said, maybe on behalf of the department of Communications, I would like also to thank all the journalists who were following us throughout this year, and to wish happy New Year to everyone.

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Besides our experts in the room, and our special guests that we just heard from, we also have on the line Dr Mike Ryan, who is our Executive Director of Health Emergencies. We have Dr Mariângela Simão, who is Assistant Director General for Access to Medicine.

We have Dr Soumya Swaminathan, WHO Chief Scientist. And we also have Frank Konings, who is our lab expert, who may intervene at some point and answer some questions, if needed. With that, we will start with questions. And I'm very much happy to hear from Helen Branswell from Stats.

HB Hi.

TJ Helen, if you could unmute yourself. Hi, Helen.

HB Hi. Thanks very much, Tarik, and hello to you all. I was hoping we could get a bit of an update on the variants from the UK and South Africa. Any kind of information about what functional changes are being seen as a consequence of these new viruses? And also, if I could tag onto that, is there any thought that mutations could actually completely erode the efficacy of the current vaccines? Is that possible, given that they target the spike? Is it more likely that they might just lessen the effect of the vaccine? Thank you.

MVK Hi, Helen. Thanks very much for the question. I'm going to begin, and then others will definitely contribute to this, because this is a big question, two big questions that you've just asked us. So, as the Director-General has just

said, we continue to work with scientists all over the world that are tracking mutations and changes in the virus. And as you know, changes are normal, changes are expected, and the more this virus circulates, the more opportunities it has to change.

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Most of the mutations that are identified, have little effect on the virus itself in terms of its behaviour, in terms of its transmission and severity that it causes. But each of these mutations that are identified need to be evaluated properly through our global lab network that was established in January.

We have a specific Working Group around virus evolution that is tracking these mutations. It's a group of scientists and geneticists, phylogenetics, people with specialties in different types of laboratory studies, links with FAO and OIE, and broader links to different technical expert groups on animal models, on vaccines, on diagnostics, so that we make sure that there is an appropriate process to evaluate each of these mutations.

So, this Virus Evolution Working Group meets regularly and discusses the variants, the mutations that are identified as they are identified, and importantly, looking at which ones are important and why. And I mention this because, as the virus changes, not all of these mutations are important, so it's important that we look at why certain ones are.

With regards to the UK and in South Africa, these are two separate virus variants that have emerged at the same time. They're different. They both have the 501Y mutation, which is a mutation in the spike protein. But they're different viruses. They're different variants. We're working with both countries. We have daily calls with our colleagues in the UK. And they are continuing to do studies looking at the epidemiology, looking at transmission characteristics, looking at the severity.

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We had a call with them today and they're releasing a report, it's likely online already, of a case-control study that they looked at in terms of severity, where they found no significant differences in hospital admissions and case fatality at 28 days, and the occurrence of reinfections among those who were infected with this variant and those who were infected with other wild-type viruses. So that is something that we've learned of recently.

They will continue to do the laboratory studies, which, again, are happening as we speak. There are labs that have been working over the holiday period to study the neutralisation, the antibody response, based on this variant. And those studies haven't yet been completed.

Separately, in South Africa, again, we're very grateful for the work that's ongoing in South Africa. They are growing the virus, and this is part of the process to be able to have a virus to conduct studies. They're in the process of growing the virus, and they will be doing neutralisation studies as well. They're also looking at the epidemiology of this variant in South Africa to determine if there are any changes in transmissibility of that variant as well.

But again, I just want to point out that as we go on with this pandemic, more variants, more mutations will be identified. We have people, we have groups

who are linked together. There's a process in place to make sure that the appropriate laboratory studies are being done.

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And it's important to note that these laboratory studies take time. We expect to have results of further lab studies in both the UK and in South Africa in the coming days and the coming weeks. And we're very grateful for those studies to be done.

Dr Frank Konings is online, who is the lead for our Virus Evolution Working Group, who can give some more specifics on the virus studies that are going to be done, so if that I could pass to Frank. And then, Dr Ana Maria is here, who can also mention specific work looking at the vaccines. So, Frank, can I hand to you, please?

FK Yes. Thank you very much, Helen, for that question. And it's a really important one. We know that we can learn a lot by sequencing the virus, like, for example, geographic spread and the detection of these variants. But in addition to sequencing, as you already hinted at, it's important to obtain these live variant viruses from clinical specimens. We call that virus isolation.

And once we have these virus isolates, in the laboratory, this will allow us to really better investigate how the variant interacts with human lung cells, for example, how it binds to it, how it enters the cells, and how it replicates or makes more copies of itself.

As Maria mentioned, it's also important, once we have the live virus or these isolates, that we can study how the antibodies interact with this variant and learn about the impact of these changes, for example, on vaccine efficacy. So, it takes time. You need to isolate the virus. You need to grow it in sufficient quantities. You need to run the experiments. You need to analyse and interpret it. So, that takes some time, a couple of weeks, most of the time.

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This is happening in the UK and South Africa. This is ongoing, in close collaboration with scientists from all over the world. And we'll keep you updated as new information becomes available. And my colleague, Ana Maria, will be able to answer your question related to changes and vaccine efficacy.

AMR Thank you very much, Frank. So, just to add to Maria and Frank, the WHO has activated groups of experts that are helping us to look into this. So, Professor Dan Barouch, who is on the call, is part of our Animal Models group. We have teleconferences to discuss what kind of studies could be helpful among animal models, to evaluate the potential effects that these variants will have in vaccine efficacy.

And as Maria says, we need to understand that we will have events like this in the future, but it doesn't mean, automatically, that we have to reconsider the efficacy of vaccines. We have to develop an approach that will help us, again and again, to evaluate.

In addition, we have discussions with our expert clinical trials and methodologies group, and we have looked into the possibilities of adding additional questions and explorations to the vaccine trials already ongoing,

and also how to prepare observational studies that could be considered during the rollout. And in fact, we know that some of our members states are indeed preparing for such observational studies, to be able to document, if they occur, any variations of efficacy over time and among the different strengths.

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Finally, we are also looking into the laboratory and the assays. And as Maria says, we are planning to have a broader consultation with all the experts from the different groups early in the year, with the aim, again, not to address only the questions this time, but to create the approaches that will allow us, globally, to address the emergence of new variants in the future.

TJ Many thanks, Dr Restrepo, as well as Frank and Maria. I think that Marion Koopmans would like to add something. Marion?

MK Yes, just a few points in this. I think this is a critical area where we have to learn how to get up to speed with our laboratory evaluation of mutations and variants with the sequencing, because we will see many more examples of this. And we have seen several examples.

Just in the past months, we have discussed variants arising following passage through mink in Denmark and in the Netherlands that also had mutations of some concern, but not to the degree that we're currently discussing. So, that package of combined genomic data analytics and pharmacological data analytics is going to be part of our critical toolbox that we need to be developing.

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There is some information that was published by the Public Health England group on the new variant that showed that, on average, and you have to look at that with caution, but on average, it appears like people infected with the new variant in the UK have a somewhat higher viral load, which could be one little piece of the explanation why this variant would lead to more transmission.

TJ Thank you very much, Professor Koopmans. Let's go to the next question. We have Kai Kupferschmidt with us. Kai.

KK Thanks. Thanks a lot, Tarik, and thanks to all of you. I wanted to follow on, as so often, from what Helen said. One of the things that I would argue that we've learned in the last year, or where the consensus has shifted scientifically a little bit, is the question of travel restrictions and how useful they are or whether they should be used or not. Now, obviously, with the new variants, they have been deployed again, even though there's a lot of uncertainty about these variants.

And I'd just like to understand how the WHO is thinking about these travel restrictions, whether you have a clear position on it and whether that position is different essentially from what the position would have been a year ago, when all of this started.

And if I may, just because this is related, David Heymann said earlier, we've learned that we don't need the broad shutdowns if we shut down the right

sectors of society early on, and stop the outbreaks. I'm just curious, and this is asking what Marion was already asking him, how David thinks about the situation in the UK and what should be done there, given what he said earlier.

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TJ Thank you very much, Kai. So, let's hear from Professor David Heymann.

DH Thanks very much, Kai. Yes, it's a big question as to whether or not travel should be restricted in this situation. But I think what we must do is look at the natural history of virus in general. And they mutate. The RNA viruses tend to mutate, and they continue to mutate, especially in areas where there's intense transmission. So, rather than spending a lot of time blocking borders, it might be more important to try to decrease transmission using basic epidemiological tools, and shut down where transmission is known to be occurring.

I know that in South Africa, they feel that transmission may have been occurring of this new variant at the end of school when there were many school parties. I think, in various parts of the UK, it's understood that it may have been transmitting when young people got together, and increased the intensity of transmission.

So, I'm not going to talk about border closing. That's a country's decision. And as we've seen, countries prefer to do their own risk assessments, using the information that's widely available, rather than listening to what the WHO has recommended for travel in the past.

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So, countries will have to sort this out with the WHO, with the International Health Regulations, a treaty to which they all adhere, as time goes forward. And there is a group that's studying whether or not the IHR need to be, in any way, reinterpreted or modified.

But what's clear is that the Director-General has given a high alert that this is an important virus, countries should be paying attention. And what we need to understand, just like the number of cases reported from the WHO, is that countries can only report what they're testing.

And in the UK, as we all know, there's a great amount of genomic testing, some of the most per-capita genomic testing in the world, genomic sequencing, and therefore, they are able to detect these changes very rapidly. Other countries are now detecting them and, of course, the blame will shift. Where did it come from? Where is it going? But that's not important. What's important today is that we're all in this together and we need to work on it together. I hope that's answered some of your questions, Kai.

TJ Many thanks, Professor Heymann. Maria?

MVK Yes, thanks. I'm not sure if Mike wants to come in as well. But just to say from the WHO perspective, in terms of our guidance on travel restrictions, what we recommend are for countries, these are national decisions, to take a risk-based approach to this, because it so much depends on how this virus is

spreading, where this virus is spreading, and the risks that are associated with your everyday actions, which include travel.

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And so we've outlined the considerations that countries need to take into account when taking these decisions. It's not a simple yes or no answer. It's not a simple all travel, no travel. There are considerations that are in place, not only to manage the travel itself, whether this is on a train or a plane, but the entire process from when you leave your house to when you arrive at your destination.

There's no zero risk right now because this virus is spreading and we know we're all at risk at the moment. But as David has just said, and as the Director-General and Mike and I have been saying for quite some time now, it's about the tools that we have to reduce transmission. We have to.

These variants, if we didn't have a wake-up call before, we have an even further wake-up call about these mutations. You've heard everyone here say that these mutations will continue to happen, and we need even more resolve. I know everyone is tired. I know that we're all kind of fed up with this and we want this to be over. But this should push us even further, to have even more resolve to end this pandemic.

Vaccines and vaccinations are coming on-line. This is another incredibly powerful tool. We cannot lose this battle now. We are all in this together, as David has just said, as you've heard us say over and over again, and we need to put in the work to reduce transmission everywhere we can.

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With these variants, what I didn't say in my previous answer is that in the variants that we have seen in South Africa and we have seen in the UK, as well as the Cluster 5 variant that was identified in Denmark, and other variants that have been detected over time, the D614G mutation that was first identified at the end of January and early February and replaced the circulating viruses by June, all of these viruses, these SARS-CoV-2 viruses, can be controlled with the measures that we have in place, with adherence to the measures that we have, with the tools that we have in our toolbox. And vaccines are another powerful tool that will help us end this.

We really need to focus on adhering to the measures that are put in place around us, and sticking to it, hanging in there as much as we can. And for those of us who are able to work from home and stay at home, we reduce the opportunity for the virus to spread, which reduces burden on health systems, and this breaks chains of transmission. So it's important that all of us play our part, all of us do what we can to reduce the spread, because all of this gets us one step closer to ending the pandemic.

TJ Dr Ryan, would you like to add something?

MR Yes, Tarik. Can you hear me?

TJ Very well. Please.

MR Great. Well, thanks, and following on from what David said and what also Maria has said, the reality is that countries like the UK and South Africa

have been doing systematic surveillance and systematic genetic sequencing. And it's really important that we keep that open approach to collecting and sharing information and that countries are not unnecessarily punished for openness and transparency and for pursuing science.

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And the DG has said that pursuit of science is key to getting the solutions that we need. We have to balance those risks. As Maria has said, we've had the D614G and we've had the strains associated with the mink in Denmark. Some countries have put in precautionary measures until they can understand the variants better.

The WHO was always clear in saying that any restrictions on travel must be evidence-based, they must be time-limited, they must be focused. And from that perspective, the WHO is clear. We need to try and contain any virus, whatever the variant is, in situ. And shutting down countries with absolute measures is neither feasible in the world we live in, nor is it necessarily the most effective public health action to take.

It's really important that countries, transparent and open countries like South Africa and the UK, who pursue science on behalf of us all, are not unduly or unnecessarily punished for their openness and their pursuit of science.

TJ Thank you very much, Dr Ryan and Dr Van Kerkhove and Professor Heymann for this. We will now go to Natasha Loder from The Economist. Natasha.

NL Oh, hello. Yes, I'm hearing that... Oh, thanks for doing this, everyone, as well. I'm hearing the Astra vaccine is going to get approval soon in the UK. And I wondered if this approval is going to advance the international access of this vaccine.

00:54:27

And then just one other quick question for Dr Koopmans about her trip back to China. I wondered if she could give some thoughts on whether she feels an intermediate species is likely to be involved in the origins of this outbreak, or whether it was more likely directly between bats to humans. Thank you very much.

TJ Thank you very much, Natasha. We have two questions there. But as you don't join us very often, we will try to answer both. So, maybe on the first question on vaccines, Dr Simão, if Assistant Director-General is online, maybe you can take the first question on the vaccines. Dr Simão.

MS Thank you very much, and thank you, Natasha. But it's a very good question because we are hearing about the NHRA, which is the UK regulator, approving the first site of the AstraZeneca. Actually, the AstraZeneca and Oxford vaccine, it has eight different nodes. It's being manufactured and trialled in different countries.

So, we are expecting that... They also have submitted a core package of documents, of dossiers, to the WHO. We are expecting that each of these nodes will have to just test separately. And we know that the EMA is receiving the dossiers as well, and the WHO is expected to assess some of the nodes by

early February. And the WHO has already received the core package, is expecting to have the assessment also done by February.

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So, this is the state we are right now. We are hopeful with the data we have seen so far, but we still need to see the complete dossiers before issuing any Emergency Use Listing. It's also promising if it's approved by the UK regulatory agency, also because this is a vaccine that has the potential of largescale manufacturing. So this is good news for everyone if it comes true. Thank you. I'll stop here.

TJ Thank you very much, Dr Simão, on this. And then let's try to answer the second question that was asked specifically, and for Professor Koopmans to answer. Professor, please.

MK Yes, thank you. So, I really think it's too early to be anything more than speculative about this. I think it's... So, what we have seen is that the virus identified in Wuhan has a close relative in bats in the region, but there's clearly a lot of distance between those. And it's very well possible that there has been an intermediary path, either through low-level circulation among people or through another species.

And we are starting to see an expanding range of animals that are susceptible to this virus. We have seen that in mink, in other fur animals. We have seen that experimentally. We've seen it in dogs and cats. So, at this stage, what I think we need is a very open mind when trying to step back into the events that led eventually to this pandemic. I hope that answers some of your question.

00:58:16

NL Thank you.

TJ Thank you very much, Professor Koopmans. Let's try to take a couple more questions, although we are already nearing the hour marker. Let's go to Sydney Morning Herald, and we have Latika Bourke with us. Latika?

LB Thank you so much. Thank you for being with us today, and for taking these questions. I'm particularly interested in your views on how you think the vaccine will work in the context of elimination, because countries in my home patch, of course, in the Asia-Pacific, have done very well and kept community transmission rates very low, to the point where some have eliminated.

But what does that mean for in the long-term, where people are vaccinated overseas? Does that ensure that they are not a risk, traveling to countries that have almost zero community transmission? Or do you think that people who have been vaccinated will still need to quarantine if they're going to countries that have low transmission?

TJ That's an excellent question, Latika. Thank you very much for that. I'll ask Dr Swaminathan if she can answer this question. Dr Swaminathan.

SS Thank you. And others might want to add, but I think that's a really important question. And I think, Latika, what we're learning now, and we continue to wait for more results from the vaccine trials, is to really understand if these vaccines, apart from preventing symptomatic disease and

severe disease and deaths, whether they're also going to reduce infections, or prevent people from getting infected with the virus, prevent them from passing it on or transmitting it to other people.

01:00:03

At the moment, I don't believe we have the evidence on any of the vaccines to be confident that it's going to prevent people from actually getting the infection and therefore being able to pass it on. So, I think until we know more, we need to assume that people who have been vaccinated also need to take the same precautions until there is a certain level of herd immunity, of course, that's been built in the population. So, again, this is a dynamic and evolving field, and I think our understanding and our recommendations will change as we get more follow-up data from these trials. Thanks. Others might want to add.

TJ Thank you very much, Dr Swaminathan. Dr Ryan?

MR No, I agree with Soumya's points there. And I think it's important that we also reflect on that the main objective of the vaccine and the first rollout will be to prevent severe illness, to prevent deaths, to protect frontline health workers, and to protect the most vulnerable people in our society.

And we would hope that that protection is offered to health workers and vulnerable people all around the world. So the first and primary objective is to decrease the impact that this disease is having on people's lives. And therefore, that will be a major step forward in bringing the world back to some kind of normal.

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The second phase is then looking at how will this vaccine affect transmission. And Soumya is right. We just don't know enough yet about length of protection and other things to be absolutely able to predict that. But I think we should be able to get good control of the virus.

A decision then to move towards elimination or eradication of the virus requires a much higher degree of efficiency and effectiveness in a vaccination programme and all of the other control measures. And we still don't know, based on virus evolution, based on so many other things.

The likely scenario is the virus will become, as David Heymann said previously, another endemic virus, a virus that will remain somewhat of a threat, but a very low-level threat in the context of an effective global vaccination programme. We will have to... It remains to be seen how well the vaccines are taken up, how close we get to a coverage level that might allow us the opportunity to go for elimination or eradication.

We've seen this with polio. We've seen this with measles. So, Bruce and others online, Ana Maria and others who have a lot of experience with measles and polio may be able to speak about this. The existence of a vaccine, even at high efficacy, is no guarantee of eliminating or eradicating an infectious disease. That is a very high bar for us to be able to get over.

First and foremost, we have to focus on saving lives, getting good control on this epidemic so our societies can return to normal, and then we will deal with

the moon-shot of potentially being able to eliminate or eradicate this virus. But at this point, based on the tools we have and the knowledge we have, that's impossible to say at this moment.

01:03:11

TJ Thank you very much Dr Swaminathan and Dr Ryan. Let's try to take one more question. And that will be from Israeli Public Radio, KAN, and we have Aaron with us. Can you please unmute yourself?

AA Sure. Can you hear me now?

TJ Yes. Please.

AA Perfect. I would like to ask to the Director-General. For the last press conference of 2020, I would like to ask, should a similar pandemic happen again, are we more prepared than we were last year to deal with it? And on a more personal than a professional note, how was your year in combating COVID? What are you taking from this year? Both questions are for the Director-General. And I would love to hear others comment on that.

TJ Thank you. Aaron, with this question, you're opening a big door. But...

MVK I get the nod from the DG. So, I will start, and I know others will want to come in. We all know it's been an incredibly challenging year. I think one of the things we've seen in countries at the start of this pandemic is countries that have had experience with similar pathogens have had this muscle memory.

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Those that have dealt with SARS coronavirus in 2003, those that have dealt with MERS coronavirus, those that have dealt with Ebola, and yellow fever, and measles, and polio, and so many other infectious pathogens, have a muscle memory and have had a trauma almost in dealing with these types of outbreaks, where they have used that experience to build a public health infrastructure.

Which have used this to build a community health workforce, which have used it to have trained health professionals at local levels, and building hospital facilities and clinics to be able to treat patients, and may not be the most high-income countries across the world, but using the resources, the people, the communities to the best of their abilities.

And in doing so, and having that trauma of previous outbreaks, knew immediately, when they heard our warnings early on in our first disease outbreak news on 5th January and the press conferences that we had after that, the declaration of the Public Health Emergency of International Concern release, outlined by the Director-General on 30th January, used that as a call to say this is something big, and using the muscle memory of those past outbreaks to get their systems, kick those systems in gear and, in doing so, act aggressively, act comprehensively, using an all-of-government, all-of-society approach, and really tackling this.

And I think that your question was about are we better prepared for the next one? I'm hopeful that, during this traumatic year that we've all had, that the

muscle memory that we have from this horrific event this year will propel us, and all of us, to build societies that are prepared for the next one.

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Using this to have a trained, protected workforce, to have community workers who can carry out contact tracing and cluster investigations, to have laboratory technicians who are trained on different types of platforms, using standard and robust technologies and innovative technologies that are coming online, making sure that we have communities that are engaged and informed and able to carry out the actions that will keep themselves safe, and again, using the solidarity that we've had across science.

So I, for one, am very hopeful that countries will use this as an opportunity to build back better. And that has to go beyond words. But countries right now, many countries, are seeing resurgence. And we're seeing some countries learn from each peak that they have had to do more, and to do better the next time as well. And I think that's a constant learning process. All of us can be better prepared, no matter what. And as you've heard many of our speakers say today, no one organisation, no one expert, no one expertise can handle this alone. We have to come together and do that.

So I think that we are learning. We will continue to learn. And I am hopeful that we will be better prepared for the next one. But we can't go from this pattern of urgency to neglect. And again, you've heard the Director-General say this many times. We need to really use this as an opportunity to make sure that we have the systems in place to be better prepared for the next one.

01:08:03

TJ Thank you very much, Dr Van Kerkhove. This will be the last question. So I'll give the floor first to Dr Ryan. And then also, we'll ask our guests if they want to add something. Just unmute yourself. And then, obviously, the last word will be with the Director-General. Dr Ryan.

MR I agree with what Maria has said. We are and have always been a learning organisation. And I think we've learned over the years that no one institution has all the capacity when it comes to dealing with these kinds of threats. What the WHO does and has done under the leadership of Dr Tedros is pull the world together around science solutions and has leveraged all of that capacity around the world.

So, therefore, I do think we're in a much better place. We're in a better place on behavioural science, clinical science, vaccine science, diagnostic science, so many other areas in terms of that. But we're also in a better place on things like supply chains and collective production of guidance and rapid dissemination of training and using the digital world in order to amplify what we do. We've got better at innovation. We got better at applying that innovation.

We're still not there yet on equity, and I'm sure the Director-General will speak to that. That's the final part of this that requires equitable distribution of all this knowledge and all this learning and all of these tools. But we are, in that sense, a learning organisation that so many people have contributed to.

And I will say one thing, and that may come as a shock to people, that this pandemic has been very severe. It's spread around the world extremely quickly and has affected every corner of this planet. But this is not necessarily the big one. This virus is very transmissible and it kills people, and it has deprived so many people of loved ones. But its current case fatality is reasonably low in comparison to other emerging diseases.

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This is a wake-up call. We are learning now how to do things better, how to do science better, how to do logistics better, how to do training better, how to do governance better, how to communicate better. We've developed a whole new science of infodemiology and advanced behavioural science in this way. So I think, from our perspective, the planet is fragile. We live in an increasingly complex global society. These threats will continue.

If there's one thing we need to take from this pandemic, with all of the tragedy and loss, is that we need to get our act together. We need to get ready for something that may even be more severe in future. In this, we must honour those we've lost by getting better at what we do every day.

TJ Thank you very much, Dr Ryan. The planet is fragile. Let's hear from Professor Koopmans. Professor?

MK Yes. I think I second that statement by Dr Mike Ryan, but particularly also that I think it's critical that we do a good lookback, once we have the time for that, to see what contributed to the successes and where could we have done better?

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I think we have seen how the foresight of some years ago to develop a focused programme prioritising pathogens, saying, these are out there, we need to make sure we have something on the shelf for that, and deciding that we needed new vaccine platforms that really can bring vaccines to the clinic or to patients, really at warp speed, that has paid off.

I think the same can be said for the development of clinical networks, clinical trial networks. That has paid off. So, they were there. They were prepared. The paperwork was in order. People were trained. That helps. And I think we can do a thorough review to see what else would be proper preparedness.

TJ Thank you very much, Professor Koopmans. Maybe Professor Heymann or Dr Abdool Karim would like to add something. Professor Heymann?

DH Thanks very much. I'll just add a few words. I think we've heard great optimism today from all the research in the way the world has pulled together to deal with this pandemic. And we're continuing to do that, moving forward. We've also heard reality.

And that reality, as Mike has just said, is that that virus will likely remain with us, endemic in the future. And no matter what we've done to date, it will continue to spread, despite vaccines, despite therapeutics, despite diagnostic tests. We have to learn to live with this and use the tools that we can in the best way possible.

And it reminds me of the end of smallpox in 1980. In 1980, smallpox was eradicated using a vaccine which was imperfect. That vaccine actually killed one per million persons vaccinated. It was not a safe vaccine. But the risk assessment said, let's get rid of smallpox.

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It was eradicated, 1980, certified. 1984, a military recruit in the US was vaccinated with the smallpox vaccine. He actually was HIV-infected and not known to be infected. This was an AIDS defining event. And six months later, he died from AIDS. We used the tool that we had to the best advantage we could before 1980, not knowing that that window of opportunity would close to eradicate smallpox.

So we can't wait. We have to continue to move ahead with the tools we have, doing the best we can, understanding that this disease will likely either become endemic in humans, in some animal, or in both. So let's move ahead together, with the WHO leading us, as they've done through many outbreaks in the past.

TJ Thank you very much, Professor Heymann. Let's all move together. And before I give the floor to Dr Tedros, Quarraisha Abdool Karim, would you like to have some final words?

QAK Thank you very much. Yes. I think that we are reminded that there's no room for complacency. We have accomplished a lot. But even in addressing the SARS-CoV-2 epidemic, there is so much more that remains to be done before we can call it a day and success.

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It's also a useful time to reflect that we still continue to deal with the challenges of other pandemics that continue to face us, including HIV, TB, and malaria, as examples, that at the end of the day, the science and the scientific advances that we make is just the first step, that it is up to us as individuals at the end on how we use that science, and that what we do for ourselves and for others at the end of the day will define, do we reach eradication or not?

So, the world is becoming even more complex as we're dealing with multiple pandemics, with the likelihood of new and emerging pandemics while we're still struggling to come to terms with these. So, I just wanted to say that ultimately, we can't be complacent, even when we have a vaccine, even when we have a cure, because it takes more than that. That's just the first step towards ending pandemics and eradicating new challenges that face us. Thank you.

TJ Thank you very much. And indeed, we shouldn't be complacent. Dr Aylward would like to add something before we give a final word to Dr Tedros.

BA Thank you very much, Tarik. To the question, we are definitely better prepared. There's incredible awareness about pandemics now. There's incredible knowledge that's been built. The tools people have just spoken about, the networks and skills are at a whole different level than previously.

But this virus is telling us we are not prepared. We're still not prepared. As Mike said, and others, we're now into second and third waves of this virus,

and we're still not prepared to deal with and manage those. So, while we are better prepared, the real question is, are we prepared, and are we prepared for the next one? We're not fully prepared for this one, let alone the next one.

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The other thing is we're prepared for flu better than we were in the past. We're now better prepared for coronaviruses. But are we better prepared for the next pandemic? We don't know what the next pandemic is. We don't know what that next virus is. And it would be folly to say that we're fully prepared. There's still a lot. And if anything, at the end of 2020, we should be humbled by the fact that we will always be preparing for these viruses.

TJ Thank you very much, Dr Aylward. This will bring us to a final word from Dr Tedros. From my side, I wish you a Happy New Year. Dr Tedros.

TAG Yes, thank you. Thank you very much, Tarik. And thank you to all colleagues for your contribution, especially to this very, very important question. My role, I think, will be less because many of the things have been said by my colleagues. But it's very important, and I would like to reflect on this.

Are we better prepared? I think, in terms of awareness, I think we're now getting it. I think the world is now understanding the centrality of health the hard way. This is not news. People say health is wealth. And when health deteriorates, even at individual level, at personal, one person, then the rest also goes havoc with that. When you're not healthy, the only thing you ask for is to get your health back. It's when you're healthy, you can aspire about anything else.

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But not only at individual level, but even at community level, national and global, we have seen the centrality of health during this pandemic. When the whole world got ill, and when we all became hostages of this virus, we have seen the centrality of it. It affected the economy. It affected our social fabric. It affected our politics. It affected everything.

So, I think the centrality of health now is very clear. And going forward, investing in health will be a priority for all countries. And all countries, in their vision, when they founded the WHO, said Health for All, more than 70 years. And I hope it's time now to be really serious and make sure that all roads lead to universal health coverage, and that all countries are serious about health for all.

So in terms of awareness and the centrality of health, I think there is progress. But to build capacity to strengthen preparedness to build our health systems, we will need time. We are now fighting with what we have. But to say the world is better prepared, the preparedness should be significant. And it takes time.

Then, the other aspect of preparedness is, I think this virus has exposed our societies, exposed us, exposed the problems that we have, the level of inequity, the level of poverty, the level of exclusion. So, health alone will not be a solution. We have to address the root cause of the problem too, the inequity in our society, all the exclusions, racism, all the roots behind the problem. And that means implementing the sustainable development goals in its fullest,

caring about our world, the planet, including climate change and the rest. So, implementing the sustainable development goals and achieving the goals we have set ourselves by 2030. And even more ambition will be necessary.

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Then there was a very personal question about what I think about 2020. 2020 for all of us has been a very difficult year, a very tragic one. And for me personally, it's not just COVID alone. COVID has been tragic, and is still tragic for all of us.

But personally, in addition to COVID, 2020 has been very difficult for me because my country is in trouble. My country, Ethiopia, is in trouble. And the war, the devastating war that's happening, is actually in my home country, in my home region, Tigray, northern part of Ethiopia. And I have many relatives there, including my younger brother, and I don't know where they are. I haven't communicated with them because communication is not there.

As if COVID is not enough, I have that personal pain also. I worry about my country. Of course, my younger brother, or relatives, are part of the society. I worry about the whole country. I cannot worry about my younger brother or relatives alone, because the situation is worsening.

So carrying all this could be tough, and has been tough. Then I see also hope. Because in difficult situations like this, we can also find ways to build a better world and hope to improve situations and, as we all say, build back even better. During this time, by the way, two months ago exact, I became a grandparent, a grandfather. Although I worry, considering the two difficult situations that are happening, about my granddaughter, but at the same time, looking at her, I see also hope.

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And that's why in my speech, I said, if the world works together, there is a solution. There is a solution globally, and there is a solution for any country. So, I am hopeful. And whatever the situation is, I believe it can change. And I call on the global community to choose peace, to choose solidarity, to choose caring for one another, caring for each other, and to choose without caring for one another, or each other, that our world could be in trouble. And we have seen that. So that's what I hope for.

And this is the last session we have, the last presser of this year. And I hope the problems and difficulties of 2020 will be behind us and we will have a better 2021. Even with the tragic events, I have said I am hopeful and we can do it together. I have faith in each other. I have faith in us. I have faith in the world. And I hope we will change for the better. I thank you.