

Victor Dzau: Good afternoon. I'm the president of the National Academy of Medicine. Thank you for joining today's webinar. It is the first of a series of webinars organized by the National Academy of Medicine and the American Public Health Association. We hope to address the state of the science on COVID-19 and explore emerging evidence on how to best mitigate the symptoms.

As you all know, this is a rapidly evolving issue. There is a real need for trustworthy, scientific analysis and dialogue on the latest COVID-19 developments. And I am particularly pleased that APHA is partnering with us on this webinar series an opportunity for the two organizations to serve as a trusted source of information and learned opinions.

This series will provide scientific analysis of informed developments in the COVID-19 response, inform policymakers, public health practitioners, clinicians, business leaders and scientists as well as the public. The webinars will feature experts in such fields as public health, infectious disease, communication and many others. I want to thank my partner George Benjamin for his leadership and willingness to partner with us, also the panel of advisors, for planning the webinar series, they have done a phenomenal job. And as you will see today, the first one on the science of social distancing practices. Again, thank you for attending. I will turn it over to Georges to say a few words and introduce the panel of speakers. Thank you.

Georges Benjamin: Thank you very much. Welcome all of you to this webinar. This is a conversation. The intent is for us to be able to get out good, scientific information during this critical time in our nation. We've got an amazing panel for you today, and we have two wonderful co-chairs who helped us plan this important event. For that I'm going to turn this over to the co-chair of the webinar. Nikki.

Nikki Laurie: Thank you Georges and Victor and to all of you online listening. We have a terrific program queued up for you today really focused on one of the major events of the day, which is social distancing, or if some people want to call it something else, that is fine. As you heard the goal is to provide trusted, scientific information. We are going to start with the scientific presentation on what we know about how COVID-19 is spread. And turn from there to the implications of that what do we know from history what do we know from science and modeling and what do we know operationally about how to do this. I am aware that there are over 10,000 people who have registered for this conference so that tells us a lot about the hunger for information. So we are very eager to have your feedback about additional webinar topics or questions you may have. You can either enter those in the chat box or by emailing apha@apha.org.

Our first speaker is Dr. Nancy Messonnier. The Director of the Center for the national Center for immunization and respiratory diseases at the CDC, she has a 25-year career as a public health servant where she is focused on control of infectious diseases including meningitis and pertussis, the response to the 2001 anthrax threat, and during the time the assistant secretary of response. I had the opportunity to work with Nancy on multiple occasions and I am forever grateful for her scientific expertise and leadership. I will turn this over to you, Dr. Messonnier.

Nancy Messonnier: Thanks to the National Academies for organizing this call. I am going to set the stage for the rest of the discussion. COVID-19 was first identified, as many of us know, as a cluster associated with a live animal seafood market in Wuhan, China in late December. Rapidly after that it became apparent that this virus was spreading person-to-person and spreading so quickly. Early distribution of cases, in January COVID-19 had been confirmed in every province in mainland China with the majority in Huanan centered in the Providence capital.

Modeling can be incredibly helpful to see how a disease is going to spread, and we certainly can expect in our interconnected world lots of spreading diseases and these maps should've helped us anticipate what was going to happen next. One way we use modeling was to better understand where the outbreak may spread globally. This is hopefully now familiar to you, but in this example we were modeling where we thought the outbreak may occur first in Africa, based on the volume of air travelers inbound to African countries from China data on the country's ability combining the circles in the graph the three African nations subsequent analysis with the first one to report confirmed COVID-19 infections.

Using modeling we would have anticipated the worldwide spread but not perhaps the remarkable speed in which it spread. This is a figure from the European CDC and it shows cases as of March 24th with the different sizing case counts in addition to the spread incidents at the Diamond Princess cruise ship. You can also see the large outbreaks in Italy, South Korea, Iran and Japan, perhaps based on travel patterns.

I will next shift to talk to you about what we normally don't know about transmission. So most agree that secretions are the main mode of transmission spread through respiratory droplets in the air that land on surfaces. One thing that we don't understand is the role of people who are pre-symptomatic or asymptomatic infections in spread. In general what we understand about respiratory diseases widely is people are more infectious when symptomatic, but there certainly is clear evidence of transmission in people who are pre-symptomatic or asymptomatic. That partly explains why this is spread so rapidly. At this time it doesn't seem likely that stool is a major part of spread. COVID-19 is readily detectable in stool but there was only one report of replication, competent virus that is cultured.

Of course as you know, RT-PCR is not sufficient. We need to be sure it is actually a virus that can still spread ... Finally, perinatal, no transmission has yet been observed in and COVID-19 has not been detected in amniotic fluid, cord blood, neonatal throat swabs or breast milk but there have been cases where it has been spread postpartum to neonates.

I want to talk more a little about this question of when most likely to spread in the role of people with asymptomatic spread. There are various bits of data about this. This is one study that looks at virus load in 17 symptomatic patients. Which you might hopefully see looking at this is the amount of virus shed from the respiratory tract seems to be greatest at the time symptom starts and the decline what this means exactly in terms of the presence of infectious virus has yet to be fully worked out. This is the focus of work at CDC.

Even if there is a goal of a partly symptomatic and as we do know that the virus shedding seems to be greatest at the time of symptom onset, which is consistent with other viral diseases. None of ... most of you who have worked in preparedness should be familiar with, but if you aren't, to orient you, it tends to frame out some of the basic concepts of preparedness for a pandemic. Something multiple people across the U.S. government and around the world have been preparing for, for a long time. This shows a hypothetical number of cases over the course of the pandemic.

We generally approach it with the main strategies. The potential pandemic is recognized as cases rise and focus on finding the case in contact tracing in order to stop the spread or stop that chain. The last transmission continued efforts we moved to mitigation. An idea of mitigation focuses on managing in order to prevent morbidity and mortality as well as a variety of nonpharmaceutical interventions, and that is what we are going to focus on next. The idea of mitigation is if you mitigate, you are able to decrease the height of the curve ... the idea is to bend to the curve so ... the health care system will have an easier time managing.

Nonpharmaceutical interventions is another way of talking about social distancing and the idea is every sector of society homes, schools, working gatherings, it will decrease personal interactions [and decrease] the availability of the virus to spread from one person to another. And that bends the curve. There is all the science, a lot of science on this, and we know that the measures work and this is some data from some surveys that worldwide sentiment was that travel restrictions and self isolation might not stop but slow it down. But viruses do spread, and this seems to be general agreement, even in the public ...

One of the basic principles of COVID-19 is the idea of personal responsibility to prevent transmission of COVID-19. Actions protect you from getting it. These are the same things we've all heard from our mother since we were children, but in situations like this, it is interesting that children's hand washing, for example, has gone up. The idea is, you avoid touching your face, you wash your hands a lot, avoid people who are sick, those are all things under our control and clearly demonstrated to decrease the spread of infectious diseases like this one.

But of course in the situation like this we need to think more broadly. On the right, you should see the front cover of CDC's morbidity mortality report. The thinking as this community about these mitigation strategies this is the most recent version of that from 2017. When we talked about these measures, a lot of what you hear is reference back to influenza because of course the pandemic of influenza is what we were all

expecting and preparing for. In many ways in which the COVID-19 pandemic is similar, and we should learn from influenza, but it is also a different virus and we need to leave ourselves open to it behaving differently. Some of the data we have from influenza is about school closures; specific modeling has shown it can be very effective in decreasing spread. Because it decreases the opportunity for kids to interact. One thing modeling brought up was that this isn't about the timing of school closures but in influenza it is much more effective to make a decision to close schools reactively as opposed to completely preemptively. I think it's similar modeling for COVID-19 is very important and I hope to talk about that later. Only preemptive, coordinated closures are actually considered interventions. There really is historic data, modeling data and observational data on effectiveness of these measures. The models can be freely used as a starting place to think about COVID-19.

Interestingly, though, before, perhaps, we are able to think through other specific dynamics and how COVID-19 might be investigated in school closures, schools began closing. I think it is amazing how quickly school closures spread across the U.S. The map should show you how many states have ordered most schools closed, how quickly states and counties and school systems, interesting to hear from modelers whether they think this is the most effective strategy and what was perhaps the most effective time to start thinking about school closures and what the effect of school closures might be. In states that have already started school closures, really, there is an opportunity to see how it is already impacting.

The main thing is the idea of social distancing in workplaces or teleworking. That also has really good data on the effective workplace social distancing. Again primarily from influenza. This is a systematic review, looking at the effectiveness of strategies, the effectiveness more pronounced when workplace social distancing is combined with other nonpharmaceutical interventions. Effectiveness declines with delayed triggering of workplace social distancing or lower compliance. And that is again based on modeling. At the time of this publication, one of the conclusions were we need more empirically -- more real-world data — on this. Hopefully at this COVID-19 outbreak continues we will all take opportunities to do those studies.

An interesting phenomenon is how quickly the general public heeded the recommendations of stopping mass gathering in troubled jurisdictions. This is data publicly available from a group called safe graph, you can find it online. You can see it by sector. The graph on the left comparing last year to this year. You can actually look at a country as a whole, state and county level and differences across the United States and how much people are restricting travel. Some of this data is based on cell phone movement. People are actually listening to the guidance to restrict movement and implement nonpharmaceutical inventions in a dramatic way. What data do we have about this more broadly? Well, some of the data we have is in the opposite sense. Example during the last pandemic of influenza in 2009, we saw pretty good data about mass gathering in densely populated areas giving rise to some outbreaks in Mexico. The suggestion of course is if you could prevent those mass gatherings, you could prevent this epidemic.

I would say that there is really very good data in general [that] social distancing works for viral, respiratory disease. Influenza preparedness there are similarities around influenza and COVID-19. I expect we may see some of the same impact. Of course it will be important to look at the layering of all the nonpharmaceutical interventions and try to ensure we do the most optimal interventions at the right time. Interconnected systems it is critical that community account for that intervention when the country begins its strategy to mitigate but also when the country begins a strategy to return to normal activity. In the interest of time I will stop there. Thank you for the opportunity.

Nikki Laurie: Thank you so much, Dr. Messonnier.

Next we are going to hear from Dr. Howard Markel who will talk about social distancing from a historical perspective and he is the distinguished Professor of history of medicine and Director of the Center for the History of Medicine at the University of Michigan. And he is the person I think widely credited with coining the phrase about 'bending the curve'. Then we will hear more on models and evidence on the effectiveness of these measures from Marc Lipsitch, professor of genealogy at Harvard, where he directs the Harvard Center for Communicable Disease Dynamics. And he is an internationally renowned model or an expert on the topic. Finally, we will hear about the operational aspects, the current state of social distancing in the U.S., from Mitch Stripling, currently the national director of emergency preparedness and response for Planned Parenthood Federation of America, formerly Assistant Commissioner for the Agency for Preparedness and

Response for New York City. Then, I will turn it over to my colleague, Carlos, to moderate the Q&A. Let's turn to Dr. Markel. Thank you.

Howard Markel: Thank you. It is a pleasure and honor to be here. I want to echo what Nancy just said about the differences between influenza and COVID-19. There are many biological actors in these pandemics. We sometimes forget the microbe is very much a living actor as well. That said, a lot of the history and data we are presenting today will have to do [with Spanish flu of 1918]. It was the greatest usage of nonpharmaceutical interventions up until the present day. In the modern, post-germ theory you should ... doctors did not know much about [virology] at the time. They were actually quite confused as to the cause and spread. Just the origin of quarantine... the word quarantine was developed by people who ran the port of Venice in the 1480s in response to an epidemic that comes from the Italian words Quaranta giorno, literally 40 days — the period ships were meant to be in the lagoon before they could enter ... to distribute goods and passengers into Venice itself. That was thought to be the period of when bubonic plague would burn itself out.

Today, many different uses of quarantine, from the Wuhan quarantine of China, compared to what was going on in the United States. ... The American experience with the 1918-1919 flu is often used as the worst-case scenario of a serious and deadly pandemic. Some 40 million-100 million people worldwide were killed by flu and bacterial pneumonia, secondary pneumonia. In America, at least ... 750,000 Americans died probably ... 40 million cases in the United States. It struck quite hard.

We were asked to look, in 2005, by the Department of Defense to look at seven ... communities. Communities that literally shut their doors, roads, schools, public, to everything to the outside world, for a period of 2-4 months. You can see the most famous: Gunnison, Colorado, a mining town owned by the western mining company, nestled in the Rocky Mountains, so they were remote to begin with but they had zero cases until they opened the gates in March. That one case and no deaths thereafter. Their similar experience, Yerba Buena Island in San Francisco Harbor, Princeton University, Trudeau Sanitarium, Bryn Mawr College. They sequestered themselves from ever having contact. To some extent in China and currently done in many states, including my own state of Michigan, we are all sheltered in place. It is not practical when you think about it. This is the same curve Nancy showed called flatten the curve — the idea that you delay peak outbreak, decompress the peak burden on hospitals and infrastructure. In a more modern sense today, you would lower the amount of cases. It doesn't prevent cases. As soon as you open the gates the virus can circulate back in and do what it does, but it can buy you time to perhaps come up with medical therapies and better yet vaccines.

This concept was in the air... asking about helix ... when they came up with the double helix. ... so, too is the concept of 'flatten the curve'. A lot of us were thinking about in Health and Human Services, CDC and academics. And it was the hypothesis behind this study we did with CDC and the group at the division of quarantine with CDC and we looked at 43 American cities from 1918, about 22 million Americans. Up until recently this was the largest study of nonpharmaceutical interventions If you take the worldwide experience involved in the greatest, largest experience of social distancing ever undertaken, I can almost hear modelers drooling as they talk about it because there are so many opportunities to study.

What we found is, it was a tale of many cities. Important that the federal government was very small and very weak at that time. And really only the states primarily with the municipalities. A lot depended on how early they implemented these before there was an inflection point because standard epi curve like the red curve were the East Coast experience. They did not have a lot of forewarning, it just came. In a layered manner you go the three isolation quarantine, school closures, which we found to be very helpful for all the reasons you just suggested. As a pediatrician I can tell you children do not have good respiratory hygiene.

And the final one is public gathering. Particularly interesting there were only 23 cities that had the double hump curve. What that means is when they pulled the trigger, cases went down. When they released the trigger too early because it was still circulating, cases went back up again. When they pulled the trigger the second time, it went back down. So you see these double hump curves. It is really neat because NPI activation ... followed by reduction of deaths and typically when NPI were deactivated, the death rates increased, which highlights the protective nature of these measures and then move forward to sustained response. Early, layered and sustained. Specificity and temporal associations between excess mortality and the triggers of NPI activation and deactivation suggest a causal relationship.

Another — none of the 43 cities had a second peak of influence about the first set of NPIs were still in effect. In essence, each of these cities, which I found was fascinating, served as their own control. The conclusion of the early come sustained and layered application of NPI — quarantine and isolation, school closures, social distancing — played a critical role in mitigating the consequences of the 1918-1919 influenza pandemic. And those cities that did it in that manner were much better on mortality and morbidity rates than cities that did not.

Here Nancy just showed most recent policy, but this was the first one included in a great deal of the modeling with historical studies developed community strategies for pandemic flu in 2007 of course operated in a document for pandemic preparedness and organization. You saw the slide that Mexico experienced in 2009. They experienced flu in late April, remarkably transparent and helpful working with other countries in the world. They did all of these NPIs for a period of 18 days. It was a double hump curve. When they release them, you could see basically when they released them cases went back up and when they put it back on cases went down. After 18 days, however, they stopped NPIs because we found out that the fatality rate was really quite low, about .48. The 1918 flu case fatality rate was on average 2.5%, in some cases as high as 10%. We only use these NPIs in worst-case scenarios where there is a great risk with a lot of people dying.

And once the case fatality rate dropped, you could see similar seasonal influenza rates, disruption social, economic and other disruptions. That was outweighed by the epidemic in 1918 but not outweighed by the 2009 pandemic. We also did oral history and study of school closures during the 2009 H1N1 pandemic and interesting organized a lot of school districts know what to do really commit to CDC by the first week of May it became clear it wasn't really worth doing. It fizzled out. In municipalities got school districts and local health officers talking about what they might do if a flu pandemic came and COVID-19 pandemic and a conversation about a plan in place and I think that is reflected by so many urban school closures in the past few weeks.

The second paper on the active school closures in the state of Michigan during the 2009 H1N1 pandemic we would get about 550 school districts. 83% closed schools but did so in a reactive way, too late. And largely a political closure because parents wanted them to do something but because it was already circulating it did not cut down on cases of flu, which shows us a very valuable lesson that if these are to work, we must pull the trigger very early, and you end up with a very difficult decision for a health officer or school superintendent to make for all the obvious reasons. NPIs don't appear to work well historically or in computer models if isolation or social distancing policies are not well-implemented or implemented too late or for too short a period of time.

The third point is very important. Once you are doing it, you have to have the patience to see it through. Because if you pull the trigger off too early, not only will the circulating virus do what it naturally does, but all the economic and social disruptions are for nothing. ... Economic, political and social costs are high [and] need to be carefully weighed against the severity of the circulating virus. As a physician, I'm sure all of you would agree when the severity of the virus is high, [mitigation] is first priority.

All social distancing strategies raise a host of practical, ethical and legal dilemmas that often demand adjudication by our leaders. Good, strong, consistent leadership is essential. School closure is a problem because is it is a safe place for a lot of kids. Kids come from homeless families or homes where abuse might be happening and they are safer at schools than staying at home. Also, school lunches and school breakfast is something that seems to have been taken care of by most cities. All of these issues, as well as parental supervision. And what parents do if they have, say, an hourly job and they don't get paid if they don't show up. These are some of the things being discussed right now in the halls of Congress as they develop a package to help American society get through this crisis. If you are interested in the history of the flu epidemic, the Centers for Disease Control has developed a wonderful American influenza epidemic of 1918-1919 [resource], it is digital, the largest collection of materials on influenza. Stories and biographies in different cities of America, photographs and primary sources and so on. www.influenza.archive.org and I will close with that. Thank you so much.

Nikki Laurie: Thank you so much, Dr. Markel. That was so terrific and a great reminder of how much we learn from history and how much you help to uncover during so much of your career now, helping us think about this current situation. Let me turn this over now to Dr. Lipsitch to talk about models.

Marc Lipsitch: Thank you. Thanks for the opportunity to be here to some honor indeed. I wish it were on a different occasion, but thank you for the opportunity. Harvard T.H. Chan School of Public Health is working pretty much nonstop on this topic. This is the team working on it. This a slide of the epidemic curve from Wuhan, focusing on the critically ill, those needing intensive care. This one picture is the reason why social distancing was being practiced in the United States right now. You see here January 23rd date, the City of Wuhan was locked down. In the brown color we see the widening number of critically ill, which rose to almost exactly four weeks after the lockdown because we have a person who gets infected, it takes them 2 - 4 weeks before they leave intensive care typically. When we are dealing with the problem we have to deal with the problem that looks small in order to avoid the three weeks later or four weeks later consequences of growing demand for intensive care and hospitalization. So that is why it is challenging. There is much pressure to put control measures in place as Howard talked about just now. The problem looks bad, but that's why we have to do it.

For reference, these are the per capita bed availability in the United States in intensive care. Available beds and total beds, including those that are occupied. We see the peak demand for care in Wuhan. It rose to where on a per capita basis every bed in intensive care available here. That is why we are talking about distancing. But before we get to social distancing, the question I get the most is, why can't we do, focus on other interventions? And Howard mentioned some of these used in 1918. Isolation and quarantine and tracing, they are good for certain kinds of diseases at certain stages of the epidemic. Those countries which caught nearly every case early with high testing capacity are capable of doing — they all depend on tracking individual cases. Also seal borders because they are islands, those in many places have been able to implement those kinds of very testing and ... individual interventions to get the problem under control.

The problem is, we are not Singapore. We are not a small town. We are a big country, and it has allowed transmission to continue to a point where most [COVID-19 cases] are undetected, even now. When case focused interventions fell, which are most of the cases, even if we could control all of them can't do much to fight the epidemic because it was controlled in such a small portion. More on this in an article I have in the Washington Post. I hope the slides will be shared.

So what we can do is social distancing ... in this modeling I'm going to describe we do not make assumptions about the effectiveness of social distancing in reducing transmission. To make a range of assumptions. One is no effect, one is medium effectiveness, and one is more effectiveness 20%-60% reduction in transmission. We are not saying which of these is likely to happen because every community in the country practically is trying different combinations of interventions. Although we have beautiful data we just saw from influenza ... but what direction.

These assumptions and the question is if we assume we can achieve some levels of social distancing what would that mean. The basic conclusion is, if we do one shot social distancing, one period where we reduce the transmission and then we let up, which has been suggested by our leaders, we delay the peak and stop this and we delay it we keep interventions in place more intense interventions the lower in this early apartment potential the higher it is because there is still many left in the population at the end of social distancing. This is the model of two epidemics we saw on Howard's slides in data from 1918.

If transmission is the same ... you get a benefit no matter what social distancing you do and actually modest amounts of social distancing for a long time do the best because they spread out the cases better than social distancing which doesn't have time to work. What about seasonality? Wintertime has more transmission than summer, and we have some pretty good evidence of that from other coronaviruses. We don't know if that is currently true with this virus.

From the summer, Australia, tropical places, we don't know how seasonal those are. Delaying the peak can backfire because it would coincide with higher transmission, therefore, more people infected versus one shot social distancing than if we did nothing, which is a discouraging outcome to say the least. That is one shot and seasonality. Also in this model we have this problem with critical-care ... if one shot distancing seasonality is negligible long term, moderate social distancing benefit. If there is seasonality and long,

effective social distancing is best, but making it worse by delaying the peak into the winter were there more cases because there's more transmission plus also coincides with flu season.

I would say that if we tried a policy of one shot social distancing it is treacherous. Please ask others because views on seasonality are varied within the community, mostly because we don't have big data. But one shot social distancing could make things worse. The alternative would be to do a multi-cycled social distancing method where we put on social distancing to try to bend the curve downward until it reaches a point where we let off. Multiple peaks in this case it would have more than two peaks like ... we saw in 1918 because they are building a more slowly. And to do that we would, if we had adequate, could potentially modulate the number of cases so we keep ... quite remarkable, technical accomplishment but it is at least in theory possible. Seasonality becomes easier because the summer gives us a little respite, so we have more time off social distancing when we cumulate herd immunity at about the same rate.

Another intervention we could imagine is trying to increase our capacity for intensive care. It is the goal of social distancing to protect intensive care system, and that means can't let it get above the number of cases above the level in which would lead to overloading intensive care and having no intensive care capacity not only makes us ... in general allows us to do less social distancing a more planned off social distancing in order to get to the same or more rapid accumulation of herd immunity, accumulation of people have been infected and we hope in the for long enough ... Seasonality on top of ICU capacity ... if there is no seasonality we have 4 to 1 on two oftentimes the accumulation of herd immunity. Even in a multi-cycle case. Seasonality helps us in which we have more control, different set of facts. We don't know if they are there or not. Doubling ICU capacity, which is not trivial, for increasing capacity would allow us to have longer breaks and faster accumulation of herd immunity. Also points to the need for very good surveillance in place so we can track the epidemic as we do the on and off social distancing. This is a policy that might work if we can accomplish it

Last thing maybe one exit strategy, if we can get cases down and testing out, we could go from being in a situation like we are in now where there is too few tests and too many cases. Successful countries have controlled with interventions. Few cases can trace most of them, most are detected and case-based interventions as Howard described, used in 1918, might be helpful here. A major caveat to that strategy is importations ... in general there is the synergy of social distancing and contact tracing .. The idea is if you get the introduction number and transmissions down enough with social distancing, other interventions become more practicable. That is the end of my main slides. And I will stop there.

Nikki Laurie: Thank you so much. What an incredible, productive and interesting presentation. I have been watching the comments from the slides come pouring in. So I know we will have a lot to talk about during the Q&A and afterwards. Thanks so much. Let's go now to Mitch Stripling to what this is like in reality on the ground.

Mitch Stripling: Thanks. Can folks hear me?

Nikki Laurie: Yes.

Mitch Stripling: Thank you so much. Hi, everybody. I am not a clinician, provider, or doctor. I am a public health emergency manager. I am astounded by the science and knowledge on the call today and am here to talk about the operations of management... how we might improve that management, talking about one shot or multiple cycles or however this works out.

I have been doing this for a long time, and I feel we are starting with a deficit because pandemic planning in this country [has been a failure of storytelling] ... People have imagined this, but for some reason in this country, we've never being able to tell the story of this in a way that made sense to folks. Countries that went through SARS and MERS brought this idea about the response from social distancing in ways that we didn't in this country. I think ... some of the difficulties in management we are seeing. We have clinics in all 50 states in three continents so we are looking at this from the really broad [perspective], really critical issues and best practices going forward.

One of the things I have learned talking with folks doing outreach and pandemic is it's a really tough time to learn new vocabulary. Talking about nonpharmaceutical interventions, social distancing, all of that language,

comes from scientific baggage. ...people are talking about social distancing, [but] physical distancing what we are trying to do — keep people physically [separate while] keeping social connections strong. Even that is vaguely generic. One thing getting a lot more successful [uptake] is moving from ‘social distancing’ to ‘stay home’ or ‘stay 6 feet away’, ‘[shop for] groceries once a week.’

The reason that language is important: the definitions they are using are challenging during this outbreak. Social distancing a few weeks ago is different. ... People are understanding we are not necessarily winning the war ...

In the management, how do we get that language to be as plain language as possible ?...Another we need to look at is durability -- variability. This is a vastly different way across the country. We are a unified information ecosystem acting in a chaotic fashion. What that means is we are seeing come around the country, ... new restrictions on the table creating confusion, which is adding to the anxiety of the population and overall lessening the effectiveness. Because we all consume news from around the country, your social distancing encounters most impacted by whatever news [you consume]. Folks stepping back saying you can choose that social distancing strategy ... that means all these different interventions every state, every governor fighting in this ecosystem causing ... uncertainty [and] likely to worsen the mental health and economic consequences because this continual uncertainty raises the social cost.

The other thing I worry about happening ... you do this with a lack of intention, you don't get your hands around the strategy all at once ... I stand -- like to every case comes together for everybody that is what you do in a democratic society in order to do that you need the unity of messaging that is not necessarily present right now and that they are doing this for a long time you need to find ways to come together around that unity of messaging because this does impose barriers.

The third point I want to make: data are not distributed equally because the population. ... when you put social distancing restrictions in place without support, ... you push more of that disease to the most marginalized. Folks that can't work from home, grocery store workers, people that have to care more about their paycheck whether they get infected. ... You can't “Netflix and Chill” your way through a global pandemic. ... you have to keep equity at the forefront and especially if we are doing this over time ... to make sure it is supported to balance the social and economic cost. Make sure we are equitable in our response ... If we do this in a way that is not sustainable now, the social economic cost of social distancing are too high now, you run the risk society may not comply if they are asked to do it over and over again because there maybe a next time as we are seeing. So you have to make sure the support is there when restrictions are put in place.

So I guess what I want to close with, because I really want to start focusing — I want everybody on this call to think with me about a new scale. I know we are in the beginning of this ... a new era than it was a few weeks ago. But it will get worse before it gets better, and as you have seen on this amazing call, we are going to be in this battle for a long time. We need to start to imagine a new story together based on solidarity and not fear. We do social distancing in ways that support the most vulnerable ... some management strategies to pull together some threads from different cases we talked about on the call and what are happening in public health circles, we need to figure out as Dr. Lipsitch was talking about what the clear triggers are for social distancing and ... based on number of cases and number of ICU beds we need to do that in order for the messaging strategy to be clear. We should do that in a shock and awe form and try to announce everything at once as clearly as possible with a long time frame attached so that you can start to put economic support measures in place and let the population know how long it's going to be and still consistent on that message.

You use simple language. We may need to let the language of nonpharmaceutical interventions go not in [practice] but in terms of public messaging. We don't teach the public Aeronautics [to fly on an airplane]..... Make sure you roll out social distancing there is equitable support attached to that because we are going to increase the compliance Try and make it all when messaging, one message and as Dr. Lipsitch said you are buying time the curve is going down because you are getting herd immunity but because of public restrictions so you've got to use that to innovate, to try and build up tracing capacity, ICU beds, try to move to a world where you don't need to use social distancing anymore. If you can do that you can keep your messaging simple, cut down the variability and focus on equity ... those are my thoughts, and I will stop there. Thanks so much for the opportunity.

Nikki Laurie: Thank you so much. That was terrific and also incredibly practical and focused in ways I think we really needed to hear. So much appreciated. This is the time for Carlos to step up and moderate this challenging theme. Scores and scores and scores of questions online. I will turn this over to Carlos to moderate the Q&A and ask our panelists to be ready to answer questions. Thank you.

Carlos del Rio: Thank you very much. This is really a fantastic webinar. With great questions and great information. I think is going to help at this time. There is obviously a lot of questions that have come up. Looking at the chat there really is an enormous amount of questions. I think a lot of the questions have a local [angle]. I will start with one: 'Is there is any evidence in the Bay Area that started shelter-in-place March 16, before anywhere else in the country, is actually flattening the curve?' Does anybody know? People that started early are seeing a difference?

Marc Lipsitch: This is Marc. There are many parts of the data I have not seen.
Breaking up.
The evidence is out there.

Carlos del Rio: One of the questions people have is "Why are we asking people to stay at home?" They read an article that 75% of transmission in China happened among family members. Why don't we use hotels as isolation centers, then isolation places as China did? Why are we sending people home to transmit to their families?

Marc Lipsitch: One important piece of that, I hope Mitch will weigh in ... one piece of that is, a large majority of transmission in the home happened largely in the time when there was a lot of social distancing because there was no place else for it to happen. Logistics have to be referred to at a particular point in time. That is what you would expect for community transmission to be shut down ...

Carlos del Rio: Thank you. I think there is some very good questions here about the fact that it looks like social distancing and interventions flatten the curve but just delay things it is too confusing. "Are we delaying things as opposed to really impacting the transmission?"

Marc Lipsitch: What we are doing is buying time. We are trying to keep our health care system intact by avoiding having so many cases at one time that the intensive care units become overwhelmed and in some places also the hospital system as a whole. There is no question in Howard's presentation, beautifully show this, it's not a free lunch. You don't just to get out of the cases from a little bit of social distancing. They are varied in intensity now because we are trying to protect our ability to take care of people not only from covert but from other things that put people in the medical care system. ...

Sorry I am going to be leaving this call but that is a great question. Others feel differently in the community we are all humble about our views on this because we are -- my personal view is we don't know how effective any given intervention will be. School closure, workplace closure, all these things because it is a new virus transmission characteristics are not fully worked out and it is a different society from 1918 into 2009. That is why we haven't said this is school closure and this is school closure plus workplace closure etc. we opted for a simple model that makes those assumptions I think we will learn much more as we turn those on but in my opinion we don't know yet.

How do we evaluate social distancing?

This is Howard. First of all, even though we are buying time we have to remember in the modern era there might be some developments that come while you are buying time. As well as preventing overflow of people into your hospitals, I think Mark is absolutely right. Strokes and diabetes, whatever the hospital has everyday, most hospitals have very high census rate so even for bed space for people with serious respiratory distress but not ventilator need to stress is an issue. And there is another hope too that the longer you delay somebody getting the disease, it may, the virus itself, may burn itself out.

To Marc's point, cannot be stressed enough, this is a novel coronavirus. We have no experience with it. So we are learning all sorts of things as we go on and in turn is know everything and do nothing insurgents do everything and know nothing and pathologists know everything and do everything but too late.

There is a problem where we will get much better data on how the social distancing plans work flattening the curve or what have you, several weeks down the line, look at the case mortality rate getting more accurate one is dependent on lots of testing for people with mild to moderate disease, to hopefully change the nominator of the CFR. This is what is so tough about it is that we are flying by the seat of our pants. I think too, Americans doing these things ... part of this is to prevent people from getting sick for as long as possible in the hope that it either goes away or we can make it go away. And, finally, 1918 was a very different time. The federal government was very weak, people lived very different lives, some people had cars but we didn't have jet planes, we didn't have interconnectivity, entertainment and all that kind of stuff. Also a majority of stay-at-home mothers who care for their children when they were out of school, which is another issue now where some 70% of Americans mothers work outside the home. All of these things are issues.

Mitch Stripling: I want to say from a management standpoint, looking at the whole of society, the community approach to this ... it's so hard to take this idea of social distancing ... because of the high societal costs. I guess the other reason there is social distancing now is this idea of buying time ... not now we are short of tests we can do now but a model we can massively test and start to contain. I guess I want to put that out there because I feel like the social tests are going to be [Inaudible] two years social distancing. But it is worth pulling resources into some kind of modified containment strategy although it's going to be [Inaudible].

Carlos del Rio: I think questions coming up, "what is the rest of letting go, releasing the trigger too early?"

I think right now we would have a second wave or people are protecting it would be several weeks at least 2 - 3 weeks before we see a peak rate of COVID-19 in the United States. I don't want to predict by definition, but that is what seems like what happened. I would go to Marc's expertise on that.

I agree with that. Now, do you have -- one of the concerns I hear people talk about, we have other cities, we have a country that is heterogenous should there be a natural strategy -- national strategy or distance local and very different when you do in a rural community, rural Indiana or rural Georgia, unlike big cities like Chicago, Atlanta or New York?

A terrific question, and I have some historical roots to it. Traditionally, public health and health matters have been in the jurisdiction of the city or state. This dates back to the early 1800s of our republic. Justice John Marshall ruled that states have the right to inspect goods coming into their borders. That included quarantine issues. For disease issues. Also in the early 1800s, it was thought to be a local phenomenon particularly epidemic diseases, organic material ... would create its own disease situation compared to say traditional conditions. In Ann Arbor we have a hotspot of municipal and state jurisdictions and ... we are blessed with a wonderful Center of disease control, but without ... local areas to federal offices it's not just come and take over unless the president declared a contagious disease emergency.... in place national strategy to account for some of these things cities versus rural areas, suburbs all that kind of stuff, the real job is not only just crisis but would we do after the crisis. ... I would vote for not only local, state and federal guidance but also international guidance ... We live in a global village. we have a global economy, and we go everywhere. I think we need to have a tool for the 21st century to have this kind of clear planning to have this federal, international going all the way down to the state, province, municipality.

Those are very, very good points. There is a variety of other questions that have come up but I think a lot of it can be summarized: "Really, are we influencing a lot of these metrics too late? ... What is the reluctance, and why didn't we do it before? What is the challenge?"

You know really looking at the influenza in 1918 the inflection point two times the rate of influenza in those cities, the year before ... three years before of course there is data for that. That's really tough with COVID-19 because of this, because it is novel we don't know what the infection point is. My view, students are states have acted might argue too early are likely to have a better experience in terms of morbidity than those New York City and New York State which is struggling right now late to come to the social distancing party would be a very different picture very different set of curves we might say see in the state of Michigan that has been very proactive shutting things down before it became a real problem.

I'm trying to look forward rather than back in part because looking back makes me so sad of missed opportunities. But I think actually the most important thing, we are putting ourselves in a position we don't want to be in for social distancing. Nobody likes it, has had impacts on especially those disadvantaged we waste his time and don't do everything to build up capacity for testing for personal protective equipment, for ventilators, for intensive care beds, all the things that we now know we need, it would be a further tragedy. That's what we've got to do and use this time well that we are buying because it is at a high price

... it matters less how many cases you have any given community than the fact that that community is socially connected to another cases throughout the geography of the country. ... We can have a strategy, but because it was in the country, it is likely in each community whether or not the community knows it yet.

Nikki Lauri: We are out of time for questions. I want to thank Carlos for the terrific questions and for moderating the candidates...we continue to hear there is a lot of unknown, a lot of uncertainty. I think towards the end we heard I think some really important forward-looking messages thinking about where we want to or could be when we relax these measures and when we see the next bump up start to arrive.

... what we want to have in place at the end of this ... we want to recover from this and be a better country than we were going into it and be stronger, more unified more united and have a much stronger public health system. So we are going to pick up this conversation next week. Everybody who is registered for this will be given an invitation, and right now we will continue the conversation about the science as far as relaxing measures are concerned we will also discuss some of the mental health strategies for getting through behavioral health strategies for addressing this and continued more discussion about the risk-benefit analyses what we need to do to be sure a month from now or six weeks from now you can help the benefits really outweigh the risks. Follow these webinars. They will be recorded and transcribed and posted on something called COVID19Conversations.org. You can find more information there.

On behalf of the National Academies and the American Public health Association, our advisor committee, panelists, terrific speakers, Carlos and everybody else, I want to thank you all for joining this conversation. I hope that it has helped you understand a little more about the evidence for what it is going on here and all the uncertainty if there are ways we can contribute to reducing some of the uncertainties. Until we see you all next week, I hope you all stay safe and healthy and continue to do other terrific work that you are doing to contribute to us solving this national problem, and this worldwide problem, together. Thanks. Victor do you have any other closing comments?

Victor Dzau: I want to thank people for being here, that is it. Thank you.

Nikki Laurie: Okay, Georges?

Georges Benjamin: Thanks, everybody.

Nikki Laurie: Thank you, everybody. Thank you very much. [event concluded]