Long Term Care Covid-19 Commission Mtg.

Jonathan Suk (ECDC)
on Thursday, January 28, 2021

77 King Street West, Suite 2020
Toronto, Ontario M5K 1A1

neesonsreporting.com | 416.413.7755

LONG TERM CARE

COVID-19 COMMISSION

PRESENTATION BY JONATHAN SUK, PhD,
EUROPEAN CENTRE FOR, DISEASE PREVENTION.
AND CONTROL,(ECDC)

--- This is the transcript of a virtual Zoom meeting, taken by Neesons, a Veritext Company, on the 28th day of January, 2021, commencing at 9:00 a.m.

[All participants appearing virtually.]

REPORTED BY: Helen Martineau, CSR

C O M M I S S I O N E R S:

The Honourable	
Frank N. Marrocco	Lead Commissioner
Dr. Jack Kitts	Commissioner
Angela Coke	Commissioner

P R E S E N T E R S:

Jonathan Suk	(PhD) European Centre for Disease Prevention and Control (ECDC)

P A R T I C I P A N T S:

Alison Drummond	Assistant Deputy Minister Long-Term Care Commission Secretariat
Derek Lett	Policy Director Long-Term Care Commission Secretariat
Alain Daoust	Team Lead Long-Term Care Commission Secretariat
Rose Bianchini	Senior Policy Analyst Long-Term Care Commission Secretariat

P A R T I C I P A N T S: (continued)

Michael Finley	Counsel, Gowling WLG
John Callaghan	Co-Lead Commission Counsel Gowling WLG
Lynn Mahoney	Counsel, Gowling WLG

--- Upon commencing at 9:00 a.m.

JONATHAN SUK: Just by way of introduction, my name is Jonathan Suk and my role at ECDC is principal expert in preparedness response. I'm not quite the head. So we have a funny nomenclature for our job titles. So I think it's -- it should be the equivalent to senior expert. So there's a couple of principal experts, which is always a bit troublesome for native English speakers in the way that they've named these posts.

But in any case, if I can show some slides. I was asked to give some background, contextual information, I believe, on our perspective, both on pandemic preparedness, and I have a bit of data to show you what's happened in Europe at a broad level in long-term care facilities in relation to the COVID-19 pandemic.

So I have two parts of the presentation, if that's appropriate with the Commissioners, then I can continue with that.

LEAD COMMISSIONER MARROCCO: I think we're fine with that. We're quite happy to proceed the way you find efficient.

JOHN CALLAGHAN: You might keep your

voice up, Jonathan, because your voice goes down a bit and the court reporter may have a hard time hearing you. So just keep your voice up a little bit, thanks.

LEAD COMMISSIONER MARROCCO: Is there a screen sharing issue?

JONATHAN SUK: Yes, sorry, I'm just trying to find the file.

So in brief, European Centre for Disease Prevention and Control, we're an agency of the European Union and we're responsible for having a broad data oversight, as it were, in setting certain standards in disease surveillance at the EU level.

Every country in Europe is responsible for their own response, so we provide technical input and support to EU member states and other stakeholders, but -- and we provide outbreak support and things like that.

Our core functions are surveillance, microbiology preparedness, country support scientific advice, training, communication and epidemic intelligence and outbreak response.

And a lot of the data that you will see from ECDC is compiled for daily epidemic

intelligence, and of course we're very plugged in with WHO and all the countries in Europe. And we're constantly screening the world for all sorts of news of different outbreaks.

And then we have a range of disease programs which is less relevant for today. We have a new program, of course, on respiratory diseases and Corona viruses.

So this is what an EU agency, just in case you hear the name. So you might hear European Medicines Agency in the news because they're responsible for vetting the vaccines that will be coming online in the EU.

We have partner agencies such as the European Food Safety Agency and Karma [ph], there's the European Environmental Agency. There's the occupational safety agencies. And so in some cases, we do a lot of work together, so there's some overlaps with the occupational safety agencies. There's overlap and a lot of collaboration with EFSA in the area of food borne disease. And with the European Medicines Agency, of course, with the vaccines and vaccine effectiveness, vaccine safety, and things like that. So there's a lot of collaboration across

these ones.

That's just to give you a bit of a background, just so you know, in general we've been incredibly busy, as everyone has been during the pandemic. We have a massive amount of data and technical reports, risk assessments on a wide range of topics that are available on our website. I'm not going to go into those here, but just to let you know that they exist and that they are here.

In terms of the rapid risk assessments, we have a formal process for this. It's when something is changed, there's a novel threat or the scope of the threat has changed or the response measures appear to be less or more effective, but something has changed in the risk equilibrium and so then we do rapid risk assessments. They're not actually that rapid. They're very extensive. They're produced by a lot of people. The first one we did was on the 17th of January, a year ago. And the most recent one came out on the new variants of concern and that was on the 21st of January this year. So we are continually monitoring and producing them.

And as I'll get to it later, we have also rapid risk assessment on COVID-19 in long-term care facilities in the EU and the European economic area that I can present some basic information on as well.

And we have a dashboard of all sorts of data and indicators and we've been producing all sorts of guidance documents and things. So there you go, that's the background.

There's also a monitoring evaluation framework for the COVID-19 response, which is something similar to what World Health Organization has to have, designated pillars for the response and then sort of indicators under each of these pillars of what should be happening or what would be a best practice for happening.

In the way that we viewed it, we had country level co-ordination, risk communication and community engagement, surveillance, vaccine monitoring, testing, policy and practice, infection prevention and control, case management and maintaining essential health services.

And of course, you can see that all of

these cut across the issue of long-term care facilities, but they cut across basically all the dimensions of the COVID-19 response, and they're all very important pillars.

Just to step back now, and I'll just give you a few slides on the perspective that we have for pandemic preparedness in general. And that's a story that starts of course prior to COVID-19, but COVID-19 is definitely a paradigm shift and a game changer for the scale and the magnitude of what we need to be doing.

We're based in a situation where we have the EU, so there's EU legislation, there's international legislation, namely the International Health Regulations, there's global processes, like the UNISDR Sendai framework for disaster risk reduction.

We try to pay attention to all of these different mechanisms and that's sort of what is shaping the way that we do our work. And then of course at national level, which is not my role, but in countries they will have their national laws as well. So there's a lot of levels of governance in the EU and we're trying our best to harmonize these sorts of

activities and policy streams and so on.

In the wake of Ebola, there is a huge emphasis on strengthening preparedness, strengthening capacity relevant for international health regulations.

And ECDC was quite actively involved in that outbreak because we had a huge amount of preparedness work to do, very hands-on preparedness for what would happen if an infected Ebola person came into the EU context. And of course we did have that through medical evacuations and so on. As well as we had a fairly strong field presence in west Africa, namely in Guinea, where there is a shortage of French speaking field epidemiologists and so ECDC was quite active in providing that.

So we were quite busy then, although our main focus is the EU and there were all sorts of evaluations afterwards, to think about what that meant for preparedness going forward.

So there was a huge wake and momentum, actually, behind the field of preparedness and strengthening global health security prior even to Ebola, but particularly after the west African Ebola outbreak.

We also have our own particular legislation on preparedness planning for the EU level and this just gives an orientation, very briefly, about what we do. And this is what the European Commission is meant to do, but we play a mediary role here in sharing best practice and experiences; promoting the interruptibility of planning because we have all these neighbouring countries and, ideally, they would be in sync; and, we have connections also to alert each other about what sorts of measures are going to be put in place.

It makes no sense if one country closes the border and not the other and things like that. So try to have as much as is possible, an EU co-ordinated approach to pandemic management.

And then supporting the implementation of the core capacity requirements and that's again from the International Health Regulations and that has been a very large point of emphasis in the last five years. This is just to give you a feeling for how we view preparedness.

And again, we viewed into a few things. So there's anticipation of threats,

there's the response and there's the recovery. So this cycle on the outermost circle tries to get into that, and then there's specific sorts of things that we do in that.

So what we did when we produced this is to try to understand basically what we were doing at ECDC and what we would hope our stakeholders would be doing and then to develop projects and tools for each of these steps.

So the first one, of course, is identifying and understanding risks; planning various response strategies based on the prioritized risks that you have developed and identified; training and capacity building where you feel that there are gaps in your risk analyses.

And then what you have is a diversion. You have either no real life event and then the emphasis is on simulation exercises, drills, table top exercises to test and see how well your plans work in practice and to try to identify gaps. Or if you have a real world event, and then the emphasis is on the response and then afterwards the emphasis is on the after action reviews to promote learning and

optimization for the next time that there's an event.

And all of that leads to this kind of cycle process where it's a continual process of quality improvement ideally. And that's the sort of way that we view preparedness. And, in brief, this also aligns with the WHO policy stream pre-COVID, when there was time more to think about these things where the priority areas of action following the west Ebola outbreak were accelerating country implementation, improved monitoring and evaluation of all of these IHR core capacities, improved event management, strengthening WHOs capacity to help countries to implement the International Health Regulations and so on.

So we've been contributing a lot to that.

And one --

LEAD COMMISSIONER MARROCCO: Can I interrupt for a minute?

JONATHAN SUK: Of course.

LEAD COMMISSIONER MARROCCO: In terms of Ebola being a trigger for preparedness, can you place that in terms of years or when

approximately that realization --

JONATHAN SUK: Yeah, sure. So I mean, the Ebola outbreak from 2014, 2015. And so in the aftermath of that, in the years 2016, 2017, 2018, where there was the opportunity to do the lessons learned in meetings and workshops and discuss that in venues such as the World Health Assembly and at the EU level, all sorts of meetings to follow up and really emphasize the need for enhanced health security.

LEAD COMMISSIONER MARROCCO: And when would the first publications of what you've just been showing us, when would that be available to people who were paying attention?

JONATHAN SUK: I mean, there were already lessons learned emerging during the Ebola crisis, of course, but there would have been a lot more of them by around 2016.

LEAD COMMISSIONER MARROCCO: Okay, thank you.

JONATHAN SUK: Yeah, my pleasure.

So one of the things that happened and I can't say that it's directly coming out of Ebola, I don't work at WHO, but one of the things that did emerge after Ebola was an

emphasis on other ways to assess implementation of the International Health Regulations.

And one of these was the joint external evaluations, which was a peer-reviewed process to go into countries. And it was really spare headed initially by the U.S., with a lot of support from Finland and WHO headquarters, to have peer review teams go into countries and in a peer review kind of manner assess, at the national level, usually with the national level agencies, where they were on a wide range of indicators.

And so I pulled out the one from preparedness here just because it gives you a feeling for the sorts of things that you're looking for. And I've been on a couple of these missions and led the discussions on that chapter.

And so you're looking at, for example, when you go to a country for preparedness, I'll look at the -- as measured by a category here. So the existence of national multi-hazard emergency risk assessments, so that's risk profiling, and that's also an IHR indicator, and resource mapping. So we were looking to see

have you plotted out and identified the key risks and have you mapped what resources exist in relation to that?

Second, existence of multi-hazard emergency response plans. So we're looking to see what sort of plans they had for a range of outbreaks. Of course we'd like to see pandemic preparedness plans, usually the highest level plan that countries would have. And then there might be more specific ones to more country dependent threats, maybe for vector borne disease or so on.

And then evidence from exercises after action reviews and so on, that there's processes in place to review and evaluate.

So those are the things at the national level that from the perspective of emergency preparedness that we're interested in helping countries to achieve. And that's been sort of guiding, as well, the approaches that we have taken.

There's a lot more detail in that slide, but I can send you the link. These are WHO reports that are easily accessible.

LEAD COMMISSIONER MARROCCO: That

would be helpful, thanks.

JONATHAN SUK: Meanwhile at ECDC, we have a framework, and again there's a lot of text here, so I apologize about that, you don't have to read the details. But we have a framework for what we're trying to achieve. And so the objectives at the end on the far right are what we're trying to achieve. This was published, I believe, in 2018.

The earliest possible identification of any event, early and effective response, and of course what you're trying to do is minimize morbidity and mortality, limit the spread of disease, minimize social disruption, and minimize any sort of other damage. And the earliest possible recovery and return to normal.

Now, COVID-19 is an order of magnitude much larger than anything almost we could have imagined and so all of those are much more challenging than they would be for a routine, as it were, outbreak.

And so going backwards then, these are sorts of things that we have assessed that should be in place.

The capacities capabilities is

interesting because a lot of the capacities are about infrastructure or resources. You have a stock pile or you don't, or you have a governance framework or you don't. And that varies, of course, very widely in the EU across countries. Obviously everyone has a governance framework, but some are more adept than others. The economic measures and workforce, these sorts of things are structural and very hard to deal with in a short timeframe.

The capabilities are the mobilization of these capacities, is the way to look at it, that you can have a stockpile of face masks, but if no one knows how to wear them and they put them on their elbows, it's not very useful. So the capability is the mobilization of the capacities in a way that enables an effective response.

And so we try to look at the things that -- we're mostly focused on assessment at ECDC under the response capabilities, but you also have policy development and implementation, the health services, which include medical surge capacity, preventative services, the management of your medical counter measures and stockpiles

and healthcare workers emergency responders.

And then a lot of communication and co-ordination for health agencies involves a lot of multi-sectoral co-operation and communication.

Also the healthcare system in almost every country is very diffuse. You have hospital networks. You may have public and private actors. You have the public health agencies. You may be working with civil protection agencies of a country. And then the external communication to the public. So these are consistently flagged as challenging areas that we need to work more on.

So in the areas that are closest to the ECDC mandate, we try to focus on those topics and to help strengthen preparedness.

I realize that this is maybe a bit too much detail for the purposes of your board, so just let me know if it's irrelevant, I can just skip forward. I don't need to spend all the time if it's not a main focus to you.

LEAD COMMISSIONER MARROCCO: We've had -- we've touched on some of these things, for example, the stockpiling of -- like we've

run across some of these problems, so it is helpful.

But before you go on, the earliest possible identification of the event, can you help us with when a person who is paying attention to these things should have figured out that there was something going on?

JONATHAN SUK: Yeah, sure. I mean, so at ECDC, the way that we do this is through epidemic intelligence. We always have somebody on duty for epidemic intelligence and we screen a wide range of data sources. Some of those are private and some of those are public.

And we knew that something was going on over, you know, around New Year's Eve last year. You know, I myself, who wasn't paying attention because I was off, but I remember seeing some Twitter notifications about a mysterious pneumonia in China. And so then there was -- we didn't know what it was. We didn't know the details. But by the first week, week and a half, in January, obviously everybody knew that there was something pretty significant that was happening. And the whole world was really scrambling to try to figure out and

obtain more details about that.

LEAD COMMISSIONER MARROCCO: Okay, thank you.

COMMISSIONER KITTS: Can I just ask a question about the report? Is there a guideline or gold standard about how often these reports, public health emergency preparedness, need to be updated or refreshed?

JONATHAN SUK: No. A gold standard, no. I mean, I don't think there's any strict rule with that.

Pandemic plans, which are more comprehensive, tend to, from our experience, they tend to take some time to be revised, usually because there's legal ramifications and so on that might be part of that.

If you're talking about more routine outbreaks, then maybe those are more regular. So you're probably reviewing pretty often, you know, food borne outbreak protocols or things like that that are more standard. And they almost become more like an SOP than an actual pandemic plan in that sense.

But I don't think there's any golden rule of thumb.

COMMISSIONER KITTS: Okay, thank you.

JONATHAN SUK: So then we try to identify the risks and I often show this slide prior to SARS because we tried to understand where all these new diseases were coming from. And two major things were that we've known for a very long time that most of the new diseases are coming through zoonosis, the animal-human interface.

And, of course, noteworthy in this slide is that two of the diseases are Corona viruses, MERS and SARS, which, from Toronto, you know very, very well. But there are many others.

So we've also had a warning shot with H1N1 pandemic, which turned out to be a "mild" pandemic certainly compared to COVID-19, but was also a warning of what might happen if something was more substantial.

So we had done scenario analyses and this is another way to look at things in terms of the anticipation.

So one is to find threats through epidemic intelligence through routine surveillance, but for our planning, we have also

done a bit of foresight, a bit of scenario analysis.

This was work that we did actually in probably around 2010, it was published in 2011, where we looked at different threat scenarios that the EU might face. I flagged this one. There were a lot of scenarios, and it's not that we exactly knew that these were coming, but we just tried to look at basic drivers of major outbreaks and major challenges and tried to figure out what would be pretty plausible, so they weren't that far reaching.

But one actually was related to increasing healthcare associated infections in nursing homes just due to the demographic trends, the challenges with antimicrobial resistance in healthcare associated infections, and the current setup or the then current setup of the nursing homes.

And another one, of course, was pandemic influenza. That was always and probably has been for the last decade the disease that pandemic plans would be based around. And so we put here that the 29 (sic) pandemic demonstrated even a relatively benign

pandemic can cause a fairly significant amount of strain on health services, as well as cause panic in unprepared societies.

So we tried with these types of analyses to just put, you know, put people in the future a little bit to try to then work backyards and think, what do we need to do to mitigate these types of scenarios?

So that's another approach that we've been doing from time to time. It's not a core aspect of ECDC work by any means, but I think, you know, the current pandemic demonstrates that we will have to do more of this going forward.

JOHN CALLAGHAN: If I might, those articles are from 2011, right?

JONATHAN SUK: Yes.

JOHN CALLAGHAN: So you were aware that countries were at risk of a pandemic, certainly of an influenza, which would have an adverse evident on the elderly and long-term care, correct? That's what these two articles --

JONATHAN SUK: That they certainly would have the potential to have that impact, if they were based on that. And then, of course,

depending on the setup of care and the demographic structure of societies.

But, yes, I mean, pandemic influenza and perhaps particularly in the field of preparedness. I mean, most of the field of preparedness in infectious disease derives from in pandemic preparedness. They're quite inseparable in many ways.

JOHN CALLAGHAN: If I could ask you, if you could forward us those articles, that would be helpful.

JONATHAN SUK: Of course. These are open access.

JOHN CALLAGHAN: Oh, are they? Okay.

JONATHAN SUK: Yes, we can send you the links to them.

So response strategies, one of the things that we have actually been working on in 2018 was the concept of One Health preparedness.

And again here this is something that we're just trying to -- I noted in our legislation, I mean, one of the challenges for us is the cross-sectoral collaboration. So we tried to find ways where we could anchor our work. And, of course, there was a big -- and

there is increasing after COVID-19, important emphasis placed on One Health.

The WHO and the FAO and the OIE have a tripartite process on One Health. And from our perspective, we tried to look into that to see what that might mean for the work we're doing with our stakeholders.

And, of course, we understood here that climate change, densities, trade travel are really among the most important drivers of infectious disease. And the point here that's challenging for public health is that those drivers of infectious disease, they fall outside of the domain of the health sector.

So we don't have the mandate or power to go and stop these processes and they're globalization processes so they're not east to stop to begin with, but we try to draw the recognition of that to emphasize the need to work together, to improve the early warning that we have, to try to go as upstream as possible to deal with the risks.

And then we were looking at ways that, based on this type of recognition, we could work with actors in other sectors to try to develop

One Health related response strategies.

One of the examples that we have noted in the EU during COVID-19 was related to the stories you have certainly seen about new variants of SARS-CoV-2 in mink populations, for example, which is a good example of the need from a One Health perspective.

And then afterwards what we've been doing is this, also promoting a lot, and this is an area that I personally work on a lot also is the after-action reviews. The colleague in office next to me is working on the simulation exercises. And WHO has processes on these for after-action reviews and simulation exercises about trying to map out how these can be best done to help countries in our -- of our stakeholders, so EU member states, to implement these.

And we usually hold on, an annual basis, training on conducting simulation exercises as well as some type of EU level table top exercise to focus on. And it can be a matter of co-ordination and the disease threat can change based on these scenarios.

But that's a key part of the overall

cycle for preparedness is the improvement. And as the after-action reviews and simulation exercises is to test and to review and test and review and constantly work to optimize. So that is what we're trying to advocate to our stakeholders over the years.

And during COVID-19, WHO also came out with something similar to this that they call it "interaction review". And we developed the phrase "in-action review", which is just the scale of COVID-19 is so massive, the response is so long, it's so challenging for us that we felt that there was a need also to try and promote our stakeholders to do very brief, targeted review during the response itself.

Because in -- the stakes are so high and the duration is so long for COVID-19 that it may not be practical to wait to the end to do the full review. But maybe there's learning opportunities during the actual pandemic itself. And so we've been trying to push this.

I don't know how many countries have actually found the time to do it. We are aware of definitely some European countries that have done this and we work together with WHO European

office to try to promote this as much as possible.

But, you know, it's difficult, it's difficult for us to even find time to do this sort of thing because everybody is incredibly busy, already running on fumes, but we are trying to promote this approach. And then afterwards, we'll be developing approaches for wide scale, after-action reviews, but that will not help the current response.

I don't know if you have any more questions about pandemic preparedness, but that's all I had for that. And I have a few slides to present to you on the situation in the EU from long-term care facilities.

JOHN CALLAGHAN: Can I ask, what's the relative value to a general pandemic plan and specific? You touched on it briefly that you had said that certainly there would be specifics for a region that might, you know, be susceptible to seek a virus or something, but what's the relative value between specific and general?

JONATHAN SUK: That's a great question. Something that we've debated

ourselves a lot is whether or not you should have one all-hazard plan with different modules for different diseases or one pandemic plan.

I mean, it's easy to say now, now I know much more because we've seen what happens with COVID-19. I think, you know, now the answer is we need to push in the future for plans that cover the really worst case scenario, that are really -- cover for these really existential threats to society.

And so for the -- a lot of the diseases that we have preparedness plans for, they're not as complex. It's -- Zika was really challenging by the way, but for a lot of the diseases, it's not as complex. As long as there's a good plan and capacity's in place, I would think that in the EU context, at least, we can handle most of these outbreaks, but they can still be challenging and disruptive, there's no question about that.

COVID-19 demonstrates, and this is what I'm saying now with hindsight, and not how we were exactly thinking then, at least me personally, we need to have the big pandemic plans which are much broader in scope and touch

across many more sectors of government and society because there are so many dimensions to dealing with a pandemic. But that's probably the difference and going forward that will probably be a point of emphasis.

So I think in -- this is, by the way some colleagues of mine, Pete Kinross, Carl Suetens, Diamantis Plachouras, and Dominique Monnet, who have a project, which is a healthcare associated infection and also an antimicrobial resistance. So that's been traditionally grouped together at ECDC.

And they have been doing work on this topic also prior to the pandemic, they have observed that there's a fair amount of healthcare acquired infections in long-term care facility settings, so they have been trying to promote measures such as infection prevention and control and surveillance and so on and trying to work on that topic. So it's not something that has come up during the pandemic, but they're already aware of this topic.

And so the data that I received from them, and that's in our last risk assessment, I mean, there are about 3.5 million people in the

EU across 62,000 in the long-term care facilities and that represents about 0.7 percent of the EU population.

There's a bit of a mixture, so the definitions are not standardized, as far as I'm aware, at the EU level. So they may include nursing homes, skilled nursing facilities, assisted living facilities, but also those facilities that have very, very severely challenging residents who might have dementia or other co-morbidities and who are quite old and are really in quite poor health. So there's a range of that, so it's not a perfect classification, perhaps.

One thing that came out in a policy report that's also cited in, I think, in our last rapid risk assessment, was that there was already a known challenge in the EU as well for access inadequacy challenge of the funding for long-term care facilities, the quality challenge and the demographic situation in the EU has made that probably more pronounced. And employment challenge, especially for women who are informal carers, and then the financial sustainability challenge relating to population aging and

increased public spending.

So these are recognized issues in advance of the pandemic in the EU. And so I would assume that this has parallels in other parts of the world as well.

One thing that's important to know that we have this surveillance, one thing that is mandated to ECDC is the reporting of COVID-19 cases. And this is a database that has absolutely millions of cases. So this data is based on millions of reported cases to ECDC.

And it's up to, in this case, up to 17th of January. It's updated once a week on our website. And what you can see here is that there's a clear gradient, and you already know this, clearly, through your Commission, that we know that the elderly disproportionately suffer from severe outcomes of COVID-19, whether that be hospitalization rates, severe hospitalization or accrued case fatality. And so that's what you can see here in the columns where you have the 80 plus and you see the highest number of circles.

Another thing that we see, and I apologize for the colours, you can blame my

colleagues back in the EU. But there's a difference, and we still see it, this is again up to last week, where the outcomes are marginally and incrementally better since around -- I'm not sure where this study's from, but roughly around June, July are the two different data sets.

I think that my Zoom window is blocking my -- there we go, to the July 31st is the blue and the green is after August 1st.

So what you see is that we are seeing a lower severe outcome rate across basically all age groups in the second -- so-called second wave of the pandemic. And we don't have the opportunity to go into that so much right now.

I mean, the assumption would be that that's improved care, better understanding in the clinical side of how to treat COVID patients, but we see a clear trend, in any case.

JOHN CALLAGHAN: Can I ask you, Jonathan, is the second wave perceived to last longer than the first wave?

JONATHAN SUK: Well, when you add perception to the --

JOHN CALLAGHAN: You're a scientist,

so I shouldn't say perception.

JONATHAN SUK: To me, perception seems like, yes, lasting forever.

I think it's hard to say. I think they've both been incredibly challenging, so I really wouldn't know how to answer that. I'd have to go back when we're out of it and really be able to look into that and demarcate what it is.

People have different opinions about that as well. Between the waves or whether or not it's just a question of the response measures that we're tightening and loosening and so on. Plus whatever seasonal effect that might exist for the disease.

JOHN CALLAGHAN: In terms of lower severe outcomes, is it possible that the virus is more contagious but less severe?

JONATHAN SUK: It's possible. I'm not a virologist, but I don't believe that that is the main hypothesis.

And, of course, right now some of this data will also include the new variants, which we are know are more infectious, like the one that's in the U.K. right now, and have taken a

foothold across many countries. And there is some indications, but the data is very preliminary, that that variant is also leading to more severe outcomes. So the opposite is also possible, but I think it's a bit early to say.

And one thing that is lacking in terms of just the capacity and the challenge of it is that we -- you know, a very small percentage of all the cases are sequenced so that we would know exactly what strain these cases are coming from.

And here you have a data, and this is a real credit to the colleagues of mine because this is hours and hours of work to put together because there's no standard reporting yet in the EU. But they have been monitoring, and this is from the 14th of November, so I guess they do this every couple of months to try to see what data exists across the EU.

And you will see that in the reported date per country that it's also quite variable, just depending on when countries have published their reports.

But the take-home message here is from

all the countries that we have found data on that a fairly high proportion of the deaths in the country have occurred at long-term care facilities. So you'll see that the second column to right. And this is on our website, so the link is below, and there's a reference to each of these data sources as well that have been manually screened by colleagues at ECDC.

So you'll see that, I mean, you'll see quite a few in the 40s. Norway 59 percent and so on.

So it's a common trend and it's certainly a common challenge across many of our member states and that's recognized to be an issue, I think, pretty universally in the EU.

COMMISSIONER KITTS: Could I just clarify? The second-last column where 48 percent for Belgium, all those numbers, that's the percent of all deaths that were in long-term care homes? All deaths in the country that would happen in long-term care homes?

JONATHAN SUK: That's right.

Now, there are going to be differences depending on when these reporting dates are of testing and so on.

So, for example, the data from Stockholm on the 15th of April might be over-represented, potentially, because there was not as much testing happening widely. So we have to take those caveats into account. But based on what was reported at the time, those were the percentages.

COMMISSIONER KITTS: So Spain was 72 percent of all deaths were elders in long-term care homes.

JONATHAN SUK: Yes, exactly.

COMMISSIONER KITTS: Wow.

JOHN CALLAGHAN: Spain had 5,400 affected facilities. They must have very small facilities.

COMMISSIONER KITTS: Well, if you go back, Jonathan, if you could go back a couple of slides, I think you've sort of defined what long-term care is.

JONATHAN SUK: Exactly. So that's in our rapid risk assessment as well. So it's a broad category.

COMMISSIONER KITTS: It's -- see ours -- if we were comparing apples-to-apples, ours would probably be either nursing homes or

skilled nursing facilities. We don't include retirement homes, assisted living, and residential care. So there may be an apples-to-apples concern.

JONATHAN SUK: Yeah, my assumption would be that there is, that the nomenclature probably varies.

And one thing that's also the case, I mean, this is anecdotal and I can't give you evidence on that, but the assumption is as well that there is different cultural practices. That in some countries, the elderly, they stay with the family and they live with the family and they're much more multi-generational. And then other countries, it's much more their facilities and it's really just nuclear families who are living together and so on.

So there's probably this cultural difference as well across the EU in terms of how many people are living in these different types of --

COMMISSIONER KITTS: I think there's no doubt that across the world this virus really picked on the elderly.

JONATHAN SUK: Yeah, yeah. The data

is very clear about that. And that's one thing that I think has not really changed with time. We've known that fairly early on and the data has been pretty stable. So whereas so many things have felt like they have been changing very rapidly during this pandemic, and I think the outcomes per age group have been one of the clearest signals that we've had epidemiologically.

LEAD COMMISSIONER MARROCCO: It's the same idea that at the beginning when people first wake up to this in the beginning of January, was it foreseeable, do you think, that long-term care facilities would be particularly at risk?

JONATHAN SUK: That's a very good question. I don't have an answer for that. I that in January -- I'd have to go back and see what studies were out then, but from my recollection, you may not have had enough perfect information at that time about the outcomes per age group and it was a new virus. We just found out in early January that it was related to SARS in some way, but we did not have that detailed information as far as I can

recollect.

I mean, it could have been by February, March that we would have had a clear picture about that.

In the European context, when Italy was hit, which was the first hard-hit country in the EU, that's when we started to realize, you know, at a more realistic tangible level how serious the pandemic was and then we started to get data, but again it was pretty chaotic at that time with testing, with the reports that were coming out. So it did take some time for the full picture to emerge about what we were dealing with and the characteristics and epidemiology of it.

And so I had that table to show you and the last thing I had here was a rapid risk assessment from the 19th of November. So my colleague described to me that from the signal they did have, they felt that during the so-called second wave there was another increase of fatalities among the eldest age group, that that was rising fairly steeply based on the surveillance signal, which was a trigger to discuss a rapid risk assessment.

And then so what we put here was that:

"Observed all cause mortality among older people underlies the severe impact of COVID-19 in this group. Residents in long-term care facilities are one of the most vulnerable populations and particular focus should be given to the prevention of SARS-CoV-2 introduction and to outbreak control in those settings."

And we note the vulnerabilities of those groups.

And then we have, which we do in all of our rapid risk assessments, but I believe this is the only one that we did specifically focused on this setting, we reiterate messages which we had surely put out before in other ways of what should be done. So within the area of long-term care facility management, what options should be considered as good practice with regard to testing, what should be considered with regard to testing, what should be done to minimize the risk of introduction into the facilities.

And then we also had here to minimize the risk of transmission within the centres having been introduced and then considerations for vaccination for seasonal and pneumococcal vaccinations as well as potential considerations for the vaccines for COVID-19, which at that time were, you know, not yet approved but coming online and we knew that they would be coming online.

JOHN CALLAGHAN: If I could ask you, there was an article that we looked at --

JONATHAN SUK: Please, go ahead.

JOHN CALLAGHAN: If there's something else, go ahead.

JONATHAN SUK: No. I was just actually checking what I had as the last slide, but it was just a link to the website that we have with all of the data on long-term care facilities.

JOHN CALLAGHAN: I guess the one thing is there were -- in an article we looked at in preparation, there was some -- at least it was a UK study, I believe, that identified areas of concern, which I think are fairly well accepted.

For example, long-term care facilities

are at greater risk if there's a higher prevalence of COVID in community. Is that one of those things that has been fairly well accepted?

JONATHAN SUK: Yeah. I think that's just your basic logical premise.

I've been working a lot on the topic of schools and that's also something that we see that, of course, the likelihood of an outbreak in a school setting or so on is pretty well correlated to the background levels of community transmission and we've seen that across many different country settings.

JOHN CALLAGHAN: And things like inadequate staff training of IPAC or working in more than one facility has also been seen to increase the risk of infection in the homes?

JONATHAN SUK: I mean, I don't have empirical evidence that -- of studies that tested the knowledge level of staff and whatever, but of course, you know, these practices, IPAC have to be practiced well to be able to minimize the risks.

JOHN CALLAGHAN: I won't take you to it. We have the article so we can rely on it.

And just last thing, are you aware of many other Commissions like ours actually being undertaken at this time as opposed to what might be going on in the future?

JONATHAN SUK: At this time, no, I'm not. So I was aware of a few in the EU setting that I think have published reports, or interim reports at least. And I know that there's a global broad pandemic COVID-19 group that's doing this, but in terms of Commissions like this at the moment, I am not, no.

JOHN CALLAGHAN: Those would be my questions, unless the Commissioners have anything else?

LEAD COMMISSIONER MARROCCO: No, I don't think we do.

Mr. Suk, thank you very much for putting this presentation together. We've been trying to broaden our scope beyond Ontario and beyond Canada to get a kind of a feel for the landscape. And this sort of thing is very, very important for what we're doing.

We're, I guess, in that situation where we're in the middle of something and trying to analyze it at the same time which, as

you can appreciate, can be quite challenging.

And like some of the Commissions too, or some of the committees to which you referred, we have put out two interim reports, primarily for the same reason. We didn't want to be reporting so long after the event that the whole thing was over.

So this is very, very helpful to us and thank you for helping out your fellow Canadians in this project. It's very much appreciated.

JONATHAN SUK: Yeah, no, it's my pleasure to speak with people in Canada and to help out where we can.

And, you know, this work that we're doing, it's all publically available and I think there's -- it's important that it's just a question of knowing what's available sometimes and where to find it. So happy to make that easy for you.

LEAD COMMISSIONER MARROCCO: Thank you very much.

--- Meeting ended at 9:52 a.m.

.

REPORTER'S CERTIFICATE

I, HELEN MARTINEAU, CSR, Certified Shorthand Reporter, certify;

That the foregoing meeting was taken before me at the time and date therein set forth;

That all remarks made at the time were recorded stenographically by me and were thereafter transcribed;

That the foregoing is a true and accurate transcript of my shorthand notes so taken. Dated this 28th day of January, 2021.

PER: HELEN MARTINEAU
CERTIFIED SHORTHAND REPORTER

WORD INDEX

< 0 >
0.7 32:*2*

< 1 >
14th 36:*18*
15th 38:*2*
17th 7:*21* 33:*13*
19th 41:*18*
1st 34:*10*

< 2 >
2010 23:*4*
2011 23:*4* 24:*15*
2014 14:*3*
2015 14:*3*
2016 14:*4*, *18*
2017 14:*4*
2018 14:*5* 17:*9* 25:*19*
2021 1:*17* 47:*13*
21st 7:*23*
28th 1:*17* 47:*13*
29 23:*24*

< 3 >
3.5 31:*25*
31st 34:*9*

< 4 >
40s 37:*10*
48 37:*18*

< 5 >
5,400 38:*13*
59 37:*10*

< 6 >
62,000 32:*1*

< 7 >
72 38:*9*

< 8 >
80 33:*22*

< 9 >
9:00 1:*18* 4:*1*
9:52 46:*23*

< A >
a.m 1:*18* 4:*1* 46:*23*
absolutely 33:*10*
accelerating 13:*11*
accepted 43:*24* 44:*4*
access 25:*13* 32:*19*
accessible 16:*24*
account 38:*5*
accrued 33:*20*
accurate 47:*12*
achieve 16:*19* 17:*6*, *8*
acquired 31:*16*
action 12:*25* 13:*10* 16:*14*
active 10:*16*
actively 10:*6*
activities 10:*1*
actors 19:*9* 26:*25*
actual 21:*22* 28:*20*
add 34:*23*
adept 18:*7*
advance 33:*3*
adverse 24:*20*
advice 5:*22*
advocate 28:*5*
Africa 10:*13*
African 10:*25*
after 10:*24* 12:*24* 14:*25* 16:*13* 26:*1* 34:*10* 46:*6*
after-action 27:*11*, *14* 28:*2* 29:*9*
aftermath 14:*4*
age 34:*13* 40:*7*, *22* 41:*22*
agencies 6:*14*, *17*, *20* 15:*11* 19:*3*, *10*, *11*
agency 5:*10* 6:*9*, *11*, *15*, *16*, *23*
aging 32:*25*
ago 7:*21*
ahead 43:*12*, *14*
Alain 2:*20*
alert 11:*10*
aligns 13:*7*
Alison 2:*14*
all-hazard 30:*2*
amount 7:*5* 10:*7* 24:*1* 31:*15*
analyses 12:*16* 22:*20* 24:*5*
analysis 23:*2*
Analyst 2:*23*
analyze 45:*25*
anchor 25:*24*
anecdotal 39:*9*
Angela 2:*5*
animal-human 22:*8*
annual 27:*19*
anticipation 11:*25* 22:*22*
antimicrobial 23:*16* 31:*11*
apologize 17:*4* 33:*25*
appear 7:*15*
appearing 1:*21*
apples-to-apples 38:*24* 39:*4*
appreciate 46:*1*
appreciated 46:*11*
approach 11:*16* 24:*9* 29:*7*
approaches 16:*20* 29:*8*
appropriate 4:*20*
approved 43:*7*
approximately 14:*1*
April 38:*2*
area 6:*21* 8:*4* 27:*10* 42:*19*
areas 13:*10* 19:*13*, *15* 43:*23*
article 43:*11*, *21* 44:*25*
articles 24:*15*, *22* 25:*10*
asked 4:*13*
aspect 24:*11*
Assembly 14:*8*
assess 15:*1*, *9*
assessed 17:*23*
assessment 8:*2* 18:*20* 31:*24* 32:*17* 38:*21* 41:*18*, *25*
assessments 7:*6*, *12*, *18* 15:*23* 42:*15*
Assistant 2:*14*
assisted 32:*8* 39:*2*
associated 23:*14*, *17* 31:*10*
assume 33:*4*
assumption 34:*16* 39:*5*, *10*
attention 9:*18* 14:*14* 20:*6*, *17*
August 34:*10*
available 7:*7* 14:*13* 46:*16*, *18*
aware 24:*17* 28:*23* 31:*22* 32:*6* 45:*1*, *6*

< B >
back 9:*5* 34:*1* 35:*7* 38:*17* 40:*18*
background 4:*13* 7:*3* 8:*9* 44:*11*
backwards 17:*22*
backyards 24:*7*
based 9:*12* 12:*12* 23:*23* 24:*25* 26:*24* 27:*24* 33:*11* 38:*6* 41:*23*
basic 8:*5* 23:*9* 44:*6*
basically 9:*2* 12:*6* 34:*12*
basis 27:*20*
beginning 40:*11*, *12*
Belgium 37:*18*
believe 4:*14* 17:*9* 35:*20* 42:*15* 43:*23*
benign 23:*25*
best 8:*16* 9:*25* 11:*6* 27:*15*
better 34:*4*, *17*
Bianchini 2:*23*
big 25:*25* 30:*24*
bit 4:*9*, *16* 5:*2*, *4* 7:*2* 19:*18* 23:*1* 24:*6* 32:*4* 36:*5*
blame 33:*25*
blocking 34:*9*
blue 34:*10*
board 19:*19*
border 11:*14*
borne 6:*22* 16:*11* 21:*20*
brief 5:*9* 13:*7* 28:*14*
briefly 11:*4* 29:*18*
broad 4:*17* 5:*12* 38:*22* 45:*9*
broaden 45:*19*
broader 30:*25*
building 12:*14*
busy 7:*4* 10:*17* 29:*6*

< C >
call 28:*8*
Callaghan 3:*3* 4:*25* 24:*14*, *17* 25:*9*, *14* 29:*16* 34:*20*, *25* 35:*16* 38:*13* 43:*10*, *13*, *20* 44:*14*, *24* 45:*12*
Canada 45:*20* 46:*13*
Canadians 46:*10*
capabilities 17:*25* 18:*11*, *21*
capability 18:*16*
capacities 13:*13* 17:*25* 18:*1*, *12*, *17*
capacity 10:*4* 11:*19* 12:*14* 13:*15* 18:*24* 36:*8*
capacity's 30:*16*
CARE 1:*1* 2:*15*, *18*, *21*, *24* 4:*17* 8:*3* 9:*1* 24:*21* 25:*1* 29:*15* 31:*16* 32:*1*, *20* 34:*17* 37:*3*, *20*, *21* 38:*10*, *19* 39:*3* 40:*14* 42:*5*, *20* 43:*18*, *25*
carers 32:*24*
Carl 31:*7*

case 4:*12* 6:*10* 8:*22* 30:*8* 33:*12*, *20* 34:*19* 39:*8*
cases 6:*18* 33:*9*, *10*, *11* 36:*10*, *11*
category 15:*21* 38:*22*
caveats 38:*5*
CENTRE 1:*7* 2:*9* 5:*9*
centres 43:*2*
certain 5:*13*
certainly 22:*17* 24:*19*, *23* 27:*4* 29:*19* 37:*13*
CERTIFICATE 47:*1*
Certified 47:*3*, *18*
certify 47:*4*
challenge 32:*18*, *19*, *20*, *23*, *25* 36:*8* 37:*13*
challenges 23:*10*, *16* 25:*22*
challenging 17:*20* 19:*13* 26:*12* 28:*12* 30:*14*, *19* 32:*10* 35:*5* 46:*1*
change 26:*9* 27:*24*
changed 7:*13*, *14*, *16* 40:*2*
changer 9:*10*
changing 40:*5*
chaotic 41:*10*
chapter 15:*18*
characteristics 41:*14*
checking 43:*16*
China 20:*19*
circle 12:*2*
circles 33:*23*
cited 32:*16*
civil 19:*10*
clarify 37:*17*
classification 32:*14*
clear 33:*15* 34:*19* 40:*1* 41:*3*
clearest 40:*8*
clearly 33:*16*
climate 26:*9*
clinical 34:*18*
closes 11:*14*
closest 19:*15*
Coke 2:*5*
Co-Lead 3:*3*
collaboration 6:*21*, *25* 25:*23*
colleague 27:*11* 41:*19*
colleagues 31:*7* 34:*1* 36:*14* 37:*8*
colours 33:*25*
column 37:*5*, *17*
columns 33:*21*
come 31:*21*
coming 6:*13* 14:*23* 22:*5*, *8* 23:*8* 36:*11* 41:*12* 43:*7*, *8*
commencing 1:*17* 4:*1*
COMMISSION 1:*3* 2:*15*, *18*, *21*, *24* 3:*3* 11:*5* 33:*16*
Commissioner 2:*3*, *4*, *5* 4:*22* 5:*5* 13:*20*, *23* 14:*11*, *19* 16:*25* 19:*23* 21:*2*, *4* 22:*1* 37:*16* 38:*8*, *12*, *16*, *23* 39:*22* 40:*10* 45:*15* 46:*21*
Commissioners 4:*21* 45:*13*
Commissions 45:*2*, *10* 46:*2*
committees 46:*3*
common 37:*12*, *13*
communication 5:*22* 8:*19* 19:*2*, *5*, *12*
community 8:*20* 44:*2*, *11*
co-morbidities 32:*11*
Company 1:*16*
compared 22:*17*
comparing 38:*24*
compiled 5:*25*
complex 30:*13*, *15*
comprehensive 21:*13*
concept 25:*19*
concern 7:*23* 39:*4* 43:*24*
conducting 27:*20*
connections 11:*10*
considerations 43:*3*, *5*
considered 42:*21*, *22*
consistently 19:*13*
constantly 6:*3* 28:*4*
contagious 35:*18*
context 10:*10* 30:*17* 41:*5*
contextual 4:*14*
continual 13:*4*
continually 7:*24*
continue 4:*21*
continued 3:*1*
contributing 13:*17*
Control 2:*11* 5:*10* 8:*22* 31:*19* 42:*10*
CONTROL,(ECDC 1:*8*
co-operation 19:*4*
co-ordinated 11:*16*
co-ordination 8:*19* 19:*3* 27:*23*
core 5:*20* 11:*19* 13:*13* 24:*10*
Corona 6:*8* 22:*11*
correct 24:*21*
correlated 44:*11*
Counsel 3:*2*, *3*, *5*
counter 18:*25*
countries 6:*2* 9:*22* 11:*9* 13:*15* 15:*5*, *8* 16:*9*, *19* 18:*6* 24:*18* 27:*16* 28:*22*, *24* 36:*1*, *23* 37:*1* 39:*12*, *15*
country 5:*15*, *21* 8:*19* 11:*13* 13:*11* 15:*20* 16:*10* 19:*7*, *11* 36:*22* 37:*3*, *20* 41:*6* 44:*13*
couple 4:*8* 15:*16* 36:*19* 38:*17*
course 6:*1*, *7*, *23* 8:*25* 9:*8*, *21* 10:*11* 12:*10* 13:*22* 14:*17* 16:*7* 17:*12* 18:*5* 22:*10* 23:*20* 24:*25* 25:*12*, *25* 26:*8* 35:*22* 44:*9*, *21*
court 5:*2*
cover 30:*8*, *9*
COVID 34:*18* 44:*2*
COVID-19 1:*3* 4:*18* 8:*2*, *11* 9:*3*, *9* 17:*17* 22:*17* 26:*1* 27:*3* 28:*7*, *11*, *17* 30:*6*, *21* 33:*8*, *18* 42:*4* 43:*6* 45:*9*
credit 36:*14*
crisis 14:*17*
cross-sectoral 25:*23*
CSR 1:*24* 47:*3*
cultural 39:*11*, *18*
current 23:*18* 24:*12* 29:*10*
cut 9:*1*, *2*
cycle 12:*2* 13:*4* 28:*1*

< D >
daily 5:*25*
damage 17:*15*
Daoust 2:*20*
dashboard 8:*6*
data 4:*16* 5:*12*, *24* 7:*6* 8:*7* 20:*12* 31:*23* 33:*10* 34:*7* 35:*23* 36:*2*, *13*, *20* 37:*1*, *7* 38:*1* 39:*25* 40:*3* 41:*10* 43:*18*
database 33:*9*
date 36:*22* 47:*6*
Dated 47:*13*
dates 37:*24*
day 1:*17* 47:*13*
deal 18:*9* 26:*22*
dealing 31:*3* 41:*14*
deaths 37:*2*, *19*, *20* 38:*9*
debated 29:*25*
decade 23:*22*
defined 38:*18*
definitely 9:*9* 28:*24*
definitions 32:*5*
demarcate 35:*8*
dementia 32:*10*
demographic 23:*15* 25:*2* 32:*21*
demonstrated 23:*25*
demonstrates 24:*12* 30:*21*
densities 26:*9*
dependent 16:*11*
depending 25:*1* 36:*23* 37:*24*
Deputy 2:*14*
Derek 2:*17*
derives 25:*6*
described 41:*19*
designated 8:*13*
detail 16:*22* 19:*19*
detailed 40:*25*
details 17:*5* 20:*21* 21:*1*
develop 12:*8* 26:*25*
developed 12:*13* 28:*9*
developing 29:*8*
development 18:*22*
Diamantis 31:*8*
difference 31:*4* 34:*2* 39:*19*

differences 37:*23*
different 6:*4* 9:*19* 23:*5* 30:*2*, *3* 34:*7* 35:*10* 39:*11*, *20* 44:*13*
difficult 29:*3*, *4*
diffuse 19:*7*
dimensions 9:*3* 31:*2*
directly 14:*23*
Director 2:*17*
disaster 9:*17*
discuss 14:*7* 41:*25*
discussions 15:*17*
DISEASE 1:*7* 2:*10* 5:*10*, *13* 6:*5*, *22* 16:*12* 17:*14* 23:*23* 25:*6* 26:*11*, *13* 27:*23* 35:*15*
diseases 6:*8* 22:*5*, *7*, *11* 30:*3*, *12*, *15*
disproportionately 33:*17*
disruption 17:*14*
disruptive 30:*19*
diversion 12:*17*
documents 8:*8*
doing 9:*11* 12:*7*, *8* 24:*10* 26:*6* 27:*9* 31:*13* 45:*10*, *22* 46:*16*
domain 26:*14*
Dominique 31:*8*
doubt 39:*23*
draw 26:*18*
drills 12:*19*
drivers 23:*9* 26:*10*, *13*
Drummond 2:*14*
due 23:*15*
duration 28:*17*
duty 20:*11*

< E >
earliest 17:*10*, *16* 20:*3*
early 17:*11* 26:*20* 36:*5* 40:*3*, *23*
easily 16:*24*
east 26:*17*
easy 30:*4* 46:*20*
Ebola 10:*2*, *10*, *24*, *25* 13:*10*, *24* 14:*3*, *17*, *24*, *25*
ECDC 2:*11* 4:*4* 5:*25* 10:*6*, *16* 12:*7* 17:*2* 18:*21* 19:*16* 20:*9* 24:*11* 31:*12* 33:*8*, *11* 37:*8*
economic 8:*4* 18:*8*
effect 35:*14*
effective 7:*16* 17:*11* 18:*17*
effectiveness 6:*24*
efficient 4:*24*
EFSA 6:*21*
elbows 18:*15*
elderly 24:*20* 33:*17* 39:*12*, *24*
elders 38:*9*
eldest 41:*22*
emerge 14:*25* 41:*13*
emergency 15:*23* 16:*5*, *18* 19:*1* 21:*7*
emerging 14:*16*
emphasis 10:*3* 11:*21* 12:*19*, *23*, *24* 15:*1* 26:*2* 31:*5*
emphasize 14:*9* 26:*19*
empirical 44:*19*
employment 32:*22*
enables 18:*17*
ended 46:*23*
engagement 8:*20*
English 4:*10*
enhanced 14:*10*
Environmental 6:*16*
epidemic 5:*23*, *25* 20:*10*, *11* 22:*24*
epidemiologically 40:*9*
epidemiologists 10:*15*
epidemiology 41:*15*
equilibrium 7:*17*
equivalent 4:*7*
especially 32:*23*
essential 8:*23*
EU 5:*14*, *17* 6:*9*, *13* 8:*3* 9:*13*, *24* 10:*10*, *18* 11:*2*, *16* 14:*8* 18:*5* 23:*6* 27:*3*, *17*, *21* 29:*15* 30:*17* 32:*1*, *3*, *6*, *18*, *21* 33:*3* 34:*1* 36:*17*, *20* 37:*15* 39:*19* 41:*7* 45:*6*
Europe 4:*17* 5:*15* 6:*2*
EUROPEAN 1:*7* 2:*9* 5:*9*, *11* 6:*11*, *15*, *16*, *22* 8:*4* 11:*5* 28:*24*, *25* 41:*5*
evacuations 10:*12*
evaluate 16:*15*
evaluation 8:*10* 13:*13*
evaluations 10:*19* 15:*4*
Eve 20:*15*
event 12:*18*, *23* 13:*2*, *14* 17:*11* 20:*4* 46:*6*
everybody 20:*22* 29:*5*
evidence 16:*13* 39:*10* 44:*19*
evident 24:*20*
exactly 23:*8* 30:*23* 36:*11* 38:*11*, *20*
example 15:*19* 19:*25* 27:*6* 38:*1* 43:*25*
examples 27:*2*
exercise 27:*22*
exercises 12:*19*, *20* 16:*13* 27:*13*, *14*, *21* 28:*3*
exist 7:*9* 16:*2* 35:*15*
existence 15:*22* 16:*4*
existential 30:*10*
exists 36:*20*
experience 21:*13*
experiences 11:*7*
expert 4:*4*, *8*
experts 4:*9*
extensive 7:*19*
external 15:*4* 19:*12*

< F >
face 18:*13* 23:*6*
facilities 4:*18* 8:*3* 9:*2* 29:*15* 32:*2*, *7*, *8*, *9*, *20* 37:*4* 38:*14*, *15* 39:*1*, *16* 40:*14* 42:*6*, *25* 43:*19*, *25*
facility 31:*17* 42:*20* 44:*16*
fair 31:*15*
fairly 10:*13* 24:*1* 37:*2* 40:*3* 41:*23* 43:*24* 44:*3*
fall 26:*13*
families 39:*16*
family 39:*13*
FAO 26:*3*
fatalities 41:*22*
fatality 33:*20*
February 41:*3*
feel 12:*15* 45:*20*
feeling 11:*23* 15:*15*
fellow 46:*9*
felt 28:*12* 40:*5* 41:*20*
field 10:*13*, *15*, *22* 25:*4*, *5*
figure 20:*25* 23:*11*
figured 20:*6*
file 5:*8*
financial 32:*24*
find 4:*24* 5:*8* 22:*23* 25:*24* 29:*4* 46:*19*
fine 4:*23*
Finland 15:*7*
Finley 3:*2*
flagged 19:*13* 23:*6*
focus 10:*18* 19:*16*, *22* 27:*22* 42:*8*
focused 18:*20* 42:*17*
follow 14:*9*
following 13:*10*
Food 6:*15*, *21* 21:*20*
foothold 36:*1*
foregoing 47:*5*, *11*
foreseeable 40:*13*
foresight 23:*1*
forever 35:*3*
formal 7:*12*
forth 47:*7*
forward 10:*20* 19:*21* 24:*13* 25:*10* 31:*4*
found 28:*23* 37:*1* 40:*23*
framework 8:*11* 9:*16* 17:*3*, *6* 18:*4*, *7*
Frank 2:*3*
French 10:*15*
full 28:*19* 41:*13*
fumes 29:*6*
functions 5:*20*
funding 32:*19*
funny 4:*6*
future 24:*6* 30:*7* 45:*4*

< G >
game 9:*10*
gaps 12:*15*, *22*
general 7:*3* 9:*7* 29:*17*, *23*
give 4:*13* 7:*2* 9:*6* 11:*22* 39:*9*
given 42:*8*
gives 11:*3* 15:*14*

global 9:*15* 10:*23* 45:*9*
globalization 26:*17*
gold 21:*6*, *9*
golden 21:*24*
good 27:*6* 30:*16* 40:*16* 42:*21*
governance 9:*24* 18:*4*, *6*
government 31:*1*
Gowling 3:*2*, *4*, *5*
gradient 33:*15*
great 29:*24*
greater 44:*1*
green 34:*10*
group 40:*7*, *22* 41:*22* 42:*5* 45:*9*
grouped 31:*12*
groups 34:*13* 42:*13*
guess 36:*18* 43:*20* 45:*23*
guidance 8:*8*
guideline 21:*5*
guiding 16:*20*
Guinea 10:*14*

< H >
H1N1 22:*16*
half 20:*22*
handle 30:*18*
hands-on 10:*8*
happen 10:*9* 22:*18* 37:*21*
happened 4:*16* 14:*22*
happening 8:*16*, *17* 20:*24* 38:*4*
happens 30:*5*
happy 4:*23* 46:*19*
hard 5:*2* 18:*9* 35:*4*
hard-hit 41:*6*
harmonize 9:*25*
head 4:*5*
headed 15:*6*
headquarters 15:*7*
Health 8:*12*, *23* 9:*15* 10:*5*, *23* 11:*20* 13:*16* 14:*7*, *10* 15:*2* 18:*23* 19:*3*, *9* 21:*7* 24:*2* 25:*19* 26:*2*, *4*, *12*, *14* 27:*1*, *7* 32:*12*
healthcare 19:*1*, *6* 23:*14*, *17* 31:*10*, *16*
hear 6:*10*
hearing 5:*3*
Helen 1:*24* 47:*3*, *17*
help 13:*15* 19:*17* 20:*5* 27:*16* 29:*10* 46:*14*
helpful 17:*1* 20:*2* 25:*11* 46:*8*
helping 16:*19* 46:*9*
high 28:*16* 37:*2*
higher 44:*1*
highest 16:*8* 33:*22*
hindsight 30:*22*
hit 41:*6*
hold 27:*19*
homes 23:*15*, *19* 32:*7* 37:*20*, *21* 38:*10*, *25* 39:*2* 44:*17*
Honourable 2:*2*
hope 12:*7*
hospital 19:*8*
hospitalization 33:*19*
hours 36:*15*
huge 10:*2*, *7*, *21*
hypothesis 35:*21*

< I >
idea 40:*11*
ideally 11:*9* 13:*5*
identification 17:*10* 20:*4*
identified 12:*14* 16:*1* 43:*23*
identify 12:*22* 22:*3*
identifying 12:*11*
IHR 13:*13* 15:*24*
imagined 17:*19*
impact 24:*24* 42:*4*
implement 13:*15* 27:*17*
implementation 11:*18* 13:*12* 15:*1* 18:*22*
important 9:*4* 26:*1*, *10* 33:*6* 45:*22* 46:*17*
improve 26:*20*
improved 13:*12*, *14* 34:*17*
improvement 13:*5* 28:*1*
in-action 28:*10*
inadequacy 32:*19*
inadequate 44:*15*
include 18:*23* 32:*6* 35:*23* 39:*1*
increase 41:*21* 44:*17*
increased 33:*1*
increasing 23:*14* 26:*1*
incredibly 7:*4* 29:*5* 35:*5*
incrementally 34:*4*
indications 36:*2*
indicator 15:*24*
indicators 8:*7*, *14* 15:*12*
infected 10:*10*
infection 8:*22* 31:*10*, *18* 44:*17*
infections 23:*14*, *17* 31:*16*
infectious 25:*6* 26:*11*, *13* 35:*24*
influenza 23:*21* 24:*19* 25:*3*
informal 32:*23*
information 4:*14* 8:*5* 40:*21*, *25*
infrastructure 18:*2*
initially 15:*6*
input 5:*17*
inseparable 25:*8*
intelligence 5:*23* 6:*1* 20:*10*, *11* 22:*24*
interaction 28:*9*
interested 16:*18*
interesting 18:*1*
interface 22:*9*
interim 45:*7* 46:*4*
international 9:*14*, *15* 10:*5* 11:*20* 13:*16* 15:*2*
interrupt 13:*21*
interruptibility 11:*7*
introduced 43:*3*
introduction 4:*3* 42:*9*, *24*
involved 10:*6*
involves 19:*3*
IPAC 44:*15*, *22*
irrelevant 19:*20*
issue 5:*6* 9:*1* 37:*15*
issues 33:*2*
Italy 41:*5*

< J >
Jack 2:*4*
January 1:*17* 7:*21*, *23* 20:*22* 33:*13* 40:*13*, *18*, *23* 47:*13*
job 4:*6*
John 3:*3* 4:*25* 24:*14*, *17* 25:*9*, *14* 29:*16* 34:*20*, *25* 35:*16* 38:*13* 43:*10*, *13*, *20* 44:*14*, *24* 45:*12*
joint 15:*3*
JONATHAN 1:*6* 2:*8* 4:*2*, *3* 5:*1*, *7* 13:*22* 14:*2*, *15*, *21* 17:*2* 20:*8* 21:*9* 22:*2* 24:*16*, *23* 25:*12*, *15* 29:*24* 34:*21*, *23* 35:*2*, *19* 37:*22* 38:*11*, *17*, *20* 39:*5*, *25* 40:*16* 43:*12*, *15* 44:*5*, *18* 45:*5* 46:*12*
July 34:*6*, *9*
June 34:*6*

< K >
Karma 6:*15*
key 16:*1* 27:*25*
kind 13:*3* 15:*9* 45:*20*
Kinross 31:*7*
Kitts 2:*4* 21:*4* 22:*1* 37:*16* 38:*8*, *12*, *16*, *23* 39:*22*
knew 20:*14*, *23* 23:*8* 43:*8*
knowing 46:*18*
knowledge 44:*20*
known 22:*6* 32:*18* 40:*3*
knows 18:*14*

< L >
lacking 36:*7*
landscape 45:*21*
large 11:*21*
larger 17:*18*
lasting 35:*3*
laws 9:*23*
Lead 2:*3*, *20* 4:*22* 5:*5* 13:*20*, *23* 14:*11*, *19* 16:*25* 19:*23* 21:*2* 40:*10* 45:*15* 46:*21*
leading 36:*3*
leads 13:*3*
learned 14:*6*, *16*
learning 12:*25* 28:*19*
led 15:*17*
legal 21:*15*
legislation 9:*13*, *14* 11:*2* 25:*22*
lessons 14:*6*, *16*
Lett 2:*17*
level 4:*17* 5:*14* 8:*19* 9:*21* 11:*3* 14:*8* 15:*10* 16:*8*, *17* 27:*21* 32:*6* 41:*8* 44:*20*
levels 9:*24*

44:11
life 12:18
likelihood 44:9
limit 17:13
link 16:23 37:6 43:17
links 25:16
live 39:13
living 32:8 39:2, 17, 20
logical 44:6
LONG 1:1 22:7 28:12, 17 30:15 46:6
longer 34:22
Long-Term 2:15, 18, 21, 24 4:17 8:3 9:1 24:20 29:15 31:16 32:1, 20 37:3, 20, 21 38:10, 19 40:14 42:5, 20 43:18, 25
looked 23:5 43:11, 21
looking 15:16, 19, 25 16:5 26:23
loosening 35:13
lot 5:24 6:18, 20, 25 7:20 9:23 13:17 14:18 15:6 16:22 17:3 18:1 19:2, 3 23:7 27:9, 10 30:1, 11, 14 44:7
lower 34:12 35:16
Lynn 3:5

< M >
made 32:21 47:8
magnitude 9:11 17:17
Mahoney 3:5
main 10:18 19:22 35:21
maintaining 8:23
major 22:6 23:9, 10
management 8:23 11:17 13:14 18:24 42:20
mandate 19:16 26:15
mandated 33:8
manner 15:9
manually 37:8
map 27:15
mapped 16:2
mapping 15:25
March 41:3
marginally 34:4
Marrocco 2:3 4:22 5:5 13:20, 23 14:11, 19 16:25 19:23 21:2 40:10 45:15 46:21
Martineau 1:24 47:3, 17
masks 18:13
massive 7:5 28:11
matter 27:23
means 24:11
meant 10:20 11:5
measured 15:21
measures 7:15 11:11 18:8, 25 31:18 35:13
mechanisms 9:19
mediary 11:6
medical 10:11 18:23, 25
Medicines 6:11, 22
meeting 1:16 46:23 47:5
meetings 14:6, 9
member 5:17 27:17 37:14
MERS 22:12
message 36:25
messages 42:17
Michael 3:2
microbiology 5:21
middle 45:24
mild 22:16
million 31:25
millions 33:10, 11
mine 31:7 36:14
minimize 17:12, 14, 15 42:24 43:1 44:23
Minister 2:14
mink 27:5
minute 13:21
missions 15:17
mitigate 24:8
mixture 32:4
mobilization 18:11, 16
modules 30:2
moment 45:11
momentum 10:21
monitoring 7:24 8:10, 21 13:12 36:17
Monnet 31:9
months 36:19
morbidity 17:13
mortality 17:13 42:2
multi-generational 39:14
multi-hazard 15:22 16:4
multi-sectoral 19:4
mysterious 20:19

< N >
named 4:11
national 9:21, 23 15:10, 22 16:17
native 4:10
Neesons 1:16
neighbouring 11:8
networks 19:8
new 6:7 7:22 20:15 22:5, 7 27:4 35:23 40:22
news 6:4, 11
nomenclature 4:6 39:6
normal 17:16
Norway 37:10
note 42:12
noted 25:21 27:2
notes 47:12
noteworthy 22:10
notifications 20:18
novel 7:13
November 36:18 41:18
nuclear 39:16
number 33:22
numbers 37:18
nursing 23:15, 19 32:7 38:25 39:1

< O >
objectives 17:7
observed 31:15 42:2
obtain 21:1
occupational 6:17, 19
occurred 37:3
office 27:12 29:1
OIE 26:3
old 32:11
older 42:3
ones 7:1 16:10
online 6:13 43:8, 9
Ontario 45:19
open 25:13
opinions 35:10
opportunities 28:20
opportunity 14:5 34:15
opposed 45:3
opposite 36:4
optimization 13:1
optimize 28:4
options 42:20
order 17:17
Organization 8:13
orientation 11:3
outbreak 5:18, 23 10:7, 25 13:11 14:3 17:21 21:20 42:10 44:9
outbreaks 6:4 16:7 21:18 23:10 30:18
outcome 34:12
outcomes 33:18 34:3 35:17 36:4 40:7, 22
outermost 12:2
outside 26:13
overall 27:25
overlap 6:20
overlaps 6:19
over-represented 38:3
oversight 5:12

< P >
pandemic 4:15, 18 7:5 9:7 11:17 16:7 21:12, 23 22:16, 17 23:21, 23, 25 24:1, 12, 18 25:3, 7 28:20 29:12, 17 30:3, 24 31:3, 14, 21 33:3 34:14 40:6 41:9 45:9
panic 24:3
paradigm 9:9
parallels 33:4
part 21:16 27:25
participants 1:21
particular 11:1 42:7
particularly 10:24 25:4 40:14
partner 6:14
parts 4:19 33:5
patients 34:19
pay 9:18
paying 14:14 20:5, 16
peer 15:8, 9
peer-reviewed 15:4
people 7:20 14:14 24:5 31:25 35:10 39:20 40:11

42:3 46:13
perceived 34:21
percent 32:2 37:10, 18, 19 38:9
percentage 36:9
percentages 38:7
perception 34:24 35:1, 2
perfect 32:13 40:21
person 10:10 20:5
personally 27:10 30:24
perspective 4:15 9:6 16:17 26:5 27:7
Pete 31:7
ph 6:15
PhD 1:6 2:8
phrase 28:10
picked 39:24
picture 41:4, 13
pile 18:3
pillars 8:13, 15 9:4
place 11:12 13:25 16:15 17:24 30:16
placed 26:2
Plachouras 31:8
plan 16:9 21:23 29:17 30:2, 3, 16
planning 11:2, 8 12:11 22:25
plans 12:21 16:5, 6, 8 21:12 23:23 30:8, 12, 25
plausible 23:11
play 11:5
pleasure 14:21 46:13
plotted 16:1
plugged 6:1
plus 33:22 35:14
pneumococcal 43:4
pneumonia 20:19
point 11:21 26:11 31:5
Policy 2:17, 23 8:21 10:1 13:7 18:22 32:15
poor 32:12
population 32:3, 25
populations 27:5 42:7
possible 11:16 17:10, 16 20:4 26:21 29:2 35:17, 19 36:5
posts 4:11
potential 24:24 43:5
potentially 38:3
power 26:15
practical 28:18
practice 8:16, 21 11:6 12:21 42:21
practiced 44:22
practices 39:11 44:22
pre-COVID 13:8
preliminary 36:3
premise 44:6
preparation 43:22
preparedness 4:4, 15 5:21 9:7 10:3, 8, 9, 20, 22 11:2, 23 13:6, 24 15:14, 20 16:8, 18 19:17 21:7 25:5, 6, 7, 19 28:1 29:12 30:12
presence 10:13
present 8:4 29:14
PRESENTATION 1:6 4:20 45:18
pretty 20:23 21:19 23:11 37:15 40:4 41:10 44:10
prevalence 44:2
preventative 18:24
PREVENTION 1:7 2:10 5:10 8:22 31:18 42:9
primarily 46:4
principal 4:4, 8
prior 9:8 10:23 22:4 31:14
prioritized 12:13
priority 13:9
private 19:9 20:13
problems 20:1
proceed 4:24
process 7:12 13:4 15:5 26:4
processes 9:16 16:14 26:16, 17 27:13
produced 7:19 12:5
producing 7:25 8:7
profiling 15:24
program 6:7
programs 6:6
project 31:9 46:10
projects 12:9
promote 12:25 28:13 29:1, 7 31:18
promoting 11:7 27:9
pronounced 32:22
proportion 37:2
protection 19:11
protocols 21:20
provide 5:16, 18
providing 10:16
public 19:8, 9, 12 20:13 21:7 26:12 33:1
publically 46:16
publications 14:12
published 17:9 23:4 36:23 45:7
pulled 15:13
purposes 19:19
push 28:21 30:7
put 11:12 18:14 23:24 24:5 36:15 42:1, 18 46:4
putting 45:18

< Q >
quality 13:5 32:20
question 21:5 29:25 30:20 35:12 40:17 46:18
questions 29:12 45:13
quite 4:5, 23 10:6, 16, 17 25:7 32:11, 12 36:22 37:10 46:1

< R >
ramifications 21:15
range 6:5 7:7 15:11 16:6 20:12 32:13
rapid 7:11, 17, 18 8:2 32:17 38:21 41:17, 25 42:15
rapidly 40:6
rate 34:12
rates 33:19
reaching 23:12
read 17:5
real 12:18, 22 36:14
realistic 41:8
realization 14:1
realize 19:18 41:7
really 14:9 15:5 20:25 26:10 30:8, 9, 13 32:12 35:6, 7 39:16, 23 40:2
reason 46:5
received 31:23
recognition 26:19, 24
recognized 33:2 37:14
recollect 41:1
recollection 40:20
recorded 47:9
recovery 12:1 17:16
reduction 9:17
reference 37:6
referred 46:3
refreshed 21:8
regard 42:22, 23
region 29:20
regular 21:18
Regulations 9:15 10:5 11:20 13:16 15:2
reiterate 42:17
related 23:13 27:1, 3 40:24
relating 32:25
relation 4:18 16:3
relative 29:17, 22
relatively 23:25
relevant 6:6 10:4
rely 44:25
remarks 47:8
remember 20:17
report 21:5 32:16
REPORTED 1:24 33:11 36:21 38:6
reporter 5:2 47:4, 18
REPORTER'S 47:1
reporting 33:8 36:16 37:24 46:6
reports 7:6 16:24 21:6 36:24 41:11 45:7, 8 46:4
represents 32:2
requirements 11:19
residential 39:3
residents 32:10 42:5
resistance 23:17 31:11
resource 15:25
resources 16:2 18:2

respiratory 6:*7*
responders 19:*1*
response 4:*5* 5:*16*, *23* 7:*15* 8:*11*, *14* 9:*3* 12:*1*, *12*, *23* 16:*5* 17:*11* 18:*18*, *21* 25:*17* 27:*1* 28:*11*, *15* 29:*10* 35:*12*
responsible 5:*11*, *15* 6:*12*
retirement 39:*2*
return 17:*16*
review 15:*8*, *9* 16:*15* 28:*3*, *4*, *9*, *10*, *15*, *19*
reviewing 21:*19*
reviews 12:*25* 16:*14* 27:*11*, *14* 28:*2* 29:*9*
revised 21:*14*
rising 41:*23*
risk 7:*6*, *11*, *16*, *17* 8:*2*, *19* 9:*17* 12:*15* 15:*23* 24:*18* 31:*24* 32:*17* 38:*21* 40:*15* 41:*17*, *25* 42:*15*, *24* 43:*2* 44:*1*, *17*
risks 12:*11*, *13* 16:*2* 22:*3* 26:*22* 44:*23*
role 4:*4* 9:*22* 11:*6*
Rose 2:*23*
roughly 34:*6*
routine 17:*20* 21:*17* 22:*24*
rule 21:*11*, *25*
run 20:*1*
running 29:*6*

< S >
Safety 6:*15*, *17*, *20*, *24*
SARS 22:*4*, *12* 40:*24*
SARS-CoV-2 27:*5* 42:*9*
scale 9:*10* 28:*11* 29:*9*
scenario 22:*20* 23:*1* 30:*8*
scenarios 23:*5*, *7* 24:*8* 27:*24*
school 44:*10*
schools 44:*8*
scientific 5:*22*
scientist 34:*25*
scope 7:*14* 30:*25* 45:*19*
scrambling 20:*25*
screen 5:*6* 20:*11*
screened 37:*8*
screening 6:*3*
seasonal 35:*14* 43:*4*
second-last 37:*17*
Secretariat 2:*16*, *19*, *22*, *25*
sector 26:*14*
sectors 26:*25* 31:*1*
security 10:*23* 14:*10*
seek 29:*21*
send 16:*23* 25:*15*
Sendai 9:*16*
Senior 2:*23* 4:*8*
sense 11:*13* 21:*23*
sequenced 36:*10*
serious 41:*9*
services 8:*24* 18:*23*, *24* 24:*2*
set 47:*6*
sets 34:*7*
setting 5:*13* 42:*17* 44:*10* 45:*6*
settings 31:*17* 42:*11* 44:*13*
setup 23:*18* 25:*1*
severe 33:*18*, *19* 34:*12* 35:*17*, *18* 36:*4* 42:*4*
severely 32:*9*
shaping 9:*20*
sharing 5:*6* 11:*6*
shift 9:*10*
short 18:*10*
shortage 10:*14*
Shorthand 47:*4*, *12*, *18*
shot 22:*15*
show 4:*12*, *16* 22:*3* 41:*16*
showing 14:*13*
sic 23:*24*
side 34:*18*
signal 41:*19*, *24*
signals 40:*8*
significant 20:*23* 24:*1*
similar 8:*12* 28:*8*
simulation 12:*19* 27:*12*, *14*, *20* 28:*2*
situation 9:*12* 29:*14* 32:*21* 45:*23*
skilled 32:*7* 39:*1*
skip 19:*21*
slide 16:*23* 22:*3*, *11* 43:*16*
slides 4:*13* 9:*6* 29:*14* 38:*18*
small 36:*9* 38:*14*
so-called 34:*13* 41:*21*
social 17:*14*
societies 24:*3* 25:*2*
society 30:*10* 31:*2*
somebody 20:*10*
SOP 21:*22*
sorry 5:*7*
sort 8:*14* 9:*19* 13:*6* 16:*6*, *20* 17:*15* 29:*5* 38:*18* 45:*21*
sorts 6:*4* 8:*6*, *8* 9:*25* 10:*19* 11:*11* 12:*3* 14:*8* 15:*15* 17:*23* 18:*8*
sources 20:*12* 37:*7*
Spain 38:*8*, *13*
spare 15:*6*
speak 46:*13*
speakers 4:*10*
speaking 10:*15*
specific 12:*3* 16:*10* 29:*18*, *22*
specifically 42:*16*
specifics 29:*19*
spend 19:*21*
spending 33:*1*
spread 17:*13*
stable 40:*4*
staff 44:*15*, *20*
stakeholders 5:*18* 12:*8* 26:*7* 27:*17* 28:*6*, *14*
stakes 28:*16*
standard 21:*6*, *9*, *21* 36:*16*
standardized 32:*5*
standards 5:*13*
started 41:*7*, *9*
starts 9:*8*
states 5:*17* 27:*17* 37:*14*
stay 39:*12*
steeply 41:*23*
stenographically 47:*9*
step 9:*5*
steps 12:*9*
stock 18:*3*
Stockholm 38:*2*
stockpile 18:*13*
stockpiles 18:*25*
stockpiling 19:*25*
stop 26:*16*, *18*
stories 27:*4*
story 9:*8*
strain 24:*2* 36:*11*
strategies 12:*12* 25:*17* 27:*1*
stream 13:*8*
streams 10:*1*
strengthen 19:*17*
strengthening 10:*3*, *4*, *23* 13:*14*
strict 21:*10*
strong 10:*13*
structural 18:*9*
structure 25:*2*
studies 40:*19* 44:*19*
study 43:*23*
study's 34:*5*
substantial 22:*19*
Suetens 31:*8*
suffer 33:*17*
SUK 1:*6* 2:*8* 4:*2*, *3* 5:*7* 13:*22* 14:*2*, *15*, *21* 17:*2* 20:*8* 21:*9* 22:*2* 24:*16*, *23* 25:*12*, *15* 29:*24* 34:*23* 35:*2*, *19* 37:*22* 38:*11*, *20* 39:*5*, *25* 40:*16* 43:*12*, *15* 44:*5*, *18* 45:*5*, *17* 46:*12*
support 5:*17*, *19*, *21* 15:*7*
supporting 11:*18*
surely 42:*18*
surge 18:*23*
surveillance 5:*14*, *20* 8:*20* 22:*25* 31:*19* 33:*7* 41:*24*
susceptible 29:*21*
sustainability 32:*24*
sync 11:*9*
system 19:*6*

< T >
table 12:*20* 27:*21* 41:*16*
take-home 36:*25*
talking 21:*17*
tangible 41:*8*
targeted 28:*14*
Team 2:*20*
teams 15:*8*
technical 5:*16* 7:*6*
tend 21:*13*, *14*
TERM 1:*1*
terms 7:*11* 13:*23*, *25* 22:*21* 35:*16* 36:*7* 39:*19* 45:*10*

test 12:*20* 28:*3*
tested 44:*20*
testing 8:*21* 37:*25* 38:*4* 41:*11* 42:*22*, *23*
text 17:*4*
thanks 5:*4* 17:*1*
thing 29:*5* 32:*15* 33:*6*, *7*, *24* 36:*7* 39:*8* 40:*1* 41:*17* 43:*20* 45:*1*, *21* 46:*7*
things 5:*19* 6:*24* 8:*8* 11:*14*, *25* 12:*4* 13:*9* 14:*22*, *25* 15:*15* 16:*16* 17:*23* 18:*9*, *19* 19:*24* 20:*6* 21:*20* 22:*6*, *21* 25:*18* 40:*5* 44:*3*, *14*
thinking 30:*23*
threat 7:*14* 23:*5* 27:*23*
threats 11:*25* 16:*11* 22:*23* 30:*10*
thumb 21:*25*
tightening 35:*13*
time 5:*3* 13:*1*, *8* 19:*22* 21:*14* 22:*7* 24:*10* 28:*23* 29:*4* 38:*6* 40:*2*, *21* 41:*11*, *12* 43:*7* 45:*3*, *5*, *25* 47:*6*, *8*
timeframe 18:*10*
titles 4:*6*
today 6:*6*
tools 12:*9*
top 12:*20* 27:*22*
topic 31:*14*, *20*, *22* 44:*7*
topics 7:*7* 19:*17*
Toronto 22:*12*
touch 30:*25*
touched 19:*24* 29:*18*
trade 26:*9*
traditionally 31:*12*
training 5:*22* 12:*14* 27:*20* 44:*15*
transcribed 47:*10*
transcript 1:*15* 47:*12*
transmission 43:*2* 44:*12*
travel 26:*9*
treat 34:*18*
trend 34:*19* 37:*12*
trends 23:*16*
tries 12:*2*
trigger 13:*24* 41:*24*
tripartite 26:*4*
troublesome 4:*9*
true 47:*11*
trying 5:*8* 9:*25* 17:*6*, *8*, *12* 25:*21* 27:*15* 28:*5*, *21* 29:*7* 31:*17*, *20* 45:*19*, *25*
turned 22:*16*
Twitter 20:*18*
type 26:*24* 27:*21*
types 24:*4*, *8* 39:*20*

< U >
U.K 35:*25*
U.S 15:*6*
UK 43:*23*
underlies 42:*3*
understand 12:*6* 22:*4*
understanding 12:*11* 34:*17*
understood 26:*8*
undertaken 45:*3*
Union 5:*11*
UNISDR 9:*16*
universally 37:*15*
unprepared 24:*3*
updated 21:*8* 33:*13*
upstream 26:*21*
useful 18:*15*

< V >
vaccination 43:*4*
vaccinations 43:*5*
vaccine 6:*23*, *24* 8:*20*
vaccines 6:*12*, *23* 43:*6*
value 29:*17*, *22*
variable 36:*22*
variant 36:*3*
variants 7:*22* 27:*5* 35:*23*
varies 18:*5* 39:*7*
various 12:*12*
vector 16:*11*
venues 14:*7*
Veritext 1:*16*
vetting 6:*12*
view 11:*23* 13:*6*
viewed 8:*18* 11:*24*
virologist 35:*20*
virtual 1:*15*
virtually 1:*21*
virus 29:*21* 35:*17* 39:*23* 40:*22*
viruses 6:*8* 22:*12*
voice 5:*1*, *3*
vulnerabilities 42:*12*
vulnerable 42:*7*

< W >
wait 28:*18*
wake 10:*2*, *21* 40:*12*
warning 22:*15*, *18* 26:*20*
wave 34:*14*, *21*, *22* 41:*21*
waves 35:*11*
ways 15:*1* 25:*8*, *24* 26:*23* 42:*18*
wear 18:*14*
website 7:*8* 33:*14* 37:*5* 43:*17*
week 20:*21*, *22* 33:*13* 34:*3*
west 10:*13*, *24* 13:*10*
WHOs 13:*14*
wide 7:*7* 15:*11* 20:*12* 29:*9*
widely 18:*5* 38:*4*
window 34:*8*
WLG 3:*2*, *4*, *5*
women 32:*23*
won't 44:*24*
work 6:*18* 9:*20* 10:*8* 12:*21* 14:*24* 19:*14* 23:*3* 24:*6*, *11* 25:*25* 26:*6*, *20*, *24* 27:*10* 28:*4*, *25* 31:*13*, *20* 36:*15* 46:*15*
workers 19:*1*
workforce 18:*8*
working 19:*10* 25:*18* 27:*12* 44:*7*, *15*
workshops 14:*6*
world 6:*3* 8:*12* 12:*22* 14:*7* 20:*24* 33:*5* 39:*23*
worst 30:*8*
Wow 38:*12*

< Y >
Yeah 14:*2*, *21* 20:*8* 39:*5*, *25* 44:*5* 46:*12*
year 7:*21*, *24* 20:*16*
years 11:*22* 13:*25* 14:*4* 28:*6*
Year's 20:*15*

< Z >
Zika 30:*13*
Zoom 1:*15* 34:*8*
zoonosis 22:*8*